As filed with the Securities and Exchange Commission on March 1, 2019

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

Precision BioSciences, Inc.
(Exact name of registrant as specified in its charter)

Delaware	2836	20-4206017
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

302 East Pettigrew St., Suite A-100
Durham, North Carolina 27701
(919) 314-5512
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Matthew Kane
President and Chief Executive Officer
Precision BioSciences, Inc.
302 East Pettigrew St., Suite A-100
Durham, North Carolina 27701
(919) 314-5512
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

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Approximate date of commencement of proposed sale to the public:
As soon as practicable after this Registration Statement is declared effective.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933 check the following box: ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act ☐

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Proposed maximum aggregate offering price(1)	Amount of registration fee(2)
Common Stock, $0.000005 par value per share	$100,000,000	$12,120

(1) Estimated solely for the purpose of calculating the registration fee in accordance with Rule 457(o) under the Securities Act of 1933. Includes the aggregate offering price of additional shares that the underwriters have the option to purchase.

(2) Calculated pursuant to Rule 457(o) based on an estimate of the proposed maximum aggregate offering price.

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

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The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Subject to Completion, dated March 1, 2019

Preliminary prospectus

shares

PRECISION BIOSCIENCES

Common stock

This is an initial public offering of shares of common stock by Precision BioSciences, Inc. We are offering shares of our common stock. The initial public offering price is expected to be between $ and $ per share.

Prior to this offering, there has been no public market for our common stock. We have applied to list our common stock on The Nasdaq Global Market under the symbol “DTIL.”

We are an “emerging growth company” under the federal securities laws and are subject to reduced public company reporting requirements for this prospectus and future filings.

	Per share	Total
Initial public offering price	$	$
Underwriting discounts and commissions(1)	$	$
Proceeds to Precision BioSciences, Inc., before expenses	$	$

(1) See “Underwriting” for a description of compensation payable to the underwriters.

We have granted the underwriters an option for a period of 30 days to purchase up to additional shares of our common stock.

Investing in our common stock involves a high degree of risk. See “Risk factors” beginning on page 12 of this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

The underwriters expect to deliver the shares of commons stock to purchasers on or about , 2019.

J.P. Morgan **Goldman Sachs & Co. LLC** **Jefferies** **Barclays**

, 2019.

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Neither we nor the underwriters have authorized anyone to provide any information or to make any representations other than those contained in this prospectus or in any free writing prospectus prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the shares offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus or in any applicable free writing prospectus is current only as of its date, regardless of its time of delivery or any sale of shares of our common stock. Our business, financial condition, results of operations and prospects may have changed since that date.

Through and including , 2019 (the 25th day after the date of this prospectus), all dealers that effect transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

We have proprietary rights to trademarks, trade names and service marks appearing in this prospectus that are important to our business. Solely for convenience, the trademarks, trade names and service marks may appear in this prospectus without the ® and ™ symbols, but any such references are not intended to indicate, in any way, that we forgo or will not assert, to the fullest extent under applicable law, our rights or the rights of the applicable licensors to these trademarks, trade names and service marks. All trademarks, trade names and service marks appearing in this prospectus are the property of their respective owners.

For investors outside the United States: Neither we nor the underwriters have done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside the United States.

Prospectus summary

This summary highlights selected information contained in greater detail elsewhere in this prospectus. This summary does not contain all of the information you should consider before investing in our common stock. You should read this entire prospectus carefully, especially the risks of investing in our common stock discussed under "Risk factors" and our financial statements and the related notes thereto included at the end of this prospectus, before making an investment decision. As used in this prospectus, unless the context otherwise requires, references to "we," "us," "our," "the Company" and "Precision" refer to Precision BioSciences, Inc. and its subsidiaries on a consolidated basis.

Overview

We are a genome editing company dedicated to improving life through our groundbreaking proprietary genome editing platform, "ARCUS." We leverage ARCUS in the development of our product candidates, which are designed to treat human diseases and create healthy and sustainable food and agricultural solutions. We believe the versatility and breadth of ARCUS support our ability to develop products across the spectrum of biotechnology. We are actively developing product candidates in three innovative and high value areas where we believe our technology has the potential to overcome the limitations of other genome editing technologies: allogeneic CAR T immunotherapy, *in vivo* gene correction, and food. The U.S. Food and Drug Administration, or FDA, recently accepted our investigational new drug, or IND, application for our first gene-edited allogeneic CAR T cell candidate targeting CD19 and we expect to commence a Phase 1/2a clinical trial in patients with acute lymphoblastic leukemia and non-hodgkin lymphoma in the first half of 2019. We believe this trial will be the first clinical investigation of an allogeneic CAR T therapy for non-hodgkin lymphoma. We believe our proprietary, one-step engineering process for producing allogeneic CAR T cells at large scale in a cost-effective manner will enable us to overcome the fundamental challenges of manufacturing that have limited the CAR T field to date.

Our genome editing platform

Genome editing is a biotechnology process that removes, inserts or repairs a portion of DNA at a specific location in a cell's genome. Our proprietary genome editing platform, ARCUS, is a novel genome editing technology using sequence-specific DNA-cutting enzymes, or nucleases, that is designed to perform modifications in the DNA of living cells and organisms.

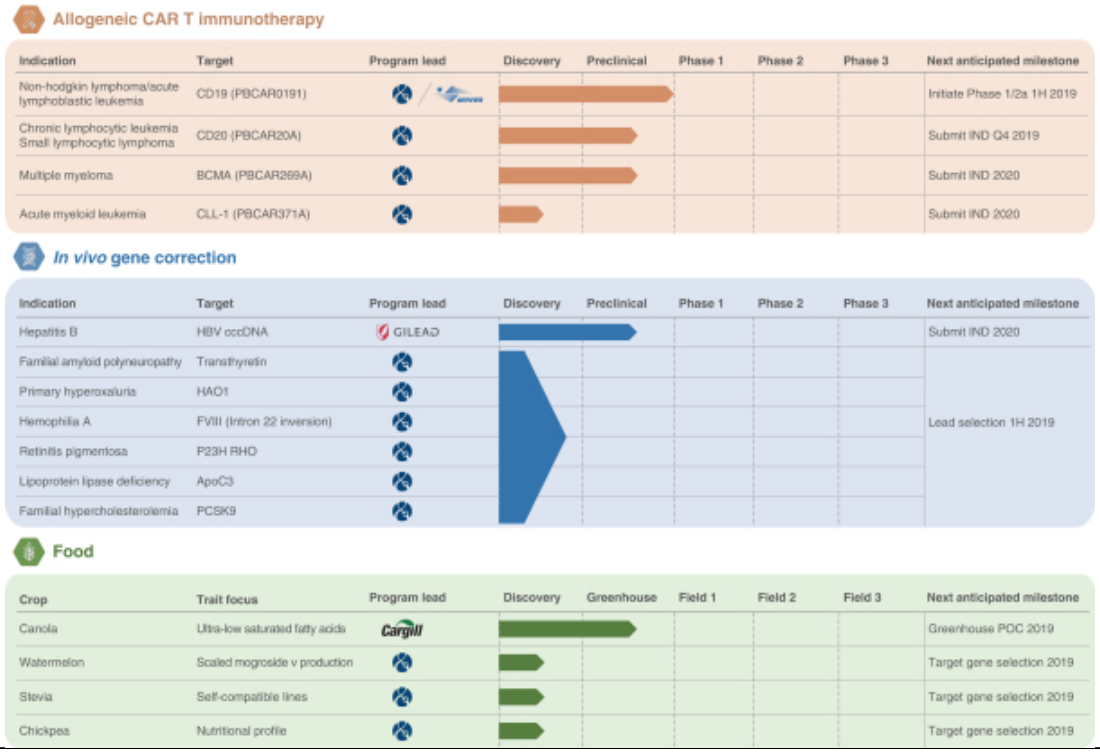
ARCUS is not a CRISPR/Cas9 technology. ARCUS is a collection of protein engineering methods that we developed specifically to re-program the DNA recognition properties of the natural genome editing enzyme, I-CreI. In nature, I-CreI is an endonuclease found in the genome of the algae *Chlamydomonas reinhardtii*, which evolved for the purpose of carrying out a complex gene insertion edit.

To apply I-CreI to genome editing in other cells or organisms, we must modify it to recognize and cut a different DNA sequence for each new application we pursue. Since the I-CreI endonuclease evolved to recognize its target sequence in the algae genome with a high degree of selectivity, as supported by scientific literature, it was necessary for us to develop sophisticated protein engineering methods to re-engineer I-CreI to bind and cut a different DNA sequence. Using ARCUS, we create customized endonucleases for particular applications. We call these custom endonucleases "ARCUS nucleases."

We believe ARCUS has a number of attributes that are beneficial for genome editing applications, such as:

- **High Specificity**. Complex genome editing applications, especially those involving the human body, require a high level of endonuclease specificity to limit the likelihood that the endonuclease will recognize and edit any genetic sequence other than its intended target.
- **High Efficiency**. In our preclinical studies conducted to date, ARCUS has shown the ability to achieve a high level of on-target editing while rarely cutting off-target.
- **Easy Delivery**. ARCUS is very small relative to other genome editing endonucleases. As such, we believe it will be compatible with many different delivery mechanisms.
- **Type of cut**. The three prime, or 3', overhangs created when ARCUS cuts DNA have been observed to promote DNA repair through a mechanism called “homology directed repair,” or HDR. 3' overhangs are stretches of unpaired nucleotides in the end of a DNA molecule. We believe this adds significant versatility to ARCUS and will enable us to efficiently insert or repair DNA as well as delete DNA.
- **Programmability**. ARCUS has been observed in our preclinical studies to recognize its DNA target site through a complex network of interactions that is challenging to re-program for new editing applications involving different DNA sequences. This engineering challenge represents a high barrier to entry and has enabled us to secure a strong intellectual property position and control over what we believe to be a superior genome editing technology.

Our product pipeline



We are leveraging ARCUS to develop product candidates in three high value areas: allogeneic CAR T immunotherapy, *in vivo* gene correction and food. In each area, we have surrounded ARCUS with ancillary technologies and manufacturing capabilities specific to that field. This enables us to advance three independent pipelines with separate and distinct opportunity and risk profiles.

Allogeneic CAR T immunotherapy. We believe that we have developed a transformative allogeneic chimeric antigen receptor, or CAR, T immunotherapy platform with the potential to overcome certain limitations of autologous CAR T cell therapies and significantly increase patient access to these cutting-edge treatments. Cancer immunotherapy is a type of cancer treatment that uses the body's immune system to fight the disease. CAR T is a form of immunotherapy in which a specific type of immune cell, called a "T cell," is genetically engineered to recognize and kill cancer cells. Current commercially available CAR T therapies are autologous, meaning the T cells used as the starting material for this engineering process are derived directly from the patient. As a consequence, the therapy is highly personalized, difficult to scale and expensive. Our allogeneic approach uses donor-derived T cells that are gene edited using ARCUS and are designed for safe delivery to an unrelated patient. We believe that this donor-derived approach will lessen the product-to-product variability seen in autologous therapies and will allow us to consistently produce a potent product by selecting donors with high quality T cells. We are able to produce allogeneic CAR T cells at large scale in a cost-effective manner and have the potential to overcome the "one patient: one product" burden of autologous CAR T cell therapies.

In February 2016, we entered into a development and commercial license agreement, as amended, with Baxalta (now Shire Plc), which we refer to as the Servier Agreement. This agreement was assigned to Les Laboratoires Servier, or Servier, in connection with Servier's acquisition of Shire's oncology business in August 2018. Pursuant to this agreement we have agreed to perform early-stage research and development on individual T cell modifications for up to six unique antigen targets, the first of which was selected by Baxalta at the inception of the agreement and the remaining five of which may be selected by Servier over the first four years of the agreement. Upon selection of an antigen target, we have agreed to develop the resulting therapeutic product candidates through Phase 1 clinical trials and prepare the clinical supply of such product candidates for use in Phase 2 clinical trials. Our most advanced program, PBCAR0191, is an allogeneic CAR T cell therapy targeting the well-validated tumor target CD19 and is being developed for acute lymphoblastic leukemia, or ALL, and non-hodgkin lymphoma, or NHL. CD19 is a protein that is expressed on the surface of B cells. Our IND for PBCAR0191 was accepted by the FDA in November 2018 and we expect to commence a Phase 1/2a clinical trial in patients with relapsed or refractory, or R/R, B-cell precursor ALL and R/R NHL in the first half of 2019. The FDA has granted PBCAR0191 orphan drug designation for the treatment of ALL. We are also in preclinical development of CAR T cell therapies targeting the tumor antigens CD20, BCMA and CLL-1. We expect to submit an IND to the FDA for our CD20 product candidate in the fourth quarter of 2019 and for each of our BCMA product candidate and our CLL-1 product candidate in 2020.

We have used the qualities of ARCUS to develop a one-step cell engineering process for allogeneic CAR T cells that is designed to rapidly yield a consistent cell product at a significantly lower cost than autologous CAR T cell therapies. Due to our one-step editing method and the decision early in the development of our allogeneic CAR T immunotherapy platform to invest in process development, we have scaled our manufacturing process and are currently producing allogeneic CAR T cells at large scale in accordance with good manufacturing practice, or GMP.

***In vivo* gene correction.** Our goal is to cure genetic diseases by correcting the DNA errors responsible for causing them. *In vivo* gene corrections are gene corrections that take place in a living organism. We are advancing a deep portfolio of diverse programs toward *in vivo* efficacy and toxicity studies. We are generating a significant large animal dataset that we believe will be the most comprehensive of any in the field and have

observed high-efficiency *in vivo* genome editing in non-human primates in our preclinical studies, as highlighted in our July 2018 publication in *Nature Biotechnology*. We believe this is the first peer-reviewed publication of *in vivo* genome editing data in non-human primates. In our preclinical studies, we observed the high-efficiency editing of the PCSK9 gene in non-human primates using ARCUS and, even at the highest dose, the treatment was observed to be well-tolerated. We have continued to observe the subjects for over two years since initial dosing and the benefit of the treatment in these studies appears to be permanent, which we believe is due to modifications to the DNA itself.

In September 2018, we announced a collaboration with Gilead Sciences, Inc. to co-develop an ARCUS-based product candidate that is designed to cure chronic Hepatitis B infection. We intend to submit an IND to the FDA in 2020 for this product candidate. We are also in the discovery stage for other *in vivo* indications: familial amyloid polyneuropathy, primary hyperoxaluria, hemophilia A, retinitis pigmentosa, lipoprotein lipase deficiency and familial hypercholesterolemia. We intend to select an indication and target for our next *in vivo* product candidate in the first half of 2019.

Food. Our food platform, which we operate through our wholly owned subsidiary, Elo Life Systems, or Elo, is an integrated suite of gene discovery and crop engineering technologies that is designed to generate pre-breeding materials in collaboration with leading food producers. Pre-breeding material is a gene edited crop intermediate that the collaborating partner can integrate into their breeding program and use in producing new crop varieties. We believe we have the most in-depth experience in crop genome editing in the industry. Over the last decade, we have worked with some of the largest plant biotechnology companies to edit gene targets and develop potential product candidates in a variety of crop plants. By combining the power of our ARCUS technology platform with target discovery, transformation and high throughput trait evaluation, we are enabling our partners to potentially address critical issues in food and agriculture created by climate change and dramatic shifts in consumer preference toward healthier eating. Our collaboration-based business model enables us to remain capital efficient throughout the product development cycle while generating revenue through various revenue-sharing models. For example, since 2014, Elo and Cargill have been engaged in a collaboration to produce ARCUS-optimized canola varieties and have achieved significantly lower levels (less than 4.5%) of saturated fatty acids compared to the current levels (7%) in greenhouse studies. Prior to commercialization of any of our food product candidates, we must complete greenhouse studies and three phases of field testing.

Our strategy

Our goal is to broadly translate the potential of genome editing into permanent genetic solutions for significant unmet needs. Our strategy to achieve this goal includes the following key elements:

- Create a fully integrated genome editing company capable of delivering solutions that address unmet needs impacting human health.
- Accelerate advancement of our first four allogeneic CAR T immunotherapy product candidates while investing in the research and development of additional allogeneic CAR T programs.
- Advance *in vivo* genetic correction programs into human clinical trials.
- Build a food business focused on developing products designed to improve human health and respond to the impacts of climate change.
- Continue investing in the optimization of ARCUS and enabling technologies.

- Create an environment that is a destination of choice for premier talent within the life sciences industry.
- Expand the breadth of our operations through additional product platforms and strategic relationships.

Sources of capital

To date, we have generated approximately $300 million from third parties through a combination of preferred stock and convertible note financings, an upfront payment under the Servier Agreement and additional funding from other strategic alliances and grants. Across our preferred stock financings, we received investments from venBio, F-Prime, ArrowMark Partners, Franklin Templeton, Cowen Healthcare, Gilead, Brace Pharma, Portfax AgTech, OCV Partners, Adage Capital, RA Capital, Amgen Ventures, Vivo and Ridgeback Capital, among others.

In March 2019, we entered into a convertible note purchase agreement for the issuance and sale of approximately $39.6 million aggregate principal amount of convertible promissory notes, or the 2019 Notes, in a private placement transaction. The 2019 Notes accrue interest at a rate of 6% per annum and will automatically settle into shares of our common stock in connection with the closing of an initial public offering by us with aggregate gross proceeds of at least $50 million at a settlement price equal to the lesser of (1) 85% of the initial public offering price per share set forth on the cover page of this prospectus or (2) a price per share equal to $800.0 million divided by our fully diluted capitalization as of immediately prior to the closing of such offering.

Risks associated with our business

Our business is subject to a number of risks that you should be aware of before making an investment decision. You should carefully consider all of the information set forth in this prospectus and, in particular, should evaluate the specific factors set forth under “Risk factors” in deciding whether to invest in our common stock. Among these important risks are the following:

- We have incurred significant operating losses since our inception and expect to continue to incur losses for the foreseeable future. We have never been profitable, and may never achieve or maintain profitability.
- We will need substantial additional funding, and if we are unable to raise a sufficient amount of capital when needed on acceptable terms, or at all, we may be forced to delay, reduce or eliminate some or all of our research programs, product development activities and commercialization efforts.
- We have a limited operating history, which makes it difficult to evaluate our current business and future prospects and may increase the risk of your investment.
- ARCUS is a novel technology, making it difficult to predict the time, cost and potential success of product candidate development. We have not yet been able to assess the safety and efficacy of any product candidates in humans.
- The regulatory landscape that will apply to development of therapeutic product candidates by us or our collaborators is rigorous, complex, uncertain and subject to change, which could result in delays or termination of development of such product candidates or unexpected costs in obtaining regulatory approvals.

- Adverse public perception of genome editing may negatively impact the developmental progress or commercial success of potential products.
- Our research and development programs may not lead to the successful identification, development or commercialization of any potential products.
- Positive results, if any, obtained from early preclinical studies or clinical trials of our product candidates may not be predictive of results of later studies or trials, and failure to replicate positive results from early studies or clinical trials may inhibit our ability to further develop and commercialize product candidates.
- Clinical trials are difficult to design and implement, expensive, time-consuming and involve an uncertain outcome, and the inability to obtain regulatory approval for product candidates would substantially harm our business.
- If any of our product candidates do not work as intended or cause undesirable side effects, it could hinder or prevent receipt of regulatory approval or realization of commercial potential for them or our other product candidates and could substantially harm our business.
- Delays in completing our planned manufacturing facility or failure to achieve operating efficiencies from it may require us to devote additional resources and management time to manufacturing operations and may delay our product development timelines.
- Our ability to compete may decline if we do not adequately protect our proprietary rights, and our proprietary rights do not necessarily address all potential threats to our competitive advantage.
- Third parties may assert claims against us alleging infringement of their patents and proprietary rights, or we may need to become involved in lawsuits to defend or enforce our patents, either of which could prohibit our use of proprietary technology or sale of potential products or put our patents and other proprietary rights at risk.

Implications of being an emerging growth company

We are an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year in which we have total annual gross revenue of $1.07 billion or more, (2) the last day of the fiscal year following the fifth anniversary of the date of the completion of this offering, (3) the date on which we have issued more than $1.0 billion in nonconvertible debt during the previous three years or (4) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission, or the SEC, which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- being permitted to present only two years of audited financial statements and only two years of related “Management’s discussion and analysis of financial condition and results of operations” in this prospectus;
- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements;

- reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports, proxy statements and registration statements; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We have taken advantage of reduced reporting burdens in this prospectus and may elect to take advantage of other reduced reporting requirements in future filings. In particular, in this prospectus, we have provided only two years of audited financial statements and corresponding “Management’s discussion and analysis of financial condition and results of operations” disclosure and have not included all of the executive compensation related information that would be required if we were not an emerging growth company.

In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This provision of the JOBS Act allows an emerging growth company to delay the adoption of these accounting standards until they would otherwise apply to private companies. We have elected to take advantage of this extended transition period.

Even after we no longer qualify as an emerging growth company, we may still qualify as a “smaller reporting company,” which would allow us to take advantage of many of the same exemptions from disclosure requirements including reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements.

Corporate information

We were incorporated in Delaware in January 2006. Our principal executive offices are located at 302 East Pettigrew St., Suite A-100, Durham, North Carolina 27701, and our telephone number is (919) 314-5512. Our website address is www.precisionbiosciences.com. The information contained in, or accessible through, our website does not constitute a part of this prospectus.

The offering

Common stock offered by us	shares
Common stock to be outstanding immediately after this offering	shares (or shares if the underwriters exercise their option to purchase additional shares in full).
Option to purchase additional shares	We have granted the underwriters a 30-day option to purchase up to additional shares of our common stock at the public offering price less the underwriting discounts and commissions.
Use of proceeds	We estimate that the net proceeds from this offering will be approximately $ million (or approximately $ million if the underwriters exercise in full their option to purchase additional shares of common stock), at an assumed public offering price of $ per share, after deducting estimated underwriting discounts and commissions and the estimated offering expenses payable by us. We anticipate that we will use the net proceeds of this offering to advance and expand our clinical and preclinical development programs, fund the build-out of our planned cGMP-compliant manufacturing facility and the remainder for working capital and other general corporate purposes. For a more complete description of our intended use of the proceeds from this offering, see “Use of proceeds.”
Risk factors	You should carefully read the “Risk factors” beginning on page 11 and the other information included in this prospectus for a discussion of factors you should consider carefully before deciding to invest in our common stock.
Proposed Nasdaq Global Market symbol	“DTIL”

The number of shares of our common stock to be outstanding after this offering is based on 33,955,770 shares of our common stock outstanding as of December 31, 2018, and excludes:

- 16,572,861 shares of common stock issuable upon exercise of stock options outstanding under our 2006 Stock Incentive Plan, referred to as our 2006 Plan, and our 2015 Stock Incentive Plan, referred to as our 2015 Plan, in each case as of December 31, 2018, at a weighted-average exercise price of $2.34 per share;
- shares of our common stock reserved for future issuance under our 2019 Incentive Award Plan, referred to as our 2019 Plan, which will become effective in connection with this offering, which number does not include any automatic increases in the number of shares of our common stock reserved for future issuance under our 2019 Plan; and
- shares of our common stock reserved for future issuance under our 2019 Employee Stock Purchase Plan, referred to as our 2019 ESPP, which will become effective in connection with this offering, which number does not include any automatic increases in the number of shares of our common stock reserved for future issuance under our 2019 ESPP.

Unless otherwise indicated, this prospectus reflects and assumes the following:

- a -for- reverse stock split of our common stock, which will become effective prior to the effectiveness of the registration statement of which this prospectus forms a part;
- the automatic conversion of all outstanding shares of our convertible preferred stock outstanding into an aggregate of 47,606,095 shares of our common stock upon the closing of this offering;
- the issuance of shares of common stock upon the automatic settlement of the 2019 Notes, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus, in connection with the closing of this offering;
- no exercise of outstanding options after December 31, 2018;
- the filing of our amended and restated certificate of incorporation, which will occur upon the closing of this offering; and
- no exercise by the underwriters of their option to purchase additional shares of our common stock.

Summary consolidated financial data

The following tables present a summary of our historical financial data for the periods ended on and as of the dates indicated. We have derived the summary consolidated statements of operations data for the years ended December 31, 2017 and 2018 and summary consolidated balance sheet data as of December 31, 2018 from our audited consolidated financial statements included elsewhere in this prospectus. Our historical results are not necessarily indicative of the results that should be expected for any future period. You should read the following summary consolidated financial data together with the more detailed information contained in "Selected consolidated financial data," "Management's discussion and analysis of financial condition and results of operations" and our consolidated financial statements and the related notes included elsewhere in this prospectus.

(in thousands, except share and per share data)	Years ended December 31, 2017	2018
Consolidated Statements of Operations Data:		
Revenue	$ 6,484	$ 10,883
Operating expenses:		
Research and development	20,324	45,122
General and administrative	8,016	13,673
Impairment of intangible assets	118	—
Total operating expenses	28,458	58,795
Loss from operations	(21,974)	(47,912)
Other income:		
Interest income	872	1,875
Net loss and net loss attributable to common stockholders—basic and diluted	$ (21,102)	$ (46,037)
Net loss per share attributable to common stockholders—basic and diluted	$ (0.62)	$ (1.37)
Weighted-average shares of common stock outstanding—basic and diluted(1)	33,956,010	33,675,834
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited)(1)		$ (0.64)
Pro forma weighted-average shares of common stock outstanding—basic and diluted (unaudited)(1)		71,840,382

(1) See Note 10 to our audited consolidated financial statements included elsewhere in this prospectus for an explanation of the method used to calculate the historical and pro forma basic and diluted net loss per share of common stock and the weighted-average number of shares used in the computation of the per share amounts.

(in thousands)	As of December 31, 2018 Actual	Pro forma(1)	Pro forma as adjusted(2)
Consolidated Balance Sheet Data:			
Cash and cash equivalents	$103,193	$ 142,743	$
Working capital(3)	101,600	101,600	
Total assets	138,600	138,600	
Total liabilities	98,640	98,640	
Accumulated deficit	(85,187)	(85,187)	
Stockholders' equity	39,960	79,510	

(1) The pro forma consolidated balance sheet data gives effect to the automatic conversion of all outstanding shares of our convertible preferred stock into an aggregate of 47,606,095 shares of common stock, which will occur upon the closing of this offering, the receipt of $39.6 million in cash proceeds from the sale of the 2019 Notes in March 2019 and the automatic settlement of the 2019 Notes into shares of our common stock in connection with the closing of this offering, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus.

(2) Reflects the pro forma adjustments described in footnote (1) and the issuance and sale of shares of common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

(3) We define working capital as current assets less current liabilities. See our consolidated financial statements included elsewhere in this prospectus for further details regarding our current assets and current liabilities.

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working capital, total assets, and stockholders' equity by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. Similarly, each increase (decrease) of 1.0 million shares in the number of shares offered by us at the assumed initial public offering price would increase (decrease) each of cash and cash equivalents, working capital, total assets, and stockholders' equity by $ million, assuming the assumed initial public offering price per share remains the same and after deducting estimated underwriting discounts and commissions. The pro forma information discussed above is illustrative only and will be adjusted based on the actual initial public offering price and other terms of our initial public offering determined at pricing.

Risk factors

Investing in our common stock involves a high degree of risk. Before investing in our common stock, you should consider carefully the risks described below, together with the other information contained in this prospectus, including our consolidated financial statements and the related notes appearing herein. The occurrence of any of the following risks could materially adversely affect our business, financial condition, results of operations and prospects. In these circumstances, the market price of our common stock could decline, and you may lose all or part of your investment.

Risks related to our financial condition, limited operating history and need for additional capital

We have incurred significant operating losses since our inception and expect to continue to incur losses for the foreseeable future. We have never been profitable, and may never achieve or maintain profitability.

We have never been profitable and do not expect to be profitable in the foreseeable future. Since inception, we have incurred significant operating losses. If our product candidates are not successfully developed and approved, we may never generate any revenue from product sales. Our net losses were $46.0 million for the year ended December 31, 2018. As of December 31, 2018, we had an accumulated deficit of $85.2 million. In addition, we have not commercialized any products and have never generated any revenue from product sales. Substantially all of our losses have resulted from expenses incurred in connection with our research and development activities, including our preclinical development activities, and from general and administrative costs associated with our operations. We have financed our operations primarily through private placements of our convertible preferred stock and our development and commercial license agreement dated February 24, 2016, as amended, with Les Laboratoires Servier, which we refer to as the Servier Agreement. The amount of our future net losses will depend, in part, on the amount and growth rate of our expenses and our ability to generate revenues.

All of our current or future product candidates will require substantial additional development time and resources before we may realize revenue from product sales, if at all. We expect to continue to incur significant expenses and operating losses for the foreseeable future. We anticipate that our expenses will increase substantially if and as we:

- continue our current research and development programs, including conducting laboratory, preclinical and greenhouse studies for product candidates;
- initiate clinical or field trials for product candidates;
- seek to identify, assess, acquire or develop additional research programs or product candidates;
- maintain, expand and protect our intellectual property portfolio;
- seek marketing approvals for any product candidates that may successfully complete development;
- establish a sales, marketing and distribution infrastructure to commercialize any products that may obtain marketing approval;
- further develop and refine the manufacturing process for our product candidates;
- change or add additional manufacturers or suppliers of biological materials or product candidates;
- validate a commercial-scale manufacturing facility compliant with current Good Manufacturing Practices, or cGMP;

- further develop our genome editing technology;
- acquire or in-license other technologies;
- seek to attract and retain new and existing personnel;
- expand our facilities; and
- operate as a public company.

No clinical studies have begun on any of our therapeutic product candidates, and it will be several years, if ever, before we obtain regulatory approval for, and are ready for commercialization of, a therapeutic product candidate. Similarly, no product candidate from our food platform has advanced to field testing, and it will be several years, if ever, before we or our collaborators commercialize any such product candidate. New food and agriculture products using the precise breeding approach generally take approximately three to five years to develop. Even if a therapeutic product candidate receives regulatory approval or a food or agriculture product advances through commercialization, future revenues for such product candidate will depend upon many factors, such as, as applicable, the size of any markets in which such product candidate is approved for sale, the market share captured by such product candidate, including as a result of the market acceptance of such product candidate and the effectiveness of manufacturing, sales, marketing and distribution operations related to such product candidate, the terms of any collaboration or other strategic arrangement we may have with respect to such product candidate and levels of reimbursement from third-party payors. If we are unable to develop and commercialize one or more product candidates either alone or with collaborators, or if revenues from any product candidate that receives marketing approval or is commercialized are insufficient, we may not achieve profitability. Even if we do achieve profitability, we may not be able to sustain or increase profitability. If we are unable to achieve and maintain profitability, the value of our common stock will be materially adversely affected.

We will need substantial additional funding, and if we are unable to raise a sufficient amount of capital when needed on acceptable terms, or at all, we may be forced to delay, reduce or eliminate some or all of our research programs, product development activities and commercialization efforts.

The process of identifying product candidates and conducting preclinical or greenhouse studies and clinical or field trials is time consuming, expensive, uncertain and takes years to complete. We expect our expenses to increase in connection with our ongoing activities, particularly as we identify, continue the research and development of, initiate clinical or field trials of, and seek marketing approval for, product candidates. In addition, if any therapeutic product candidate that we develop alone or with collaborators obtains marketing approval, we may incur significant commercialization expenses related to product manufacturing, sales, marketing and distribution efforts. Furthermore, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise sufficient capital when needed, we may be forced to delay, reduce or eliminate current or future research programs, product development activities and/or commercialization efforts.

We expect that our existing cash and cash equivalents, together with the net proceeds from this offering, will be sufficient to fund our expected operating expenses and capital expenditure requirements through . We have based this estimate on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect. Our operating plans and other demands on our cash resources may change as a result of many factors, including factors unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings or other sources, such as strategic collaborations. We do not currently expect future grant revenues to be a material source of revenue.

Attempting to secure additional financing may divert our management from our day-to-day activities, which may adversely affect our ability to develop product candidates. Our future capital requirements will depend on many factors, including:

- the timing, scope, progress, costs, results and analysis of results of research activities, preclinical or greenhouse studies and clinical or field trials for any of our product candidates;
- the costs of future activities, including product manufacturing, sales, marketing and distribution activities for any product candidates that receive regulatory approval;
- the success of our existing collaborative relationships;
- the extent to which we exercise any development or commercialization rights under collaborative relationships;
- our ability to establish and maintain additional collaborative relationships on favorable terms, or at all;
- the extent to which we expand our operations and the timing of such expansion, including with respect to facilities, employees and product development platforms;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property and proprietary rights and defending intellectual property-related claims;
- the extent to which we acquire or in-license other technologies or product candidates;
- the extent to which we acquire or invest in other businesses;
- the costs of operating as a public company; and
- the amount of revenues, if any, received from commercial sales of any products that we develop alone or with collaborators that receive regulatory approval.

Even if we believe we have sufficient funds for our current or future operating plans, we may seek additional capital if market conditions are favorable or in light of specific strategic considerations. Adequate additional financing may not be available to us on acceptable terms, or at all. If we are unable to obtain sufficient funding on a timely basis or on favorable terms, we may be required to significantly delay, reduce or eliminate one or more of our research or product development programs and/or commercialization efforts. We may also be unable to expand our operations or otherwise capitalize on business opportunities as desired. Any of these events could materially adversely affect our financial condition and business prospects.

Raising additional capital may cause dilution to our stockholders, including purchasers of common stock in this offering, restrict our operations or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of equity and/or debt financings and collaborations, licensing agreements or other strategic arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of such securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. To the extent that we raise additional capital through debt financing, it would result in increased fixed payment obligations and a portion of our operating cash flows, if any, being dedicated to the payment of principal and interest on such indebtedness. In addition, debt financing may involve agreements that include restrictive covenants that impose operating restrictions, such as restrictions on the incurrence of additional debt, the making of certain capital expenditures or the declaration of dividends. To the extent we raise additional capital through

arrangements with collaborators or otherwise, we may be required to relinquish some of our technologies, research programs, product development activities, product candidates and/or future revenue streams, license our technologies and/or product candidates on unfavorable terms or otherwise agree to terms unfavorable to us. Furthermore, any capital raising efforts may divert our management from their day-to-day activities, which may adversely affect our ability to advance research programs, product development activities or product candidates.

We have a limited operating history, which makes it difficult to evaluate our current business and future prospects and may increase the risk of your investment.

We are a genome editing company with a limited operating history. We formed our company in 2006 and spent the first nine years of our company's history developing and refining our core technology, and only during the past several years have we focused our efforts on advancing the development of product candidates. Investment in biopharmaceutical and agricultural biotechnology product development is a highly speculative endeavor. It entails substantial upfront capital expenditures, and there is significant risk that any product candidate will fail to demonstrate adequate efficacy or an acceptable safety profile, obtain any required regulatory approvals or become commercially viable. Our genome editing platform and the technologies we are using are new and unproven. We have not yet commenced human clinical trials for any of our product candidates, nor have we commenced field trials for any of our product candidates from our food platform. We have not yet demonstrated an ability to initiate or successfully complete any clinical or field trials, obtain any required marketing approvals, manufacture products, conduct sales, marketing and distribution activities, or arrange for a third party to do any of the foregoing on our behalf. Consequently, any predictions made about our future success or viability may not be as accurate as they could be if we had a history of successfully developing and commercializing products.

Additionally, we encounter risks and difficulties frequently experienced by new and growing companies in rapidly developing and changing industries, including challenges in forecasting accuracy, determining appropriate investments of our limited resources, gaining market acceptance of our technology, managing a complex regulatory landscape and developing new product candidates, which may make it more difficult to evaluate our likelihood of success. Our current operating model may require changes in order for us to adjust to these challenges or scale our operations efficiently. Our limited operating history, particularly in light of the rapidly evolving nature of the biopharmaceutical and agricultural biotechnology industries and the genome editing field, may make it difficult to evaluate our technology and business prospects or to predict our future performance. Additionally, due to the stage of our operations, we expect that our financial condition and operating results may fluctuate significantly from quarter to quarter as a result of many factors as we build our business, and you should not rely upon the results of any particular quarterly or annual period as indications of future operating performance.

We may expend our limited resources pursuing particular research programs or product candidates that may be less successful or profitable than other programs or product candidates.

Research programs to identify new product candidates and product development platforms require substantial technical, financial and human resources. We may focus our efforts and resources on potential programs, product candidates or product development platforms that ultimately prove to be unsuccessful. Any time, effort and financial resources we expend on identifying and researching new product candidates and product development platforms may divert our attention from, and adversely affect our ability to continue, development and commercialization of existing research programs, product candidates and product development platforms. Clinical trials or field trials, as applicable, of any of our product candidates may never commence despite the expenditure of significant resources in pursuit of their development, and our spending on current and future research and development programs, product candidates and product development

platforms may not yield any commercially viable products. As a result of having limited financial and managerial resources, we may forego or delay pursuit of opportunities that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to timely capitalize on viable commercial products or profitable market opportunities. Additionally, if we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other strategic arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

We expect to take advantage of a Research and Development Tax Incentive program in Australia, which could be amended or changed.

We may be eligible to receive a financial incentive from the Australian government as part of its Research and Development Tax Incentive program, or R&D Tax Incentive program. The R&D Tax Incentive program is one of the key elements of the Australian government's support for Australia's innovation system and, if eligible, provides the recipient with a 43.5% refundable tax offset for research and development activities in Australia. There have been recent proposals to change the structure of the innovation and research and development funding landscape in Australia, which may impact the research and development tax incentive receivable for the 2018 financial year and beyond. There can be no assurance that we will qualify and be eligible for such incentives or that the Australian government will continue to provide incentives, offset, grants and rebates on similar terms or at all.

Risks related to the identification, development and commercialization of our product candidates

ARCUS is a novel technology, making it difficult to predict the time, cost and potential success of product candidate development. We have not yet been able to assess the safety and efficacy of any product candidates in humans.

Our success depends on our ability to develop and commercialize product candidates using our novel genome editing technology. The novel nature of our technology makes it difficult to accurately predict the developmental challenges we may face for product candidates as they proceed through research, preclinical or greenhouse studies and clinical or field trials. There have been a limited number of clinical trials of products created with genome editing technologies, none of which has utilized our technology, and no therapeutic product candidates created with other genome editing technologies have received marketing approval in the United States or Europe. Because our therapeutic research programs are all in research or preclinical stages, we have not yet been able to assess the safety or efficacy of any product candidates in humans. Current or future product candidates may not meet safety and efficacy requirements for continued development or ultimate approval in humans and may cause significant adverse events or toxicities. All of our product candidates are designed to act at the level of DNA, and because animal DNA differs from human DNA, it will be difficult for us to test our therapeutic product candidates in animal models for either safety or efficacy, and any testing that we conduct may not translate to their effects in humans. Moreover, animal models may not exist for some of the targets, diseases or indications that we intend to pursue. Similarly, we and our collaborators have not yet completed field trials for any agricultural product candidates created with our technology. Our product candidates may not be able to properly implement desired genetic edits with sufficient accuracy to be viable therapeutic or agricultural products, and there may be long-term effects associated with them that we cannot predict at this time. Any problems we experience related to the development of our genome editing technology or any of our or our collaborators' research programs or product candidates may cause significant delays or unanticipated costs, and we may not be able to satisfactorily solve such problems. These factors may prevent us

or our collaborators from completing our preclinical or greenhouse studies or any clinical or field trials that we or our collaborators may initiate, or profitably commercializing any product candidates on a timely basis, or at all. We may also experience delays in developing a sustainable, reproducible and scalable manufacturing process as we develop and prepare to commercialize product candidates. These factors make it more difficult for us to predict the time, cost and potential success of product candidate development. If our product development activities take longer or cost more than anticipated, or if they ultimately are not successful, it would materially adversely affect our business and results of operations.

The genome editing field is relatively new and evolving rapidly, and other existing or future technologies may provide significant advantages over our ARCUS platform, which could materially harm our business.

To date, we have focused our efforts on optimizing our proprietary genome editing technology and exploring its potential applications. ARCUS is a novel genome editing technology using sequence-specific DNA-cutting enzymes, or nucleases, that is designed to perform modifications in the DNA of living cells and organisms. Other companies have previously undertaken research and development of genome editing technologies using zinc finger nucleases, transcription activator-like effector nucleases, or TALENs, and clustered regularly interspaced short palindromic repeats associated protein-9 nuclease, or CRISPR/Cas9, although none has obtained marketing approval for a product candidate developed using such technologies. Other genome editing technologies, or other existing or future technologies, may lead to the development of treatments or products that may be considered better suited for use in human therapeutics or agriculture, which could reduce or eliminate our commercial opportunity.

We are heavily dependent on the successful development and translation of ARCUS, and due to the early stages of our product development operations, we cannot give any assurance that any product candidates will be successfully developed and commercialized.

We are at an early stage of development of the product candidates currently in our programs and are continuing to develop our ARCUS technology. To date, we have invested substantially all of our efforts and financial resources to develop ARCUS and advance our current product development programs, including conducting preclinical studies and other early research and development activities, and providing general and administrative support for these operations. Our future success is dependent on our ability to successfully develop and, where applicable, obtain regulatory approval for, including marketing approval for, and then successfully commercialize, product candidates, either alone or with collaborators. We have not yet developed and commercialized any product candidates, and we may not be able to do so, alone or with collaborators.

Our research and development programs may not lead to the successful identification, development or commercialization of any products.

The success of our business depends primarily upon our ability to identify, develop and commercialize products using our genome editing technology. With the exception of our CD19 product candidate for which we plan to initiate a Phase 1/2a clinical trial in patients with relapsed or refractory, or R/R, B-cell precursor ALL and R/R NHL in the first half of 2019, all current product candidates and product development programs are still in the discovery, preclinical or greenhouse stages. We may be unsuccessful in advancing those product candidates into clinical development or field trials or in identifying any developing additional product candidates. Our ability to identify and develop product candidates is subject to the numerous risks associated with preclinical and early stage biotechnology development activities, including that:

- the use of ARCUS may be ineffective in identifying additional product candidates;
- we may not be able to assemble sufficient resources to acquire or discover additional product candidates;
- we may not be able to enter into collaborative arrangements to facilitate development of product candidates;

- competitors may develop alternatives that render our product candidates obsolete or less attractive;
- our product candidates may be covered by third parties' patents or other exclusive rights;
- the regulatory pathway for a product candidate may be too complex, expensive or otherwise difficult to navigate successfully; or
- our product candidates may be shown to not be effective, have harmful side effects or otherwise pose risks not outweighed by such product candidate's benefits or have other characteristics that may make the products impractical to manufacture, unlikely to receive any required marketing approval, unlikely to generate sufficient market demand or otherwise not achieve profitable commercialization.

Even if we do commence clinical trials of product candidates and continue to identify new product candidates, such product candidates may never be approved. Failure to successfully identify and develop new product candidates and obtain regulatory approvals for our products would have a material adverse effect on our business and financial condition and could cause us to cease operations.

If our product candidates do not achieve projected development milestones or commercialization in the announced or expected timeframes, the further development or commercialization of such product candidates may be delayed, and our business will be harmed.

We sometimes estimate, or may in the future estimate, the timing of the accomplishment of various scientific, clinical, manufacturing, regulatory and other product development objectives. These milestones may include our expectations regarding the commencement or completion of scientific studies or clinical or field trials, the submission of regulatory filings, the receipt of marketing approval or the realization of other commercialization objectives. The achievement of many of these milestones may be outside of our control. All of these milestones are based on a variety of assumptions, including assumptions regarding capital resources, constraints and priorities, progress of and results from development activities and the receipt of key regulatory approvals or actions, any of which may cause the timing of achievement of the milestones to vary considerably from our estimates. If we or our collaborators fail to achieve announced milestones in the expected timeframes, the commercialization of the product candidates may be delayed, our credibility may be undermined, our business and results of operations may be harmed, and the trading price of our common stock may decline.

Adverse public perception of genome editing may negatively impact the developmental progress or commercial success of products that we develop alone or with collaborators.

The developmental and commercial success of our current product candidates, or any that we develop alone or with collaborators in the future, will depend in part on public acceptance of the use of genome editing technology for the prevention or treatment of human diseases or for application in food or agricultural products. Adverse public perception of applying genome editing technology for these purposes may negatively impact our ability to raise capital or enter into strategic agreements for the development of product candidates.

The commercial success of any food or agricultural products that we develop alone or with collaborators may be adversely affected by claims that biotechnology plant products are unsafe for consumption or use, pose risks of damage to the environment or create legal, social or ethical dilemmas. Additionally, the public may perceive any potential food or agricultural products created with ARCUS to constitute genetically modified organisms, or GMO, even if they do not constitute genetically modified organisms under relevant regulatory requirements, and may be unwilling to consume them because of negative opinions regarding consumption of genetically modified organisms. This may result in expenses, delays or other impediments to development programs in our food platform or the market acceptance and commercialization of any potential food or agricultural products.

Any therapeutic product candidates may involve editing the human genome. The commercial success of any such potential therapeutic products, if successfully developed and approved, may be adversely affected by

claims that genome editing is unsafe, unethical or immoral. This may lead to unfavorable public perception and the inability of any therapeutic product candidates to gain the acceptance of the public or the medical community. Unfavorable public perceptions may also adversely impact our or our collaborators' ability to enroll clinical trials for therapeutic product candidates. Moreover, success in commercializing any therapeutic product candidates that receive regulatory approval will depend upon physicians prescribing, and their patients being willing to receive, treatments that involve the use of such product candidates in lieu of, or in addition to, existing treatments with which they are already familiar and for which greater clinical data may be available. Publicity of any adverse events in, or unfavorable results of, preclinical studies or clinical trials for any current or future product candidates, or with respect to the studies or trials of our competitors or of academic researchers utilizing genome editing technologies, even if not ultimately attributable to our technology or product candidates, could negatively influence public opinion. Negative public perception about the use of genome editing technology in human therapeutics and food or agricultural products, whether related to our technology or a competitor's technology, could result in increased governmental regulation, delays in the development and commercialization of product candidates or decreased demand for the resulting products, any of which may have a negative impact on our business and financial condition.

Interim "top-line" and preliminary data from studies or trials that we announce or publish from time to time may change as more data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, we may publish interim "top-line" or preliminary data from preclinical or greenhouse studies or clinical or field trials. Interim data are subject to the risk that one or more of the outcomes may materially change as more data become available. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the top-line results that we report may differ from future results of the same studies, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Preliminary or "top-line" data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, interim and preliminary data should be viewed with caution until the final data are available. Additionally, interim data from clinical trials that we may complete are subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Adverse differences between preliminary or interim data and final data could significantly harm our business prospects.

Further, others, including regulatory agencies, may not accept or agree with our assumptions, estimates, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular product candidate or product and our company in general. In addition, the information we choose to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is the material or otherwise appropriate information to include in our disclosure. Any information we determine not to disclose may ultimately be deemed significant by you or others with respect to future decisions, conclusions, views, activities or otherwise regarding a particular product candidate or our business. If the top-line data that we report differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for, and commercialize, product candidates may be harmed, which could significantly harm our business prospects.

We face significant competition in industries experiencing rapid technological change, and there is a possibility that our competitors may achieve regulatory approval before us or develop product candidates or treatments that are safer or more effective than ours, which may harm our financial condition and our ability to successfully market or commercialize any of our product candidates.

The development and commercialization of new drug products is highly competitive, and the genome editing field is characterized by rapidly changing technologies, significant competition and a strong emphasis on intellectual property. We will face competition with respect to our current and future therapeutic product candidates from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. Potential competitors also include academic institutions, government agencies and other public and private research organizations that conduct research, seek patent protection and establish collaborative arrangements for research, development, manufacturing and commercialization of products. Competition for improving plant genetics comes from conventional and advanced plant breeding techniques, as well as from the development of advanced biotechnology traits. Other potentially competitive sources of improvement in crop yields include improvements in crop protection chemicals, fertilizer formulations, farm mechanization, other biotechnology and information management. Programs to improve genetics and crop protection chemicals are generally concentrated within a relatively small number of large companies, while non-genetic approaches are underway with a broader set of companies.

There are a number of large pharmaceutical and biotechnology companies that currently market and sell products or are pursuing the development of products for the treatment of the disease indications for which we have research programs. Some of these competitive products and therapies are based on scientific approaches that are similar to our approach, and others are based on entirely different approaches. We principally compete with others developing and utilizing genome editing technology in the human health and plant sciences sectors, including companies such as Cellectis S.A., CRISPR Therapeutics, AG, Editas Medicine, Inc., Intellia Therapeutics, Inc. and Sangamo Therapeutics, Inc. Several companies, including Novartis Pharmaceuticals Corp. and Gilead Sciences, Inc., or Gilead, have obtained FDA approval for autologous immunotherapies, and a number of companies, including Cellectis S.A., Celgene Corp., Allogene Therapeutics and CRISPR Therapeutics AG, are pursuing allogeneic immunotherapies. We expect that our operations focused on developing products for *in vivo* gene correction will face substantial competition from others focusing on gene therapy treatments, especially those that may focus on conditions that our product candidates target. Moreover, any human therapeutics products that we develop alone or with collaborators will compete with existing standards of care for the diseases and conditions that our product candidates target and other types of treatments, such as small molecule, antibody or protein therapies. Our competitors in the agricultural biotechnology space include Pairwise Plants, LLC, Caribou Biosciences, Inc., Corteva Agriscience, Tropic Biosciences UK LTD, Calyxt, Inc. and Cibus.

Many of our current or potential competitors, either alone or with their collaborators, have significantly greater financial resources and expertise in research and development, manufacturing, preclinical or greenhouse testing, conducting clinical or field trials, obtaining regulatory approvals and marketing approved products than we do. Mergers and acquisitions in the pharmaceutical, biotechnology and agricultural biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products we develop alone or with collaborators or that would render

any such products obsolete or non-competitive. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we or our collaborators may obtain approval for any that we develop, which could result in our competitors establishing a strong market position before we are able to enter the market. Additionally, technologies developed by our competitors may render our product candidates uneconomical or obsolete, and we or our collaborators may not be successful in marketing any product candidates we may develop against competitors. The availability of our competitors' products could limit the demand, and the price we are able to charge, for any products that we develop alone or with collaborators.

Our future profitability, if any, depends in part on our and our collaborators' ability to penetrate global markets, where we would be subject to additional regulatory burdens and other risks and uncertainties associated with international operations that could materially adversely affect our business.

Our future profitability, if any, will depend in part on our ability and the ability of our collaborators to commercialize any products that we or our collaborators may develop in markets throughout the world. Commercialization of products in various markets could subject us to risks and uncertainties, including:

- obtaining, on a country-by-country basis, the applicable marketing authorization from the competent regulatory authority;
- the burden of complying with complex and changing regulatory, tax, accounting, labor and other legal requirements in each jurisdiction that we or our collaborators pursue;
- reduced protection for intellectual property rights;
- differing medical and agricultural practices and customs affecting acceptance in the marketplace;
- import or export licensing requirements;
- governmental controls, trade restrictions or changes in tariffs;
- economic weakness, including inflation, or political instability in particular non-U.S. economies and markets;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad;
- longer accounts receivable collection times;
- longer lead times for shipping;
- language barriers;
- foreign currency exchange rate fluctuations;
- foreign reimbursement, pricing and insurance regimes; and
- the interpretation of contractual provisions governed by foreign laws in the event of a contract dispute.

We have no prior experience in these areas, and our collaborators may have limited experience in these areas. Failure to successfully navigate these risks and uncertainties may limit or prevent market penetration for any products that we or our collaborators may develop, which would limit their commercial potential and our revenues.

Product liability lawsuits against us could cause us to incur substantial liabilities and could limit commercialization of any products that we develop alone or with collaborators.

We face an inherent risk of product liability and professional indemnity exposure related to the testing in clinical or field trials of our product candidates. We will face an even greater liability risk if we commercially sell any products that we or our collaborators may develop for human use or consumption. Manufacturing defects, errors in product distribution or storage processes, improper administration or application and known or unknown side effects of product usage may result in liability claims against us or third parties with which we have relationships. These actions could include claims resulting from acts by our collaborators, licensees and subcontractors over which we have little or no control.

For example, our liability could be sought by patients participating in clinical trials for potential therapeutic product candidates as a result of unexpected side effects, improper product administration or the deterioration of a patient's condition, patient injury or even death. Criminal or civil proceedings might be filed against us by patients, regulatory authorities, biopharmaceutical companies and any other third party using or marketing any product candidates or products that we develop alone or with collaborators. On occasion, large judgments have been awarded in class action lawsuits based on products that had unanticipated adverse effects. If we cannot successfully defend ourselves against claims that product candidates or products we develop alone or with collaborators caused harm, we could incur substantial liabilities.

Regardless of merit or eventual outcome, liability claims may result in:

- significant time and costs to defend the related litigation;
- injury to our reputation and significant negative media attention;
- diversion of management's attention from pursuing our strategy;
- withdrawal of clinical trial participants;
- delay or termination of clinical trials;
- decreased demand for any products that we develop alone or with collaborators;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue; and
- the inability to further develop or commercialize any products.

Although the clinical trial process is designed to identify and assess potential side effects, clinical development does not always fully characterize the safety and efficacy profile of a new medicine, and it is always possible that a drug or biologic, even after regulatory approval, may exhibit unforeseen side effects. If our product candidates were to cause adverse side effects during clinical trials or after approval, we may be exposed to substantial liabilities. Physicians and patients may not comply with any warnings that identify known potential adverse effects and patients who should not use our product candidates. If any of our product candidates are approved for commercial sale, we will be highly dependent upon consumer perceptions of us and the safety and quality of such products. We could be adversely affected if we are subject to negative publicity associated with illness or other adverse effects resulting from patients' use or misuse of such products or any similar products distributed by other companies.

Although we maintain product liability insurance coverage, it may not be adequate to cover all liabilities that we may incur. We anticipate that we will need to increase our insurance coverage when we begin clinical trials

and if we or our collaborators successfully commercialize any products. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost or in an amount adequate to satisfy any liabilities to which we may become subject.

Additional risks related to the identification, development and commercialization of our therapeutic product candidates

The regulatory landscape that will apply to development of therapeutic product candidates by us or our collaborators is rigorous, complex, uncertain and subject to change, which could result in delays or termination of development of such product candidates or unexpected costs in obtaining regulatory approvals.

Regulatory requirements governing products created with genome editing technology or involving gene therapy treatment have changed frequently and will likely continue to change in the future. Approvals by one regulatory agency may not be indicative of what any other regulatory agency may require for approval, and there is substantial, and sometimes uncoordinated, overlap in those responsible for regulation of gene therapy products, cell therapy products and other products created with genome editing technology. For example, in addition to the submission of an investigational new drug application, or IND, to the FDA, before initiation of a clinical trial in the United States, certain human clinical trials for cell therapy products and gene therapy had historically been subject to review by the Recombinant DNA Advisory Committee, or the RAC, of the National Institutes of Health, or NIH, Office of Biotechnology Activities, or OBA, pursuant to the NIH Guidelines for Research Involving Recombinant DNA Molecules, or NIH Guidelines. Following an initial review, RAC members would make a recommendation as to whether the protocol raises important scientific, safety, medical, ethical or social issues that warrant in-depth discussion at the RAC's quarterly meetings. Even though the FDA decides whether individual cell therapy or gene therapy protocols may proceed under an IND, the RAC's recommendations were shared with the FDA and the RAC public review process, if undertaken, could delay the initiation of a clinical trial, even if the FDA had reviewed the trial design and details and has not objected to its initiation or has notified the sponsor that the study may begin. Conversely, the FDA can put an IND on clinical hold even if the RAC provided a favorable review or has recommended against an in-depth, public review.

On August 17, 2018, the NIH issued a notice in the Federal Register and issued a public statement proposing changes to the oversight framework for gene therapy trials, including changes to the applicable NIH Guidelines to modify the roles and responsibilities of the RAC with respect to human clinical trials of gene therapy products, and requesting public comment on its proposed modifications. During the public comment period, which closed October 16, 2018, the NIH has announced that it will no longer accept new human gene transfer protocols for review as part of the protocol registration process under the existing NIH Guidelines or convene the RAC to review individual clinical protocols. These trials will remain subject to the FDA's oversight and other clinical trial regulations, and oversight at the local level will continue as otherwise set forth in the NIH Guidelines. Specifically, under the NIH Guidelines, supervision of human gene transfer trials includes evaluation and assessment by an institutional biosafety committee, or IBC, a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment, and such review may result in some delay before initiation of a clinical trial. While the NIH Guidelines are not mandatory unless the research in question is being conducted at or sponsored by institutions receiving NIH funding of recombinant or synthetic nucleic acid molecule research, many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them. Even though we may not be required to submit a protocol for our gene therapy product candidates through the NIH for RAC review, we will still be subject to significant regulatory oversight by the FDA, and in addition to the government regulators, the applicable IBC and institutional review board, or IRB, of each institution at which we or our collaborators conduct clinical trials of our product candidates, or a central IRB if appropriate, would need to review and approve the proposed clinical trial.

The same applies in the European Union, or the EU. The European Medicines Agency, or the EMA, has a Committee for Advanced Therapies, or CAT, that is responsible for assessing the quality, safety and efficacy of advanced-therapy medicinal products. Advanced-therapy medical products include gene therapy medicine, somatic-cell therapy medicines and tissue-engineered medicines. The role of the CAT is to prepare a draft opinion on an application for marketing authorization for a gene therapy medicinal candidate that is submitted to the EMA. In the EU, the development and evaluation of a gene therapy medicinal product must be considered in the context of the relevant EU guidelines. The EMA may issue new guidelines concerning the development and marketing authorization for gene therapy medicinal products and require that we comply with these new guidelines. Similarly complex regulatory environments exist in other jurisdictions in which we might consider seeking regulatory approvals for our product candidates, further complicating the regulatory landscape. As a result, the procedures and standards applied to gene therapy products and cell therapy products may be applied to any of our gene therapy or genome editing product candidates, but that remains uncertain at this point.

The clinical trial requirements of the FDA, the EMA and other regulatory authorities and the criteria these regulators use to evaluate the safety and efficacy of a product candidate vary substantially according to the type, complexity, novelty and intended use and market of the potential products. The regulatory approval process for product candidates created with novel genome editing technology such as ours can be more lengthy, rigorous and expensive than the process for other better known or more extensively studied product candidates and technologies. Since we are developing novel treatments for diseases in which there is little clinical experience with new endpoints and methodologies, there is heightened risk that the FDA, the EMA or comparable regulatory bodies may not consider the clinical trial endpoints to provide clinically meaningful results, and the resulting clinical data and results may be more difficult to analyze. This may be a particularly significant risk for many of the genetically defined diseases for which we may develop product candidates alone or with collaborators due to small patient populations for those diseases, and designing and executing a rigorous clinical trial with appropriate statistical power is more difficult than with diseases that have larger patient populations. Regulatory agencies administering existing or future regulations or legislation may not allow production and marketing of products utilizing genome editing technology in a timely manner or under technically or commercially feasible conditions. Even if our product candidates obtain required regulatory approvals, such approvals may later be withdrawn as a result of changes in regulations or the interpretation of regulations by applicable regulatory agencies.

Changes in applicable regulatory guidelines may lengthen the regulatory review process for our product candidates, require additional studies or trials, increase development costs, lead to changes in regulatory positions and interpretations, delay or prevent approval and commercialization of such product candidates, or lead to significant post-approval limitations or restrictions. Additionally, adverse developments in clinical trials conducted by others of gene therapy products or products created using genome editing technology, such as products developed through the application of a CRISPR/Cas9 technology, or adverse public perception of the field of genome editing, may cause the FDA, the EMA and other regulatory bodies to revise the requirements for approval of any product candidates we may develop or limit the use of products utilizing genome editing technologies, either of which could materially harm our business. Furthermore, regulatory action or private litigation could result in expenses, delays or other impediments to our research programs or the development or commercialization of current or future product candidates.

As we advance product candidates alone or with collaborators, we will be required to consult with these regulatory and advisory groups and comply with all applicable guidelines, rules and regulations. If we fail to do so, we or our collaborators may be required to delay or terminate development of such product candidates. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approval necessary to bring a product candidate to market could decrease our ability to generate sufficient product revenue to maintain our business.

The regulatory approval processes of the FDA and comparable foreign authorities are lengthy, time consuming and inherently unpredictable, and if we are ultimately unable to obtain regulatory approval for our product candidates, our business will be substantially harmed.

We and any collaborators are not permitted to commercialize, market, promote or sell any product candidate in the United States without obtaining marketing approval from the FDA. Foreign regulatory authorities, such as the EMA, impose similar requirements. The time required to obtain approval by the FDA, the EMA and comparable foreign authorities is unpredictable, but typically takes many years following the commencement of clinical trials and depends upon numerous factors, including substantial discretion of the regulatory authorities. In addition, approval policies, regulations or the type and amount of clinical data necessary to gain approval may change during the course of a product candidate's clinical development and may vary among jurisdictions. To date, we have not submitted a biologics license application, or BLA, or other marketing authorization application to the FDA or similar drug approval submissions to comparable foreign regulatory authorities for any product candidate. We and any collaborators must complete additional preclinical or nonclinical studies and clinical trials to demonstrate the safety and efficacy of our product candidates in humans to the satisfaction of the regulatory authorities before we will be able to obtain these approvals.

Our product candidates could fail to receive regulatory approval for many reasons, including the following:

- the FDA or comparable foreign regulatory authorities may disagree with the design or implementation of our or our collaborators' clinical trials;
- we or our collaborators may be unable to demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities that a product candidate is safe and effective for its proposed indication;
- the results of clinical trials may not meet the level of statistical significance required by the FDA or comparable foreign regulatory authorities for approval;
- we or our collaborators may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;
- the FDA or comparable foreign regulatory authorities may disagree with our or our collaborators' interpretation of data from preclinical studies or clinical trials;
- the data collected from clinical trials of product candidates may not be sufficient to support the submission of a BLA or other submission or to obtain regulatory approval in the United States or elsewhere;
- the FDA or comparable foreign regulatory authorities may fail to approve the manufacturing processes or facilities of third-party manufacturers with which we or our collaborators contract for clinical and commercial supplies;
- the FDA or comparable foreign regulatory authorities may fail to approve the companion diagnostics we contemplate developing with collaborators; and
- the approval policies or regulations of the FDA or comparable foreign regulatory authorities may significantly change in a manner rendering our or our collaborators' clinical data insufficient for approval.

This lengthy approval process as well as the unpredictability of future clinical trial results may result in our failing to obtain regulatory approval to market our product candidates, which would significantly harm our business, results of operations and prospects.

In addition, even if we were to obtain approval, regulatory authorities may approve any of our product candidates for fewer or more limited indications than we request, may impose significant limitations in the

form of narrow indications, warnings, or a Risk Evaluation and Mitigation Strategy, or REMS. Regulatory authorities may not approve the price we or our collaborators intend to charge for products we may develop, may grant approval contingent on the performance of costly post-marketing clinical trials, or may approve a product candidate with a label that does not include the labeling claims necessary or desirable for the successful commercialization of that product candidate. Any of the foregoing scenarios could materially harm the commercial prospects for our product candidates.

Clinical trials are difficult to design and implement, expensive, time-consuming and involve an uncertain outcome, and the inability to successfully and timely conduct clinical trials and obtain regulatory approval for our product candidates would substantially harm our business.

Clinical testing is expensive and usually takes many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process, and product candidates in later stages of clinical trials may fail to show the desired safety and efficacy traits despite having progressed through preclinical studies and initial clinical trials. To date, neither we nor our collaborators have initiated any clinical trials for any product candidates. We do not know whether planned clinical trials will begin on time, need to be redesigned, recruit and enroll patients on time or be completed on schedule, or at all. Clinical trials can be delayed, suspended or terminated for a variety of reasons, including in connection with:

- the inability to generate sufficient preclinical, toxicology or other *in vivo* or *in vitro* data to support the initiation of clinical trials;
- applicable regulatory authorities disagreeing as to the design or implementation of the clinical trials;
- obtaining regulatory authorization to commence a trial;
- reaching an agreement on acceptable terms with prospective contract research organizations, or CROs, and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- obtaining IRB approval at each site;
- developing and validating the companion diagnostic to be used in a clinical trial, if applicable;
- insufficient or inadequate supply or quality of product candidates or other materials necessary for use in clinical trials, or delays in sufficiently developing, characterizing or controlling a manufacturing process suitable for clinical trials;
- recruiting and retaining enough suitable patients to participate in a trial;
- having enough patients complete a trial or return for post-treatment follow-up;
- adding a sufficient number of clinical trial sites;
- inspections of clinical trial sites or operations by applicable regulatory authorities, or the imposition of a clinical hold;
- clinical sites deviating from trial protocol or dropping out of a trial;
- the inability to demonstrate the efficacy and benefits of a product candidate;
- discovering that product candidates have unforeseen safety issues, undesirable side effects or other unexpected characteristics;
- addressing patient safety concerns that arise during the course of a trial;

- receiving untimely or unfavorable feedback from applicable regulatory authorities regarding the trial or requests from regulatory authorities to modify the design of a trial;
- non-compliance with applicable regulatory requirements by us or third parties or changes in such regulations or administrative actions;
- suspensions or terminations by IRBs of the institutions at which such trials are being conducted, by the Data Safety Monitoring Board, or DSMB, for such trial or by the FDA or other regulatory authorities due to a number of factors, including those described above;
- third parties being unable or unwilling to satisfy their contractual obligations to us; or
- changes in our financial priorities, greater than anticipated costs of completing a trial or our inability to continue funding the trial.

Many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates. Additionally, we or our collaborators may experience unforeseen events during or resulting from clinical trials that could delay or prevent receipt of marketing approval for or commercialization of product candidates. For example, clinical trials of product candidates may produce negative, inconsistent or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical trials or abandon development programs. Regulators may also revise the requirements for approving the product candidates, or such requirements may not be as we anticipate. If we or our collaborators are required to conduct additional clinical trials or other testing of product candidates beyond those that we or our collaborators currently contemplate, if we or our collaborators are unable to successfully complete clinical trials or other testing of such product candidates, if the results of these trials or tests are not positive or are only modestly positive or if there are safety concerns, we may:

- incur unplanned costs;
- be delayed in obtaining or fail to obtain marketing approval for product candidates;
- obtain marketing approval in some countries and not in others;
- obtain marketing approval for indications or patient populations that are not as broad as intended or desired;
- obtain marketing approval with labeling that includes significant use or distribution restrictions or safety warnings, including boxed warnings;
- be subject to additional post-marketing testing requirements;
- be subject to changes in the way the product is administered;
- have regulatory authorities withdraw or suspend their approval of the product or impose restrictions on its distribution;
- be sued; or
- experience damage to our reputation.

If we or our collaborators experience delays in the commencement or completion of our clinical trials, or if we or our collaborators terminate a clinical trial prior to completion, we may experience increased costs, have difficulty raising capital and/or be required to slow down the development and approval process timelines. Furthermore, the product candidates that are the subject of such trials may never receive regulatory approval, and their commercial prospects and our ability to generate product revenues from them could be impaired or not realized at all.

Any product candidates that we or our collaborators may develop will be novel and may be complex and difficult to manufacture, and if we experience manufacturing problems, it could result in delays in development and commercialization of such product candidates or otherwise harm our business.

Our product candidates involve or will involve novel genome editing technology and will require processing steps that are more complex than those required for most small molecule drugs, resulting in a relatively higher manufacturing cost. Moreover, unlike small molecules, the physical and chemical properties of biologics generally cannot be fully characterized. As a result, assays of the finished product may not be sufficient to ensure that such product will perform in the intended manner. Although we intend to employ multiple steps to control the manufacturing process, we may experience manufacturing issues with any of our product candidates that could cause production interruptions, including contamination, equipment or reagent failure, improper installation or operation of equipment, facility contamination, raw material shortages or contamination, natural disasters, disruption in utility services, human error, disruptions in the operations of our suppliers, inconsistency in cell growth and variability in product characteristics. We may encounter problems achieving adequate quantities and quality of clinical-grade materials that meet FDA, EMA or other comparable applicable standards or specifications with consistent and acceptable production yields and costs. Even minor deviations from normal manufacturing processes could result in reduced production yields, product defects and other supply disruptions. If microbial, viral or other contaminations are discovered in our product candidates or in the manufacturing facilities in which such product candidates are made, such manufacturing facilities may need to be closed for an extended period of time to investigate and remedy the contamination. Our manufacturing process for any allogeneic CAR T cell product candidate that we develop alone or with collaborators will be susceptible to product loss or failure due to logistical issues associated with the collection of white blood cells, or starting material, from healthy third-party donors, shipping such material to the manufacturing site, ensuring standardized production batch-to-batch in the context of mass production, freezing the manufactured product, shipping the final product globally and infusing patients with such product. Problems with the manufacturing process, even minor deviations from the normal process, could result in product defects or manufacturing failures that result in lot failures, product recalls, product liability claims or insufficient inventory.

As product candidates are developed through preclinical to late-stage clinical trials towards approval and commercialization, we expect that various aspects of the development program, such as manufacturing methods, may be altered along the way in an effort to help optimize processes and results. Such changes carry the risk that they will not achieve the intended objectives, and any of these changes could cause our product candidates to perform differently and affect the results of future clinical trials or our reliance on results of trials that have previously been conducted using the product candidate in its previous form. If the manufacturing process is changed during the course of product development, we or our collaborators may be required to repeat some or all of the previously conducted trials or conduct additional bridging trials, which could increase our costs and delay or impede our ability to obtain marketing approval.

We expect our manufacturing strategy for one or more of our product candidates may involve the use of contract manufacturing organizations, or CMOs, as well as establishing our own capabilities and infrastructure, including a manufacturing facility. We believe that development of our own manufacturing facility will provide us with enhanced control of material supply for both clinical trials and the commercial market, enable the more rapid implementation of process changes and help us achieve better long-term margins. We have no experience in developing a manufacturing facility and may never be successful in developing our own manufacturing facility or capability. The facilities used by us and our contract manufacturers to manufacture therapeutic product candidates must be approved by the FDA pursuant to inspections that will be conducted after we submit our BLA to the FDA. We do not control the manufacturing process of, and are currently completely dependent on, our contract manufacturing partners for compliance with cGMP, for the manufacture of our

product candidates. We may establish multiple manufacturing facilities as we expand our commercial footprint to multiple geographies, which will be costly and time consuming and may lead to regulatory delays. Even if we are successful, our manufacturing capabilities could be affected by cost-overruns, potential problems with scale-out, process reproducibility, stability issues, lot inconsistency, timely availability of reagents or raw materials, unexpected delays, equipment failures, labor shortages, natural disasters, utility failures, regulatory issues and other factors that could prevent us from realizing the intended benefits of our manufacturing strategy and have a material adverse effect on our business.

The FDA, the EMA and other foreign regulatory authorities may require us to submit samples of any lot of any product that may receive approval together with the protocols showing the results of applicable tests at any time. Under some circumstances, the FDA, the EMA or other foreign regulatory authorities may require that we not distribute a lot until the relevant agency authorizes its release. Slight deviations in the manufacturing process, including those affecting quality attributes and stability, may result in unacceptable changes in the product that could result in lot failures or product recalls. Lot failures or product recalls could cause us or our collaborators to delay product launches or clinical trials, which could be costly to us and otherwise harm our business. Problems in our manufacturing process also could restrict our or our collaborators' ability to meet market demand for products.

Any problems in our manufacturing process or facilities could make us a less attractive collaborator for potential partners, including larger pharmaceutical companies and academic research institutions, which could limit our access to additional attractive development opportunities.

We will rely on donors of T cells to manufacture product candidates from our allogeneic CAR T immunotherapy platform, and if we do not obtain an adequate supply of T cells from qualified donors, development of those product candidates may be adversely impacted.

We are developing a pipeline of allogeneic T cell product candidates that are engineered from healthy donor T cells, which vary in type and quality. This variability in type and quality of a donor's T cells makes producing standardized product candidates more difficult and makes the development and commercialization pathway of those product candidates more uncertain. We have developed a screening process designed to enhance the quality and consistency of T cells used in the manufacture of our CAR T cell product candidates. If we are unable to identify and obtain T cells from donors that satisfy our criteria in sufficient quantity, to obtain such cells in a timely manner or to address variability in donor T cells, development of our CAR T cell product candidates may be delayed or there may be inconsistencies in the product candidates we produce, which could negatively impact development of such product candidates, harm our reputation and adversely impact our business and prospects.

Delays in completing the manufacturing facility we are building or failure to achieve operating efficiencies from it may require us to devote additional resources and management time to manufacturing operations and may delay our product development timelines.

We have leased approximately 17,300 square feet of space for our manufacturing facility at a location approximately seven miles from our headquarters in Durham, North Carolina, at which we intend to establish and equip a manufacturing facility compliant with cGMP. We may face delays in the completion of the manufacturing facility and cannot guarantee that this facility will be available for manufacturing beginning with our BCMA product candidate. In addition, we may not experience the anticipated operating efficiencies as we commence manufacturing operations at the new facility. Any such delays may disrupt or delay the supply of our product candidates if we have not maintained a sufficient back-up supply of such product candidates through third-party manufacturers. Moreover, changing manufacturing facilities may also require that we or our collaborators conduct additional studies, make notifications to regulatory authorities, make additional filings to

regulatory authorities, and obtain regulatory authority approval for the new facilities, which may be delayed or which we may never receive. We will further need to comply with the FDA's and applicable foreign regulatory authorities' cGMP requirements for the production of product candidates for clinical trials and, if approved, commercial supply, and will be subject to FDA and comparable foreign regulatory authority inspection. These requirements include the qualification and validation of our manufacturing equipment and processes. We may not be able to develop or acquire the internal expertise and resources necessary for compliance with these requirements. Should we fail to comply with cGMP requirements, the opening of our manufacturing facility will be delayed. If we fail to achieve the operating efficiencies that we anticipate, our manufacturing and operating costs may be greater than expected, which could have a material adverse impact on our operating results.

In order to complete our planned manufacturing facility, we may be forced to devote greater resources and management time than anticipated, particularly in areas relating to operations, quality, regulatory, facilities and information technology. We also may encounter problems hiring and retaining the experienced scientific, quality-control and manufacturing personnel needed to operate our manufacturing processes. If we experience unanticipated employee shortage or turnover in any of these areas, we may not be able to effectively manage our ongoing manufacturing operations and we may not achieve the operating efficiencies that we anticipate from the new facility, which may negatively affect our product development timeline or result in difficulties in maintaining compliance with applicable regulatory requirements.

Any such problems could result in the delay, prevention or impairment of clinical development and commercialization of our product candidates.

We or our collaborators may experience delays or difficulties in enrolling patients in clinical trials, which could delay or prevent receipt of regulatory approvals.

We or our collaborators may not be able to initiate or continue clinical trials on a timely basis or at all for any product candidates we or our collaborators identify or develop if we or our collaborators are unable to locate and enroll a sufficient number of eligible patients to participate in the trials as required by applicable regulations or as needed to provide appropriate statistical power for a given trial. Additionally, some of our competitors may have ongoing clinical trials for product candidates that would treat the same indications as one or more of our product candidates, and patients who would otherwise be eligible for our clinical trials may instead enroll in our competitors' clinical trials.

Patient enrollment may also affected by many factors, including:

- severity and difficulty of diagnosing of the disease under investigation;
- size of the patient population and process for identifying subjects;
- eligibility and exclusion criteria for the trial in question;
- our or our collaborators' ability to recruit clinical trial investigators with the appropriate competencies and experience;
- design of the trial protocol;
- availability and efficacy of approved medications or therapies, or other clinical trials, for the disease or condition under investigation;
- perceived risks and benefits of the product candidate under trial or testing, or of the application of genome editing to human indications;
- availability of genetic testing for potential patients;

- efforts to facilitate timely enrollment in clinical trials;
- patient referral practices of physicians;
- ability to obtain and maintain subject consent;
- risk that enrolled subjects will drop out before completion of the trial;
- ability to monitor patients adequately during and after treatment; and
- proximity and availability of clinical trial sites for prospective patients.

We expect that some of our product candidates will focus on rare genetically defined diseases with limited patient pools from which to draw for enrollment in clinical trials. The eligibility criteria of our clinical trials will further limit the pool of available trial participants. In addition to the factors identified above, patient enrollment in any clinical trials we or our collaborators may conduct may be adversely impacted by any negative outcomes our competitors may experience, including adverse side effects, clinical data showing inadequate efficacy or failures to obtain regulatory approval.

Furthermore, our or our collaborators' ability to successfully initiate, enroll and conduct a clinical trial outside the United States is subject to numerous additional risks, including:

- difficulty in establishing or managing relationships with CROs and physicians;
- differing standards for the conduct of clinical trials;
- differing standards of care for patients with a particular disease;
- an inability to locate qualified local consultants, physicians and partners; and
- the potential burden of complying with a variety of foreign laws, medical standards and regulatory requirements, including the regulation of pharmaceutical and biotechnology products and treatments.

Enrollment delays in clinical trials may result in increased development costs for any of our product candidates, which may cause the value of our company to decline and limit our ability to obtain additional financing. If we or our collaborators have difficulty enrolling a sufficient number of patients to conduct clinical trials as planned, we may need to delay, limit or terminate ongoing or planned clinical trials, any of which may have an adverse effect on our results of operations and prospects.

Results of preclinical studies and early clinical trials of product candidates may not be predictive of results of later studies or trials. Our product candidates may not have favorable results in later clinical trials, if any, or receive regulatory approval.

Preclinical and clinical drug development is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the preclinical study or clinical trial process. Despite promising preclinical or clinical results, any product candidate can unexpectedly fail at any stage of preclinical or clinical development. The historical failure rate for product candidates in our industry is high.

The results from preclinical studies or early clinical trials of a product candidate may not be predictive of the results from later preclinical studies or clinical trials, and interim results of a clinical trial are not necessarily indicative of final results. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy characteristics despite having progressed through preclinical studies and initial clinical trials. Many companies in the biopharmaceutical and biotechnology industries have suffered significant setbacks at later stages of development after achieving positive results in early stages of development, and we may face similar

setbacks. These setbacks have been caused by, among other things, preclinical findings made while clinical trials were underway or safety or efficacy observations made in clinical trials, including previously unreported adverse events. Moreover, non-clinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that believed their product candidates performed satisfactorily in preclinical studies and clinical trials nonetheless failed to obtain regulatory approval. The use of our genome editing technology in our product candidates has never undergone testing in humans and has only been tested in a limited manner in animals, and results from animal studies may not be predictive of clinical trial results. Even if any product candidates progress to clinical trials, these product candidates may fail to show the safety and efficacy in clinical development required to obtain regulatory approval, despite the observation of positive results in animal studies. Our or our collaborators' failure to replicate positive results from early research programs and preclinical or greenhouse studies may prevent us from further developing and commercializing those or other product candidates, which would limit our potential to generate revenues from them and harm our business and prospects.

For the foregoing reasons, we cannot be certain that any ongoing or future preclinical studies or clinical trials will be successful. Any safety or efficacy concerns observed in any one of our preclinical studies or clinical trials in a targeted area could limit the prospects for regulatory approval of product candidates in that and other areas, which could have a material adverse effect on our business and prospects.

If any of our product candidates do not work as intended or cause undesirable side effects, it could hinder or prevent receipt of regulatory approval or realization of commercial potential for them or our other product candidates and could substantially harm our business.

Our product candidates may be associated with off-target editing or other serious adverse events, undesirable side effects or unexpected characteristics. Results of clinical trials could reveal severe or recurring side effects, toxicities or unexpected events, including death. Off-target cuts could lead to disruption of a gene or a genetic regulatory sequence at an unintended site in the DNA. In those instances where we also provide a segment of DNA, it is possible that following off-target cut events, such DNA could be integrated into the genome at an unintended site, potentially disrupting another important gene or genomic element. There may also be delayed adverse events following exposure to therapeutics made with genome editing technologies due to persistent biologic activity of the genetic material or other components of products used to carry the genetic material. In addition to serious adverse events or side effects caused by product candidates we develop alone or with collaborators, the administration process or related procedures may also cause undesirable side effects. Any side effects may not be appropriately recognized or managed by the treating medical staff. We or our collaborators expect to have to train medical personnel using any product candidates we may develop to understand the side effect profiles for our clinical trials and upon any commercialization of such product candidates. Inadequate training in recognizing or managing the potential side effects of such product candidates could result in patient injury or death.

If any such events occur, clinical trials or commercial distribution of any product candidates or products we develop alone or with collaborators could be suspended or terminated, and our business and reputation could suffer substantial harm. Treatment-related side effects could affect patient recruitment and the ability of enrolled patients to complete the trial or result in potential liability claims. Regulatory authorities could order us or our collaborators to cease further development of, deny approval of or require us to cease selling any product candidates or products for any or all targeted indications. If we or our collaborators elect, or are required, to delay, suspend or terminate any clinical trial or commercialization efforts, the commercial prospects of such product candidates or products may be harmed, and our ability to generate product revenues from them or other product candidates that we develop may be delayed or eliminated.

Additionally, if we successfully develop a product candidate alone or with collaborators and it receives marketing approval, the FDA could require us to adopt a REMS to ensure that the benefits of treatment with such product candidate outweigh the risks for each potential patient, which may include, among other things, a communication plan to health care practitioners, patient education, extensive patient monitoring or distribution systems and processes that are highly controlled, restrictive and more costly than what is typical for the industry. We or our collaborators may also be required to adopt a REMS or engage in similar actions, such as patient education, certification of health care professionals or specific monitoring, if we or others later identify undesirable side effects caused by any product that we develop alone or with collaborators. Such identification could also have several additional significant negative consequences, such as:

- regulatory authorities may suspend, withdraw or limit approvals of such product, or seek an injunction against its manufacture or distribution;
- regulatory authorities may require additional warnings on the label, including “boxed” warnings, or issue safety alerts, Dear Healthcare Provider letters, press releases or other communications containing warnings or other safety information about the product;
- we may be required to create a medication guide outlining the risks of such side effects for distribution to patients;
- we may be required to change the way a product is administered or conduct additional trials;
- the product may become less competitive;
- we or our collaborators may decide to remove the product from the marketplace;
- we may be subject to fines, injunctions or the imposition of civil or criminal penalties;
- we could be sued and be held liable for harm caused to patients; and
- our reputation may suffer.

Any of these events could prevent us or our collaborators from achieving or maintaining market acceptance of any potential product.

We are subject to federal, state and non-U.S. healthcare and privacy laws and regulations relating to our business, and could face substantial penalties if we are determined not to have fully complied with such laws, which would have an adverse impact on our business.

Our business operations, as well as our current and anticipated future arrangements with investigators, healthcare professionals, consultants, third-party payors, customers and patients, expose or will expose us to broadly applicable foreign, federal, and state fraud and abuse and other healthcare and privacy laws and regulations. These laws constrain the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute any potential products for which we may obtain marketing approval. Such laws include:

- the U.S. federal Anti-Kickback Statute, which prohibits, among other things, persons and entities from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward, or in return for, either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under a U.S. healthcare program such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the U.S. federal Anti-Kickback Statute or specific intent to violate it in order to have committed a violation. In addition, the government may assert that a claim including items or services resulting from a violation of the

U.S. federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;

- U.S. federal civil and criminal false claims laws and civil monetary penalties laws, including the civil False Claims Act, which can be enforced through civil whistleblower or qui tam actions, prohibits, among other things, individuals and entities from knowingly presenting, or causing to be presented, to the U.S. government, claims for payment or approval that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. government;
- the U.S. Health Insurance Portability and Accountability Act of 1996, or HIPAA, which imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payors, or knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement, in connection with the delivery of, or payment for, healthcare benefits, items or services. Similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their implementing regulations, impose obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information without appropriate authorization by covered entities subject to the rule, such as health plans, healthcare clearinghouses and certain healthcare providers, as well as their business associates that perform certain services for or on their behalf involving the use or disclosure of individually identifiable health information;
- the U.S. Physician Payments Sunshine Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to CMS information related to payments or other "transfers of value" made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, and requires applicable manufacturers and group purchasing organizations to report annually to the Centers for Medicare and Medicaid Services, or CMS, ownership and investment interests held by the physicians described above and their immediate family members; and
- analogous state and non-U.S. laws and regulations, such as state anti-kickback and false claims laws, which may apply to our business practices, including, but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, or by the patients themselves; state laws that require pharmaceutical and device companies to comply with the industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws and regulations that require manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures and pricing information; state and local laws which require the registration of pharmaceutical sales representatives; state and non-U.S. laws governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA; state and non-U.S., enacted and proposed, laws and regulations regarding the collection, distribution, use, security, and storage of personally identifiable information and other data relating to individuals (including the EU General Data Protection Regulation 2016/679 and the California Consumer Protection Act); and federal and state consumer protection laws are being applied to enforce regulations related to the online collection, use, and dissemination of data, thus complicating compliance efforts.

Efforts to ensure that our current and future business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities may conclude that our business practices do not comply with current or future statutes, regulations, agency guidance or case law involving applicable healthcare laws. If our operations are found to be in violation of any of these or any other health regulatory laws that may apply to us, we may be subject to significant penalties, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgement, individual imprisonment, possible exclusion from participation in Medicare, Medicaid and other U.S. healthcare programs, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, contractual damages, reputational harm, diminished profits and future earnings, and curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations. Defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired. If any of the above occur, it could adversely affect our ability to operate our business and our results of operations.

We have received orphan drug designation for PBCAR0191 for the treatment of ALL and we may seek orphan drug designation for some or all of our other product candidates, but we may be unable to obtain such designations or to maintain the benefits associated with orphan drug designation, which may negatively impact our ability to develop or obtain regulatory approval for such product candidates and may reduce our revenue if we obtain such approval.

We may seek orphan drug designation for some or all of our product candidates in specific orphan indications in which there is a medically plausible basis for the use of these products. Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, defined as a disease or condition with a patient population of fewer than 200,000 in the United States, or a patient population greater than 200,000 in the United States when there is no reasonable expectation that the cost of developing and making available the drug or biologic in the United States will be recovered from sales in the United States for that drug or biologic. Orphan drug designation must be requested before submitting a biologics license application, or BLA. In the United States, orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and user-fee waivers. After the FDA grants orphan drug designation, the generic identity of the drug and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. We have received orphan drug designation in the United States for PBCAR0191 for the treatment of ALL. Although we may seek orphan product designation for some or all of our other product candidates, we may never receive such designations.

If a product that has orphan drug designation subsequently receives the first FDA approval for a particular active ingredient for the disease for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other applications, including a BLA, to market the same biologic for the same indication for seven years, except in limited circumstances such as a showing of clinical superiority to the product with orphan product exclusivity or if FDA finds that the holder of the orphan drug exclusivity has not shown that it can ensure the availability of sufficient quantities of the orphan drug to meet the needs of patients with the disease or condition for which the drug was designated. Even if we or our collaborators obtain orphan drug designation for a product candidate, we may not be the first to obtain marketing approval for any particular orphan indication due to the uncertainties associated with developing pharmaceutical products. Exclusive marketing rights in the United States may be limited if we or our collaborators seek approval for an indication broader than the orphan designated indication and may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is

unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition. Further, even if a product obtains orphan drug exclusivity, that exclusivity may not effectively protect the product from competition because different drugs with different active moieties can be approved for the same condition. Even after an orphan drug is approved, the FDA can subsequently approve the same drug with the same active moiety for the same condition if the FDA concludes that the later drug is safer, more effective, or makes a major contribution to patient care. Furthermore, the FDA can waive orphan exclusivity if we or our collaborators are unable to manufacture sufficient supply of the product.

Similarly, in Europe, a medicinal product may receive orphan designation under Article 3 of Regulation (EC) 141/2000. This applies to products that are intended for a life-threatening or chronically debilitating condition and either (1) such condition affects no more than five in 10,000 persons in the EU when the application is made, or (2) the product, without the benefits derived from orphan status, would be unlikely to generate sufficient returns in the EU to justify the necessary investment. Moreover, in order to obtain orphan designation in the EU it is necessary to demonstrate that there exists no satisfactory method of diagnosis, prevention or treatment of such condition authorized for marketing in the EU or, if such a method exists, the product will be of significant benefit to those affected by the condition. In the EU, orphan medicinal products are eligible for financial incentives such as reduction of fees or fee waivers and applicants can benefit from specific regulatory assistance and scientific advice. Products receiving orphan designation in the EU can receive 10 years of market exclusivity, during which time no similar medicinal product for the same indication may be placed on the market. An orphan product can also obtain an additional two years of market exclusivity in the EU for pediatric studies. However, the 10-year market exclusivity may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation—for example, if the product is sufficiently profitable not to justify maintenance of market exclusivity. Additionally, marketing authorization may be granted to a similar product for the same indication at any time if:

- the second applicant can establish that its product, although similar, is safer, more effective or otherwise clinically superior;
- the first applicant consents to a second orphan medicinal product application; or
- the first applicant cannot supply enough orphan medicinal product.

If we or our collaborators do not receive or maintain orphan drug designation for product candidates for which we seek such designation, it could limit our ability to realize revenues from such product candidates.

We may seek fast-track designation for some or all of our product candidates, but we may not receive such designation, and even if we do, it may not lead to a faster development or regulatory review or approval process, and will not increase the likelihood that such product candidates will receive marketing approval.

We may seek fast-track designation and review for some or all of our product candidates. If a drug is intended for the treatment of a serious or life-threatening condition or disease, and nonclinical or clinical data demonstrate the potential to address an unmet medical need, the product may qualify for FDA fast track designation, for which sponsors must apply. The FDA has broad discretion whether or not to grant this designation. Thus, even if we or our collaborators believe a particular product candidate is eligible for this designation, the FDA may decide not to grant it. Moreover, even if we do receive fast track designation, we or our collaborators may not experience a faster development process, review or approval compared to conventional FDA procedures. In addition, the FDA may withdraw fast track designation if it believes that the designation is no longer supported by data from the clinical development program.

If the product candidates that we or our collaborators may develop receive regulatory approval in the United States or another jurisdiction, they may never receive approval in other jurisdictions, which would limit market opportunities for such product candidate and adversely affect our business.

Approval of a product candidate in the United States by the FDA or by the requisite regulatory agencies in any other jurisdiction does not ensure approval of such product candidate by regulatory authorities in other countries or jurisdictions. The approval process varies among countries and may limit our or our collaborators' ability to develop, manufacture, promote and sell product candidates internationally. Failure to obtain marketing approval in international jurisdictions would prevent the product candidates from being marketed outside of the jurisdictions in which regulatory approvals have been received. In order to market and sell product candidates in the EU and many other jurisdictions, we and our collaborators must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and may involve additional preclinical studies or clinical trials both before and after approval. In many countries, any product candidate for human use must be approved for reimbursement before it can be approved for sale in that country. In some cases, the intended price for such product is also subject to approval. Further, while regulatory approval of a product candidate in one country does not ensure approval in any other country, a failure or delay in obtaining regulatory approval in one country may have a negative effect on the regulatory approval process in others. If we or our collaborators fail to comply with the regulatory requirements in international markets or to obtain all required marketing approvals, the target market for a particular potential product will be reduced, which would limit our ability to realize the full market potential for the product and adversely affect our business.

Recently enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize any product candidates we or our collaborators develop and may adversely affect the prices for such product candidates.

In the United States and certain non-U.S. jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our or our collaborators' ability to profitably sell any product candidates that obtain marketing approval.

For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively the Affordable Care Act, was enacted in the United States. Among the provisions of the Affordable Care Act of importance to our product candidates, the Affordable Care Act establishes an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents; increases in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program, extends manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations, expands eligibility criteria for Medicaid programs, expansion of the entities eligible for discounts under the Public Health program, addresses a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, creates a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% (and 70% commencing January 1, 2019) point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D, and creates a licensure framework for follow-on biologic products.

At this time, we are unsure of the full impact that the Affordable Care Act will have on our business. There have been judicial and political challenges to certain aspects of the Affordable Care Act. For example, since January 2017, President Trump has signed two executive orders and other directives designed to delay, circumvent, or

loosen certain requirements mandated by the Affordable Care Act. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the Affordable Care Act. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the Affordable Care Act have been signed into law. Tax legislation enacted on December 22, 2017 entitled "an Act to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018, Pub.L. 115–97," or the Tax Cuts and Jobs Act of 2017, includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Additionally, on January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain Affordable Care Act-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share. Further, the Bipartisan Budget Act of 2018, among other things, amends the Affordable Care Act, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole." More recently, in July 2018, the CMS published a final rule permitting further collections and payments to and from certain Affordable Care Act qualified health plans and health insurance issuers under the Affordable Care Act risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. Congress may consider other legislation to repeal or repeal and replace other elements of the Affordable Care Act.

In addition, other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. On August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, created the Joint Select Committee on Deficit Reduction to recommend to Congress proposals for spending reductions. The Joint Select Committee did not achieve a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, triggering the legislation's automatic reduction to several government programs. This includes reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2027 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Further, there has been heightened governmental scrutiny recently over pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for pharmaceutical products, some of which are included in the Trump administration's budget proposal for fiscal year 2019. Additionally, the Trump administration released a "Blueprint" to lower drug prices and reduce out of pocket costs of drugs that contains additional proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of drug products paid by consumers. The U.S. Department of Health and Human Services has begun the process of soliciting feedback on some of these measures and, at the same, is immediately implementing others under its existing authority. Although a number of these, and other potential, proposed measures will require authorization through additional legislation to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical product and medical device pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access

and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and medical devices to purchase and which suppliers will be included in their prescription drug and other healthcare programs.

Additionally, on May 30, 2018, the Trickett Wendler, Frank Mongiello, Jordan McLinn, and Matthew Bellina Right to Try Act of 2017, or the Right to Try Act, was signed into law. The law, among other things, provides a federal, or the framework for certain patients with life-threatening diseases or conditions to access certain investigational new drug products that have completed a Phase 1 clinical trial and that are undergoing investigation for FDA approval. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA permission under the FDA expanded access program. There is no obligation for a drug manufacturer to make its drug products available to eligible patients as a result of the Right to Try Act.

We expect that the Affordable Care Act, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria, new payment methodologies and in additional downward pressure on the price that we or our collaborators may receive for any approved or cleared product. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If we or our collaborators are slow or unable to adapt to new requirements or policies, or if we or our collaborators are not able to maintain regulatory compliance, any of our product candidates may lose any regulatory approval that may have been obtained and we may not achieve or sustain profitability, which would adversely affect our business.

Even if we obtain regulatory approval for any products that we develop alone or with collaborators, such products will remain subject to ongoing regulatory requirements, which may result in significant additional expense.

Even if products we develop alone or with collaborators receive regulatory approval, they will be subject to ongoing regulatory requirements for manufacturing, labeling, packaging, distribution, storage, advertising, promotion, sampling, record-keeping and submission of safety and other post-market information, among other things. Any regulatory approvals received for such products may also be subject to limitations on the approved indicated uses for which they may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing and surveillance studies. For example, the holder of an approved BLA in the United States is obligated to monitor and report adverse events and any failure of a product to meet the specifications in the BLA. FDA guidance advises that patients treated with some types of gene therapy undergo follow-up observations for potential adverse events for as long as 15 years. Similarly, in the EU, pharmacovigilance obligations are applicable to all medicinal products. In addition to those, holders of a marketing authorization for gene or cell therapy products must detail, in their application, the measures they envisage to ensure follow-up of the efficacy and safety of these products. In cases of particular concern, marketing authorization holders for gene or cell therapy products in the EU may be required to design a risk management system with a view to identifying, preventing or minimizing risks and may be obliged to carry out post-marketing studies. In the United States, the holder of an approved BLA must also submit new or supplemental applications and obtain FDA approval for certain changes to the approved product, product labeling or manufacturing process. Similar provisions apply in the EU. Advertising and promotional materials must comply with FDA rules and are subject to FDA review, in addition to other potentially applicable federal and state laws. Similarly, in the EU any promotion of medicinal products is highly regulated and, depending on the specific jurisdiction involved, may require prior vetting by the competent national regulatory authority.

In addition, product manufacturers and their facilities are subject to payment of user fees and continual review and periodic inspections by the FDA and other regulatory authorities for compliance with cGMP requirements and adherence to commitments made in the BLA or foreign marketing application. If we, our collaborators or a regulatory agency discovers previously unknown problems with a product such as adverse events of unanticipated severity or frequency or problems with the facility where the product is manufactured or disagrees with the promotion, marketing or labeling of that product, a regulatory agency may impose restrictions relative to that product, the manufacturing facility or us or our collaborators, including requiring recall or withdrawal of the product from the market or suspension of manufacturing.

Moreover, if any of our product candidates are approved, our product labeling, advertising, promotion and distribution will be subject to regulatory requirements and continuing regulatory review. The FDA strictly regulates the promotional claims that may be made about drug products. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product's approved labeling.

If we or our collaborators fail to comply with applicable regulatory requirements following approval of any potential products we may develop, authorities may:

- issue an untitled enforcement letter or a warning letter asserting a violation of the law;
- seek an injunction, impose civil and criminal penalties, and impose monetary fines, restitution or disgorgement of profits or revenues;
- suspend or withdraw regulatory approval;
- suspend or terminate any ongoing clinical trials or implement requirements to conduct post-marketing studies or clinical trials;
- refuse to approve a pending BLA or comparable foreign marketing application (or any supplements thereto) submitted by us or our collaborators;
- restrict the labeling, marketing, distribution, use or manufacturing of products;
- seize or detain products or otherwise require the withdrawal or recall of products from the market;
- refuse to approve pending applications or supplements to approved applications that we or our collaborators submit;
- refuse to permit the import or export of products; or
- refuse to allow us or our collaborators to enter into government contracts.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response and could generate negative publicity. The occurrence of any event or penalty described above may inhibit our or our collaborators' ability to commercialize products and our ability to generate revenues.

In addition, the FDA's policies, and policies of foreign regulatory agencies, may change, and additional regulations may be enacted that could prevent, limit or delay regulatory approval of product candidates. For example, in December 2016, the 21st Century Cures Act, or the Cures Act, was signed into law. The Cures Act, among other things, is intended to modernize the regulation of biologics and spur innovation, but its ultimate implementation is unclear. We cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative or executive action, either in the United States or abroad. For example, certain policies of the Trump administration may impact our business and industry. Namely, the

Trump administration has taken several executive actions, including the issuance of a number of Executive Orders, that could impose significant burdens on, or otherwise materially delay, the FDA's ability to engage in routine oversight activities such as implementing statutes through rulemaking, issuance of guidance and review and approval of marketing applications. It is difficult to predict how these requirements will be implemented, and the extent to which they will impact the FDA's ability to exercise its regulatory authority. If these executive actions impose restrictions on the FDA's ability to engage in oversight and implementation activities in the normal course, our business may be negatively impacted. If we or our collaborators are slow or unable to adapt to changes in existing requirements or the adoption of new requirements, or if we or our collaborators are unable to maintain regulatory compliance, marketing approval that has been obtained may be lost and we may not achieve or sustain profitability.

Even if any product we develop alone or with collaborators receives marketing approval, such product may fail to achieve the degree of market acceptance by physicians, patients, healthcare payors and others in the medical community necessary for commercial success.

The commercial success of any potential therapeutic products we develop alone or with collaborators will depend upon their degree of market acceptance by physicians, patients, third-party payors and others in the medical community. Even if any potential therapeutic products we develop alone or with collaborators receive marketing approval, they may nonetheless fail to gain sufficient market acceptance by physicians, patients, healthcare payors and others in the medical community. The degree of market acceptance of any product we develop alone or with collaborators, if approved for commercial sale, will depend on a number of factors, including:

- the efficacy and safety of such product as demonstrated in clinical trials;
- the prevalence and severity of any side effects;
- the clinical indications for which the product is approved by FDA, the EMA or other regulatory authorities;
- product labeling or product insert requirements of the FDA, the EMA or other regulatory authorities, including any limitations or warnings contained in a product's approved labeling;
- public attitudes regarding genome editing technologies;
- our and any collaborators' ability to educate the medical community about the safety and effectiveness of the product;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies, as well as their willingness to accept a therapeutic intervention that involves the editing of the patient's genome;
- the potential and perceived advantages compared to alternative treatments;
- convenience and ease of administration compared to alternative treatments;
- any restrictions on the use of such product together with other treatments or products;
- market introduction of competitive products;
- publicity concerning such product or competing products and treatments;
- the ability to offer such product for sale at a competitive price;

- the strength of marketing and distribution support; and
- sufficient third-party coverage and adequate reimbursement.

If any products we develop alone or with collaborators do not achieve an adequate level of acceptance, we may not generate significant product revenues, and we may not become profitable.

If we are unable to establish sales and marketing capabilities or enter into agreements with third parties to sell and market any products we develop alone or with collaborators, the commercialization of such products may not be successful if and when they are approved.

We do not have a sales or marketing infrastructure and have no experience in the sale, marketing or distribution of biopharmaceutical or other commercial products. To achieve commercial success for any approved products for which we retain sales and marketing responsibilities, we must either develop a sales and marketing organization or outsource these functions to third parties. In the future, we may choose to build a focused sales, marketing and commercial support infrastructure to sell, or participate in sales activities with our collaborators for, certain product candidates if and when they are approved.

There are risks involved with both establishing our own commercial capabilities and entering into arrangements with third parties to perform these services. For example, restricted or closed distribution channels may make it difficult to distribute products to segments of the patient population, and the lack of complementary medicines to be offered by sales personnel may put us at a competitive disadvantage relative to companies with more extensive product lines.

Recruiting and training a sales force or reimbursement specialists are expensive and time consuming and could delay any product launch. If the commercial launch of a product for which we recruit a sales force and establish marketing and other commercialization capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses, and our investment would be lost if we cannot retain or reposition our commercialization personnel. Factors that may inhibit our efforts to commercialize products on our own include:

- unforeseen costs and expenses associated with creating an independent commercialization organization;
- our inability to recruit, train, retain and effectively manage adequate numbers of effective sales, marketing, customer service and other support personnel, including for reimbursement or medical affairs;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe any future medicines; and
- the inability of reimbursement professionals to negotiate arrangements for formulary access, reimbursement and other acceptance by payors.

If we choose to enter into arrangements with third parties to perform sales, marketing, commercial support or distribution services, we may not be successful in entering into such arrangements or may be unable to do so on terms that are favorable to us. Entering into such third-party arrangements may subject us to a variety of risks, including:

- product revenues or profitability to us being lower than if we were to market and sell any products we or our collaborators may develop ourselves;
- our inability to exercise direct control over sales and marketing activities and personnel;
- failure of the third parties to devote necessary resources and attention to, or other inability to, sell and market any products we or our collaborators may develop;

- potential disputes with third parties concerning sales and marketing expenses, calculation of royalties and sales and marketing strategies; and
- unforeseen costs and expenses associated with sales and marketing.

If we do not establish effective commercialization capabilities, either on our own or in collaboration with third parties, we will not be successful in commercializing any of our product candidates that may receive approval.

If the market opportunities for any products we develop alone or with collaborators are smaller than our estimates, or if we are unable to successfully identify enough patients, our revenues may be adversely affected.

We focus some of our research and product development on treatments for rare genetic diseases. Our and our collaborators' projections of both the number of people who have these diseases, as well as the subset of people with these diseases who have the potential to benefit from treatment with product candidates we may develop, are based on estimates. These estimates may prove to be incorrect, and new studies may change the estimated incidence or prevalence of these diseases. The number of patients in the United States, Europe and elsewhere may turn out to be lower than expected, and patients may not be amenable to treatment with products that we may develop alone or with collaborators, or may become increasingly difficult to identify or gain access to, any of which would decrease our ability to realize revenue from any such products for such diseases.

The successful commercialization of potential products will depend in part on the extent to which governmental authorities and health insurers establish coverage, and the adequacy of reimbursement levels and pricing policies, and failure to obtain or maintain coverage and adequate reimbursement for any potential products that may receive approval, could limit marketability of those products and decrease our ability to generate revenue.

The availability of coverage and adequacy of reimbursement by government healthcare programs such as Medicare and Medicaid, private health insurers and other third-party payors is essential for most patients to be able to afford prescription medications such as the potential therapeutic products we develop alone or with collaborators. The ability to achieve acceptable levels of coverage and reimbursement for any potential products that may be approved by governmental authorities will have an effect on our and our collaborators' ability to successfully commercialize such products. Even if products we develop alone or with collaborators obtain coverage by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. If coverage and reimbursement in the United States, the EU or elsewhere is not available for any products we develop alone or with collaborators that may be approved, or any reimbursement that may become available is decreased or eliminated in the future, we and our collaborators may be unable to commercialize such products.

There is significant uncertainty related to the insurance coverage and reimbursement of newly approved drugs and biologics. In the United States, third-party payors, including private and governmental payors, such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs and biologics will be covered. The Medicare and Medicaid programs increasingly are used as models in the United States for how private payors and other governmental payors develop their coverage and reimbursement policies for drugs and biologics. Some third-party payors may require pre-approval of coverage for new or innovative devices or drug therapies before they will reimburse healthcare providers who use such therapies. We cannot predict at this time what third-party payors will decide with respect to the coverage and reimbursement for any product that we develop alone or with collaborators.

No uniform policy for coverage and reimbursement for products exists among third-party payors in the United States. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a

result, the coverage determination process is often a time-consuming and costly process that will require us or our collaborators to provide scientific and clinical support for the use of any potential products that may be approved to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. Furthermore, rules and regulations regarding reimbursement change frequently, in some cases on short notice. Obtaining coverage and adequate reimbursement for products we develop alone or with collaborators may be particularly difficult because of the higher prices often associated with drugs administered under the supervision of a physician. In certain instances, payors may not separately reimbursement for the product itself, but only for the treatments or procedures in which such product is used. A decision by a third-party payor not to cover or separately reimburse for products that we develop alone or with collaborators or procedures using such products, could reduce physician utilization of any such products that may receive approval.

Third-party payors are increasingly challenging prices charged for pharmaceutical products and services, and many third-party payors may refuse to provide coverage and reimbursement for particular drugs or biologics when an equivalent generic drug, biosimilar or a less expensive therapy is available. If approved, it is possible that a third-party payor may consider any products that we develop alone or with collaborators as substitutable and only offer to reimburse patients for the less expensive product. Pricing of existing third-party therapeutics may limit the amount we will be able to charge for any products that may receive approval even if we or our collaborators show improved efficacy or improved convenience of administration such products. These payors may deny or revoke the reimbursement status of a given product or establish prices for new or existing marketed products at levels that are too low to enable us to realize an appropriate return on our investment in the product. If reimbursement is not available or is available only at limited levels, we or our collaborators may not be able to successfully commercialize any of the products that we develop, even if approved, and we may not be able to obtain a satisfactory financial return on them. Moreover, increasing efforts by governmental and third-party payors in the United States and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for any products we develop alone or with collaborators that may receive approval. We expect to experience pricing pressures in connection with the sale of any products that may receive approval due to the trend toward managed health care, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and biologics and surgical procedures and other treatments, has become intense. As a result, increasingly high barriers are being erected to the entry of new products.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe and elsewhere have and will continue to put pressure on the pricing and usage of any products we develop alone or with collaborators that may receive approval. In many countries, the prices of medical products are subject to varying price control mechanisms as part of national health systems. Other countries allow companies to fix their own prices for medical products, but monitor and control company profits. Additional international price controls or other changes in pricing regulation could restrict the amount that we or our collaborators are able to charge for products that we develop that may receive approval. Accordingly, in markets outside the United States, the reimbursement for such products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenue and profits.

Our product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated.

If we are successful in achieving regulatory approval to commercialize any biologic product candidate we develop alone or with collaborators, it may face competition from biosimilar products. In the United States, our

product candidates are regulated by the FDA as biologic products subject to approval under the BLA pathway. The Biologics Price Competition and Innovation Act of 2009, or the BPCIA, created an abbreviated pathway for the approval of biosimilar and interchangeable biologic products following the approval of an original BLA. The abbreviated regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as "interchangeable" based on its similarity to an existing brand product. Under the BPCIA, an application for a biosimilar product may not be submitted until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years after the reference product was first licensed by the FDA. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of their product. The law is complex and is still being interpreted and implemented by the FDA. As a result, its ultimate impact, implementation, and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for biological product candidates.

We believe that any of our product candidates that are approved as biological products under a BLA should qualify for the 12-year period of exclusivity. However, there is a risk that this exclusivity could be shortened due to congressional action or otherwise, or that the FDA will not consider such product candidates to be reference products for competing products, potentially creating the opportunity for generic competition sooner than anticipated. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have also been the subject of recent litigation. Moreover, the extent to which a biosimilar product, once approved, will be substituted for any one of our or our collaborators' reference products in a way that is similar to traditional generic substitution for non-biologic products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing. If competitors are able to obtain marketing approval for biosimilars referencing any products that we develop alone or with collaborators that may be approved, such products may become subject to competition from such biosimilars, with the attendant competitive pressure and potential adverse consequences.

Additional risks related to the identification, development and commercialization of our food and agricultural product candidates

The regulatory landscape that may govern any potential food or agricultural products that we or our collaborators may develop is uncertain and may adversely impact the development and commercialization activities of our food platform.

In the United States, the United States Department of Agriculture, or the USDA, regulates, among other things, the introduction (including the importation, interstate movement or release into the environment) of organisms and products altered or produced through genetic engineering determined to be plant pests or for which there is reason to believe are plant pests. Such organisms and products are considered "regulated articles." However, a petitioner may submit a request for a determination by the USDA of "nonregulated status" for a particular article. A petition for determination of nonregulated status must include detailed information, including relevant experimental data and publications, field trial reports and a description of the genotypic differences between the regulated article and the nonmodified recipient organism, among other things. Neither we nor, to our knowledge, our collaborators have obtained a determination from the USDA that any product candidates are not "regulated articles" under these regulations. We cannot predict whether the USDA, advocacy groups or other third parties will contend that these products are regulated articles. The USDA's regulations also require that companies obtain a permit or file a notification before engaging in the introduction (including the importation, interstate movement or release into the environment such as in field trials) of "regulated articles."

Additionally, a change in the way the USDA interprets its regulations, or a change in its regulations, could subject our or our collaborators' products to more burdensome regulations, thereby substantially increasing the time and costs associated with developing product candidates. Complying with the USDA's Part 340 regulations, including permitting requirements, is a costly, time-consuming process and could delay or prevent the commercialization of any potential food or agricultural products we or our collaborators may develop.

Any potential food or agricultural products that we or our collaborators develop may also be subject to extensive FDA food product regulations. Under sections 201(s) and 409 of the Federal Food, Drug, and Cosmetic Act, or the FDCA, any substance that becomes or is reasonably expected to become a component of food is a food additive and is therefore subject to FDA premarket review and approval, unless the substance is generally recognized, among qualified experts, as having been adequately shown to be safe under the conditions of its intended use (generally recognized as safe, or GRAS), or unless the use of the substance is otherwise excluded from the definition of a food additive, and any food that contains an unsafe food additive is considered adulterated under section 402(a)(2)(C) of the FDCA. The FDA may classify some or all of the potential food or agricultural products that we or our collaborators may develop as containing a food additive that is not GRAS or otherwise determine that such products contain significant compositional differences from existing plant products that require further review. Such classification would cause these potential products to require pre-market approval, which could delay the commercialization of these products. In addition, the FDA is currently evaluating its approach to the regulation of gene-edited plants. For example, on January 19, 2017, the FDA issued a notice in the Federal Register requesting public comment on the use of genome editing techniques to produce new plant varieties that are used for human or animal food or foods that are derived from such new plant varieties produced using genome editing. Among other things, the notice asked for data and information in response to questions about the safety of foods from gene-edited plants, such as whether categories of gene-edited plants present food safety risks different from other plants produced through traditional plant breeding. If the FDA enacts new regulations or policies with respect to gene-edited plants, such policies could result in additional compliance costs and delay or even prevent the commercialization of any of our product candidates, which could negatively affect our profitability. Any delay in the regulatory consultation process, or a determination that any potential products we or our collaborators may develop do not meet regulatory requirements by the FDA or other regulators, could cause a delay in, or prevent, the commercialization of our products, which may lead to reduced acceptance by the public and an increase in competitor products that may directly compete with ours, or could otherwise negatively impact our business, prospects and results of operations.

On May 4, 2018, the USDA issued a proposed rule implementing the National Bioengineered Food Disclosure Standard, with a proposed compliance date of January 1, 2020. Under this proposed rule, the label of a bioengineered, or BE, food must include a disclosure that the food is a BE food or contains a BE ingredient, with certain exceptions. This proposed rule defines BE food as "a food that contains genetic material that was has been modified through in vitro recombinant deoxyribonucleic acid, or DNA, techniques and for which the modification could not otherwise be obtained through conventional breeding or found in nature," except in the case of an incidental additive present in food at an insignificant level and that does not have any technical or functional effect in the food. If this proposed rule is passed and products developed by our collaborators based on our ARCUS technology are required to be labeled "BE," consumer perception of these products may be adversely affect.

In the EU, genetically modified foods, or GM foods, can only be authorized for sale on the market once they have been subject to rigorous safety assessments. The procedures for evaluation and authorization of GM foods are governed by Regulation (EC) 1829/2003 on GM food and feed and Directive 2001/18/EC on the release of genetically modified organisms, or GMOs, into the environment. If the GMO is not to be used in food or feed, then an application must be made under Directive 2001/18/EC. If the GMO is to be used in food or feed (but it is

not grown in the EU) then a single application for both food and feed purposes under Regulation 1829/2003 should be made. If the GMO is used in feed or food and it is also grown in the EU, an application for both cultivation and food/feed purposes needs to be carried out under Regulation (EC) 1829/2003. A different EU regulation, Regulation (EC) 1830/2003, regulates the labeling of products that contain GMOs that are placed on the EU market. Directive 2001/18/EC was amended by Directive (EU) 2015/412 which gives EU Member States more flexibility to allow, restrict or prohibit growing GMOs in their territory, on a range of environmental grounds, even if such crops were previously authorized at EU level. Under Directive 2015/412, EU Member State restrictions or prohibitions can only cover cultivation, and not the free circulation and import of genetically modified seeds and plant propagation material, and should be in conformity with the internal market rules of the EU Treaties. In March 2018, the Commission adopted Commission Directive (EU) 2018/350 amending Directive 2001/18/EC as regards the environmental risk assessment of GMOs. This measure aims to bring the assessment of the environmental risk of GM foods in the EU up to date with developments in scientific knowledge and technical progress. Member States have to transpose the Directive by September 29, 2019. Further EU level legislation on GM foods includes Directive 2009/41/EC on contained use of genetically modified micro-organisms and Regulation (EC) 1946/2003 on transboundary movements of GMOs.

We cannot predict whether or when any governmental authority will change its regulations with respect to any potential food or agricultural products that we develop alone or with collaborators. Advocacy groups have engaged in publicity campaigns and filed lawsuits in various countries against companies and regulatory authorities seeking to halt biotechnology approval activities or influence public opinion against genetically engineered products. In addition, governmental reaction to negative publicity concerning genetically edited agricultural products could result in greater regulation of genetic research and derivative products or regulatory costs that render our or our collaborators' development of potential food or agricultural products cost prohibitive. Our collaborators may use or integrate our products or technology into other products in ways that could subject those collaborators or products to additional regulation.

The overall agricultural industry is susceptible to agricultural price changes, and we may be exposed to risks from changes in commodity prices.

Changes in the prices of agricultural products could result in changes in demand for and prices of food and agricultural products that we or our collaborators may develop. We may be susceptible to these changes as a result of factors beyond our control, such as general economic conditions, seasonal fluctuations, weather conditions, demand, food safety concerns, product recalls and government regulations, subsidies or market export tariffs. If demand for agricultural products that we or our collaborators may develop is negatively impacted, our potential revenues under collaboration agreements for such products may decline, which could adversely affect our results of operations.

The successful commercialization of any food or agricultural products we develop will depend in part on our collaborators' ability to produce high-quality plants and seeds cost-effectively on a large scale and to accurately forecast demand for such potential products, and they may be unable to do so.

The production of commercial-scale quantities of food or agricultural products or seeds for them requires the multiplication of the plants or seeds through a succession of plantings and seed harvests. The cost-effective production of high-quality, high-volume quantities of such products or seeds may depend in part on our collaborators' abilities to scale production processes to produce plants and seeds in sufficient quantity to meet demand. Our collaborators' existing or future plant and seed production techniques may not enable timely meeting of large-scale production goals cost-effectively for any potential food or agricultural products that we and our collaborators may develop. Although we have worked with some of the largest plant biotechnology companies to edit gene targets and develop potential product candidates in a variety of crop plants, no commercial food or agricultural products have ever been developed using our technology.

In addition, because of the length of time it takes to produce commercial quantities of marketable plants and seeds, our collaborators will need to make seed production decisions well in advance of food product sales. The ability to accurately forecast demand can be adversely affected by a number of factors outside of their control, including changes in market conditions, environmental factors, such as pests and diseases, and adverse weather conditions.

The commercial success of any consumer-centric food or agricultural products that we or our collaborators may develop is reliant on the needs of food manufacturers and the recognition of shifting consumer preferences.

The commercial success of any consumer-centric products depends in part on the ability of the food manufacturer to accurately determine the shifting needs and desires of the ultimate consumer. We will not control the marketing, distribution labeling or any other aspects of the sale and commercialization of the manufacturers' food products. Consumer preferences may be a significant driver in the success of food manufacturers in their efforts to sell food and agricultural products, including products that we or our collaborators may develop. While current trends indicate that consumer preferences may be moving towards "healthier" options, we cannot predict whether such trends will continue or which types of food products will be demanded by consumers in the future. Additionally, as health and nutritional science continues to progress, consumer perception of what foods, nutrients and ingredients are considered "healthy" may shift. We and our collaborators may not be dynamic enough in responding to consumer trends and creating products that will be demanded by consumers in the future. In addition, if consumer demand is lower than our estimates or those of our collaborators, our ability to realize revenues from potential food or agricultural products may be limited. Failure by our collaborators to successfully recognize consumer trends could lower demand for potential food or agricultural products that we or our collaborators may develop, which could harm our business, results of operations and financial condition.

Some of the potential food products we develop alone or with collaborators may be distributed into markets or countries in which they have not received regulatory approval, which may result regulatory challenges or lawsuits.

The scale of the agricultural industry may make it difficult to monitor and control the distribution of any potential food products that we develop alone or with collaborators. As a result, such products may be sold inadvertently within jurisdictions where they are not approved for distribution. Such sales may lead to regulatory challenges or lawsuits against us, which could result in significant expenses and divert our management's attention, which could harm our business, results of operations and financial condition.

Risks related to our reliance on third parties

We have entered into significant arrangements with collaborators and expect to depend on collaborations with third parties for certain research, development and commercialization activities, and if any such collaborations are not successful, it may harm our business and prospects.

We have sought in the past, and anticipate that we will continue to seek in the future, third-party collaborators for the research, development and commercialization of certain product candidates and the research and development of certain technologies. For example, we are party to the Servier Agreement, pursuant to which we are focused on research and development of allogeneic chimeric antigen receptor T cell therapies for up to six oncology targets that utilize or incorporate our genome editing technologies, and we are also party to a collaboration with Gilead focused on research and development of therapeutic product candidates for the treatment of Hepatitis B using ARCUS nucleases. In addition, our food platform is based on a consumer-centric model, whereby our research and development activities and potential revenues are based on the needs and

commercial success of our collaborators. For example, we are a party to a commercial license agreement with Cargill focused on targeting and modifying certain genes related to saturated oil production in canola plants. Our likely collaborators for other product research and development arrangements include large and mid-size pharmaceutical and biotechnology companies biotechnology and food, beverage, nutrition and agricultural biotechnology companies, and our likely collaborators for other technology research and development arrangements include universities and other research institutions.

Working with collaborators poses several significant risks. We will likely have limited control over the amount and timing of resources that our collaborators dedicate to the product candidates or technologies we may seek to develop with them. A variety of factors may impact resource allocation decisions of collaborators, such as study or trial results, changes in the collaborator's strategic focus, turnover in personnel responsible for the development activities, financial capacity or external factors such as a business combination or change in control that diverts resources or creates competing priorities. Collaboration agreements may not lead to development or commercialization of product candidates or the development of technologies in the most efficient manner or at all. Resource allocation and other developmental decisions made by our collaborators may result in the delay or termination of research programs, studies or trials, repetition of or initiation of new studies or trials or provision of insufficient funding or resources for the completion of studies or trials or the successful marketing and distribution of any product candidates that may receive approval. Collaborators could independently develop, or develop with third parties, product candidates or technologies that compete directly or indirectly with our product candidates or technologies if the collaborators believe that competitive products or technologies are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours. Collaborators may not properly obtain, maintain, enforce or defend our intellectual property or proprietary rights or may use our proprietary information in such a way that could jeopardize or invalidate our proprietary information or expose us to potential litigation. Disputes may arise between us and our collaborators that result in the delay or termination of the research, development or commercialization activities or that result in costly litigation or arbitration that diverts management attention and resources.

Our ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements. If our collaborations do not result in the successful development and commercialization of product candidates or technologies, or if one of our collaborators terminates its agreement with us, we may not receive any future funding or milestone or royalty payments under the collaboration. If we do not receive the funding we expect under these agreements, our development of product candidates or technologies could be delayed, and we may need additional resources to develop such product candidates or technologies. In addition, if one of our collaborators terminates its agreement with us, we may find it more difficult to find a suitable replacement collaborator or attract new collaborators and may need to raise additional capital to pursue further development or commercialization of the applicable product candidates or technologies. These events could delay development programs and negatively impact the perception of our company in business and financial communities. Failure to develop or maintain relationships with any current collaborators could result in the loss of opportunity to work with that collaborator or reputational damage that could impact our relationships with other collaborators in the relatively small industry communities in which we operate. Moreover, all of the risks relating to product development, regulatory approval and commercialization described in this prospectus apply to the activities of our collaborators. If our existing collaboration agreements or any collaborative or strategic relationships we may establish in the future are not effective and successful, it may damage our reputation and business prospects, delay or prevent the development and commercialization of product candidates and inhibit or preclude our ability to realize any revenues.

If we are not able to establish collaborations on commercially reasonable terms, we may have to alter our research, development and commercialization plans.

Our research and product development programs and the potential commercialization of any product candidates we develop alone or with collaborators will require substantial additional cash to fund expenses, and we expect that we will continue to seek collaborative arrangements with others in connection with the development and potential commercialization of current and future product candidates or the development of ancillary technologies. We face significant competition in establishing relationships with appropriate collaborators. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration and the proposed collaborator's evaluation of a number of factors. Those factors may include, among other things and as applicable for the type of potential product or technology, an assessment of the opportunities and risks of our technology, the design or results of studies or trials, the likelihood of approval, if necessary, by the USDA, the FDA or similar regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products and technologies and industry and market conditions generally.

Current or future collaborators may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us. Additionally, we may be restricted under existing collaboration agreements from entering into future agreements on certain terms or for certain development activities with potential collaborators. For example, we have granted exclusive rights or options to Servier and Gilead for certain targets, and during the terms of our respective collaboration agreements with them we will be restricted from granting rights to other parties to use our ARCUS technology to pursue potential products that address those targets. Similarly, our collaboration agreements have in the past and may in the future contain non-competition provisions that could limit our ability to enter into strategic collaborations with future collaborators.

Collaborations are complex and time-consuming to negotiate and document. We may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we do enter into additional collaboration agreements, the negotiated terms may force us to relinquish rights that diminish our potential profitability from development and commercialization of the subject product candidates or others. If we are unable to enter into additional collaboration agreements, we may have to curtail the research and development of the product candidate or technology for which we are seeking to collaborate, reduce or delay research and development programs, delay potential commercialization timelines, reduce the scope of any sales or marketing activities or undertake research, development or commercialization activities at our own expense. If we elect to increase our expenditures to fund research, development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all.

We expect to rely on third parties to conduct, supervise and monitor our clinical trials and some aspects of our research and preclinical testing, and if those third parties do not successfully carry out their contractual duties, comply with regulatory requirements, or otherwise perform in a satisfactory manner, we may not be able to obtain regulatory approval or commercialize product candidates, or such approval or commercialization may be delayed, and our business may be substantially harmed.

We may rely on medical institutions, clinical investigators, contract laboratories and other third parties, such as CROs, to conduct preclinical studies and future clinical trials for our product candidates. Nevertheless, we will be responsible for ensuring that each of our studies and trials is conducted in accordance with the applicable

protocol, legal and regulatory requirements and scientific standards, and our reliance on such third parties will not relieve us of our regulatory responsibilities.

Although we intend to design the trials for our product candidates either alone or with collaborators, third parties may conduct all of the trials. As a result, many important aspects of our research and development programs, including their conduct and timing, will be outside of our direct control. Our reliance on third parties to conduct future studies and trials will also result in less direct control over the management of data developed through studies and trials than would be the case if we were relying entirely upon our own staff. Communicating with outside parties can also be challenging, potentially leading to mistakes and difficulties in coordinating activities. Outside parties may have staffing difficulties, fail to comply with contractual obligations, experience regulatory compliance issues, undergo changes in priorities, become financially distressed or form relationships with other entities, some of which may be our competitors. We also face the risk of potential unauthorized disclosure or misappropriation of our intellectual property by CROs or other third parties, which may reduce our trade secret protection and allow our potential competitors to access and exploit our proprietary technology. For any violations of laws and regulations during the conduct of our preclinical studies and future clinical trials, we could be subject to warning letters or enforcement action that may include civil penalties up to and including criminal prosecution.

For example, we will remain responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA requires us to comply with regulations, commonly referred to as Good Clinical Practices, or GCPs, for conducting, monitoring, recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. If we, our collaborators, our CROs or other third parties fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable and FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We also are required to register certain ongoing clinical trials and post the results of such completed clinical trials on a government-sponsored database, ClinicalTrials.gov, within certain timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

If our CROs or other third parties do not successfully carry out their contractual duties or obligations, fail to meet expected deadlines, or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols or regulatory requirements or for any other reasons, trials for product candidates may be extended, delayed or terminated, and we or our collaborators may not be able to obtain regulatory approval for, or successfully commercialize, any product candidate that we develop. If we are required to repeat, extend the duration of or increase the size of any trials we conduct, it could significantly delay commercialization and require significantly greater expenditures. As a result of any of these factors, our financial results and the commercial prospects for any product candidate that we or our collaborators may develop would be harmed, our costs could increase and our ability to generate revenues could be delayed.

We expect to rely on third parties to supply raw materials or manufacture product supplies that are necessary for the conduct of preclinical studies, clinical trials and manufacturing of our product candidates, and failure by third parties to provide us with sufficient quantities of products, or to do so at acceptable quality levels or prices and on a timely basis, could harm our business.

We are dependent on third parties for the supply of various biological materials, such as cells, cytokines and antibodies, and the manufacture of product supplies, such as media, plasmids, mRNA and AAV viral vectors, that are necessary to produce our product candidates. The supply of these materials could be reduced or interrupted at any time. In such case, identifying and engaging an alternative supplier or manufacturer could result in delay, and we may not be able to find other acceptable suppliers or manufacturers on acceptable terms, or at all. Switching suppliers or manufacturers may involve substantial costs and is likely to result in a

delay in our desired clinical and commercial timelines. If we change suppliers or manufacturers for commercial production, applicable regulatory agencies may require us to conduct additional studies or trials. If key suppliers or manufacturers are lost, or if the supply of the materials is diminished or discontinued, we or our collaborators may not be able to develop, manufacture and market product candidates in a timely and competitive manner, or at all. If any of our product candidates receives approval, we will likely need to seek alternative sources of supply of raw materials or manufactured product supplies and there can be no assurance that we will be able to establish such relationships to provide such supplies on commercially reasonable terms or at acceptable quality levels, if at all. If we are unable to identify and procure additional sources of supply that fit our required needs, we could face substantial delays or incur additional costs in procuring such materials. In addition, manufactured product supplies are subject to stringent manufacturing processes and rigorous testing. Delays in the completion and validation of facilities and manufacturing processes of these materials could adversely affect the ability to complete studies or trials and commercialize any product candidates that may receive approval. Furthermore, if our suppliers or manufacturers encounter challenges relating to employee turnover, the supply and manufacturing of our materials could be delayed or adversely affected as such parties seek to hire and train new employees. These factors could cause the delay of studies or trials, regulatory submissions, required approvals or commercialization of product candidates that we or our collaborators may develop, cause us to incur higher costs and prevent us from commercializing products successfully. Furthermore, if our suppliers or manufacturers fail to meet contractual requirements, and we are unable to secure one or more replacements capable of production at a substantially equivalent cost, our or our collaborators' studies or trials may be delayed and we could lose potential revenue.

We may rely on third parties for at least a portion of the manufacturing process of product candidates, and failure by those parties to adequately perform their obligations could harm our business.

We do not currently own any facility that may be used as our clinical-scale manufacturing and processing facility and expect that we may rely on outside vendors for at least a portion of the manufacturing process of product candidates that we or our collaborators may develop. The facilities used by our contract manufacturers to manufacture product candidates must be approved by the FDA or other foreign regulatory agencies pursuant to inspections that will be conducted after we submit an application to the FDA or other foreign regulatory agencies. To the extent that we or our collaborators engage third parties for manufacturing services, we will not control the manufacturing process of, and will be completely dependent on, our contract manufacturing providers for compliance with cGMP requirements for manufacture of the product candidates. We have not yet caused any product candidates to be manufactured or processed on a commercial scale and may not be able to do so. We will make changes as we work to optimize the manufacturing process, and we cannot be sure that even minor changes in the process will result in products that are safe and effective. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or other regulatory authorities, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. In addition, we have no control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of product candidates or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market any of our or our collaborators' potential products.

Risks related to intellectual property

Our ability to compete may decline if we do not adequately protect our proprietary rights, and our proprietary rights do not necessarily address all potential threats to our competitive advantage.

Our commercial success depends upon obtaining and maintaining proprietary rights to our intellectual property estate, including rights relating to ARCUS and to our product candidates, as well as successfully defending these rights against third-party challenges and successfully enforcing these rights to prevent third-party infringement. We will only be able to protect ARCUS and product candidates from unauthorized use by third parties to the extent that valid and enforceable patents or effectively protected trade secrets cover them. Our ability to obtain and maintain patent protection for ARCUS and our product candidates is uncertain due to a number of factors, including that:

- we may not have been the first to invent the technology covered by our pending patent applications or issued patents;
- we may not be the first to file patent applications covering product candidates, including their compositions or methods of use, as patent applications in the United States and most other countries are confidential for a period of time after filing;
- our compositions and methods may not be patentable;
- our disclosures in patent applications may not be sufficient to meet the statutory requirements for patentability;
- any or all of our pending patent applications may not result in issued patents;
- others may independently develop identical, similar or alternative technologies, products or compositions or methods of use thereof;
- others may design around our patent claims to produce competitive technologies or products that fall outside of the scope of our patents;
- we may fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection;
- we may not seek or obtain patent protection in countries that may eventually provide us a significant business opportunity;
- any patents issued to us may not provide a basis for commercially viable products, may not provide any competitive advantages or may be successfully challenged by third parties;
- others may identify prior art or other bases upon which to challenge and ultimately invalidate our patents or otherwise render them unenforceable; and
- the growing scientific and patent literature relating to engineered endonucleases, including our own patents and publications, may make it increasingly difficult or impossible to patent new engineered nucleases in the future.

Even if we have or obtain patents covering ARCUS or any product candidates or compositions, we and our collaborators may still be barred from making, using and selling such product candidates or technologies because of the patent rights of others. Others may have filed, and in the future may file, patent applications covering compositions, products or methods that are similar or identical to ours, which could materially affect our ability to successfully develop any product candidates or to successfully commercialize any approved

products alone or with collaborators. In addition, because patent applications can take many years to issue, there may be currently pending applications unknown to us that may later result in issued patents that we or our collaborators may infringe. These patent applications may have priority over patent applications filed by us.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our owned and licensed patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or freedom to operate or in patent claims being narrowed, invalidated or held unenforceable, in whole or in part, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. Furthermore, we cannot guarantee that any patents will be issued from any pending or future owned or licensed patent applications. Thus, even if our patent applications issue as patents, they may not issue in a form that will provide us with meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. In addition, third parties may be able to develop products that are similar to, or better than, ours in a way that is not covered by the claims of our patents, or may have blocking patents that could prevent us from marketing our products or practicing our own patented technology. Moreover, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after it is filed. Various extensions may be available; however the life of a patent, and the protection it affords, is limited. Without patent protection for current or future product candidates, we may be open to competition from generic versions of such potential products. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to those we or our collaborators may develop.

Obtaining and maintaining a patent portfolio entails significant expense, including periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and patent applications. These expenditures can be at numerous stages of prosecuting patent applications and over the lifetime of maintaining and enforcing issued patents. We may or may not choose to pursue or maintain protection for particular intellectual property in our portfolio. If we choose to forgo patent protection or to allow a patent application or patent to lapse purposefully or inadvertently, our competitive position could suffer. Furthermore, we employ reputable law firms and other professionals to help us comply with the various procedural, documentary, fee payment and other similar provisions we are subject to and, in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. There are situations, however, in which failure to make certain payments or noncompliance with certain requirements in the patent process can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, our competitors might be able to enter the market, which would have a material adverse effect on our business.

Legal action that may be required to enforce our patent rights can be expensive and may involve the diversion of significant management time. There can be no assurance that we will have sufficient financial or other resources to file and pursue infringement claims, which typically last for years before they are concluded. In addition, these legal actions could be unsuccessful and result in the invalidation of our patents, a finding that they are unenforceable or a requirement that we enter into a licensing agreement with or pay monies to a third party for use of technology covered by our patents. We may or may not choose to pursue litigation or other actions against those that have infringed on our patents, or have used them without authorization, due to the associated expense and time commitment of monitoring these activities. If we fail to successfully protect or enforce our intellectual property rights, our competitive position could suffer, which could harm our results of operations.

Many biotechnology companies and academic institutions are currently pursuing a variety of different nuclease systems for genome engineering, such a TAL endonucleases, zinc-finger nucleases, and CRISPR/Cas9 nucleases, and the use of those nucleases in cancer immunotherapy, gene therapy and genome editing. Although those

nucleases are physically and chemically different from our ARCUS nucleases, those companies and institutions may seek patents that broadly cover aspects of cancer immunotherapy, gene therapy and genome editing using nucleases generally. Such patents, if issued, valid and enforceable, could prevent us from marketing our product candidates, if approved, practicing our own patented technology, or might require us to take a license which might not be available on commercially reasonable terms or at all. While we expect that we will continue to be able to patent our ARCUS nucleases for the foreseeable future, as the scientific and patent literature relating to engineered endonucleases increases, including our own patents and publications, it may become more difficult or impossible to patent new engineered endonucleases in the future.

If we fail to comply with our obligations in the agreements under which we license intellectual property rights from third parties or otherwise experience disruptions to our business relationships with our licensors, we could lose license rights that are important to our business.

We are a party to a number of intellectual property license agreements that are important to our business and expect to enter into additional license agreements in the future. Our existing license agreements impose, and we expect that future license agreements will impose, various diligence, milestone payment, royalty and other obligations on us. We may need to outsource and rely on third parties for many aspects of the development, sales and marketing of any products covered under our current and future license agreements. Delay or failure by these third parties could adversely affect the continuation of our license agreements with our licensors. If we fail to comply with any of our obligations under these agreements, or we are subject to a bankruptcy, our licensors may have the right to terminate the license, in which event we would not be able to market any products covered by the license.

In addition, disputes may arise regarding the payment of the royalties due to licensors in connection with our exploitation of the rights we license from them. Licensors may contest the basis of royalties we retained and claim that we are obligated to make payments under a broader basis. In addition to the costs of any litigation we may face as a result, any legal action against us could increase our payment obligations under the respective agreement and require us to pay interest and potentially damages to such licensors.

In some cases, patent prosecution of our licensed technology is controlled solely by the licensor. If such licensor fails to obtain and maintain patent or other protection for the proprietary intellectual property we license from such licensor, we could lose our rights to such intellectual property or the exclusivity of such rights, and our competitors could market competing products using such intellectual property. In that event, we may be required to expend significant time and resources to develop or license replacement technology. If we are unable to do so, we or our collaborators may be unable to develop or commercialize the affected product candidates, which could harm our business significantly. In other cases, we control the prosecution of patents resulting from licensed technology. In the event we breach any of our obligations related to such prosecution, we may incur significant liability to our licensing partners.

For example, our license agreement with Duke University, or Duke, which we refer to as the Duke License, imposes various payment, royalty and other obligations on us in order to maintain the license. If we fail to make royalty payments or milestone payments required under the Duke License, Duke may terminate the agreement. If we or our affiliates obtain a license from a third party to practice the Duke technology, we must use commercially reasonable efforts to secure a covenant not to sue Duke, or any of its faculty, students, employees or agents, for any research and development efforts conducted at Duke that resulted in the creation of any of its inventions or intellectual property rights arising therefrom. Additionally, because development of the Duke technology was funded in part by the U.S. government, it is subject to certain government rights and obligations, including the requirement that any products sold in the United States based upon such technology be substantially manufactured in the United States.

In addition, our cross-license agreement with Cellectis, or the Cellectis License, imposes various obligations on us in order to maintain the license. In particular, if we participate in or provide assistance to a third party challenging the validity, enforceability and/or patentability of any claim of any patent licensed to us by Cellectis under this agreement, Cellectis may terminate the agreement. The Cellectis License does not provide exclusive rights to use the licensed intellectual property and technology or rights in all relevant fields in which we may wish to develop or commercialize our technology and products in the future. As a result, we are not able to prevent competitors from developing and commercializing competitive products and technology that may use this technology. Additionally, we do not have the right to control the preparation, filing, prosecution, maintenance, enforcement and defense of patents and patent applications covering the technology that we license from Cellectis. Therefore, we cannot be certain that these patents and patent applications will be prepared, filed, prosecuted, maintained and defended in a manner consistent with the best interests of our business. If Cellectis or other licensors fail to prosecute, maintain, enforce and defend the patents subject to such licenses, or lose rights to those patents or patent applications, the rights we have licensed may be reduced or eliminated, and our right to develop and commercialize any of our products that are the subject of such licensed rights could be adversely affected.

If we fail to comply with our obligations under the Duke License or the Cellectis License, or arrangements with any other licensors, our counterparties may have the right to terminate these agreements, in which event we might not be able to develop, manufacture or market any product candidate that is covered by these agreements, which could materially adversely affect the value of any such product candidate. Termination of these agreements or reduction or elimination of our rights under these agreements may result in our having to negotiate new or reinstated agreements with less favorable terms, or cause us to lose our rights under these agreements, including our rights to important intellectual property or technology.

Disputes may arise regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- the amounts of royalties, milestones or other payments due to our licensors;
- the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the license agreement;
- the sublicensing of patent and other rights under our collaborative development relationships;
- our diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- the ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our collaborators; and
- the priority of invention of patented technology.

Such disputes may be costly to resolve and may divert management's attention away from day-to-day activities. If disputes over intellectual property that we have licensed from third parties prevent or impair our ability to maintain our licensing arrangements on acceptable terms, we or our collaborators may be unable to successfully develop and commercialize the affected product candidates.

Some of our in-licensed intellectual property has been discovered through government funded programs and thus may be subject to federal regulations such as "march-in" rights, certain reporting requirements and a preference for U.S.-based companies, and compliance with such regulations may limit our exclusive rights and our ability to contract with non-U.S. manufacturers.

Certain intellectual property rights that have been in-licensed pursuant to the Duke License have been generated through the use of U.S. government funding and are therefore subject to certain federal regulations.

As a result, the U.S. government may have certain rights to intellectual property embodied in our current or future product candidates pursuant to the Bayh-Dole Act of 1980, or the Bayh-Dole Act. These U.S. government rights include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right, under certain limited circumstances, to require the licensor to grant exclusive, partially exclusive or non-exclusive licenses to any of these inventions to a third party if it determines that (1) adequate steps have not been taken to commercialize the invention, (2) government action is necessary to meet public health or safety needs or (3) government action is necessary to meet requirements for public use under federal regulations (also referred to as “march-in rights”). The U.S. government also has the right to take title to these inventions if the licensor fails to disclose the invention to the government or fails to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us to expend substantial resources. In addition, the U.S. government requires that any products embodying any of these inventions or produced through the use of any of these inventions be manufactured substantially in the United States, and the Duke License requires that we comply with this requirement. This preference for U.S. industry may be waived by the federal agency that provided the funding if the owner or assignee of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture the products substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for U.S. industry may limit our ability to contract with non-U.S. product manufacturers for products covered by such intellectual property. To the extent any of our owned or licensed future intellectual property is also generated through the use of U.S. government funding, the provisions of the Bayh-Dole Act may similarly apply.

If we do not obtain patent term extension in the United States under the Hatch-Waxman Act and in foreign countries under similar legislation with respect to our product candidates, thereby potentially extending the term of marketing exclusivity for such product candidates, our business may be harmed.

In the United States, a patent that covers an FDA-approved drug or biologic may be eligible for a term extension designed to restore the period of the patent term that is lost during the premarket regulatory review process conducted by the FDA. Depending upon the timing, duration and conditions of FDA marketing approval of our product candidates, one or more of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, or the Hatch-Waxman Act, which permits a patent term extension of up to five years for a patent covering an approved product as compensation for effective patent term lost during product development and the FDA regulatory review process. In the European Union, our product candidates may be eligible for term extensions based on similar legislation. In either jurisdiction, however, we may not receive an extension if we fail to apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. Even if we are granted such extension, the duration of such extension may be less than our request. If we are unable to obtain a patent term extension, or if the term of any such extension is less than our request, the period during which we can enforce our patent rights for that product will be in effect shortened and our competitors may obtain approval to market competing products sooner. The resulting reduction of years of revenue from applicable products could be substantial.

Patents and patent applications involve highly complex legal and factual questions, which, if determined adversely to us, could negatively impact our patent position.

The patent positions of biopharmaceutical and biotechnology companies and other actors in our fields of business can be highly uncertain and typically involve complex scientific, legal and factual analyses. In particular, the interpretation and breadth of claims allowed in some patents covering biopharmaceutical compositions may be uncertain and difficult to determine, and are often affected materially by the facts and

circumstances that pertain to the patented compositions and the related patent claims. The standards of the United States Patent and Trademark Office, or the USPTO, and its foreign counterparts are sometimes uncertain and could change in the future. Consequently, the issuance and scope of patents cannot be predicted with certainty. Patents, if issued, may be challenged, invalidated or circumvented. U.S. patents and patent applications may also be subject to interference or derivation proceedings, and U.S. patents may be subject to reexamination proceedings, post-grant review and/or *inter partes* review in the USPTO. International patents may also be subject to opposition or comparable proceedings in the corresponding international patent office, which could result in either loss of the patent or denial of the patent application or loss or reduction in the scope of one or more of the claims of the patent or patent application. In addition, such interference, derivation, reexamination, post-grant review, *inter partes* review and opposition proceedings may be costly. Accordingly, rights under any issued patents may not provide us with sufficient protection against competitive products or processes.

Furthermore, even if not challenged, our patents and patent applications may not adequately protect our technology and any product candidates or products that we develop alone or with collaborators or prevent others from designing their products to avoid being covered by our claims. If the breadth or strength of protection provided by the patent applications we hold with respect to product candidates or potential products is threatened, it could dissuade companies from collaborating with us to develop, and could threaten our or their ability to successfully commercialize, such product candidates. Furthermore, for U.S. applications in which all claims are entitled to a priority date before March 16, 2013, an interference proceeding can be provoked by a third party or instituted by the USPTO in order to determine who was the first to invent any of the subject matter covered by such patent claims.

In addition, changes in, or different interpretations of, patent laws in the United States and other countries may permit others to use our discoveries or to develop and commercialize our technology and product candidates or products without providing any compensation to us, or may limit the scope of patent protection that we are able to obtain. The laws of some countries do not protect intellectual property rights to the same extent as U.S. laws, and those countries may lack adequate rules and procedures for defending our intellectual property rights.

If the patent applications we hold or have in-licensed with respect to our current and future research and development programs and product candidates fail to issue, if their validity, breadth or strength of protection is threatened, or if they fail to provide meaningful exclusivity for our technology or any products and product candidates that we or our collaborators may develop, it could dissuade companies from collaborating with us to develop product candidates, encourage competitors to develop competing products or technologies and threaten our or our collaborators' ability to commercialize future product candidates. Any such outcome could have a material adverse effect on our business.

Third parties may assert claims against us alleging infringement of their patents and proprietary rights, or we may need to become involved in lawsuits to defend or enforce our patents, either of which could result in substantial costs or loss of productivity, delay or prevent the development and commercialization of product candidates, prohibit our use of proprietary technology or sale of potential products or put our patents and other proprietary rights at risk.

Our commercial success depends in part upon our ability to develop, manufacture, market and sell product candidates without alleged or actual infringement, misappropriation or other violation of the patents and proprietary rights of third parties. Litigation relating to infringement or misappropriation of patent and other intellectual property rights in the pharmaceutical, biotechnology and agricultural biotechnology industries is common, including patent infringement lawsuits, interferences, oppositions and reexamination proceedings before the USPTO and corresponding international patent offices. The various markets in which we plan to

operate are subject to frequent and extensive litigation regarding patents and other intellectual property rights. In addition, many companies in intellectual property-dependent industries, including the biotechnology, agricultural biotechnology and pharmaceutical industries, have employed intellectual property litigation as a means to gain an advantage over their competitors. Numerous United States, EU and other internationally issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we and our collaborators are developing product candidates, and as the biotechnology, agricultural biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may be subject to claims of infringement of the intellectual property rights of third parties. For example, we are aware of certain patents held by third parties relating to the modification of T cells, including the production of CAR T cells. Although conducting clinical trials and other development activities with respect to our CAR T product candidates is not considered an act of infringement in the United States, if and when any of our CAR T product candidates may be approved by the FDA, those third parties may seek to enforce their patents by filing a patent infringement lawsuit against us. As a result of any patent infringement claims, or in order to avoid any potential infringement claims, we may choose to seek, or be required to seek, a license from the third party, which may require payment of substantial royalties or fees, or require us to grant a cross-license under our intellectual property rights, similar to the cross license we granted Cellectis as part of our patent litigation settlement. These licenses may not be available on reasonable terms or at all. Even if a license can be obtained on reasonable terms, the rights may be nonexclusive, which would give our competitors access to the same intellectual property rights. If we are unable to enter into a license on acceptable terms, we or our collaborators could be prevented from commercializing one or more product candidates, or forced to modify such product candidates, or to cease some aspect of our business operations, which could harm our business significantly. We or our collaborators might also be forced to redesign or modify our technology or product candidates so that we no longer infringe the third-party intellectual property rights, which may result in significant cost or delay to us, or which redesign or modification could be impossible or technically infeasible. Even if we were ultimately to prevail, any of these events could require us to divert substantial financial and management resources that we would otherwise be able to devote to our business.

Further, if a patent infringement suit is brought against us, our collaborators or our third-party service providers, our development, manufacturing or sales activities relating to the product or product candidate that is the subject of the suit may be delayed or terminated. In addition, defending such claims has in the past and may in the future cause us to incur substantial expenses and, if successful, could cause us to pay substantial damages if we are found to be infringing a third party's patent rights. These damages potentially include increased damages and attorneys' fees if we are found to have infringed such rights willfully. Some claimants may have substantially greater resources than we do and may be able to sustain the costs of complex intellectual property litigation to a greater degree and for longer periods of time than we could. In addition, patent holding companies that focus solely on extracting royalties and settlements by enforcing patent rights may target us. In addition, if the breadth or strength of protection provided by the patents and patent applications we own or in-license is threatened, it could dissuade companies from collaborating with us to license, develop or commercialize current or future product candidates.

We have been and may in the future be subject to third-party claims and similar adversarial proceedings or litigation in other jurisdictions regarding our infringement of the patent rights of third parties. Even if such claims are without merit, a court of competent jurisdiction could hold that these third-party patents are valid, enforceable and infringed, and the holders of any such patents may be able to block our or our collaborators' ability to further develop or commercialize the applicable product candidate unless we obtain a license under the applicable patents, or until such patents expire or are finally determined to be invalid or unenforceable. Similarly, if any third-party patents were held by a court of competent jurisdiction to cover aspects of our technologies, compositions, formulations, or methods of treatment, prevention or use, the holders of any such patents may be able to prohibit our use of those technologies, compositions, formulations, methods of

treatment, prevention or use or other technologies, effectively blocking our or our collaborators' ability to develop and commercialize the applicable product candidate until such patent expires or is finally determined to be invalid or unenforceable or unless we or our collaborators obtain a license.

Some of our competitors may be able to sustain the costs of complex intellectual property litigation more effectively than we can because they have substantially greater resources. In addition, intellectual property litigation, regardless of its outcome, may cause negative publicity, adversely impact prospective customers, cause product shipment delays or prohibit us from manufacturing, marketing or otherwise commercializing our products, services and technology. Any uncertainties resulting from the initiation and continuation of any litigation could have a material adverse effect on our ability to raise additional funds or otherwise have a material adverse effect on our business, results of operation, financial condition or cash flows.

If we or one of our licensors were to initiate legal proceedings against a third party to enforce a patent covering our technology or a product candidate, the defendant could counterclaim that our patent is invalid or unenforceable. In patent litigation in the United States and Europe, defendant counterclaims alleging invalidity or unenforceability are common. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, for example, lack of novelty, obviousness or non-enablement. Third parties might allege unenforceability of our patents because during prosecution of the patent an individual connected with such prosecution withheld relevant information, or made a misleading statement. The outcome of proceedings involving assertions of invalidity and unenforceability during patent litigation is unpredictable. With respect to the validity of patents, for example, we cannot be certain that there is no invalidating prior art of which we and the patent examiner were unaware during prosecution, but that an adverse third party may identify and submit in support of such assertions of invalidity. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our technology or product candidates. Our patents and other intellectual property rights also will not protect our technology if competitors design around our protected technology without infringing our patents or other intellectual property rights. Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses and could distract our technical and management personnel from their normal responsibilities. In addition, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments, and if securities analysts or investors view these announcements in a negative light, the price of our common stock could be adversely affected. Such litigation or proceedings could substantially increase our operating losses and reduce our resources available for development activities. We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings.

Developments in patent law could have a negative impact on our business.

From time to time, the United States Supreme Court, or the Supreme Court, other federal courts, the United States Congress, or Congress, the USPTO and similar international authorities may change the standards of patentability, and any such changes could have a negative impact on our business. For example, the America Invents Act, or the AIA, which was passed in September 2011, resulted in significant changes to the U.S. patent system. An important change introduced by the AIA is that, as of March 16, 2013, the United States transitioned from a "first-to-invent" to a "first-to-file" system for deciding which party should be granted a patent when two or more patent applications are filed by different parties claiming the same invention. Under a "first-to-file" system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to a patent on the invention regardless of whether another inventor had made the invention earlier. A third party that files a patent application in the USPTO after that date but before us could

therefore be awarded a patent covering an invention of ours even if we made the invention before it was made by the third party. Circumstances could prevent us from promptly filing patent applications on our inventions.

The AIA limited where a patentee may file a patent infringement suit and provided opportunities for third parties to challenge any issued patent in the USPTO. Those provisions apply to all of our U.S. patents, regardless of when issued. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in U.S. federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action. These provisions could increase the uncertainties and costs surrounding the prosecution of our or our licensors' patent applications and the enforcement or defense of our or our licensors' issued patents.

Additionally, the Supreme Court has ruled on several patent cases in recent years either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations, and there are other open questions under patent law that courts have yet to decisively address. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of our patents and patent applications. Depending on decisions by Congress, the federal courts and the USPTO, the laws and regulations governing patents could change in unpredictable ways and could weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future. In addition, the European patent system is relatively stringent in the type of amendments that are allowed during prosecution, but the complexity and uncertainty of European patent laws has also increased in recent years. Complying with these laws and regulations could limit our ability to obtain new patents in the future that may be important for our business.

If we were unable to protect the confidentiality of our trade secrets and enforce our intellectual property assignment agreements, our business and competitive position would be harmed.

In addition to patent protection, because we operate in the highly technical field of development of product candidates and products using genome editing, we rely significantly on trade secret protection in order to protect our proprietary technology and processes. Trade secrets are difficult to protect. Our policy is to enter into confidentiality and intellectual property assignment agreements with our employees, consultants, outside scientific collaborators, sponsored researchers and other advisors. These agreements generally require that the other party keep confidential and not disclose to third parties all confidential information developed by the party or made known to the party by us during the course of the party's relationship with us. These agreements also generally provide that inventions conceived by the party in the course of rendering services to us will be our exclusive property. However, we may be unsuccessful in executing such an agreement with each party who in fact conceives or develops intellectual property that we regard as our own. Our assignment agreements may not be self-executing or may be breached, and we may be forced to bring claims against third parties, or defend claims they may bring against us, to determine the ownership of what we regard as our intellectual property. In addition, these agreements may be held unenforceable and may not effectively assign intellectual property rights to us. If our trade secrets and other unpatented or unregistered proprietary information are disclosed, we are likely to lose such trade secret protection.

In addition, certain provisions in our intellectual property agreements may be susceptible to multiple interpretations. The resolution of any contract interpretation disagreement that may arise could affect the scope of our rights to the relevant intellectual property or technology, or affect financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

In addition, agreements with third parties typically restrict the ability of such third parties to publish data potentially relating to our trade secrets. Our academic collaborators typically have rights to publish data, provided that we are notified in advance and may delay publication for a specified period of time in order to secure our intellectual property rights arising from the arrangement. In other cases, publication rights are controlled exclusively by us, although in some cases we may share these rights with other parties. We also conduct joint research and product development activities that may require us to share trade secrets under the terms of our research and development collaborations or similar agreements. In addition to contractual measures, we try to protect the confidential nature of our proprietary information using physical and technological security measures. Such measures may not provide adequate protection for our proprietary information. For example, our security measures may not prevent an employee or consultant with authorized access from misappropriating our trade secrets and providing them to a competitor, and the recourse we have available against such misconduct may not provide an adequate remedy to protect our interests fully. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret can be difficult, expensive and time consuming, and the outcome is unpredictable. In addition, courts outside the United States may be less willing to protect trade secrets. Furthermore, our proprietary information may be independently developed by others in a manner that could prevent legal recourse by us. Competitors could purchase any products we may develop and commercialize and attempt to reverse engineer and replicate some or all of the competitive advantages we derive from our development efforts, willfully infringe our intellectual property rights or design around our protected technology. In addition, our key employees, consultants, suppliers or other individuals with access to our proprietary technology and know-how may incorporate that technology and know-how into projects and inventions developed independently or with third parties. As a result, disputes may arise regarding the ownership of the proprietary rights to such technology or know-how, and any such dispute may not be resolved in our favor. If any of our confidential or proprietary information, including our trade secrets, were to be disclosed or misappropriated, or if any such information was independently developed by a competitor, our competitive position could be harmed and such disclosure or misappropriation could have a material adverse effect on our business.

We will not seek to protect our intellectual property rights in all jurisdictions throughout the world, and we may not be able to adequately enforce our intellectual property rights even in the jurisdictions where we seek protection.

Filing, prosecuting and defending patents on product candidates in all countries and jurisdictions throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States could be less extensive than those in the United States, assuming that rights are obtained in the United States. In-licensing patents covering product candidates in all countries throughout the world may similarly be prohibitively expensive, if such opportunities are available at all. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions.

We generally apply for patents in those countries where we intend to make, have made, use, offer for sale or sell products and where we assess the risk of infringement to justify the cost of seeking patent protection. However, we do not seek protection in all countries where we sell products and we may not accurately predict all the countries where patent protection would ultimately be desirable. If we fail to timely file a patent application in any such country or major market, we may be precluded from doing so at a later date. Competitors may use our technologies in jurisdictions where we do not pursue and obtain patent protection to develop their own products and may export otherwise infringing products to territories where we have patent protection, but where our ability to enforce our patent rights is not as strong as in the United States. These

products may compete with any products that we or our collaborators may develop, and our patents or other intellectual property rights may not be effective or sufficient to prevent such competition.

The laws of some other countries do not protect intellectual property rights to the same extent as the laws of the United States. For example, European patent law restricts the patentability of methods of treatment of the human body more than U.S. law does. Patent protection must ultimately be sought on a country-by-country basis, which is an expensive and time-consuming process with uncertain outcomes. Accordingly, we may choose not to seek patent protection in certain countries, and we will not have the benefit of patent protection in such countries. In addition, the legal systems of some countries, particularly developing countries, do not favor the enforcement of patents and other intellectual property protection, especially those relating to biopharmaceuticals or biotechnologies. As a result, many companies have encountered significant difficulties in protecting and defending intellectual property rights in certain jurisdictions outside the United States. Such issues may make it difficult for us to stop the infringement of our patents, if obtained, or the misappropriation of our other intellectual property rights. For example, many other countries, including countries in the EU, have compulsory licensing laws under which a patent owner must grant licenses to third parties. In addition, many countries limit the enforceability of patents against third parties, including government agencies or government contractors. In these countries, patents may provide limited or no benefit. In those countries, we and our licensors may have limited remedies if patents are infringed or if we or our licensors are compelled to grant a license to a third party, which could materially diminish the value of those patents and could limit our potential revenue opportunities. Accordingly, our and our licensors' efforts to enforce intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we own or license.

Furthermore, proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, subject our patents to the risk of being invalidated or interpreted narrowly, subject our patent applications to the risk of not issuing or provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded to us, if any, may not be commercially meaningful, while the damages and other remedies we may be ordered to pay such third parties may be significant. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

We may not be successful in obtaining or maintaining necessary rights to product components and processes for our development pipeline through acquisitions and in-licenses.

We have rights, through licenses from third parties and under patents that we own, to the intellectual property to develop the product candidates we are currently developing alone or with collaborators. Because our programs may involve additional product candidates that may require the use of proprietary rights held by third parties, the growth of our business may depend in part on our ability to acquire, in-license or use these proprietary rights. In addition, product candidates may require specific formulations to work effectively and efficiently, and these rights may be held by others. We may be unable to acquire or in-license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify. The licensing and acquisition of third-party intellectual property rights is a competitive area, and a number of more established companies, or companies that have greater resources than we do, may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider necessary or attractive to develop or commercialize product candidates. These established companies may have a competitive advantage over us due to their size and greater cash resources and clinical development and commercialization capabilities. We may not be able to successfully complete such negotiations and ultimately acquire the rights to the intellectual property surrounding product candidates that we may seek to acquire.

For example, we sometimes collaborate with academic institutions to accelerate our preclinical research or development under written agreements with these institutions. Typically, these institutions provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the strategic alliance. Regardless of such right of first negotiation, we may be unable to negotiate a license within the specified time frame or under terms that are acceptable to us, and the institution may license such intellectual property rights to third parties, potentially blocking our ability to pursue our development and commercialization plans.

In addition, companies that perceive us to be a competitor may be unwilling to assign or license to us intellectual property rights that we require in order to successfully develop and commercialize potential products. We also may be unable to obtain such a license or assignment on terms that would allow us to make an appropriate return on our investment. In either event, our business and prospects for growth could suffer.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected. We may not be able to protect our rights to our trademarks and trade names, which we need to build name recognition among potential collaborators or customers in our markets of interest. At times, competitors may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other registered trademarks or trademarks that incorporate variations of our unregistered trademarks or trade names. Over the long term, if we are unable to successfully register our trademarks and trade names and establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. Our efforts to enforce or protect our proprietary rights related to trademarks, trade secrets, domain names, copyrights and other intellectual property may be ineffective and could result in substantial costs and diversion of resources and could adversely impact our financial condition or results of operations.

Risks related to our organization, structure and operations

We will need to expand our organization, and we may experience difficulties in managing this growth, which could disrupt our operations.

As of December 31, 2018, we had 127 employees. We will need to significantly expand our organization, and our future financial performance, ability to develop and commercialize product candidates alone or with collaborators and ability to compete effectively will depend in part on our ability to effectively manage any future growth. We may have difficulty identifying, hiring and integrating new personnel. Many of the biotechnology companies that we compete against for qualified personnel and consultants have greater financial and other resources, different risk profiles and a longer history than we do. If we are unable to continue to attract and retain high-quality personnel and consultants, the rate and success at which we can identify and develop product candidates, enter into collaborative arrangements and otherwise operate our business will be limited.

Future growth would impose significant additional responsibilities on our management, including the need to identify, recruit, maintain, motivate and integrate additional employees, consultants and contractors. Management may need to divert a disproportionate amount of its attention away from our day-to-day activities and devote a substantial amount of time to managing these growth activities. Due to our limited financial resources and the limited experience of our management team in managing a company with such anticipated growth, we may not be able to effectively manage the expected expansion of our operations or recruit and train

additional qualified personnel. Moreover, the expected physical expansion of our operations may lead to significant costs and may divert our management and business development resources from other projects, such as the development of product candidates. If we are not able to effectively manage the expansion of our operations, it may result in weaknesses in our infrastructure, increase our expenses more than expected, give rise to operational mistakes, loss of business opportunities, loss of employees and reduced productivity. Our future financial performance, ability to successfully commercialize any of our product candidates and our ability to compete effectively will depend, in part, on our ability to effectively manage any future growth.

We may engage in transactions that could disrupt our business, cause dilution to our stockholders or reduce our financial resources.

In the future, we may enter into transactions to acquire or in-license rights to product candidates, products or technologies or to acquire other businesses. If we do identify suitable candidates, we may not be able to enter into such transactions on favorable terms, or at all. Any such acquisitions or in-licenses may not strengthen our competitive position, and these transactions may be viewed negatively by customers or investors. We may decide to incur debt in connection with an acquisition or in-license, which may negatively impact our financial condition and restrict our operations, or issue our common stock or other equity securities to the stockholders of the acquired company, which would reduce the percentage ownership of our existing stockholders. We could incur losses resulting from undiscovered liabilities of the acquired business that are not covered by the indemnification we may obtain from the sellers of the acquired business. In addition, we may not be able to successfully integrate the acquired personnel, technologies and operations into our existing business in an effective, timely and nondisruptive manner. Such transactions may also divert management attention from day-to-day responsibilities, increase our expenses and reduce our cash available for operations and other uses. We cannot predict the number, timing or size of future acquisitions or in-licenses or the effect that they might have on our operating results.

Our future success depends on our ability to retain our Chief Executive Officer, Chief Scientific Officer, Chief Technology Officer and other key executives and to attract, retain and motivate qualified personnel.

We are highly dependent on the research and development experience, technical skills, leadership and continued service of certain members of our management and scientific teams, including Matthew Kane, our Chief Executive Officer, Derek Jantz, our Chief Scientific Officer, and Jeff Smith, our Chief Technology Officer. Although we have formal employment agreements with our executive officers, these agreements do not prevent them from terminating their employment with us at any time upon thirty days' written notice. We maintain a $1 million "key man" life insurance policy for our benefit on each of the lives of Drs. Jantz and Smith, but not on the lives of any of our other team members. The loss of the services of any of these persons could impede the achievement of our research, development and commercialization objectives.

Recruiting and retaining qualified scientific, clinical, manufacturing and, if we retain commercialization responsibility for any product candidate we develop alone or with collaborators, sales and marketing personnel will also be critical to our success. We may not be able to attract and retain these personnel on acceptable terms or at all given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategies. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us. The inability to recruit, integrate, motivate and retain additional skilled and qualified personnel, or the loss of services of certain executives, key employees, consultants or advisors, may impede the progress of our research, development and commercialization objectives and have a material adverse effect on our business.

We will incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives and corporate governance practices, including establishing and maintaining proper and effective internal control over financial reporting.

As a public company, we will incur significant legal, accounting and other expenses that we did not incur as a private company. We will be subject to the Securities Exchange Act of 1934, as amended, or the Exchange Act, including the reporting requirements thereunder, the Sarbanes-Oxley Act of 2002, the Dodd-Frank Wall Street Reform and Consumer Protection Act, the listing requirements of The Nasdaq Stock Market LLC, or Nasdaq, and other applicable securities rules and regulations, including requirements related to the establishment and maintenance of effective disclosure and financial controls and corporate governance practices. Our management and other personnel will need to devote a substantial amount of time to these compliance initiatives. Moreover, these rules and regulations will increase our legal and financial compliance costs, make some activities more difficult, time consuming or costly, and increase demand on our systems and resources. When we no longer qualify as an emerging growth company, legal, accounting and other expenses are expected to further increase.

Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404, we will be required to furnish a report by our management on our internal control over financial reporting beginning with our second annual report following the completion of our initial public offering. However, while we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404 of the Sarbanes-Oxley Act within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. We may need to hire more employees in the future or engage outside consultants to comply with these requirements, which will further increase our costs and expenses. If we fail to implement the requirements of Section 404 of the Sarbanes-Oxley Act in the required timeframe, we may be subject to sanctions or investigations by regulatory authorities, including the SEC and Nasdaq. Furthermore, if we are unable to conclude that our internal control over financial reporting is effective, our investors may lose confidence in the accuracy and completeness of our financial reports, the market price of our common stock could decline, and we could be subject to sanctions or investigations by regulatory authorities. Failure to implement or maintain an effective internal control system could also restrict our future access to the capital markets.

Our business and operations would suffer in the event of system failures or security breaches.

Despite the implementation of security measures, our computer systems, as well as those of third parties with which we have relationships, are vulnerable to damage from computer viruses, unauthorized access, natural and manmade disasters, terrorism, war and telecommunication and electrical failures. While we do not believe that we have experienced any such system failure, accident or security breach to date, if such an event were to occur and cause interruptions in our or their operations, it could result in delays and/or material disruptions of our research and development programs. For example, the loss of trial data from completed, ongoing or planned trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of or damage to data or applications, or inappropriate disclosure of personal, confidential or proprietary information, we could incur liability and the development of our product candidates could be delayed.

The U.S. federal and various state and foreign governments have enacted or proposed requirements regarding the collection, distribution, use, security and storage of personally identifiable information and other data relating to individuals, and U.S. federal and state consumer protection laws are being applied to enforce regulations related to the online collection, use and dissemination of data. In the ordinary course of our business, we and third parties with which we have relationships will continue to collect and store sensitive data,

including intellectual property, clinical trial data, proprietary business information, personal data and personally identifiable information of our clinical trial subjects and employees, in data centers and on networks. The secure processing, maintenance and transmission of this information is critical to our operations. Despite our and our collaborators' security measures, our information technology and infrastructure may be vulnerable to attacks by hackers or internal bad actors, breaches due to employee error, technical vulnerabilities, malfeasance or other disruptions. A number of proposed and enacted federal, state and international laws and regulations obligate companies to notify individuals of security breaches involving particular personally identifiable information, which could result from breaches experienced by us or by third parties, including collaborators, vendors, contractors or other organizations with which we have formed strategic relationships. Although, to our knowledge, neither we nor any such third parties have experienced any material security breach, and even though we may have contractual protections with such third parties, any such breach could compromise our or their networks and the information stored there could be accessed, publicly disclosed, lost or stolen. Any such access, disclosure, notifications, follow-up actions related to such a security breach or other loss of information could result in legal claims or proceedings, liability under laws that protect the privacy of personal information and significant costs, including regulatory penalties, fines and legal expenses, and such an event could disrupt our operations, cause us to incur remediation costs, damage our reputation and cause a loss of confidence in us and our or such third parties' ability to conduct clinical trials, which could adversely affect our reputation and delay our research and development programs.

We or third parties with whom we have relationships may be adversely affected by natural or manmade disasters, and our business continuity and disaster recovery plans may not adequately protect us from a serious disaster.

Natural or manmade disasters could severely disrupt our operations and have a material adverse effect on our business, results of operations, financial condition and prospects. If a natural disaster, power outage or other event occurred that prevented us from using all or a significant portion of our facilities, that damaged our infrastructure or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for us to continue our business for a substantial period of time, and our research and development activities could be setback or delayed. The disaster recovery and business continuity plans we have in place may prove inadequate in the event of a serious disaster or similar event. We may incur substantial expenses as a result of the limited nature of our disaster recovery and business continuity plans, which could have a material adverse effect on our business, and such an event could disrupt our operations, cause us to incur remediation costs, damage our reputation and cause a loss of confidence in us and our or third parties' ability to conduct clinical trials, which could adversely affect our reputation and delay our research and development programs.

Our insurance policies are expensive and protect us only from some business risks, which leaves us exposed to significant uninsured liabilities.

We do not carry insurance for all categories of risk that our business may encounter. If we obtain marketing approval for any product candidates that we or our collaborators may develop, we intend to acquire insurance coverage to include the sale of commercial products, but we may be unable to obtain such insurance on commercially reasonable terms or in adequate amounts. We do not carry specific biological or hazardous waste insurance coverage, and our property, casualty and general liability insurance policies specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. Accordingly, in the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and clinical trials or regulatory approvals for any of our product candidates could be suspended. We also expect that operating as a public company will make it more expensive for us to obtain director and officer liability insurance, and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. As a result, it may be

more difficult for us to attract and retain qualified individuals to serve on our board of directors, our board committees or as our executive officers.

Insurance coverage is becoming increasingly expensive, and in the future we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses. We do not know if we will be able to maintain existing insurance with adequate levels of coverage, and any liability insurance coverage we acquire in the future may not be sufficient to reimburse us for any expenses or losses we may suffer. A successful liability claim or series of claims brought against us could require us to pay substantial amounts and cause our share price to decline and, if judgments exceed our insurance coverage, could adversely affect our results of operations and business, including preventing or limiting the development and commercialization of any product candidates that we or our collaborators may develop.

Unstable market and economic conditions may have serious adverse consequences on our business, financial condition and stock price.

Global credit and financial markets have experienced extreme volatility and disruptions in the past several years, including severely diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability, and similar deterioration in the credit and financial markets and confidence in economic conditions may occur in the future. Our general business strategy may be adversely affected by any such economic downturn, volatile business environment or unpredictable and unstable market conditions. If the current equity and credit markets deteriorate, or do not improve, it may make any necessary debt or equity financing more difficult, more costly and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance and stock price and could require us to delay or abandon clinical development plans. In addition, there is a risk that one or more of our current service providers, manufacturers or others with whom we have strategic relationships may not survive any difficult economic times, which could directly affect our ability to attain our operating goals.

As of December 31, 2018, we had cash and cash equivalents of $103.2 million. While we are not aware of any downgrades, material losses or other significant deterioration in the fair value of our cash and cash equivalents since December 31, 2018, deterioration of the global credit and financial markets could negatively impact our current portfolio of cash equivalents or our ability to meet our financing objectives. Furthermore, our stock price may decline due in part to the volatility of the stock market and any general economic downturn.

If we or any of our contract manufacturers or other suppliers fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur significant costs.

We and any of our contract manufacturers and suppliers are subject to numerous federal, state and local environmental, health and safety laws, regulations and permitting requirements, including those governing laboratory procedures; the generation, handling, use, storage, treatment and disposal of hazardous and regulated materials and wastes; the emission and discharge of hazardous materials into the ground, air and water; and employee health and safety. Our operations involve the use of hazardous and flammable materials, including chemicals and biological and radioactive materials. Our operations also produce hazardous waste. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials. In the event of contamination or injury resulting from our use of hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. Under certain environmental laws, we could be held responsible for costs relating to any contamination at our current or past facilities and at third-party facilities. We also could incur significant costs associated with civil or criminal fines and penalties.

Compliance with applicable environmental laws and regulations may be expensive, and current or future environmental laws and regulations may impair our research and product development efforts. In addition, we cannot entirely eliminate the risk of accidental injury or contamination from these materials or wastes. Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not carry specific biological or hazardous waste insurance coverage, and our property, casualty and general liability insurance policies (under which we currently have an aggregate of approximately $10 million in coverage) specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. Accordingly, in the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals for any product candidate we develop alone or with collaborators could be suspended, which could have a material adverse effect on our business and financial condition.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws, regulations and permitting requirements, and any third-party contract manufacturers and suppliers we engage will also be subject to such current and future regulations and requirements. These current or future laws, regulations and permitting requirements may impair our research, development or production efforts. Failure to comply with these laws, regulations and permitting requirements, either by us or by any third-party contract manufacturers and suppliers we engage, also may result in substantial fines, penalties or other sanctions or business disruption.

Our business operations, including our current and future relationships with third parties, will expose us to penalties for potential misconduct or improper activity, including non-compliance with regulatory standards and requirements.

Complex laws constrain our business and the financial arrangements and relationships through which we conduct our operations, including how we may research, market, sell and distribute product candidates alone or with collaborators. We are exposed to the risk of fraud or other misconduct by our employees, consultants and collaborators and, if we or our collaborators commence clinical trials and proceed to commercialization, our principal investigators and commercial partners, as well as healthcare professionals, third-party payors, patient organizations and customers. For example, misconduct by these parties could include intentional failures to comply with FDA regulations or the regulations applicable in the EU and other jurisdictions, provide accurate information to the FDA, the European Commission and other regulatory authorities, comply with healthcare fraud and abuse laws and regulations in the United States and abroad, report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, false and/or misleading statements, corruption of government officials, self-dealing and other abusive practices. These laws and regulations restrict or prohibit a wide range of pricing, discounting, marketing, promotion, sales commission and customer incentive programs and other business arrangements. Such misconduct also could involve the improper use or misrepresentation of information obtained in the course of clinical trials, creating fraudulent data in preclinical studies or clinical trials, illegal misappropriation of study materials or other property, or improper interactions with the FDA or other regulatory authorities, which could result in regulatory sanctions and cause serious harm to our or our collaborators' reputations.

Ensuring that our internal operations and current and future business arrangements with third parties comply with applicable healthcare laws and regulations will involve substantial costs. Additionally, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. It is possible that governmental authorities will conclude that our business practices do not comply with current or future statutes, regulations, agency guidance or case law involving applicable fraud and abuse or other

healthcare laws and regulations. If our operations are found to be in violation of any of the laws described above or any other governmental laws and regulations that may apply to us, we may be subject to significant penalties, including civil, criminal and administrative penalties, damages, fines, exclusion from government-funded healthcare programs, such as Medicare and Medicaid or similar programs in other countries or jurisdictions, additional reporting requirements and oversight if subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, disgorgement, individual imprisonment, contractual damages, reputational harm, diminished profits and the curtailment or restructuring of our operations. If any of the physicians or other providers or entities with whom we expect to do business are found to not be in compliance with applicable laws, they may be subject to similar penalties, such as criminal, civil or administrative sanctions, including exclusions from government-funded healthcare programs and imprisonment, which could affect our ability to operate our business. Further, defending against any such actions can be costly and time-consuming and may require significant personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

We intend to adopt, prior to the completion of this offering, a code of conduct applicable to all of our employees, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent such activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from government investigations or other actions or lawsuits stemming from a failure to comply with applicable laws or regulations. Additionally, we are subject to the risk that a person could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could result in the imposition of any of the penalties discussed above and have a significant impact on our business and financial condition.

The recently passed Tax Cuts and Jobs Act of 2017 could adversely affect our business and financial condition.

On December 22, 2017, President Trump signed into law new legislation, known as the Tax Cuts and Job Act of 2017, or the Tax Act, that significantly revises the Internal Revenue Code of 1986, as amended, or the Code. The Tax Act, among other things, contains significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, limitation of the tax deduction for interest expense to 30% of adjusted taxable income (except for certain small businesses), limitation of the deduction for net operating losses to 80% of current year taxable income and elimination of net operating loss carrybacks, one-time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, elimination of U.S. tax on foreign earnings (subject to certain important exceptions), immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions). Notwithstanding the reduction in the corporate income tax rate, the overall impact of the Tax Act is uncertain, and our business and financial condition could be adversely affected. In addition, it is unknown if and to what extent various states will conform to the Tax Act. The impact of the Tax Act on holders of our common stock is likewise uncertain and could be adverse. We urge our stockholders to consult with their legal and tax advisors with respect to this legislation and the potential tax consequences of investing in or holding our common stock.

We are subject to complex tax rules relating to our business, and any audits, investigations or tax proceedings could have a material adverse effect on our business, results of operations and financial condition.

We are subject to income and non-income taxes in the United States. Income tax accounting often involves complex issues, and judgment is required in determining our provision for income taxes and other tax liabilities. We recently formed a subsidiary in Australia and may operate in other non-US jurisdictions in the future. We could become subject to income and non-income taxes in non-US jurisdictions as well. In addition, many

jurisdictions have detailed transfer pricing rules, which require that all transactions with non-resident related parties be priced using arm's length pricing principles within the meaning of such rules. The application of withholding tax, goods and services tax, sales taxes and other non-income taxes is not always clear and we may be subject to tax audits relating to such withholding or non-income taxes. We believe that our tax positions are reasonable and our tax reserves are adequate to cover any potential liability. We are currently not subject to any tax audits. However, the Internal Revenue Service or other taxing authorities may disagree with our positions. If the Internal Revenue Service or any other tax authorities were successful in challenging our positions, we may be liable for additional tax and penalties and interest related thereto or other taxes, as applicable, in excess of any reserves established therefor, which may have a significant impact on our results and operations and future cash flow.

We may not be able to utilize all, or any, of our net operating loss carryforwards.

We have incurred substantial losses during our history, do not expect to become profitable in the near future, and we may never achieve profitability. As of December 31, 2018, we had U.S. federal and state net operating loss carryforwards of approximately $40.0 million and $39.8 million, respectively. Our federal net operating loss carryforwards of $19.4 million will begin to expire in 2030 while the remaining federal net operating loss carryforwards of $20.6 million carry forward indefinitely. The state net operating loss carryforwards begin to expire in 2025. In addition, we have U.S. federal and state research and development tax credits of $3.6 million and an amount less than $0.1 million as of December 31, 2018, respectively, available to offset future U.S. federal and state income taxes, which begin to expire in 2027 and 2030, respectively. Unused losses generated in taxable years ending after December 31, 2017 will not expire and may be carried forward indefinitely, but will be deductible only to the extent of 80% of current year taxable income (computed without regard to the deduction for the net operating losses) in any given year. It is uncertain if and to what extent various states will conform to the newly enacted federal tax law.

As of December 31, 2018, we have a valuation allowance for the full amount of our net deferred tax assets as the realization of the net deferred tax assets is not determined to be more likely than not. In addition, Sections 382 and 383 of the Code limit a corporation's ability to utilize its net operating loss carryforwards and certain other tax attributes (including research credits) to offset any future taxable income or tax if the corporation experiences a cumulative ownership change of more than 50% over any rolling three-year period. State net operating loss carryforwards (and certain other tax attributes) may be similarly limited. A Section 382 ownership change can therefore result in significantly greater tax liabilities than a corporation would incur in the absence of such a change, and any increased liabilities could adversely affect the corporation's business, results of operations, financial condition and cash flow. We have not yet determined if any prior change in the ownership of our equity or any change in such ownership in connection with this offering, would trigger a Section 382 ownership change. It is possible that such a Section 382 ownership change has already occurred in prior periods. Furthermore, additional ownership changes may occur in the future as a result of events over which we will have little or no control, including purchases and sales of our equity by our 5% stockholders, the emergence of new 5% stockholders, additional equity offerings or redemptions of our stock or certain changes in the ownership of any of our 5% stockholders. As a result, our pre-2018 net operating loss carryforwards (and research tax credits) may expire prior to being used, and our net operating loss carryforwards and tax credits generated in 2018 and thereafter will be subject to a percentage limitation, upon an ownership change. Similar provisions of state tax law may also apply to limit our use of accumulated state tax attributes. As a result, even if we attain profitability, we may be unable to use all or a material portion of our NOLs and other tax attributes, which could adversely affect our future cash flows.

Risks related to this offering and owning our common stock

An active trading market for our common stock may not develop, and you may not be able to sell your shares at or above the initial public offering price.

Prior to this offering, there has been no public market for shares of our common stock. Although we anticipate that our common stock will be approved for listing on Nasdaq, an active trading market for our common stock may never develop or be sustained following this offering. The lack of an active trading market may impair your ability to sell your shares at the time you wish to sell them or at a price that you consider reasonable, reduce the market value of your shares, impair our ability to raise capital and impair our ability to attract, motivate and retain our employees through equity incentive awards. The initial public offering price of our common stock will be determined through negotiations between us and the underwriters, and it may not be indicative of the market price of our common stock in an open market after this offering. Consequently, you may not be able to sell your common stock at or above the initial public offering price and may lose a portion or all of your investment.

We expect that our common stock price will fluctuate significantly, which could result in substantial losses for purchasers of shares in this offering.

Our stock price is likely to be volatile. You should invest in our common stock only if you can withstand a significant loss and wide fluctuations in the market value of your investment. The market price for our common stock may be influenced by many factors, including those discussed in this “Risk factors” section and the following:

- inconsistent trading volume levels of our common stock;
- announcements or expectations regarding debt or equity financing efforts;
- sales of common stock by us, our insiders or our other stockholders;
- actual or anticipated fluctuations in our financial condition and operating results;
- failure to meet or exceed financial estimates and projections of the investment community or that we provide to the public;
- results from or delays in our studies or trials, or those of our collaborators, competitors or companies perceived to be similar to us;
- delay, failure or discontinuation of any of our product development and research programs, or those of our collaborators, competitors or companies perceived to be similar to us;
- announcements about new research programs or product candidates from us or our collaborators, our competitors or companies perceived to be similar to us;
- announcements by us, our collaborators, our competitors or companies perceived to be similar to us relating to significant acquisitions, strategic partnerships or alliances, joint ventures, collaborations or capital commitments;
- actual or anticipated changes in our growth rate relative to our competitors or companies perceived to be similar to us;
- fluctuations in the valuation of our collaborators, our competitors or companies perceived to be comparable to us;

- a lack of, limited or withdrawal of coverage by security analysts, or positive or negative recommendations by them;
- actual or expected changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- publication of research reports about us, genome editing or the biopharmaceutical and agricultural biotechnology industries;
- developments or changing views regarding the use of genomic products, including those that involve genome editing;
- our ability to effectively manage our growth;
- the recruitment or departure of key personnel;
- the results of any efforts by us to identify, develop, acquire or in-license additional product candidates, products or technologies;
- unanticipated serious safety concerns related to the use of any of our product candidates, or those of our competitors or companies perceived to be similar to us;
- the termination of a collaboration agreement, licensing agreement or other strategic arrangement or the inability to establish additional strategic arrangements on favorable terms, or at all;
- regulatory actions with respect to any of our product candidates, or those of our competitors or companies perceived to be similar to us;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- regulatory or legal developments in the United States and other countries;
- changes in physician, hospital, healthcare provider or agricultural practices that may make our or our collaborators' products less useful;
- changes in the structure of healthcare payment systems;
- significant lawsuits, such as products liability, patent or stockholder litigation; and
- general economic, industry and market conditions.

These and other market and industry factors may cause the market price and demand for our common stock to fluctuate substantially, regardless of our actual operating performance. These factors may have a material adverse effect on the market price and liquidity of our common stock, which may limit or prevent you from readily selling your shares of common stock and may affect our ability to obtain financing or enter into desired strategic relationships.

We could be subject to securities class action litigation.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because biopharmaceutical companies have experienced significant stock price volatility in recent years. If we face such litigation, it could result in substantial costs and a diversion of management's attention and resources, which could harm our business.

If you purchase shares of common stock in this offering, you will suffer immediate dilution of your investment.

The initial public offering price of our common stock will be substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our common stock in this offering, you will pay a price per share that substantially exceeds our net tangible book value per share after this offering. Based on an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, you will experience immediate dilution of $ per share, representing the difference between our pro forma as adjusted net tangible book value per share, after giving effect to this offering, and the assumed initial public offering price. As of December 31, 2018, there were 16,572,861 shares subject to outstanding options with a weighted-average exercise price of $2.34 per share. To the extent these outstanding options are ultimately exercised, you will incur further dilution. In addition, purchasers of common stock in this offering will have contributed approximately % of the aggregate price paid by all purchasers of our stock but will own only approximately % of our common stock outstanding after this offering. For a further description of the dilution that you will experience immediately after this offering, see “Dilution.”

A significant portion of our total outstanding shares is restricted from immediate resale but may be sold into the market in the near future, which could cause the market price of our common stock to decline significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market, or the perception in the market that the holders of a large number of shares of common stock intend to sell shares, could reduce the market price of our common stock. Based on the number of shares of common stock outstanding on December 31, 2018, after this offering and after giving effect to the conversion of all outstanding shares of our convertible preferred stock into shares of our common stock upon the closing of this offering and the automatic settlement of our convertible promissory notes, or the 2019 Notes, into shares of our common stock in connection with the closing of this offering, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus, we will have shares of common stock outstanding, or if the underwriters exercise their option to purchase additional shares in full. Of these shares, the shares, or shares if the underwriters exercise their option to purchase additional shares in full, we are selling in this offering may be resold in the public market immediately, unless purchased by our affiliates. The remaining shares are currently restricted under securities laws or as a result of lock-up or other agreements, but will be able to be sold after this offering as described in the “Shares eligible for future sale” section of this prospectus.

Approximately shares will be available for sale in the public market beginning 180 days after the date of this prospectus following the expiration of lock-up agreements between our stockholders and the underwriters. JP Morgan Securities LLC, Goldman Sachs & Co. LLC and Jefferies LLC may release these stockholders from their lock-up agreements with the underwriters at any time and without notice, except for officers and directors, for whom notice of such waiver would be provided two business days before the effective date thereof, which would allow for earlier sales of shares in the public market.

In addition, as of December 31, 2018, up to shares of common stock that are either subject to outstanding options or reserved for future issuance under our employee benefit plans will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules, the lock-up agreements and Rule 144 and Rule 701 under the Securities Act of 1933, as amended, or the Securities Act. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

Moreover, after this offering, holders of an aggregate of shares of our common stock will have rights, subject to conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. We also plan to register all shares of common stock that we may issue under our equity compensation plans or that are issuable

upon exercise of outstanding options. Once we register these shares, they can be freely sold in the public market upon issuance and once vested, subject to volume limitations applicable to affiliates and the lock-up agreements described in "Underwriting." If substantial portions of these additional shares are sold, or if it is perceived that they will be sold, in the public market, the market price of our common stock could decline.

After this offering, our executive officers, directors and significant stockholders will have the ability to directly or indirectly influence all matters submitted to stockholders for approval.

Our executive officers, directors, current 5% or greater stockholders and affiliated entities will beneficially own approximately % of the outstanding shares of our common stock after this offering, assuming no exercise of the underwriters' option to purchase additional shares and assuming that group does not participate in this offering. As a result, these stockholders, acting together, will have significant influence over all matters that require approval by our stockholders, including the election of directors and approval of significant corporate transactions. Corporate action might be taken even if other stockholders, including those who purchase shares in this offering, oppose them. This concentration of ownership might also have the effect of delaying or preventing a change of control of our company that other stockholders may view as beneficial.

We have broad discretion in the use of the net proceeds from this offering and may not use them effectively.

Our management will have broad discretion in the application of the net proceeds from this offering, and we could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. We expect that we will use the net proceeds from this offering to advance and expand our clinical and preclinical development programs and for working capital and other general corporate purposes, which may include the costs of establishing a manufacturing facility, as set forth under "Use of proceeds." However, our use of these proceeds may differ substantially from our current plans. The failure by our management to apply these funds effectively could harm our business and financial condition. Pending their use, we may invest the net proceeds from this offering in a manner that does not produce income or that loses value. These investments may not yield a favorable return to our investors.

We do not currently intend to pay dividends on our common stock.

We do not intend to pay any dividends to holders of our common stock for the foreseeable future. We currently intend to invest our future earnings, if any, to fund our growth. Therefore, you are not likely to receive any dividends on your common stock for the foreseeable future, and the success of an investment in our common stock will depend upon any future appreciation in its value. Consequently, you may need to sell all or part of your common stock after price appreciation, which may never occur, as the only way to realize any future gains on your investment.

If securities or industry analysts do not publish research or reports about us and our business, or if they issue an adverse or misleading opinion regarding our common stock, our stock price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us and our business. We do not currently have, and may never obtain, research coverage by securities and industry analysts. If no or few securities or industry analysts commence coverage of us, the trading price for our stock would be negatively impacted. In the event we obtain securities or industry analyst coverage, if any of the analysts who cover us issue an adverse or misleading opinion regarding us, our business model, our intellectual property or our stock performance, or if our preclinical studies and clinical trials and operating results fail to meet the expectations of analysts, our stock price would likely decline. If one or more of these analysts ceases coverage of us or fails to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

Provisions in our amended and restated certificate of incorporation and restated bylaws that will become effective upon the closing of this offering or Delaware law might discourage, delay or prevent a change in control of our company or changes in our management and therefore depress the trading price of our common stock.

Provisions in our amended and restated certificate of incorporation and our restated bylaws, which will become effective upon the closing of this offering, may discourage, delay or prevent a merger, acquisition or other change in control of our company that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions include those establishing:

- a classified board of directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our board of directors;
- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from filling vacancies on our board of directors;
- the ability of our board of directors to authorize the issuance of shares of preferred stock and to determine the terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquirer;
- the ability of our board of directors to alter our bylaws without obtaining stockholder approval;
- the required approval of the holders of at least two-thirds of the shares entitled to vote at an election of directors to adopt, amend or repeal our bylaws or repeal the provisions of our amended and restated certificate of incorporation regarding the election and removal of directors;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- the requirement that a special meeting of stockholders may be called only by the chairman of the board of directors, our chief executive officer (or our president, in the absence of a chief executive officer) or a majority of our board of directors, which may delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and
- advance notice procedures that stockholders must comply with in order to nominate candidates to our board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of us.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the General Corporation Law of the State of Delaware, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum to the fullest extent permitted by law, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim for breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (3) any action asserting a claim arising pursuant to any provision of the General Corporation Law of the State of Delaware, our amended and restated certificate of incorporation or our amended and restated bylaws, (4) any action to interpret, apply, enforce or determine the validity of our amended and restated certificate of incorporation or our amended and restated bylaws, or (5) any action asserting a claim governed by the internal affairs doctrine. Under our amended and restated certificate of incorporation, this exclusive forum provision will not apply to claims which are vested in the exclusive jurisdiction of a court or forum other than the Court of Chancery of the State of Delaware, or for which the Court of Chancery of the State of Delaware does not have subject matter jurisdiction. For instance, the provision would not apply to actions arising under federal securities laws, including suits brought to enforce any liability or duty created by the Exchange Act or the rules and regulations thereunder. This exclusive forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. For example, stockholders who do bring a claim in the Court of Chancery could face additional litigation costs in pursuing any such claim, particularly if they do not reside in or near the State of Delaware. The Court of Chancery may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments or results may be more favorable to us than to our stockholders.

We are an "emerging growth company," and the reduced disclosure requirements applicable to emerging growth companies may make our common stock less attractive to investors.

We are an "emerging growth company," as defined in the JOBS Act. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year in which we have total annual gross revenue of $1.07 billion or more, (2) the last day of the fiscal year following the fifth anniversary of the date of the completion of this offering, (3) the date on which we have issued more than $1.0 billion in nonconvertible debt during the previous three years, or (4) the date on which we are deemed to be a large accelerated filer under the rules of the SEC which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- being permitted to present only two years of audited financial statements and only two years of related "Management's discussion and analysis of financial condition and results of operations" disclosure in this prospectus;
- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended;
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements;

- reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports, proxy statements and registration statements; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We have taken advantage of reduced reporting burdens in this prospectus. In particular, in this prospectus, we have provided only two years of audited financial statements and corresponding “Management’s discussion and analysis of financial condition and results of operations” disclosure, and we have not included all of the executive compensation related information that would be required if we were not an emerging growth company. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be reduced or more volatile. In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of these accounting standards until they would otherwise apply to private companies. We have elected to take advantage of this extended transition period.

Special note regarding forward-looking statements

This prospectus contains forward-looking statements. All statements other than statements of present and historical facts contained in this prospectus, including statements regarding our future results of operations and financial position, business strategy, prospective products, planned preclinical or greenhouse studies and clinical or field trials, regulatory approvals, research and development costs, and timing and likelihood of success, as well as plans and objectives of management for future operations, may be forward-looking statements. Without limiting the foregoing, the words “anticipate,” “believe,” “could,” “expect,” “should,” “plan,” “intend,” “estimate,” “target,” “may,” “will,” “would,” “potential,” the negative thereof and similar words and expressions are intended to identify forward-looking statements.

Forward-looking statements are based on our management’s beliefs and assumptions and on information currently available to us. Such statements are subject to a number of known and unknown risks, uncertainties and assumptions, and actual results may differ materially from those expressed or implied in the forward-looking statements due to various factors, including, but not limited to, those identified under “Risk factors” and “Management’s discussion and analysis of financial condition and results of operations” and elsewhere in this prospectus. These risks and uncertainties include factors relating to:

- the initiation, cost, timing, progress and results of research and development activities, preclinical or greenhouse studies and clinical or field trials;
- our or our collaborators’ ability to identify, develop and commercialize product candidates;
- our or our collaborators’ ability to advance product candidates into, and successfully complete, clinical or field trials;
- the potential for off-target editing or other adverse events, undesirable side effects or unexpected characteristics associated with any of our product candidates;
- our or our collaborators’ ability to obtain and maintain regulatory approval of future product candidates, and any related restrictions, limitations and/or warnings in the label of an approved product candidate;
- the success of our existing collaboration agreements;
- our ability to enter into new collaboration arrangements;
- our ability to achieve our anticipated operating efficiencies as we commence manufacturing operations at our new facility;
- our ability to obtain funding for our operations;
- public perception about genome editing technology and its applications;
- our ability to obtain and maintain intellectual property protection for our technology and any of our product candidates;
- our or our collaborators’ ability to successfully commercialize any of our product candidates;
- the rate and degree of market acceptance of any of our product candidates;
- regulatory developments in the United States and international jurisdictions;
- competition in the genome editing, biopharmaceutical, biotechnology and agricultural biotechnology fields;
- potential manufacturing problems associated with any of our product candidates;

- potential liability lawsuits and penalties related to our technology, our product candidates and our current and future relationships with third parties;
- our ability to attract and retain key scientific and management personnel;
- our ability to effectively manage the growth of our operations;
- our ability to contract with third-party suppliers and manufacturers and their ability to perform adequately under those arrangements;
- our use of proceeds from this offering;
- our financial performance; and
- expected fluctuations of our stock price.

All forward-looking statements speak only as of the date of this prospectus, and except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise.

Industry and other data

We obtained the industry, statistical and market data in this prospectus from our own internal estimates and research as well as from industry and general publications and research, surveys and studies conducted by third parties. In some cases, we do not expressly refer to the sources from which this data is derived. In that regard, when we refer to one or more sources of this type of data in any paragraph, you should assume that other data of this type appearing in the same paragraph is derived from the same sources, unless otherwise expressly stated or the context otherwise requires. All of the market data used in this prospectus involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such data. While we believe that each of these studies and publications is reliable, the industry in which we operate is subject to a high degree of uncertainty and risk due to a variety of important factors, including those described in “Risk factors.” These and other factors could cause results to differ materially from those expressed in the estimates made by third parties and by us.

Use of proceeds

We estimate that the net proceeds to us from the issuance and sale of shares of our common stock in this offering will be approximately $ million, assuming an initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us. If the underwriters' option to purchase additional shares from us is exercised in full, we estimate that our net proceeds will be approximately $ million. Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share would increase (decrease) the net proceeds to us from this offering by approximately $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us. Each increase (decrease) of 1.0 million in the number of shares we are offering would increase (decrease) the net proceeds to us from this offering by approximately $ million, assuming that the assumed initial public offering price stays the same and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us.

The principal purposes of this offering are to obtain additional capital to support our operations, to create a public market for our common stock and to facilitate our future access to the public equity markets. We anticipate that we will use the net proceeds from this offering, together with our existing cash and cash equivalents, as follows:

- approximately $ million to complete a Phase 1/2a clinical trial for our CD19 CAR T cell product candidate;
- approximately $ million to advance and expand the development of our other CAR T cell product candidates and allogeneic CAR T immunotherapy platform;
- approximately $ million to advance and expand the preclinical development of our *in vivo* gene correction platform, including early discovery efforts, chemistry, manufacturing and controls, or CMC, and IND-enabling studies;
- approximately $ million to fund the build-out of our planned cGMP-compliant manufacturing facility; and
- the remainder for working capital and other general corporate purposes, including the portion of expenses we are responsible for with respect to the development of our food platform.

This expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. We may also use a portion of the net proceeds to in-license, acquire or invest in additional businesses, technologies, products or assets, although currently we have no specific agreements, commitments or understandings in this regard. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds to be received upon the closing of this offering or the amounts that we will actually spend on the uses set forth above. Predicting the cost necessary to develop our technology and product candidates can be difficult, and we anticipate that we will need additional funds to complete our development programs. The amounts and timing of our actual expenditures and the extent of our preclinical studies and clinical trials and other development efforts may vary significantly depending on numerous factors, including the progress of our development efforts, the status of and results from preclinical studies and any clinical trials we may commence in the future, as well as any collaborations that we may enter into with third parties for our product candidates and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering.

Based on our current operating plan and planned use of the net proceeds from this offering and our existing cash and cash equivalents, we estimate that such funds will be sufficient to enable us to fund our operating

expenses and capital expenditure requirements through . We have based this estimate on assumptions that may prove to be incorrect, and we could use our available capital resources sooner than we currently expect. We may satisfy our future cash needs through the sale of equity securities, debt financings, working capital lines of credit, corporate collaborations or license agreements, grant funding, interest income earned on invested cash balances or a combination of one or more of these sources.

Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in a variety of capital preservation investments, including short-term, investment-grade, interest-bearing instruments and U.S. government securities.

Dividend policy

We have never declared or paid any cash dividends on our capital stock. We intend to retain future earnings, if any, to finance the operation and expansion of our business and do not anticipate paying any cash dividends in the foreseeable future. Any future determination related to our dividend policy will be made at the discretion of our board of directors after considering our financial condition, results of operations, capital requirements, business prospects and other factors our board of directors deems relevant, and subject to any restrictions applicable to us contained in any future financing instruments.

Capitalization

The following table sets forth our cash and cash equivalents and capitalization as of December 31, 2018:

- on an actual basis;
- on a pro forma basis to reflect:
  - the automatic conversion of all outstanding shares of our convertible preferred stock into 47,606,095 shares of common stock upon the closing of this offering;
  - the receipt of approximately $39.6 million in cash proceeds from the sale of the 2019 Notes in March 2019;
  - the settlement of the 2019 Notes into shares of our common stock, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus, in connection with the closing of this offering; and
  - the filing and effectiveness of our amended and restated certificate of incorporation, which will occur upon the closing of this offering; and
- on a pro forma as adjusted basis to give further effect to our issuance and sale of shares of our common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The pro forma as adjusted information below is illustrative only, and our capitalization following the closing of this offering will be adjusted based on the actual initial public offering price and other terms of this offering determined at pricing. You should read this information in conjunction with our consolidated financial statements and the related notes included elsewhere in this prospectus and the "Management's discussion and analysis of financial condition and results of operations" section and other financial information contained in this prospectus.

	As of December 31, 2018		
	Actual	Pro forma	Pro forma as adjusted(1)
(in thousands, except share and per share amounts)			
Cash and cash equivalents	$ 103,193	$ 142,743	$
Convertible preferred stock, $0.0001 par value per share: 47,606,100 shares authorized, 47,606,095 shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	$ 5	$ —	$
Common stock, $0.000005 par value per share: 130,000,000 shares authorized, 35,685,875 shares issued and 33,955,770 shares outstanding, actual; shares authorized, pro forma and pro forma as adjusted; shares issued and 81,561,865 shares outstanding, pro forma; shares issued and shares outstanding, pro forma as adjusted	—	—	
Preferred stock, $0.0001 par value per share: no shares authorized, issued and outstanding, actual; shares authorized, pro forma and pro forma as adjusted; no shares issued and outstanding, pro forma and pro forma as adjusted	—	—	
Additional paid-in capital	126,094	165,649	
Accumulated deficit	(85,187)	(85,187)	
Treasury stock	(952)	(952)	
Total stockholders' equity	39,960	79,510	
Total capitalization	$ 39,960	$ 79,510	$

(1) Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, additional paid-in capital, total assets, total stockholders' equity and total capitalization by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. Similarly, each increase (decrease) of 1.0 million shares in the number of shares offered by us at the assumed initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, additional paid-in capital, total stockholders' equity and total capitalization by approximately $ million, assuming the assumed initial public offering price per share remains the same and after deducting estimated underwriting discounts and commissions.

The number of shares of our common stock on a pro forma and pro forma as adjusted basis set forth in the table above is based on 33,955,770 shares of our common stock outstanding as of December 31, 2018 and does not include:

- 16,572,861 shares of common stock issuable upon exercise of stock options outstanding under our 2006 Plan and our 2015 Plan as of December 31, 2018, at a weighted-average exercise price of $2.34 per share;
- shares of our common stock reserved for future issuance under our 2019 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our 2019 Plan; and
- shares of our common stock reserved for future issuance under our 2019 ESPP, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our 2019 ESPP.

Dilution

If you invest in our common stock in this offering, your ownership interest will be immediately diluted to the extent of the difference between the initial public offering price per share of our common stock and the pro forma as adjusted net tangible book value per share of our common stock after this offering.

As of December 31, 2018, we had a historical net tangible book value of $36.0 million, or $1.06 per share of common stock, based on 33,955,770 shares of common stock outstanding as of such date. Our historical net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of our common stock outstanding as of December 31, 2018. We define net tangible book value as total assets less total liabilities, intangible assets and deferred offering costs. We define total tangible assets as total assets less intangible assets and deferred offering costs.

Our pro forma net tangible book value as of December 31, 2018 was $36.0 million, or $0.44 per share. Pro forma net tangible book value represents the amount of our total tangible assets less total liabilities, after giving effect to the automatic conversion of all shares of our convertible preferred stock outstanding as of December 31, 2018 into an aggregate of 47,606,095 shares of our common stock in connection with this offering and the automatic settlement of the 2019 Notes into shares of our common stock in connection with the closing of this offering, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus. Pro forma net tangible book value per share represents our pro forma net tangible book value divided by the total number of shares outstanding as of December 31, 2018, after giving effect to the pro forma adjustment described above.

After giving further effect to the receipt of the net proceeds from our issuance and sale of shares of common stock in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of December 31, 2018 would have been approximately $ million, or approximately $ per share. This amount represents an immediate increase in pro forma net tangible book value of $ per share to our existing stockholders and an immediate dilution of approximately $ per share to new investors participating in this offering. We determine dilution by subtracting the pro forma as adjusted net tangible book value per share after this offering from the amount of cash that a new investor paid for a share of common stock. The following table illustrates this dilution:

Assumed initial public offering price per share		$
Historical net tangible book value per share as of December 31, 2018	$1.06	
Pro forma decrease per share attributable to the conversion of our convertible preferred stock and settlement of the 2019 Notes		
Pro forma net tangible book value per share as of December 31, 2018		
Increase in the pro forma net tangible book value per share attributable to this offering		
Pro forma as adjusted net tangible book value per share after this offering		
Dilution per share to new investors participating in this offering		$

The dilution information discussed above is illustrative only and will change based on the actual initial public offering price and other terms of this offering determined at pricing. Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted net tangible book value per share after this offering by $ per share, and dilution in pro forma net tangible book value per share to new investors purchasing common stock in this offering by $ per share, assuming that the number of shares

offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. An increase of 1.0 million shares in the number of shares offered by us would increase our pro forma as adjusted net tangible book value per share after this offering by $ per share and decrease the dilution to new investors purchasing common stock in this offering by $ per share, assuming the assumed initial public offering price remains the same and after deducting estimated underwriting discounts and commissions. A decrease of 1.0 million shares in the number of shares offered by us would decrease our pro forma as adjusted net tangible book value per share after this offering by $ per share and increase the dilution to new investors purchasing common stock in this offering by $ per share, assuming the assumed initial public offering price remains the same and after deducting estimated underwriting discounts and commissions.

If the underwriters exercise their option to purchase additional shares of our common stock in full, the pro forma as adjusted net tangible book value per share after this offering would be $ per share, the increase in pro forma net tangible book value per share would be $ per share and the dilution per share to new investors would be $ per share, in each case based on the initial public offering price of $ per share, after deducting estimated underwriting discounts and commissions and the estimated offering expenses payable by us.

The following table summarizes, as of December 31, 2018, on the pro forma as adjusted basis described above, the total number of shares of common stock purchased from us on an as converted to common stock basis, the total consideration paid or to be paid and the average price per share paid or to be paid by existing stockholders and by new investors in this offering at an assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, before deducting the underwriting discounts and commissions and estimated offering expenses payable by us. As the table shows, new investors purchasing common stock in this offering will pay an average price per share substantially higher than our existing stockholders paid.

	Shares purchased		Total consideration		Average price per share
	Number	Percent	Amount	Percent	
Existing stockholders	81,561,865	%	$123,483,206	%	$ 1.51
New investors					
Total		100.0%	$	100.0%	

If the underwriters exercise their option to purchase additional shares of our common stock in full, the percentage of shares of common stock held by existing stockholders will decrease to approximately % of the total number of shares of our common stock outstanding after this offering, and the number of shares held by new investors will increase to , or approximately % of the total number of shares of our common stock outstanding after this offering.

A $1.00 increase or decrease in the assumed initial public offering price of $ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase or decrease the total consideration paid by new investors by $ million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by percentage points, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. An increase or decrease of 1.0 million shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase or decrease the total consideration paid by new investors by $ million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by % and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by percentage points, assuming the assumed initial public offering price per share remains the same and after deducting the underwriting discounts and commissions.

The foregoing tables and calculations (other than the historical net tangible book value calculation) are based on the number of shares of our common stock outstanding as of December 31, 2018, after giving effect to the automatic conversion of all outstanding shares of our convertible preferred stock into common stock in connection with this offering, and exclude:

- 16,572,861 shares of common stock issuable upon exercise of stock options outstanding under our 2006 Plan and our 2015 Plan as of December 31, 2018, at a weighted-average exercise price of $2.34 per share;
- shares of our common stock reserved for future issuance under our 2019 Plan, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our 2019 Plan; and
- shares of our common stock reserved for future issuance under our 2019 ESPP, which will become effective in connection with this offering, as well as any automatic increases in the number of shares of our common stock reserved for future issuance under our 2019 ESPP.

To the extent that these outstanding stock options are exercised, new stock options are issued or we issue additional shares of common stock in the future, there will be further dilution to new investors. In addition, we may choose to raise additional capital because of market conditions or strategic considerations, even if we believe that we have sufficient funds for our current or future operating plans. If we raise additional capital through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

Selected consolidated financial data

You should read the following selected consolidated financial data together with our consolidated financial statements and the related notes included elsewhere in this prospectus and "Management's discussion and analysis of financial condition and results of operations." We have derived the consolidated statement of operations data for the years ended December 31, 2017 and 2018 and the consolidated balance sheet data as of December 31, 2017 and 2018 from our audited consolidated financial statements included elsewhere in this prospectus. Our historical results are not necessarily indicative of the results that should be expected in any future period.

	Years ended December 31,	
(in thousands, except share and per share data)	**2017**	**2018**
Consolidated Statements of Operations Data:		
Revenue	$ 6,484	$ 10,883
Operating expenses:		
Research and development	20,324	45,122
General and administrative	8,016	13,673
Impairment of intangible assets	118	—
Total operating expenses	28,458	58,795
Loss from operations	(21,974)	(47,912)
Other income:		
Interest income	872	1,875
Net loss and net loss attributable to common stockholders—basic and diluted	$ (21,102)	$ (46,037)
Net loss per share attributable to common stockholders—basic and diluted	$ (0.62)	$ (1.37)
Weighted-average shares of common stock outstanding—basic and diluted(1)	33,956,010	33,675,834
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited) (1)		$ (0.64)
Pro forma weighted-average shares of common stock outstanding—basic and diluted (unaudited) (1)		71,840,382

(1) See Note 10 to our audited consolidated financial statements included elsewhere in this prospectus for an explanation of the method used to calculate the historical basic and diluted net loss per share of common stock and the weighted-average number of shares used in the computation of the per share amounts.

	As of December 31,	
(in thousands)	**2017**	**2018**
Consolidated Balance Sheet Data:		
Cash and cash equivalents	$ 62,802	$ 103,193
Working capital(1)	55,129	101,600
Total assets	72,682	138,600
Total liabilities	99,051	98,640
Accumulated deficit	(39,111)	(85,187)
Stockholders' (deficit) equity	(26,369)	39,960

(1) We define working capital as current assets less current liabilities. See our consolidated financial statements included elsewhere in this prospectus for further details regarding our current assets and current liabilities.

Management's discussion and analysis of financial condition and results of operations

You should read the following discussion and analysis of financial condition and operating results together with the section captioned "Selected consolidated financial data" and our consolidated financial statements and the related notes included elsewhere in this prospectus. This discussion contains forward-looking statements that involve risks and uncertainties. As a result of many factors, such as those set forth in the section of the prospectus captioned "Risk factors" and elsewhere in this prospectus, our actual results may differ materially from those anticipated in these forward-looking statements.

Overview

We are a genome editing company dedicated to improving life through our groundbreaking proprietary genome editing platform, "ARCUS." We leverage ARCUS in the development of our product candidates, which are designed to treat human diseases and create healthy and sustainable food and agricultural solutions. We believe the versatility and breadth of ARCUS support our ability to develop products across the spectrum of biotechnology. We are actively developing product candidates in three innovative and high value areas where we believe our technology has the potential to overcome the limitations of other genome editing technologies: allogeneic CAR T immunotherapy, *in vivo* gene correction, and food. The U.S. Food and Drug Administration, or FDA, recently accepted our investigational new drug, or IND, application for our first gene-edited allogeneic CAR T cell candidate targeting CD19 and we expect to commence a Phase 1/2a clinical trial in patients with acute lymphoblastic leukemia and non-hodgkin lymphoma in the first half of 2019. We believe this trial will be the first clinical investigation of an allogeneic CAR T therapy for non-hodgkin lymphoma. We believe our proprietary, one-step engineering process for producing allogeneic CAR T cells at large scale in a cost-effective manner will enable us to overcome the fundamental challenges of manufacturing that have limited the CAR T field to date.

Since our formation in 2006, we have devoted substantially all of our resources to developing ARCUS, conducting research and development activities, recruiting skilled personnel, developing manufacturing processes, establishing our intellectual property portfolio and providing general and administrative support for these operations. We have financed our operations primarily with proceeds from the sale of our convertible preferred stock and upfront payments from licensing arrangements. To date, we have generated approximately $300 million from third parties through a combination of preferred stock and convertible note financings, an upfront payment under the Servier Agreement and additional funding from other strategic alliances and grants. In March 2019, we entered into a convertible note purchase agreement for the issuance and sale of approximately $39.6 million aggregate principal amount of convertible promissory notes, or the 2019 Notes, in a private placement transaction.

Since our inception, we have incurred significant operating losses and have not generated any revenue from the sale of products. Our ability to generate any product revenue or product revenue sufficient to achieve profitability will depend on the successful development and eventual commercialization of one or more of our product candidates or the product candidates of our collaborators for which we may receive milestone payments or royalties. Our net losses were $21.1 million and $46.0 million for the years ended December 31, 2017 and 2018, respectively. As of December 31, 2018, we had an accumulated deficit of $85.2 million.

We expect our operating expenses to increase substantially in connection with the expansion of our product development programs and capabilities. We will not generate revenue from product sales unless and until we successfully complete clinical development and obtain regulatory approval for one of our product candidates or the product candidates of our collaborators for which we may receive milestone payments or royalties. If we obtain regulatory approval for any of our product candidates, we expect to incur significant expenses related to

developing our commercialization capability to support product sales, marketing and distribution. In addition, following the closing of this offering, we expect to incur additional costs associated with operating as a public company.

As a result of these anticipated expenditures, we will need additional financing to support our continuing operations. Until such time as we can generate significant revenue from product sales, if ever, we expect to finance our cash needs through a combination of public or private equity or debt financings or other sources, which may include current and new collaborations with third parties. Adequate additional financing may not be available to us on acceptable terms, or at all. Our inability to raise capital as and when needed would have a negative impact on our financial condition and our ability to pursue our business strategy. We cannot assure you that we will ever generate significant revenue to achieve profitability.

Because of the numerous risks and uncertainties associated with the development of therapeutic and agricultural products, we are unable to predict the timing or amount of increased expenses or when or if we will be able to achieve or maintain profitability. Even if we are able to generate revenue from product sales, we may not become profitable. If we fail to become profitable or are unable to sustain profitability on a continuing basis, then we may be required to raise additional capital on terms that are unfavorable to us or we may be unable to continue our operations at planned levels and be forced to reduce or terminate our operations.

We currently conduct our operations through two reportable segments: Therapeutics and Food. Our Therapeutics segment is focused on allogeneic CAR T immunotherapy and *in vivo* gene correction. Our Food segment focuses on applying ARCUS to develop food and nutrition products through collaboration agreements with consumer-facing companies.

Collaborations

Gilead

In September 2018, we and Gilead entered into a collaboration and license agreement, which we refer to as the Gilead Agreement, to develop genome editing tools using ARCUS to target viral DNA associated with the Hepatitis B virus. Pursuant to the terms of the agreement, Gilead received an exclusive license to exploit the resulting synthetic nucleases and products that use them to treat the Hepatitis B virus in humans, and we are entitled to receive up to approximately $40 million in research funding over an initial three year term and milestone payments of up to an aggregate of $445 million, consisting of up to $105.0 million in development milestone payments and up to $340.0 million in commercial milestone payments. We are also entitled to receive tiered royalties ranging from the high single digit percentages to the mid-teen percentages on worldwide net sales of the products developed through the term of the agreement, subject to customary potential reductions.

We recognized $3.7 million in revenues under the Gilead Agreement during the year ended December 31, 2018 and recorded $2.3 million in deferred revenue as of December 31, 2018. We did not receive any milestone payments under the Gilead Agreement during the year ended December 31, 2018.

Servier

In February 2016, we entered into the Servier Agreement, pursuant to which we have agreed to develop allogeneic chimeric antigen receptor T cell therapies for up to six unique antigen targets. One target was selected at the agreement’s inception, and Servier is entitled to select the remaining five targets over the first four years of the agreement. Upon selection of an antigen target under the agreement, we have agreed to perform early-stage research and development on individual T cell modifications for the selected target, develop the resulting therapeutic product candidates through Phase 1 clinical trials and prepare clinical supply of such product candidates for use in Phase 2 clinical trials.

We received an upfront payment of $105.0 million under the Servier Agreement. We have the ability to receive total payments, including the upfront payment, option fees and milestone payments, in the aggregate across all six targets, of up to approximately $1.6 billion. This includes up to $1.5 billion in milestone payments, consisting of up to $401.3 million in development milestone payments and up to $1.1 billion in commercial milestone payments. We are also entitled to receive tiered royalties ranging from the mid-single digit percentages to the sub-teen percentages on worldwide net sales, subject to potential customary reductions. We also have the right to participate in the development and commercialization of any licensed products resulting from the collaboration through a 50/50 co-development and co-promotion option in the United States, subject to our payment of an option fee, which is exercisable after Servier's commercial option exercise.

We recognized $5.8 million in revenues under the Servier Agreement during each of the years ended December 31, 2017 and 2018. The amount recorded as deferred revenue was $94.4 million and $88.6 million as of December 31, 2017 and 2018, respectively. No development or sales-based milestones were received for the fiscal years ended December 31, 2017 and 2018.

Components of our results of operations

Revenue

To date, we have not generated any revenue from product sales and do not expect to generate any revenue from product sales in the foreseeable future. We record revenue from collaboration agreements, including amounts related to upfront payments, annual fees for licenses of our intellectual property and research and development funding.

Research and development expenses

Research and development expenses consist primarily of costs incurred for our research activities, including our discovery efforts and the development of our product candidates. These include the following:

- salaries, benefits and other related costs, including stock-based compensation expense, for personnel engaged in research and development functions;
- expenses incurred under agreements with third parties, including CROs and other third parties that conduct preclinical research and development activities and clinical trials on our behalf;
- costs of developing and scaling our manufacturing process and manufacturing drug products for use in our preclinical studies and future clinical trials, including the costs of CMOs that will manufacture our clinical trial material for use in our preclinical studies and potential future clinical trials;
- costs of outside consultants, including their fees and related travel expenses;
- costs of laboratory supplies and acquiring, developing and manufacturing preclinical study and clinical trial materials;
- license payments made for intellectual property used in research and development activities; and
- facility-related expenses, which include direct depreciation costs and expenses for rent and maintenance of facilities and other operating costs if specifically identifiable to research activities.

We expense research and development costs as incurred.

We track external research and development costs, including the costs of laboratory supplies and services, outsourced research and development, clinical trials, contract manufacturing, laboratory equipment and maintenance and certain other development costs, by product candidate when the costs are specifically

identifiable to a product candidate. Internal and external costs associated with infrastructure resources, other research and development costs, facility related costs and depreciation and amortization that are not identifiable to a specific product candidate are included in the platform development, early-stage research and unallocated expenses category in the table below.

The following table summarizes our research and development expenses by product candidate or development program:

	Years ended December 31,		
	2017	2018	Increase
(in thousands)			
Direct research and development expenses by product candidate:			
CD19 external development costs	$ 3,844	$13,654	$ 9,810
Platform development, early-stage research and unallocated expenses:			
Employee-related costs	9,878	14,784	4,906
Laboratory supplies and services	2,183	4,061	1,878
Outsourced research and development	1,455	7,055	5,600
Laboratory equipment and maintenance	324	519	195
Facility-related costs	832	1,431	599
Depreciation and amortization	1,205	1,759	554
Other research and development costs	603	1,859	1,256
Total research and development expenses	$20,324	$45,122	$ 24,798

Research and development activities are central to our business model. We expect that our research and development expenses will continue to increase substantially for the foreseeable future and will comprise a larger percentage of our total expenses as we initiate a Phase 1/2a clinical trial for our CD19 product candidate and continue to discover and develop additional product candidates.

We cannot determine with certainty the duration and costs of future clinical trials of our CD19 product candidate or any other product candidate we may develop or if, when or to what extent we will generate revenue from the commercialization and sale of any product candidate for which we obtain marketing approval. We may never succeed in obtaining marketing approval for any product candidate. The duration, costs and timing of clinical trials and development of our CD19 product candidate and any other our product candidate we may develop will depend on a variety of factors, including:

- the scope, rate of progress, expense and results of clinical trials of our CD19 product candidate, as well as of any future clinical trials of other product candidates and other research and development activities that we may conduct;
- uncertainties in clinical trial design and patient enrollment rates;
- the actual probability of success for our product candidates, including their safety and efficacy, early clinical data, competition, manufacturing capability and commercial viability;
- significant and changing government regulation and regulatory guidance;
- the timing and receipt of any marketing approvals; and
- the expense of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights.

A change in the outcome of any of these variables with respect to the development of a product candidate could mean a significant change in the costs and timing associated with the development of that product candidate.
For example, if the FDA or another regulatory authority were to require us to conduct clinical trials beyond those that we anticipate will be required for the completion of clinical development of a product candidate, or if we experience significant delays in our clinical trials due to slower than expected patient enrollment or other reasons, we would be required to expend significant additional financial resources and time on the completion of clinical development.

General and administrative expenses

General and administrative expenses consist primarily of salaries and other related costs, including stock-based compensation, for personnel in our executive, finance, business development, operations and administrative functions. General and administrative expenses also include legal fees relating to intellectual property and corporate matters; professional fees for accounting, auditing, tax and consulting services; insurance costs; travel expenses; and facility-related expenses, which include direct depreciation costs and expenses for rent and maintenance of facilities and other operating costs that are not specifically attributable to research activities.

We expect that our general and administrative expenses will increase in the future as we increase our personnel headcount to support our continued research activities and development of product candidates. Following this offering, we also expect to incur increased expenses associated with being a public company, including costs of accounting, audit, legal, regulatory and tax-related services associated with maintaining compliance with Nasdaq and SEC requirements; director and officer insurance costs; and investor and public relations costs.

Interest income

Interest income consists of interest income earned on our cash and cash equivalents.

Income taxes

Since our inception in 2006, we have generated cumulative federal and state net operating loss and R&D credit carryforwards for which we have not recorded any net tax benefit due to the uncertainty around utilizing these tax attributes within their respective carryforward periods. As of December 31, 2018, we had federal and state net operating loss carryforwards of $40.0 million and $39.8 million, respectively, which may be available to offset future taxable income. The U.S. federal net operating loss carryforwards of $19.4 million will begin to expire in 2030 while the remaining federal net operating loss carryforwards of $20.6 million carry forward indefinitely. The state net operating loss carryforwards begin to expire in 2025, As of December 31, 2018, we also had federal research and development tax credit carryforwards of $3.6 million, which begin to expire in 2027. As of December 31, 2018, we also have federal contribution carryforwards of less than $0.1 million, which begin to expire in 2020. We have recorded a full valuation allowance against our net deferred tax assets at each balance sheet date.

On December 22, 2017, the Tax Cuts and Jobs Act was signed into United States law. The Tax Cuts and Jobs Act includes a number of changes to existing tax law, including, among other things, a permanent reduction in the federal corporate income tax rate from a top marginal tax rate of 35% to a flat rate of 21%, effective as of January 1, 2018, as well as a limitation of the deduction for net operating losses to 80% of annual taxable income and elimination of net operating loss carrybacks, in each case, for losses arising in taxable years beginning after December 31, 2017 (though any such net operating losses may be carried forward indefinitely). The federal tax rate change resulted in a reduction in the gross amount of our deferred tax assets and liabilities recorded as of December 31, 2017, and a corresponding reduction in our valuation allowance. As a result, no income tax expense or benefit was recognized as of the enactment date of the Tax Cuts and Jobs Act.

Results of operations

Comparison of years ended December 31, 2017 and 2018

The following table summarizes our results of operations for the years ended December 31, 2017 and 2018, together with the changes in those items in dollars:

	Years ended December 31,		
	2017	2018	Change
(in thousands)			
Revenue	$ 6,484	$ 10,883	$ 4,399
Operating expenses:			
Research and development	20,324	45,122	24,798
General and administrative	8,016	13,673	5,657
Impairment of intangible assets	118	—	(118)
Total operating expenses	28,458	58,795	30,337
Loss from operations	(21,974)	(47,912)	(25,938)
Other income:			
Interest income	872	1,875	1,003
Net loss	$ (21,102)	$ (46,037)	$ (24,935)

Revenue

Revenue for the year ended December 31, 2017 was $6.5 million, compared to $10.9 million for the year ended December 31, 2018. The increase of $4.4 million in revenue during the year ended December 31, 2018 was generally the result of increases in research funding of $3.7 million from Gilead and of $1.0 million from another joint development collaboration partner, which was partially offset by a $0.3 million decrease in license fees from a biopharmaceutical manufacturer and a $0.1 million decrease in license fees from a collaboration partner.

Research and development expenses

	Years ended December 31,		
	2017	2018	Increase
(in thousands)			
Direct research and development expenses by product candidate:			
CD19 external development costs	$ 3,844	$13,654	$ 9,810
Platform development, early-stage research and unallocated expenses:			
Employee-related costs	9,878	14,784	4,906
Laboratory supplies and services	2,183	4,061	1,878
Outsourced research and development	1,455	7,055	5,600
Laboratory equipment and maintenance	324	519	195
Facility-related costs	832	1,431	599
Depreciation and amortization	1,205	1,759	554
Other research and development costs	603	1,859	1,256
Total research and development expenses	$20,324	$45,122	$ 24,798

Research and development expenses for the year ended December 31, 2017 were $20.3 million, compared to $45.1 million for the year ended December 31, 2018. The increase of $24.8 million was primarily due to increases of $9.8 million in direct research and development expenses related to our CD19 program and $15.0 million in platform development and early-stage research expenses. Our CD19 program incurred expenditure increases of $7.3 million to CMOs for clinical trial material, $0.7 million to CROs for clinical trial costs, $0.8 million in lab services, $0.4 million in scientific service providers, and $0.6 million in other costs. Platform development and early-stage research expenses increased primarily due to a $5.6 million increase in outsourced research and development spending on our development programs, excluding our CD19 program, and $4.9 million of additional employee-related cost associated with increased headcount to support our technology platform development and manufacturing capabilities.

General and administrative expenses

General and administrative expenses were $8.0 million for the year ended December 31, 2017, compared to $13.7 million for the year ended December 31, 2018. The increase of $5.7 million was primarily due to an increase of $3.0 million in employee-related costs as we increased our general and administrative headcount. General and administrative expenses also increased due to costs required to meet our growing infrastructure needs. Contributing to the increase were $0.5 million in facility related costs, including equipment, $1.1 million in consulting fees, $0.5 million in information technology costs, and $0.3 million in depreciation and amortization.

Interest income

Interest income was $0.9 million for the year ended December 31, 2017 compared to $1.9 million for the year ended December 31, 2018. The increase of $1.0 million of interest income generated on our cash and cash equivalent balances for the year ended December 31, 2018 compared to the year ended December 31, 2017 was the result of higher interest rates and having higher cash balances invested in 2018 compared to 2017.

Segment results

The following tables summarize segment revenues and segment operating loss for the years ended December 31, 2017 and 2018 (see Note 14 to our audited consolidated financial statements included elsewhere in this prospectus for additional information regarding our segments):

	Years ended December 31,	
	2017	**2018**
(in thousands)		
Revenue:		
Therapeutics	$ 6,064	$ 9,523
Food	420	1,360
Total segment revenue	6,484	10,883
Segment operational cash expenditures:		
Therapeutics	$ 11,062	$ 35,045
Food	1,699	9,125
Total segment operational cash expenditures	12,761	44,170
Allocation of centralized research and development operational cash expenditures:		
Therapeutics	$ 6,948	$ 11,605
Food	1,164	2,901
Total allocation of centralized research and development operational cash expenditures	8,112	14,506
Segment operating income (loss):		
Therapeutics	$ (11,946)	$ (37,127)
Food	(2,443)	(10,666)
Total segment operating loss	(14,389)	(47,793)

We evaluate the operating performance of each segment based on segment operating loss. Segment operating loss is derived by deducting operational cash expenditures from revenue. Operational cash expenditures are cash disbursements made that are specifically identifiable to the reportable segment (including specifically identifiable research and development and property, equipment and software expenditures) plus an allocation of centralized research and development expenditures for early stage research, nuclease development and the purchase of general laboratory supplies. These expenditures are allocated to the segments based on headcount. The reportable segment and centralized research and development operational cash expenditures include cash disbursements for compensation, lab supplies, purchases of property, equipment and software and procuring services from CROs, CMOs and research organizations. We do not allocate general operational expenses or non-cash income statement amounts to our reportable segments.

Therapeutics segment

Revenue for the year ended December 31, 2017 was $6.1 million, compared to $9.5 million for the year ended December 31, 2018. The increase of $3.4 million was attributable to a $3.7 million increase in research funding received from Gilead, which was partially offset by a $0.3 million decrease in license fees from a biopharmaceutical manufacturer.

Segment operational cash expenditures for the year ended December 31, 2017 were $11.1 million, compared to $35.0 million for the year ended December 31, 2018. The increase of $23.9 million was primarily due to an

increase in payments made to service providers for research and development, contract manufacturing, clinical trial research, lab supplies and services, and an increase in employee headcount and related costs. Segment operating loss increased $25.2 million from $11.9 million for the year ended December 31, 2017 to $37.1 million for the year ended December 31, 2018 primarily due to the factors discussed above.

Food segment

Revenue for the year ended December 31, 2017 was $0.4 million, compared to $1.4 million for the year ended December 31, 2018. The increase of $0.9 million was primarily attributable to an increase in research funding of $1.0 million from another joint development collaboration partner.

Segment operational cash expenditures for the year ended December 31, 2017 were $1.7 million, compared to $9.1 million for the year ended December 31, 2018. The increase of $7.4 million was primarily due to an increase in leasehold improvements, equipment and lab supply expenditures and employee headcount and related costs. Segment operating loss increased $8.3 million from $2.4 million for the year ended December 31, 2017 to $10.7 million for the year ended December 31, 2018 primarily due to the factors discussed above.

Liquidity and capital resources

Since our inception, we have incurred significant operating losses. We expect to incur significant expenses and operating losses for the foreseeable future as we advance the preclinical and clinical development of our product candidates. We expect that our research and development and general and administrative costs will continue to increase, including in connection with conducting preclinical studies and clinical trials for our product candidates, contracting with CMOs and building out internal capacity to have product manufactured to support preclinical studies and clinical trials, expanding our intellectual property portfolio and providing general and administrative support for our operations. As a result, we will need additional capital to fund our operations, which we may obtain from additional equity or debt financings, collaborations, licensing arrangements or other sources.

We do not currently have any approved products and have never generated any revenue from product sales. To date, we have financed our operations primarily with proceeds from the sale of our convertible preferred stock and upfront payments from licensing arrangements. To date, we have generated approximately $300 million from third parties through a combination of preferred stock and convertible note financings, an upfront payment under the Servier Agreement and additional funding from other strategic alliances and grants.

Cash flows

Our cash and cash equivalents totaled $103.2 million as of December 31, 2018. We had no indebtedness as of December 31, 2018.

The following table summarizes our sources and uses of cash for the periods presented:

	Years ended December 31,	
	2017	**2018**
(in thousands)		
Net cash used in operating activities	$ (24,169)	$ (51,723)
Net cash used in investing activities	(5,515)	(15,663)
Net cash (used in) provided by financing activities	(937)	107,777
Increase (decrease) in cash and cash equivalents	$ (30,621)	$ 40,391

Cash flows for the year ended December 31, 2018

Operating activities

Net cash used in operating activities for the year ended December 31, 2018 was $51.7 million, primarily consisting of our net loss of $46.0 million as we incurred expenses associated with our CD19 program, platform development and early-stage research and general and administrative expenses. In addition, we had non-cash charges of $4.8 million for depreciation and stock-based compensation expense. Net cash used in operating activities was also impacted by $10.5 million in changes in operating assets and liabilities, including $7.5 million in prepaid expenses, $3.2 million in deferred revenue, $0.5 million in accounts receivable, $0.7 million in accounts payable and $0.4 million in other current assets and other assets, which were partially offset by changes of $1.8 million in accrued expenses.

Investing activities

Net cash used in investing activities for the year ended December 31, 2018 was $15.7 million, which was attributable to purchases of property, equipment and software of $14.3 million and the acquisition of intellectual property of $1.4 million.

Financing activities

Net cash provided in financing activities for the year ended December 31, 2018 was $107.8 million, consisting of the net proceeds from the issuance of our Series B convertible preferred stock financing of $109.7 million, net of offering costs, and $0.2 million in proceeds from stock option exercises, partially offset by $2.1 million in payments for deferred offering costs associated with our planned initial public offering.

Cash flows for the year ended December 31, 2017

Operating activities

Net cash used in operating activities for the year ended December 31, 2017 was $24.2 million, primarily consisting of our net loss of $21.1 million as we incurred expenses associated with research activities on our CD19 program and research activities on other applications for our technology and incurred general and administrative expenses. In addition, we had a loss of $0.1 million on the disposal of assets and non-cash charges of $2.0 million for depreciation and stock-based compensation expense and the impairment of intangible assets. Net cash used in operating activities was also impacted by $5.1 million in changes in operating assets and liabilities, including $6.2 million in deferred revenue and $0.6 million in prepaid expenses and other current assets, partially offset by changes of $0.9 million in accounts payable, $0.7 million in accrued expenses and other current liabilities and $0.1 million in other assets.

Investing activities

Net cash used in investing activities for the year ended December 31, 2017 was $5.5 million, which was attributable to purchases of property, equipment and software of $5.6 million, partially offset by $0.1 million from the proceeds from the disposal of equipment.

Financing activities

Net cash used in financing activities for the year ended December 31, 2017 was $0.9 million, consisting of repurchases of common stock of $1.0 million, partially offset by less than $0.1 million in proceeds from stock option exercises.

Funding requirements

Our operating expenses have increased substantially in 2017 and 2018 and are expected to increase substantially in 2019 and in the future in connection with our ongoing activities, particularly as we advance our preclinical activities including pre-IND enabling studies, scale-up of manufacturing processes and engagement with CMOs and initiation of human clinical trials. In addition, following the closing of this offering, we expect to incur additional costs associated with operating as a public company.

Specifically, our costs and expenses will increase as we:

- pursue the clinical development of our CD19 program;
- pursue the preclinical and clinical development of our other CAR T cell product candidates and allogeneic CAR T immunotherapy platform, our gene correction platform and our other product candidates;
- further scale up our internal manufacturing processes and capabilities and contract with CMOs to support our preclinical studies and clinical trials of our product candidates and make other capital expenditures to support our operations;
- in-license or acquire the rights to other products, product candidates or technologies;
- maintain, expand and protect our intellectual property portfolio;
- hire additional personnel in research, manufacturing and regulatory and clinical development as well as management personnel; and
- expand our operational, financial and management systems and increase personnel, including personnel to support our operations as a public company.

We believe that the anticipated net proceeds from this offering, together with our existing cash and cash equivalents, will enable us to fund our operating expenses and capital expenditure requirements through . We have based these estimates on assumptions that may prove to be imprecise, and we could utilize our available capital resources sooner than we expect.

Because of the numerous risks and uncertainties associated with research, development and commercialization of pharmaceutical and agricultural products, it is difficult to estimate with certainty the amount of our working capital requirements. Our future funding requirements will depend on many factors, including:

- the progress, costs and results of our clinical development and initial clinical trials for our CD19 program;
- the progress, costs and results of our additional research and preclinical development programs;
- the outcome, timing and cost of meeting regulatory requirements established by the FDA and other comparable foreign regulatory authorities;
- the costs and timing of internal process development and manufacturing scale-up activities and contract with CMOs associated with our CD19 program and other programs we advance through preclinical and clinical development;
- our ability to establish and maintain strategic collaborations, licensing or other agreements and the financial terms of such agreements;
- the scope, progress, results and costs of any product candidates that we may derive from ARCUS or any other product candidates we may develop alone or with collaborators;

- the extent to which we in-license or acquire rights to other products, product candidates or technologies;
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and protecting our intellectual property rights and defending against any intellectual property-related claims; and
- the costs and timing of future commercialization activities, including product manufacturing, marketing, sales and distribution, for any product candidates for which we or our collaborators obtain marketing approval.

Until such time, if ever, that we can generate product revenue sufficient to achieve profitability, we expect to finance our cash needs through a combination of public or private equity or debt financings, collaboration agreements, other third-party funding, strategic alliances, licensing arrangements and marketing and/or distribution arrangements.

To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through other third-party funding, collaboration agreements, strategic alliances, licensing arrangements or marketing and distribution arrangements, we may have to relinquish valuable rights to our technologies, future revenue streams, product development and research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts or grant rights to develop and market products or product candidates that we would otherwise prefer to develop and market ourselves.

Contractual obligations and commitments

The following is a summary of our contractual obligations and commitments as of December 31, 2018:

		Payments due by period			
	Total	Less than 1 year	1—3 years	3-5 years	More than 5 years
(in thousands)					
Operating lease obligation(1)	$14,530	$ 1,999	$4,384	$4,663	$ 3,484

(1) Represents future minimum lease payments under our operating leases for office and/or lab space at the following locations: 302 East Pettigrew Street, Durham, North Carolina expiring in July 2024, 5 Laboratory Drive, Research Triangle Park, North Carolina expiring in April 2026 and 20 TW Alexander Drive, Research Triangle Park, North Carolina expiring in August 2026 (see Note 9 to our consolidated financial statements included elsewhere in this prospectus for additional information on these lease agreements).

In addition, we have entered into the Duke License, under which we are obligated to make aggregate future milestone payments of up to $0.2 million upon the achievement of specified corporate milestones as well as low-single digit percent royalty payments based on future net sales of applicable products and generally mid-teen percent royalties based on sublicensing revenue. See “Business—License and collaboration agreements” for more information regarding our payment obligations under the Duke License. We have not included future payments under the Duke License in the table above since the payment obligations under the Duke License are contingent upon future events, such as the achievement of specified milestones or generating product sales, and we are unable to estimate the timing or likelihood of achieving these milestones or generating future product sales.

We also enter into contracts in the normal course of business with CROs, CMOs, universities and other third parties for preclinical research studies, clinical trials and testing and manufacturing services. These contracts

do not contain minimum purchase commitments and are cancelable by us upon prior written notice. Payments due upon cancellation consist only of payments for services provided or expenses incurred, including noncancelable obligations of our service providers, up to the date of cancellation. These payments are not included in the table above as the amount and timing of such payments are not known.

Critical accounting policies and use of estimates

Our management's discussion and analysis of financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of our consolidated financial statements and related disclosures requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities, costs and expenses and the disclosure of contingent assets and liabilities in our consolidated financial statements. We base our estimates on historical experience, known trends and events and various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. We evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements included elsewhere in this prospectus, we believe that the following accounting policies are those most critical to the judgments and estimates used in the preparation of our consolidated financial statements.

Revenue recognition

Our revenues are generated primarily through collaborative research, license, development and commercialization agreements. The terms of these agreements generally contain multiple elements, or deliverables, which may include (1) licenses, or options to obtain licenses, to use our technology, (2) research and development activities to be performed on behalf of the collaborative partner, and (3) in certain cases, services in connection with the manufacturing of preclinical and clinical material. Payments we receive under these arrangements typically include one or more of the following: non-refundable, upfront license fees; option exercise fees; funding of research and/or development efforts; clinical and development, regulatory, and sales milestone payments; and royalties on future product sales. We classify payments received under these agreements as revenues within our consolidated statements of operations.

In February 2016, we entered into the Servier Agreement for the licensing of our ARCUS proprietary genome editing platform and the research, development, and manufacturing of product for clinical trials and commercialization of products. In September 2018, we entered into a collaboration and license agreement with Gilead, which we refer to as the Gilead Agreement, to develop genome editing tools using our ARCUS proprietary genome editing platform. Both agreements use our genome editing technology for the treatment of certain diseases (see Note 13 to our consolidated financial statements included elsewhere in this prospectus). Consideration we received, or may receive, under these collaboration and license agreements include upfront nonrefundable payments, research funding payments and payments based upon the achievement of certain milestones and royalties on any resulting net product sales.

Revenue is recognized when all of the following conditions are met: (1) persuasive evidence of an arrangement exists, (2) delivery has occurred or services have been rendered, (3) fees are fixed or determinable, and (4) collection of fees is reasonably assured.

We analyze our collaboration arrangements to assess whether they are within the scope of Accounting Standards Codification 808, Collaborative Arrangements, or ASC 808, to determine whether such arrangements

involve joint operating activities performed by parties that are both active participants in the activities and exposed to significant risks and rewards dependent on the commercial success of such activities. This requires that we determine whether elements of the collaboration are deemed to be within the scope of ASC 808 and those that are more reflective of a vendor-customer relationship and therefore within the scope of Accounting Standards Codification 605-25, Revenue Recognition—Multiple-Element Arrangements, or ASC 605. To date, we have no arrangements that are within the scope of ASC 808.

When evaluating multiple element arrangements under ASC 605, we determine whether the arrangement should be divided into separate units of accounting and how the arrangement consideration should be measured and allocated among the separate units of accounting. An element qualifies as a separate unit of accounting when the delivered element has standalone value to the customer. Any delivered elements that do not qualify as separate units of accounting are combined with other undelivered elements within the arrangement as a single unit of accounting. If the arrangement constitutes a single combined unit of accounting, we determine the revenue recognition method for the combined unit of accounting and recognize the revenue over the period from inception through the date the last deliverable within the single unit of accounting is delivered. Our arrangements do not include a general right of return relative to delivered elements.

Amounts received prior to satisfying all revenue recognition criteria are recorded as deferred revenue in our accompanying consolidated balance sheets. Our deferred revenue includes nonrefundable upfront license fees. The deferred revenue is recognized into revenue on a proportional or straight-line basis over the estimated period of our substantive performance obligations or the period the rights granted are in effect. Analyzing the arrangement to identify deliverables requires the use of judgment and each deliverable may be an obligation to deliver services, a right or license to use an asset or another performance obligation.

In arrangements that include license rights and other noncontingent deliverables, these deliverables do not have standalone value because the noncontingent deliverables are dependent on the license rights, are not sold separately and cannot be resold. In addition, when noncontingent deliverables are sold with upfront license rights, the license rights do not represent the culmination of a separate earnings process. As such, we account for the license and the noncontingent deliverables as a single combined unit of accounting. In such instances, the license revenue in the form of nonrefundable upfront payments is deferred and recognized over the applicable relationship period, which historically has been the estimated period of our substantive performance obligations or the period the rights granted are in effect.

We will recognize clinical and development, regulatory, and sales milestone payments as revenue when earned if they are substantive and we have no ongoing performance obligations related to the milestone payment. A milestone payment is considered substantive if it (1) is commensurate with either our performance to achieve the milestone or the enhanced value of the delivered item as a result of a specific outcome from our performance to achieve the milestone, (2) relates solely to past performance, and (3) is reasonable relative to all of the deliverables and payment terms, including other potential milestone consideration, within the arrangement.

Royalties earned on product sales, if any, are recognized based on contractual terms of the agreement when reported sales are reliably measurable and collectibility is reasonably assured, provided that there are no performance obligations then remaining. To date, none of our product candidates have been approved and, therefore, we have not earned any royalty revenue from product sales.

In the event an agreement was to be terminated and we have no further performance obligations at that time, we would recognize as revenue any portion of the non-refundable upfront payment and other payments that had not previously been recorded as revenue and were classified as deferred revenue at the date of such termination.

Accrued research and development expenses

As part of the process of preparing our consolidated financial statements, we are required to estimate our accrued research and development expenses. This process involves reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated costs incurred for the services when we have not yet been invoiced or otherwise notified of the actual costs. The majority of our service providers invoice us in arrears for services performed, on a pre-determined schedule or when contractual milestones are met; however, some require advance payments. We make estimates of our accrued expenses as of each balance sheet date in our consolidated financial statements based on facts and circumstances known to us at that time. Examples of estimated accrued research and development expenses include fees paid to the following:

- CROs and other third parties in connection with performing research and development activities, conducting preclinical studies and clinical trials on our behalf;
- vendors in connection with preclinical development activities; and
- CMOs and other vendors in connection with product manufacturing and development and distribution of preclinical supplies.

We base our expenses related to preclinical studies on our estimates of the services received and efforts expended pursuant to quotes and contracts with CROs that conduct and manage preclinical studies and clinical trials and CMOs that manufacture product for our research and development activities on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the expense. In accruing fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or amount of prepaid expense accordingly. Although we do not expect our estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may cause us to report amounts that are too high or too low in any particular period. To date, we have not made any material adjustments to our prior estimates of accrued research and development expenses.

Stock-based compensation

We measure stock options and other stock-based awards granted to our employees, directors, consultants and advisors based on the fair value on the date of the grant and recognize compensation expense for those awards, net of actual forfeitures, over the requisite service period, which is generally the vesting period of the respective award.

For stock-based awards granted to non-employees, compensation expense is recognized over the period during which services are rendered by such non-employees until completed. At the end of each financial reporting period prior to the completion of the service, the fair value of these awards is re-measured using the then-current fair value of our common stock and updated assumption inputs in the Black-Scholes option-pricing model.

We estimate the fair value of each stock option grant on the date of grant using the Black-Scholes option-pricing model, which uses as inputs the fair value of our common stock and assumptions we make for the volatility of our common stock, the expected term of our stock options, the risk-free interest rate for a period that approximates the expected term of our stock options and our expected dividend yield.

Determination of fair value of common stock

As there has been no public market for our common stock to date, the estimated fair value of our common stock has been determined by our board of directors as of the date of each option grant, with input from management, taking into consideration our most recently available third-party valuations of common stock at the time of the grants, as well as our board of directors' assessment of additional objective and subjective factors that it believed were relevant and which may have changed from the date of the most recent valuation through the date of the grant. Third-party valuations, or valuation reports, were performed in accordance with the guidance outlined in the American Institute of Certified Public Accountants' Accounting and Valuation Guide, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*.

Our common stock valuation reports were prepared using a market approach, utilizing either the guideline M&A or guideline public company methodologies. Under the guideline M&A methodology, a set of mergers and acquisitions within the biotechnology and pharmaceutical industries for similar stage companies were reviewed and an applicable equity value was selected to apply to the company. Under the guideline public company methodology, the market capitalizations of similar public companies were analyzed and an applicable capitalization for the company was selected on the basis of qualitative and quantitative factors.

For each valuation report, an option pricing allocation method, or OPM, was selected to allocate the total equity value across the various securities outstanding at the time of the valuation. The OPM treats common stock and preferred stock as call options on the total equity value of a company, with exercise prices based on the value thresholds at which the allocation among the various holders of a company's securities changes. These third-party valuations resulted in a valuation of our common stock of $0.94 and $6.18 per share as of December 31, 2017 and November 30, 2018, respectively.

In addition to considering the results of the valuation reports, our board of directors considered various objective and subjective factors to determine the fair value of our common stock as of each grant date, including:

- the prices at which we sold shares of preferred stock and the superior rights and preferences of the preferred stock relative to our common stock at the time of each grant;
- the progress of our research and development programs, including the status and results of preclinical studies for our product candidates;
- our stage of development and commercialization and our business strategy;
- external market conditions affecting the biopharmaceutical industry and trends within that industry;
- our financial position, including cash on hand, and our historical and forecasted performance and operating results;
- the lack of an active public market for our common stock and our convertible preferred stock;
- the likelihood of achieving a liquidity event, such as an initial public offering, or IPO, or sale of our company in light of prevailing market conditions; and
- the analysis of IPOs and the market performance of similar companies in the biopharmaceutical industry.

The assumptions underlying these valuations represented management's best estimate, which involved inherent uncertainties and the application of management's judgment. As a result, if we had used different assumptions or estimates, the fair value of our common stock and our stock-based compensation expense could have been materially different.

Once a public trading market for our common stock has been established in connection with the closing of this offering, it will no longer be necessary for our board of directors to estimate the fair value of our common stock in connection with our accounting for granted stock options and other such awards we may grant, as the fair value of our common stock will be determined based on the quoted market price of our common stock.

Recent accounting pronouncements

A description of recent accounting pronouncements that may potentially impact our financial position, results of operations or cash flows is disclosed in Note 1 to our audited consolidated financial statements included elsewhere in this prospectus.

Off-balance sheet arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined under SEC rules.

Quantitative and qualitative disclosures about market risk

We are exposed to market risks in the ordinary course of our business. These risks primarily include interest rate sensitivities. Our interest-earning assets consist of cash and cash equivalents, which are denominated in U.S. dollars. We had cash and cash equivalents of $103.2 million, or 74.5% of our total assets, at December 31, 2018. Interest income earned on these assets was $1.9 million for the year ended December 31, 2018. Our interest income is sensitive to changes in the general level of interest rates, primarily U.S. interest rates. At December 31, 2018, our cash equivalents consisted of money market funds and repurchase agreements that were collateralized by deposits in the form of government securities and obligations. Such interest-earning instruments carry a degree of interest rate risk; however, historical fluctuations in interest income have not been significant for us and we do not expect significant fluctuations in the future. We had no debt outstanding as of December 31, 2018.

Emerging growth company status

We are an “emerging growth company,” as defined in the JOBS Act, and we may take advantage of reduced reporting requirements that are otherwise applicable to public companies. Section 107 of the JOBS Act exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies are required to comply with those standards. We have elected to take advantage of the extended transition period for complying with new or revised accounting standards; and as a result of this election, our financial statements may not be comparable to companies that comply with public company effective dates. The JOBS Act also exempts us from having to provide an auditor attestation of internal control over financial reporting under Sarbanes-Oxley Act Section 404(b).

We will remain an “emerging growth company” until the earliest of (1) the last day of the fiscal year in which we have total annual gross revenues of $1.07 billion or more, (2) the last day of the fiscal year following the fifth anniversary of the completion of our IPO, (3) the date on which we have issued more than $1.0 billion in nonconvertible debt during the previous three years or (4) the date on which we are deemed to be a large accelerated filer under the rules of the SEC, which generally is when we have more than $700 million in market value of our stock held by non-affiliates and we have been a public company for at least 12 months and have filed one annual report on Form 10-K.

Business

Overview

We are a genome editing company dedicated to improving life through our groundbreaking proprietary genome editing platform, “ARCUS.” We leverage ARCUS in the development of our product candidates, which are designed to treat human diseases and create healthy and sustainable food and agricultural solutions. We believe the versatility and breadth of ARCUS support our ability to develop products across the spectrum of biotechnology. We are actively developing product candidates in three innovative and high value areas where we believe our technology has the potential to overcome the limitations of other genome editing technologies: allogeneic CAR T immunotherapy, *in vivo* gene correction, and food. The U.S. Food and Drug Administration, or FDA, recently accepted our investigational new drug, or IND, application for our first gene-edited allogeneic CAR T cell candidate targeting CD19 and we expect to commence a Phase 1/2a clinical trial in patients with acute lymphoblastic leukemia and non-hodgkin lymphoma in the first half of 2019. We believe this trial will be the first clinical investigation of an allogeneic CAR T therapy for non-hodgkin lymphoma. We believe our proprietary, one-step engineering process for producing allogeneic CAR T cells at large scale in a cost-effective manner will enable us to overcome the fundamental challenges of manufacturing that have limited the CAR T field to date.

Our Pipeline

Allogeneic CAR T immunotherapy

We believe that we have developed a transformative allogeneic chimeric antigen receptor, or CAR, T immunotherapy platform with the potential to overcome certain limitations of autologous CAR T cell therapies and significantly increase patient access to these cutting-edge treatments. Cancer immunotherapy is a type of cancer treatment that uses the body’s immune system to fight the disease. CAR T is a form of immunotherapy in which a specific type of immune cell, called a “T cell,” is genetically engineered to recognize and kill cancer cells. Current commercially available CAR T therapies are autologous, meaning the T cells used as the starting material for this engineering process are derived directly from the patient. As a consequence, the therapy is highly personalized, difficult to scale, and expensive. Our allogeneic approach uses donor-derived T cells that are gene edited using ARCUS and are designed for safe delivery to an unrelated patient. We believe that this donor-derived approach will allow us to consistently produce a potent product by selecting donors with high quality T cells and will lessen the product-to-product variability seen in autologous therapies. We are able to produce allogeneic CAR T cells at a large scale in a cost-effective manner and have the potential to overcome the “one patient: one product” burden of autologous CAR T cell therapies.

We have used the qualities of ARCUS to develop a one-step cell engineering process for allogeneic CAR T cells that is designed to rapidly yield a consistent cell product at a significantly lower cost than autologous CAR T cell therapies. Due to our one-step editing method and the decision early in the development of our allogeneic CAR T immunotherapy platform to invest in process development, we have scaled our manufacturing process and are currently producing allogeneic CAR T cells at large scale in accordance with good manufacturing practice, or GMP.

In February 2016, we entered into a development and commercial license agreement, as amended, with Baxalta (now Shire Plc), which we refer to as the Servier Agreement. This agreement was assigned to Les Laboratoires Servier, or Servier, in connection with Servier’s acquisition of Shire’s oncology business in August 2018. Pursuant to this agreement we have agreed to perform early-stage research and development on individual T cell modifications for up to six unique antigen targets, the first of which was selected by Baxalta at the inception of the agreement and the remaining five of which may be selected by Servier over the first four years of the agreement.

Upon selection of an antigen target, we have agreed to develop the resulting therapeutic product candidates through Phase 1 clinical trials and prepare the clinical supply of such product candidates for use in Phase 2 clinical trials. We have the ability to opt-in to a 50/50 co-development and co-promotion agreement in the United States on all licensed products under the Servier agreement.

Our most advanced program, PBCAR0191, is an allogeneic CAR T cell therapy targeting the well-validated tumor target CD19 and is being developed for acute lymphoblastic leukemia, or ALL, and non-hodgkin lymphoma, or NHL. CD19 is a protein that is expressed on the surface of B cells. Our IND for PBCAR0191 was accepted by the FDA in November 2018 and we expect to commence a Phase 1/2a clinical trial in patients with relapsed or refractory, or R/R, B-cell precursor ALL and R/R NHL in the first half of 2019. The FDA has granted PBCAR0191 orphan drug designation for the treatment of ALL. We are also in preclinical development of CAR T cell therapies targeting the tumor antigens CD20, BCMA, and CLL-1. We expect to submit an IND to the FDA for our CD20 product candidate in the fourth quarter of 2019 and for each of our BCMA product candidate and our CLL-1 product candidate in 2020.

***In vivo* gene correction.** Our goal is to cure genetic diseases by correcting the DNA errors responsible for causing them. *In vivo* gene corrections are gene corrections that take place in a living organism. We are advancing a deep portfolio of diverse programs toward *in vivo* efficacy and toxicity studies. We are generating a significant large animal dataset that we believe will be the most comprehensive of any in the field and have observed high-efficiency *in vivo* genome editing in non-human primates in our preclinical studies, as highlighted in our July 2018 publication in *Nature Biotechnology*. We believe this is the first peer-reviewed publication of *in vivo* genome editing data in non-human primates. In our preclinical studies, we observed the high-efficiency editing of the PCSK9 gene in non-human primates using ARCUS and, even at the highest dose, the treatment was observed to be well-tolerated. We have continued to observe the subjects for over two years since initial dosing and the benefit of the treatment in these studies appears to be permanent, which we believe is due to modifications to the DNA itself.

In September 2018, we announced a collaboration with Gilead Sciences, Inc. to co-develop an ARCUS-based product candidate that is designed to cure chronic Hepatitis B infection. We intend to submit an IND to the FDA in 2020 for this product candidate. We are also in the discovery stage for other *in vivo* indications: familial amyloid polyneuropathy, primary hyperoxaluria, hemophilia A, retinitis pigmentosa, lipoprotein lipase deficiency and familial hypercholesterolemia. We intend to select an indication and target for our next *in vivo* product candidate in the first half of 2019.

Food. Our food platform, which we operate through our wholly owned subsidiary, Elo Life Systems, or Elo, is an integrated suite of gene discovery and crop engineering technologies that is designed to generate pre-breeding materials in collaboration with leading food producers. Pre-breeding material is a gene edited crop intermediate that the collaborating partner can integrate into their breeding program and use in producing new crop varieties. We believe we have the most in-depth experience in crop genome editing in the industry. Over the last decade, we have worked with some of the largest plant biotechnology companies to edit gene targets and develop potential product candidates in a variety of crop plants. By combining the power of our ARCUS technology platform with target discovery, transformation and high throughput trait evaluation, we are enabling our partners to potentially address critical issues in food and agriculture created by climate change and dramatic shifts in consumer preference toward healthier eating. Our collaboration-based business model enables us to remain capital efficient throughout the product development cycle while generating revenue through various revenue-sharing models. For example, since 2014, Elo and Cargill have been engaged in a collaboration to produce ARCUS-optimized canola varieties and have achieved significantly lower levels (less than 4.5%) of saturated fatty acids compared to the current levels (7%) in greenhouse studies. Prior to commercialization of any of our food product candidates, we must complete greenhouse studies and three phases of field testing.

Our team

We believe that our team, whom we call Precisioneers, has among the deepest scientific experience and capabilities of all genome editing companies. Derek Jantz, Ph.D., our Chief Scientific Officer and a co-founder of Precision, and Jeff Smith, Ph.D., our Chief Technology Officer and also a co-founder of Precision, have been working with genome editing technology for more than 15 years. They are pioneers in the genome editing field and developed our ARCUS genome editing platform to address what they perceived as limitations in the existing genome editing technologies. Our Chief Executive Officer, Matthew Kane, also a co-founder of Precision, has almost 20 years' experience in life sciences, most of which has been working in genome editing.

We have selectively expanded our team of Precisioneers to include individuals with extensive industry experience and expertise in the discovery, development, manufacture and commercialization of cell and gene therapies and the creation of innovative solutions to myriad problems affecting food systems. Over half of our team of Precisioneers have advanced degrees, including 48 with Ph.D. degrees.

We are a purpose driven organization, and we have carefully promoted a culture that values innovation, accountability, respect, adaptability and perseverance. We strive to ensure that our open, collaborative culture empowers Precisioneers to be their best selves and do their best work. We strongly believe that our shared values will help our team navigate and overcome any challenges we may experience as we pursue our mission of improving life through genome editing. Our culture has helped build a world-class team with industry-leading experience in genome editing and continually attracts new talent to further build our capabilities. Our team is a group of motivated individuals that value the opportunity to contribute their time and talents toward the pursuit of improving life. Precisioneers appreciate high-quality research and are moved by the opportunity to translate their work into treatments and solutions that will impact human health.

Our strategy

We are dedicated to improving life. Our goal is to broadly translate the potential of genome editing into permanent genetic solutions for significant unmet needs. Our strategy to achieve this goal includes the following key elements:

- **Create a fully integrated genome editing company capable of delivering solutions that address unmet needs impacting human health.** We believe that, to be a leader in the field of genome editing and maximize the impact of our ARCUS genome editing platform, we must be able to control those elements of our business that may provide us with certain strategic advantages or operational efficiencies. We intend to continue to invest in comprehensive research, development and commercial capabilities that provide control and oversight of our product candidates from discovery through commercialization.
- **Accelerate advancement of our first four allogeneic CAR T immunotherapy product candidates while investing in the research and development of additional allogeneic CAR T programs.** We believe that we have developed the first allogeneic CAR T cell manufacturing platform capable of producing drug product at scale today. We have selected four validated CAR T cell targets that we believe offer the greatest chance of clinical success for our initial product candidates, which we intend to rapidly advance into clinical development. In November 2018, the FDA accepted the IND for our lead CAR T cell product candidate targeting CD19 and we expect to commence a Phase 1/2a clinical trial in patients with R/R B-cell precursor ALL and R/R NHL in the first half of 2019.
- **Advance *in vivo* genetic correction programs into human clinical trials.** In our preclinical studies, we observed the high-efficiency and tolerability of *in vivo* genome editing in a non-human primate, as published in *Nature Biotechnology* in July 2018. To our knowledge, we are the first company to complete this milestone,

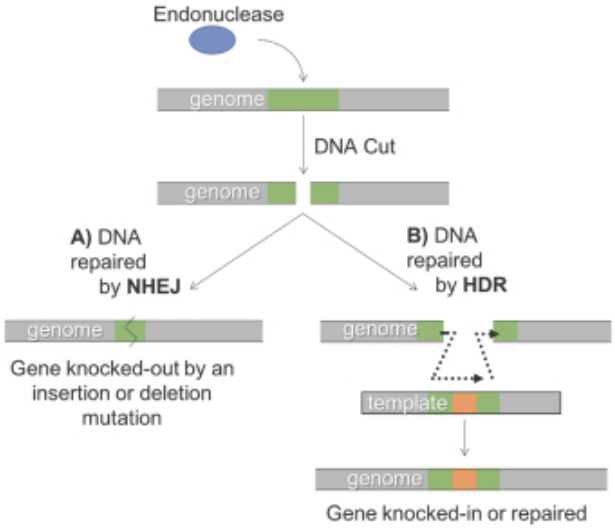
which we believe to be critical to successful *in vivo* genome editing therapeutic development. We intend to build on this early success by diligently advancing a diverse portfolio of preclinical *in vivo* gene correction programs through additional large animal studies, focusing initially on gene targets occurring in the liver and eye. Based on the results from these large animal studies, we intend to advance a subset of these programs to human clinical trials.

- **Build a food business focused on developing products designed to improve human health and respond to the impacts of climate change.** We believe that rapidly changing consumer preferences and food insecurity resulting from population growth and climate change will drive significant demand for genome-edited food products. We are building a fully integrated discovery and development platform that combines genome editing, gene discovery, plant transformation and high-throughput testing to enable accelerated innovation in the food industry. We employ a business model that is focused on collaborating with critical stakeholders within the supply chain from the outset of any given project. We believe that this approach will enable us to successfully respond to growing unmet needs within food supply to build a human health-focused business in a capital-efficient manner.
- **Continue investing in the optimization of ARCUS and enabling technologies.** We believe that a key to our future success is the quality of the genome editing tools that we produce. Since our founding, we have devoted ourselves to continuously refining the precision and efficiency of our core genome editing platform. We intend to continue this investment in ARCUS while surrounding it with enabling technologies and expertise to retain what we believe is a leadership position in the field.
- **Create an environment that is a destination of choice for premier talent within the life sciences industry.** We believe that we currently have among the deepest and strongest skill set within the genome editing industry and credit much of our past success to our commitment to our team and culture. Our future success will depend on our ability to continue to attract and retain world-class talent within our markets of interest. We intend to consciously invest in fostering an environment within our company that is both challenging and supportive and inspires our team to broadly translate genome editing into permanent genetic solutions.
- **Expand the breadth of our operations through additional product platforms and strategic relationships.** We believe that the ARCUS genome editing platform has broad utility beyond our current areas of focus. We intend to invest in the development of additional product platforms and seek collaborations with companies with expertise in areas outside of our current target markets to maximize the value of our company.

Overview of genome editing

Deoxyribonucleic acid, or DNA, carries the genetic instructions for all basic functions of a living cell. These instructions are encoded in four different molecules, called bases, which are strung together in specific sequences to form genes. Each gene is responsible for a specific function in a cell, and the complete set of genes in a cell, which can consist of tens of thousands of genes and billions of individual bases, is known as a genome. The complete genome sequence has been determined for many organisms, including humans. This allows scientists to identify specific genes and determine how their unique sequences contribute to a particular cellular function. Studying variations in gene sequences further informs an understanding of why a cell behaves a certain way, which can greatly enhance understanding of what causes and how to treat aberrant behavior that leads to disease.

Genome editing is a biotechnology process that removes, inserts or repairs a portion of DNA at a specific location in a cell's genome. Early applications of genome editing focused on advancing genetic research. As genome editing technologies have advanced, their application is moving beyond understanding disease to treating or preventing disease by editing DNA. Genome editing is accomplished by delivering a DNA cutting enzyme, called an endonuclease, to a targeted segment of genetic code. Once the endonuclease cuts the DNA, the cell has to repair the break to survive and will generally do so in one of two ways, as shown below.



There are two primary mechanisms of DNA repair, non-homologous end joining, or NHEJ, and homology directed repair, or HDR. As shown in A) above, NHEJ is a pathway that repairs breaks in DNA without a template. NHEJ is the less precise method of repair that prioritizes speed over accuracy, making it prone to leaving insertions and/or deletions of DNA bases at the cut site. These insertions or deletions can disrupt the gene sequence and can be used to inactivate or "knock out" the function of the gene. Accordingly, genome editing technologies can be used to permanently knock out a gene in a cell or organism by creating a break in the DNA sequence of that gene.

As shown in B) above, HDR is a mechanism of DNA repair whereby the cell uses a second DNA molecule with a sequence similar to that of the cut DNA molecule to guide the repair process. Since HDR uses a "template" of similar genetic information to guide the repair process, it is the more precise mechanism of cellular repair. HDR results in the sequence of the template being copied permanently into the genome at the site of the DNA cut. If we provide a template DNA molecule directly to the edited cell and the cell repairs itself using HDR, a new gene can be incorporated or "knocked in" at a precise location in the genome. Alternatively, the use of HDR can "repair" a DNA mutation by correcting it to the proper functioning sequence when repairing the break. Thus, genome editing endonucleases can be used to introduce a variety of different changes to the genetic code of a cell or organism including gene knockout, gene insertion and gene repair.

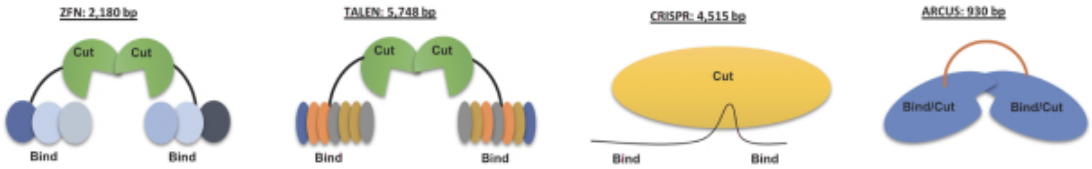
There are several genome editing technologies, including ARCUS, zinc-finger nucleases, or ZFNs, TAL-effector nucleases, or TALENs, and CRISPR/Cas9. These technologies differ from one another principally in the properties of the endonuclease that they each employ. The different endonucleases have fundamentally different mechanisms of recognizing and cutting their DNA targets, which gives each technology advantages and disadvantages depending on how each is used.

Our approach to genome editing

We are pioneers in the field of genome editing and have extensive experience with a breadth of genome editing technologies. Our Precision platform was developed to address limitations of other editing technologies that could impair their deployment for therapeutic applications. We looked to nature for examples of genome editing and found the I-CreI endonuclease from the algae *Chlamydomonas reinhardtii*. Unlike ZFN, TALEN or CRISPR/Cas9, I-CreI is a natural enzyme that evolved to edit a large, complex genome. In nature, it is responsible for modifying a specific location in the algae genome by inserting a gene using the HDR process, according to scientific literature.

We believe that I-CreI has a number of attributes that make it attractive for the development of novel genome editing endonucleases, such as:

- **Specificity.** Complex genome editing applications, especially those involving the human body, require a high level of endonuclease specificity to limit the likelihood that the endonuclease will recognize and edit any genetic sequence other than its intended target. Based on scientific literature, we believe that several attributes of I-CreI naturally inhibit off-target cutting. I-CreI:
  - Recognizes and cuts a DNA sequence in the genome of algae that is 22 base pairs in length. A sequence of this length is statistically expected to occur only once in a large genome.
  - Recognizes its DNA target site through a large number of complex molecular interactions with the bases. Relative to other endonucleases, an unusually high percentage of the I-CreI protein surface area is dedicated to specific contacts with the DNA bases. This method of site recognition enhances I-CreI's ability to discriminate among similar sequences of DNA, reducing the likelihood that it will cut DNA sequences that differ even slightly from the intended DNA sequence.
  - Physically couples the functions of DNA binding and DNA cutting. The region of I-CreI that is responsible for DNA site recognition also contains the region that cuts the DNA, or the active site. Due to this structure, the active site is not in a position to cut unless the enzyme is seated properly on the correct DNA sequence. ZFN, TALEN and CRISPR/Cas9 are multi-domain endonucleases in which the DNA-binding and DNA-cutting functions reside in different regions of the enzyme.



  - Remains inactive in the absence of its DNA target site. When I-CreI is not bound to its proper DNA target site, it folds up on itself such that its active site is blocked from external interaction. In this form, I-CreI is inert. This structural configuration provides a type of natural "on/off switch" that reduces I-CreI's activity away from the target site. Other genome editing endonucleases lack this type of natural control over the enzyme's cutting activity.
  - Cuts slowly and with low turnover. Relative to other genome editing endonucleases and to enzymes in general, I-CreI has a very slow mechanism of action. I-CreI takes a relatively long time to cut its DNA target site and, after doing so, remains bound to the cut DNA ends. These properties greatly reduce the likelihood that I-CreI will cut any other DNA site after making its initial on-target cut. We believe that this translates directly to a reduction in the frequency of off-target cutting without sacrificing on-target editing efficiency. In contrast, other editing endonucleases have high rates of catalysis and turnover because their natural function is defending bacteria from viruses.

- **Efficiency.** Most applications of genome editing technology require that a sufficient portion of the targeted cells are edited to achieve the desired result. The activity level of the endonuclease is one factor that can affect how many cells are edited. The slow catalytic mechanism of I-CreI imparts specificity but does not impact its on-target efficiency for genome editing purposes because genome editing involves cutting only a single site in a cell. As such, I-CreI is able to achieve a high level of on-target editing while rarely cutting off-target, as supported by scientific literature.
- **Delivery.** Size and structural simplicity affect the ease with which endonucleases can be delivered to cells for editing. I-CreI is very small relative to other genome editing endonucleases. It is approximately one quarter to one sixth of the size of the ZFN, TALEN and CRISPR/Cas9 endonucleases. Unlike those endonucleases, I-CreI can be delivered as a single gene. As such, we believe it is compatible with many different delivery mechanisms. Additionally, I-CreI's size and structure facilitate the simultaneous delivery of multiple engineered endonucleases to introduce more than one edit to a cell. Both of these properties significantly broaden the spectrum of potential applications for I-CreI-based genome editing endonucleases.
- **Type of cut.** The three prime, or 3', overhangs created when I-CreI cuts DNA have been shown to promote DNA repair through a mechanism called "homology directed repair," or HDR. 3' overhangs are stretches of unpaired nucleotides in the end of a DNA molecule. A genome editing technology that facilitates cellular repair through HDR enables applications that require a gene insertion or gene repair. Unlike other editing endonucleases, I-CreI creates four base 3' overhangs when it cuts its DNA site, which increases the likelihood that the cell will repair the DNA cut through HDR. As such, the DNA cuts created by I-CreI can be exploited to efficiently insert or repair DNA, consistent with the natural role of I-CreI in catalyzing the targeted insertion of a gene in algae.
- **Programmability.** I-CreI recognizes its DNA target site through a complex network of interactions that is challenging to re-program for new editing applications involving different DNA sequences. The challenges associated with re-programming I-CreI have, historically, hampered its adoption by the genome editing community in favor of more easily engineered endonucleases. This engineering challenge represents a high barrier to entry and has enabled us to secure a strong intellectual property position and control over what we believe to be a superior genome editing technology.

Other than the key programming challenge, we believed that the differentiated properties of I-CreI cited above made it an ideal "scaffold" for the development of novel genome editing tools. Moreover, we believed those properties were differentiated enough from other editing technologies to merit substantial investment in overcoming the key challenge of programmability. To that end, we invested 15 years of research effort to develop a robust, proprietary protein engineering method that now enables us to consistently re-program I-CreI to direct it to targeted sites in a genome. We call our approach "ARCUS."

Our ARCUS genome editing platform

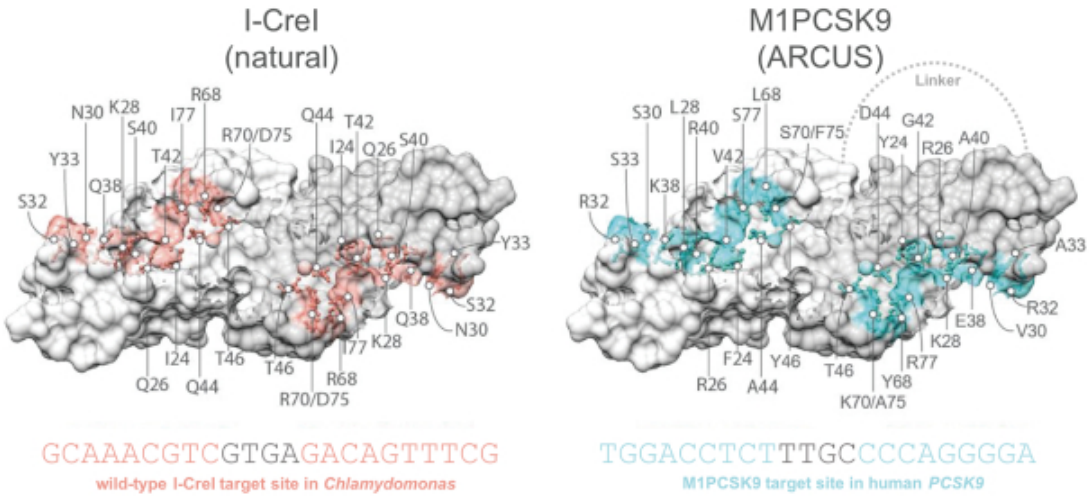
ARCUS is a collection of protein engineering methods that we developed specifically to re-program the DNA recognition properties of I-CreI. In nature, the I-CreI endonuclease recognizes and cuts a DNA sequence in the genome of algae. To apply I-CreI to genome editing in other cells or organisms, we must modify it to recognize and cut a different DNA sequence for each new application we pursue. Since the I-CreI endonuclease evolved to recognize its target sequence in the algae genome with a high degree of selectivity, as supported by scientific literature, it was necessary for us to develop sophisticated protein engineering methods to re-engineer I-CreI endonucleases to bind and cut a different DNA sequence. Using the ARCUS process, we create customized endonucleases for particular applications. We call these custom endonucleases "ARCUS nucleases." Our process is proprietary and core components are claimed in an extensive international patent portfolio. Moreover, since the ARCUS process involves a sophisticated blend of protein engineering art and science, each

ARCUS nuclease we create is novel and, we believe, patentable. As of December 31, 2018, we have obtained U.S. patents with claims directed to three ARCUS nucleases as compositions of matter, and currently claim over 250 ARCUS nucleases as compositions of matter in pending U.S. and foreign patent applications.

Our objective with ARCUS is to redirect I-CreI to a new location in a genome without compromising its editing abilities. To accomplish this, we modify the parts of the enzyme that, as reported by scientific literature, are involved in recognizing the specific DNA target site. These enzyme parts are also reported to comprise the I-CreI active site and to be involved in anchoring the enzyme to its DNA site in the algae genome. In our preclinical studies, we have observed that these modifications allowed us to control how tightly an engineered variant of I-CreI binds to its intended DNA site, as well as how quickly it cuts, in a plant or animal cell. By adjusting these two parameters, we observed that we can generally control the efficiency with which the engineered endonuclease cuts its intended target site or any potential off-target sites.

The natural I-CreI target site is pseudo-palindromic, meaning the first half of the sequence is approximately a mirror image of the second half of the sequence. Palindromic DNA sites are rare in most genomes so it was necessary for us to develop additional technology that would overcome this limitation on the diversity of DNA sites that we can target. To this end, the ARCUS process involves the production of *two* re-programmed I-CreI proteins for each target site. These two different proteins are then linked together into a single protein that can be expressed from a single gene. This approach, called a “single-chain endonuclease,” represents a major advancement in I-CreI engineering because it enables our ARCUS nucleases to recognize and cut *non*-palindromic target sites using an endonuclease that, like natural I-CreI, is very small and easy to deliver to cells.

The graphic below depicts the molecular structure of natural I-CreI in comparison to an engineered ARCUS nuclease called “M1PCSK9.” The regions of the structures colored in pink or cyan represent the amino acid building blocks that are responsible for contacting the DNA target site and determining the sequence of DNA bases that the endonuclease recognizes and cuts. The DNA target sites recognized by the two endonucleases are shown below the structures.



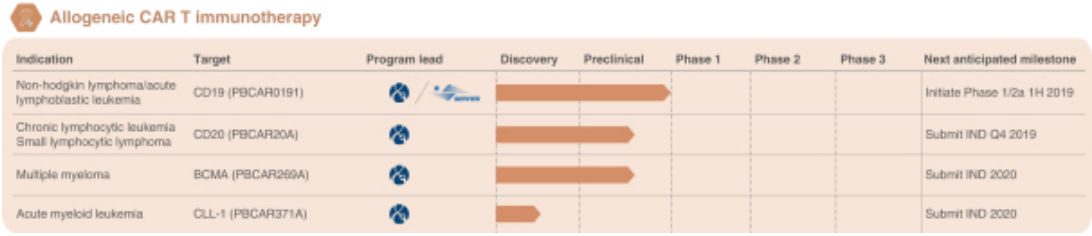
Since creating an ARCUS nuclease requires such extensive reengineering of I-CreI, it is, generally, an iterative process that involves multiple cycles of design and testing. We can typically produce a first-generation ARCUS nuclease in seven weeks. First-generation nucleases are suitable for research and development, proof-of-concept studies or other non-therapeutic applications. For therapeutic applications requiring the lowest possible off-targeting, however, we are rarely satisfied with generation one and each endonuclease

undergoes extensive optimization. To this end, we thoroughly interrogate the nuclease with respect to its on- and off-target cutting properties using ultra-sensitive tests that we developed specifically for use with ARCUS. These results then inform our design of a second-generation nuclease with the goal of optimizing on-target efficiency while minimizing off-target cutting. Therapeutic ARCUS nucleases typically require two to four cycles of design and testing, often resulting in off-target cutting frequencies that are below the limit of detection with our most sensitive assays. This process can take six months or longer and has resulted in development of “therapeutic-grade” editing endonucleases.

The ARCUS process is robust and reproducible. It enables us to create engineered variants of the I-CreI endonuclease that recognize and cut DNA sites that bear little resemblance to I-CreI’s natural target site. Importantly, however, ARCUS retains the attributes of I-CreI that we believe make it highly suitable as a genome editing endonuclease for complex commercial applications. We expect ARCUS nucleases to be exquisitely specific as a result of the natural structure of I-CreI and the intricate design process we employ to create them. We believe ARCUS nucleases are the smallest and easiest to deliver genome editing endonucleases. Like I-CreI, in our preclinical studies, ARCUS nucleases have been observed to produce DNA cuts with 3’ overhangs that promote HDR, facilitating gene insertions and gene repairs in addition to gene knockouts. We believe that these attributes will enable us to translate ARCUS into patient-based clinical trials and a wide array of product candidates that have the potential to address the limitations of other genome editing technologies and improve life.

We believe that ARCUS is a leading genome editing platform for therapeutic and food applications. Realizing the potential of ARCUS, however, requires supporting technologies and capabilities. To facilitate the potential commercial deployment of ARCUS in different fields, we surround it with ancillary technologies, domain expertise and infrastructure specific to that area of development. Our goal is to leverage ARCUS to build additional product-development platforms designed to rapidly generate new products in a given field. We are currently developing products from three such platforms: allogeneic CAR T immunotherapy, *in vivo* gene correction and food.

Our allogeneic CAR T immunotherapy platform



We are leveraging the properties of ARCUS in an integrated platform for the development and large-scale production of allogeneic CAR T cell immunotherapies. A key to the success of this platform is a proprietary, one-step method for modifying the genetics of T cells from a healthy donor to make them detect and kill cancer cells. This method allows us to manufacture CAR T cell product candidates rapidly, at large scale and with greater consistency than currently marketed CAR T cell therapies. As such, we believe that our allogeneic CAR T cell platform will greatly increase patient access to these cutting-edge treatments.

CAR T cell therapies

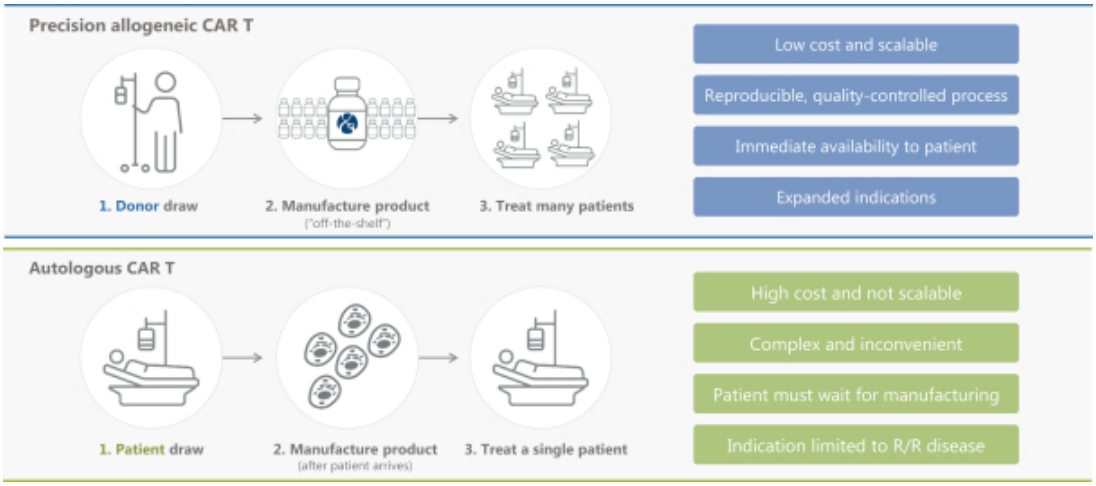
CAR T cell therapy is a form of cancer immunotherapy that uses a patient’s immune system to kill cancer cells. T cells are a component of the immune system that can distinguish pathogen-infected or tumor cells from

healthy cells and kill them. Recognition of pathogen-infected cells or tumor cells occurs through a protein called a T cell receptor, or TCR, that is expressed on the surface of T cells. Tumor cells, however, have evolved numerous ways to evade TCR-mediated killing by T cells. In CAR T cell therapy, T cells are engineered *ex vivo* to express a protein called a chimeric antigen receptor, or CAR, that recognizes specific tumor cells and allows the T cells to function independently of the TCR, thus circumventing tumor cells' evasion of the TCR. CAR T cell therapy has been shown in clinical trials to be an effective treatment for patients that have not responded to traditional cancer treatments, and there are now two FDA approved CAR T cell products available to treat certain types of leukemia and lymphoma.

The most common form of CAR T cell therapy, which includes the two approved therapies, is referred to as "autologous" CAR T cell therapy because the CAR T cells are generated using T cells taken directly from the cancer patient. T cells are harvested from the patient, genetically engineered *ex vivo* to express a CAR, and then injected back into the patient. While autologous CAR T cell therapy has been shown to be effective for treating certain tumor types, it has several significant drawbacks:

- **Patient eligibility.** Many patients may not be eligible for the treatment because of low T cell numbers and poor T cell quality or because the risk of undergoing the process to harvest T cells is too great.
- **Consistency.** Since each autologous therapy is, by definition, unique, it is difficult to define standards of safety and efficacy or to thoroughly assess the quality of the product prior to infusion into the patient.
- **Delay in treatment.** Because the process to make CAR T cells can take several weeks, there is a significant delay in treating what can often be very aggressive tumors. If manufacturing complications such as contamination, mislabeling or low yield are encountered, the patient may not survive long enough to attempt manufacturing a second time.
- **Cost.** The CAR T cell manufacturing process is complex and expensive. In the case of an autologous therapy, the process must be performed, in its entirety, for each patient. As such, scaling of the manufacturing process is exceedingly difficult, and the cost of product manufacturing has resulted in high treatment costs per patient. This high cost of treatment, along with the practical complexities described above, limits the availability of autologous CAR T cell therapies to patients.

We believe that the use of allogeneic, or donor-derived, CAR T cells will address many of the challenges associated with autologous CAR T cell therapy. An allogeneic approach allows selection of donors using specific criteria to define “healthy” T cells, which we expect will lessen the product-to-product variability seen in autologous therapies. Donor-derived cells could be used in any patient, eliminating the “one patient: one product” burden of autologous CAR T cell therapies. Because healthy donors would provide the starting material, patients that were too sick or otherwise unqualified for an autologous approach may benefit from an allogeneic CAR T cell therapy. Additionally, patients receiving an off-the-shelf allogeneic treatment would not have to wait for the manufacture of a personalized autologous treatment, which could be further delayed by manufacturing difficulties. By scaling the manufacturing of CAR T cells and optimizing the manufacturing process for a specific pool of donors, we believe that allogeneic CAR T cells can be manufactured at costs that are significantly lower than autologous CAR T cells and that will, over time, approach the manufacturing costs for conventional biologic drugs. These potential advantages of an allogeneic approach should allow for a safer, more predictable product with defined quality standards and significantly increase patient access.



The major challenge to producing allogeneic CAR T cells is that donor-derived T cells still express their own TCR. Because the TCR enables T cells to recognize cells that are foreign to the donor, they may induce graft versus host disease, or GvHD, if introduced to the patient in their natural form. This is a dangerous condition in which the donor T cells indiscriminately attack cells in the body of the patient. Accordingly, expression of the TCR must be eliminated in donor cells before the cells can be engineered into CAR T cells and administered to a patient. An allogeneic CAR T cell therapy therefore requires the use of a genome editing technology like ARCUS to knock out TCR genes in the DNA to produce “universal” donor cells that are designed to be incapable of eliciting GvHD.

We and others have shown that genome editing can be used to eliminate expression of the TCR on donor cells, and there are several companies working on gene-edited allogeneic CAR T cell therapies. However, there are a number of challenges associated with manufacturing gene-edited allogeneic CAR T cells, including the following:

- **T cell phenotype.** T cells actually comprise several subtypes of different cells. Some subtypes of T cells are directly responsible for killing virus-infected or tumor cells, while other subtypes serve a helper function. Some subsets retain a “memory” function and can be recalled later if the target tumor reappears, and some subsets even decrease the killing activity of T cells. These subsets are distinguished by the unique combination of proteins they express on their cell surface, which is described as their “phenotype.”

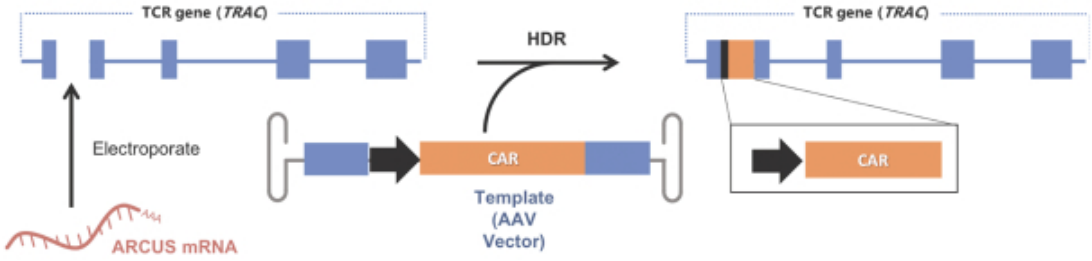
Understanding what phenotypes of T cells are best for a CAR T cell therapy is important, as is the ability to maintain the stability of those phenotypes throughout the manufacturing process. Depending on growth conditions, phenotypes of T cells may change over the course of a manufacturing run, and the final product may not be the desired mix of T cell subtypes.

- **Consistency.** In most CAR T cell therapies, the CAR is introduced into the T cell using a viral vector, usually a lentiviral vector. Lentiviral vectors are retroviruses that are typically engineered to insert DNA, in this case the gene encoding a CAR, into a random location in the genome of a cell. When introduced in this manner, CAR expression typically varies significantly from cell-to-cell depending on the number of CARs that were delivered and where in the T cell genome they were inserted. This variability can cause CAR T cells to be inconsistent from cell-to-cell within the same CAR T cell batch. Too little expression could make the CAR T cell unable to activate and kill when it identifies a cancer cell. Too much expression could lead the CAR T cell to become hyper-stimulated, which can lead to an inactive state known as “exhaustion.”
- **Scalability.** Manufacturing scale drives the cost and availability of the final “off-the-shelf” product. If an allogeneic CAR T cell therapy cannot be manufactured at large scale, it has few advantages over an autologous therapy. While generating allogeneic CAR T cells at lab scale (a few million cells) is straightforward, manufacturing them at a clinically relevant scale (billions of cells) is a major challenge that is impacted by, among other things, the efficiency of CAR gene insertion, the efficiency of on- and off-target genome editing, starting donor T cell phenotype and the duration of the manufacturing process.

Our approach to allogeneic CAR T cells

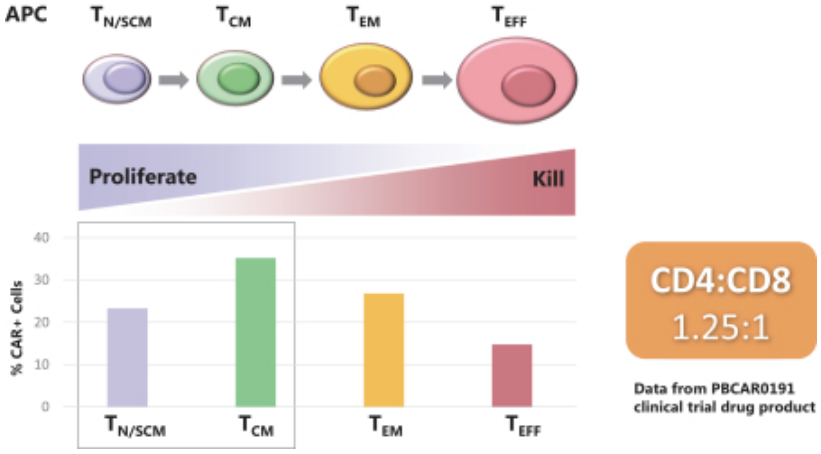
We have used the qualities of ARCUS to create a one-step cell engineering process for allogeneic CAR T cells that we believe yields a well-defined cell product in a cost-effective manner. To produce an allogeneic CAR T cell, it is necessary to make two edits to the DNA of T cells from a healthy donor. First, it is necessary to knock out the gene that encodes the TCR to prevent the donor-derived T cells from eliciting GvHD in the patient. The TCR is actually a complex of several different components encoded by different genes, and knocking out any one of them is generally sufficient to prevent the TCR from functioning. Second, it is necessary to add, or knock in, a gene that encodes the CAR to give the T cells the ability to recognize and kill cancer cells. Precision developed a proprietary, one-step method for achieving both genetic changes simultaneously. This method, aspects of which are protected by nine issued U.S. patents, involves the use of ARCUS to target the insertion of a CAR gene directly into the gene that encodes the alpha subunit of the TCR. This approach adds the DNA encoding the CAR while simultaneously disrupting the DNA encoding the TCR, essentially replacing one gene with the other.

One-step engineered allogeneic CAR T cells

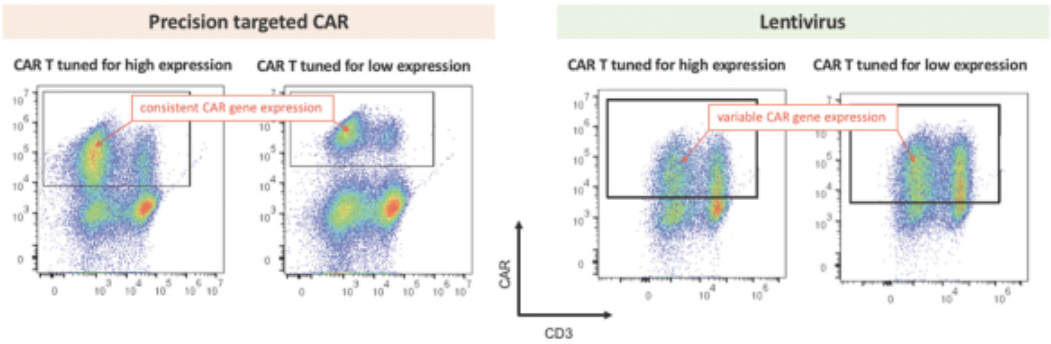


We believe that our one-step engineering approach, and the differentiated attributes of the ARCUS nucleases used to implement it, will overcome many of the critical challenges associated with allogeneic CAR T cell production as follows:

- **T cell phenotype.** According to scientific literature, T cell phenotype has a profound impact on the efficacy of CAR T cell therapy. Specifically, "young" CAR T cells with naïve and central memory phenotypes have been observed to undergo the most robust proliferation following administration, which leads to a therapeutic effect. Therefore, we have established a T cell platform that is designed to maximize the percentage of cells with these ideal phenotypes. Our process starts with carefully screening donors to identify individuals with high percentages of naïve or central memory T cells and a ratio of CD4:CD8 T cells that we believe should yield the most potent cell product. To this end, we have developed our own set of analytics for screening candidate donors and have put significant effort into identifying individuals with the desired T cell profiles. We then use proprietary growth strategies and media to maintain the selected phenotype throughout the CAR T manufacturing process. Importantly, our one-step genome editing approach helps minimize cell processing time, which helps prevent the CAR T cells from differentiating during the process. We believe our 10-day allogeneic manufacturing process is the shortest in the industry. The figure below shows phenotype data from PBCAR0191 CAR T cells that were produced as anticipated drug product for our planned Phase 1/2a clinical trial in patients with R/R B-cell precursor ALL and R/R NHL. The drug product comprises mostly naïve ($T_{N/SCM}$) and central memory (T_{CM}) T cells in a CD4:CD8 ratio of 1.25:1.



- **Consistency.** By targeting the insertion of the CAR gene to a defined location in the DNA of the cell, we are able to produce populations of T cells that are identical at the DNA level. This makes the cells in our CAR T cell drug formulation less heterogeneous as compared to manufacturing processes that use lentiviral vectors. Importantly, our genome editing process gives us greater control over the amount of CAR that is expressed on the surface of each CAR T cell, which determines how easily the CAR T cell is activated once it encounters a cancer cell. This allows us to "fine-tune" the CAR T cells to ensure that they respond appropriately to the cancer but do not become hyper-activated or exhausted. The below comparison demonstrates the difference in consistency achieved by using lentivirus delivery compared with targeted delivery through an ARCUS nuclease. CAR T cells produced using ARCUS exhibit reduced cell-to-cell variability as well as more controlled levels of CAR gene expression depending on whether the cells are tuned for high expression or low expression.



- **Scalability.** To realize the potential benefits of allogeneic CAR T cell therapy, it will be important to manufacture as many cells as possible in each batch in accordance with GMP. Scaling efficiently requires scale-up at every step in the process and, as with all drug manufacturing, process development takes significant time and capital. We made the decision early in the development of our CAR T cell platform to invest in process development and manufacturing rather than initiating clinical trials with a process that would not fully support development and commercialization. We did this, in part, because we believed that several attributes of ARCUS, such as high specificity and high knock-in efficiency, would allow us to scale manufacturing more effectively than our competitors. As a consequence of our early investment and the one-step editing method enabled by ARCUS, we have scaled our manufacturing process today. Over the last twelve months, we have manufactured our lead anti-CD19 allogeneic CAR T cell product candidate at a multi-billion cell scale consistently, and our best manufacturing runs have yielded over one hundred doses of drug product at a dose of 1.0 x 10^6 CAR T cells/kg, which is one of the expected dose levels in our planned Phase 1/2a clinical trial in patients with R/R B-cell precursor ALL and R/R NHL. The table below summarizes results from our last three full-scale manufacturing campaigns, each of which occurred in the last six months and produced a GMP batch of PBCAR0191 to support this planned trial.

Batch name	Product	Total CAR T cell yield	# vials frozen (60M CAR T cells/vial)
CTM1	PBCAR0191 (GMP)	15.0e9	130
CTM2	PBCAR0191 (GMP)	9.6e9	114
CTM3	PBCAR0191 (GMP)	8.3e9	100

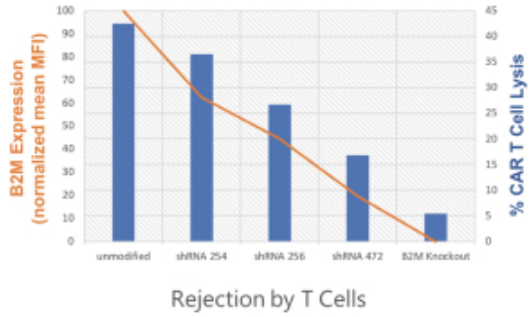
In order to maximize the potential of our CAR T cell platform, we have developed extensive in-house capabilities to support the entire process, from discovery to manufacturing, including:

- A fully human antibody platform for the production of novel CAR binding domains.

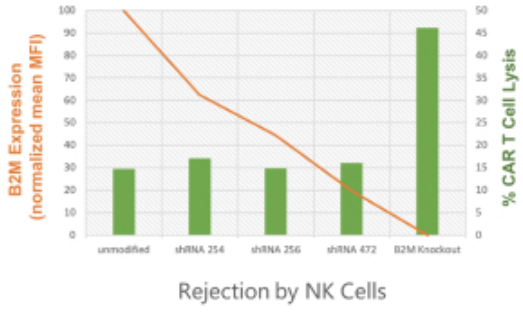
- A proprietary collection of costimulatory signaling domains that, if incorporated into a CAR, induce the cell to multiply in response to exposure to cancer cells.
- A high-throughput method for screening new CARs to evaluate their cancer killing activity and target specificity.
- ARCUS for knocking genes out or in to optimize the genetics of our CAR T cells.
- An in-house adeno-associated virus, or AAV, platform for the production of CAR-encoding AAV vectors.
- An in-house mRNA platform for the production of ARCUS-encoding mRNA.
- An in-house animal facility with real-time tumor imaging capabilities.
- Proprietary cytometry panels, potency assays and other bioanalytics for product quality control and release.
- Proprietary manufacturing process for large-scale production of GMP CAR T cells.
- In-house GMP manufacturing facility expected to be completed in the second half of 2019.

Preventing CAR T cell rejection

A patient's immune system is expected to recognize allogeneic CAR T cells as foreign and destroy or reject the cells. This rejection could limit the efficacy of the CAR T therapy if the cells do not persist long enough in the patient to eradicate the tumor. Patients who receive CAR T therapy are typically preconditioned prior to being given the cell therapy using lympho-depleting drugs such as cyclophosphamide or fludarabine, which significantly suppress the immune system of the patient. We believe that this degree of preconditioning will be sufficient to prevent CAR T cell rejection by patients receiving our CAR T treatments. Nonetheless, to help mitigate this risk, we intend to evaluate multiple lymphodepletion regimens in our planned Phase 1/2a clinical trial of PBCAR0191 in patients with R/R B-cell precursor ALL and R/R NHL. Standard cyclophosphamide/fludarabine preconditioning is optimized for autologous CAR T but higher concentrations of the drugs have been delivered safely to patients. Therefore, in the event that we observe PBCAR0191 CAR T cell rejection following standard lymphodepletion, we plan to switch to a more intense cyclophosphamide/fludarabine preconditioning protocol. If this approach is still not sufficient to enhance CAR T cell persistence, we plan to incorporate an additional piece of our technology that we call "stealth cell" into the product candidate. The stealth cell technology is a modified CAR T vector that is designed to suppress a gene called beta-2-microglobulin, or B2M, in CAR T cells using a short-hairpin RNA, or shRNA. In preclinical studies, we and others have observed that suppression or elimination of B2M reduces the rejection of CAR T cells by T cells from an unrelated individual. However, we have found that complete elimination of B2M, for example by knocking the gene out using gene editing, provokes rejection of the CAR T cells by an alternative immune cell called natural killer, or NK. As shown in the figure below, in preclinical studies, we have observed that suppression of B2M to a level that is approximately 5% to 20% of normal levels can significantly reduce rejection by T cells without inducing an NK response. We are currently developing stealth cell versions of our anti-CD19, anti-CD20 and anti-BCMA CAR T vectors.



Rejection by T Cells



Rejection by NK Cells

Our allogeneic CAR T immunotherapy pipeline

We plan to leverage our CAR T cell platform to develop product candidates against validated CAR T cell targets in the near term. By focusing on vetted targets, we seek to avoid many technical hurdles associated with early clinical development and can validate our allogeneic platform in patients with fewer variables. This approach also allows us to leverage the abundance of available public resources for these targets, including CARs, cell and animal models, and clinical protocols. In parallel to advancing product candidates for validated CAR T cell targets, we are performing early-stage research on more challenging solid tumor targets for which the quality and efficiency of the genome editing is expected to be critical for success. Therefore, we expect that we will gradually shift from a focus on validated liquid tumor targets to more challenging solid tumor targets.

The first four product candidates in our CAR T cell development pipeline are:

- **PBCAR0191**. We are developing PBCAR0191 as an allogeneic anti-CD19 CAR T cell product candidate for the treatment of R/R B-Cell precursor ALL and R/R NHL. CD19 is a protein that is expressed on the surface of B cells. It is a well-validated target for CAR T cell therapy and the two currently marketed autologous CAR T cell products also target CD19. In February 2016, we entered into the Servier Agreement, pursuant to which we have agreed to develop allogeneic CAR T cell therapies for CD19 and up to five additional unique antigen targets selected by Servier. We expect to commence a Phase 1/2a clinical trial in patients with R/R B-Cell precursor ALL and R/R NHL in the first half of 2019.

  Our accepted IND for PBCAR0191 included data from three preclinical studies in mice aimed at establishing therapeutic efficacy. The first of these studies was an *in vitro* potency assessment. In this study, the potency of PBCAR0191 CAR T cells was evaluated by measuring cell proliferation, cytotoxic killing, and production of effector cytokines in response to co-culture with CD19+ or CD19- target cells in mice. PBCAR0191 CAR T cells generated from three different donors were observed to proliferate in response to stimulation by CD19+ target cells including Raji (human Burkitt lymphoma), NALM/6 (human acute lymphoblastic leukemia) and K19 (K562 myelogenous leukemia cells transfected to express human CD19) at a wide range of doses (effector to target ratios ranging from 10:1 to 1:10). These observations show that, in this study, PBCAR0191 cells became activated by and killed CD19+ cells at a wide range of cell doses. In this study, we observed that PBCAR0191 cells did not proliferate in response to cells that lack CD19 (co-culture with gene-edited CD19 negative NALM/6 tumor targets or CD19 negative cell lines of myelogenous leukemia or histiocytic lymphoma). Further, we observed T cell receptor knockout control T cells generated from the same donors did not proliferate in response to CD19+ target cells.

  We further evaluated PBCAR0191 in a pair of *in vivo* studies in mice. As shown below, PBCAR0191 was observed to prolong survival in mouse models of leukemia and lymphoma at multiple doses. The pharmacokinetics of PBCAR0191 were evaluated by counting CAR T cells in the blood, marrow, or spleen

during the lymphoma study. PBCAR0191 was observed to be well-tolerated in these studies and no adverse events were observed.

We have also assessed the safety of PBCAR0191 in four preclinical studies in mice. First, the potential of PBCAR0191 to elicit GvHD was assessed in an *in vitro* study in which we observed that gene-edited PBCAR0191 cells, unlike natural T cells, showed only a minimal amount of proliferation when co-cultured with dendritic cells from an unrelated donor, suggesting that PBCAR0191 cells do not appear capable of killing CD19- cells from a different person and will not be expected to elicit GvHD as a result.

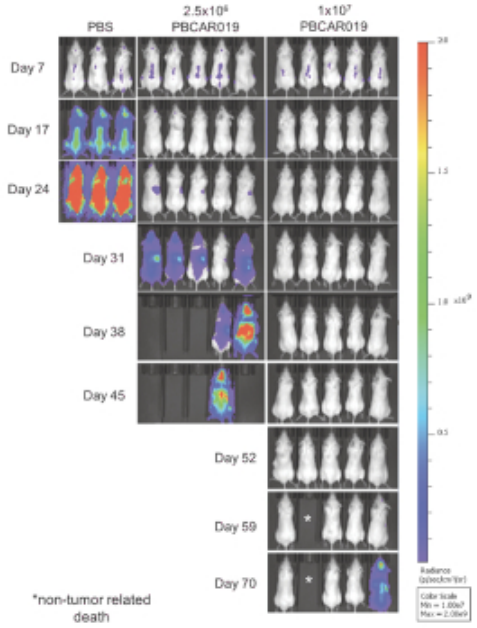
The potential for GvHD was further assessed *in vivo* in a mouse xenograft model. As shown below, $3x10^7$ PBCAR0191 cells (or $3x10^7$ natural peripheral blood mononuclear cells) were infused into an immunodeficient mouse. Mice were monitored for weight loss and survival. In this study, we observed that PBCAR0191-treated mice gained weight at the same rate as the control group and were healthy for the duration of the study, whereas the peripheral blood mononuclear cell-injected animals lost weight and would not have survived the study.

The third safety study was a karyotype analysis in mice. No clonal chromosomal abnormalities were observed in 100 metaphase spreads from three different donors, showing that PBCAR0191 cells did not have a high frequency of chromosome abnormalities that may cause tumorigenesis in this study.

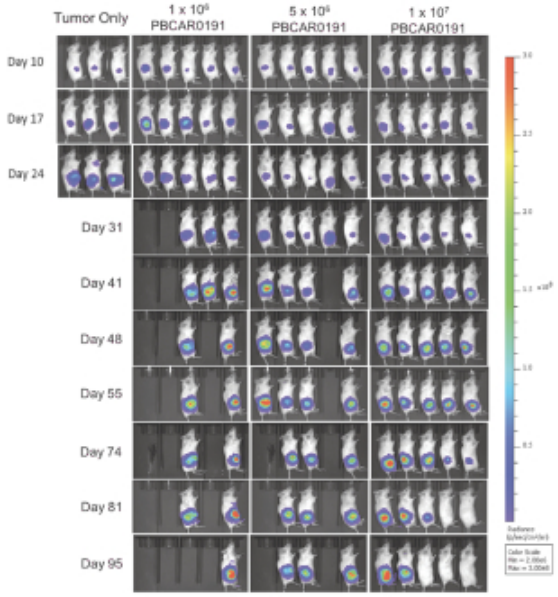
Finally, the potential for tumorigenicity was evaluated using an interleukin, or IL-2 independent growth assay. IL-2 independent growth is a standard test for T cell tumorigenesis. PBCAR0191 cells produced from three different donors continued to proliferate when IL-2 was added to the culture media with a decline in proliferative capacity observed in excess of ten days. In contrast, PBCAR0191 cells cultured in the absence of exogenous IL-2 did not exhibit continued proliferation, and by 14 days of culture in the absence of IL-2 viable PBCAR0191 cells could no longer be detected in the sample. Thus, PBCAR0191 cells were not observed to be tumorigenic in this study.

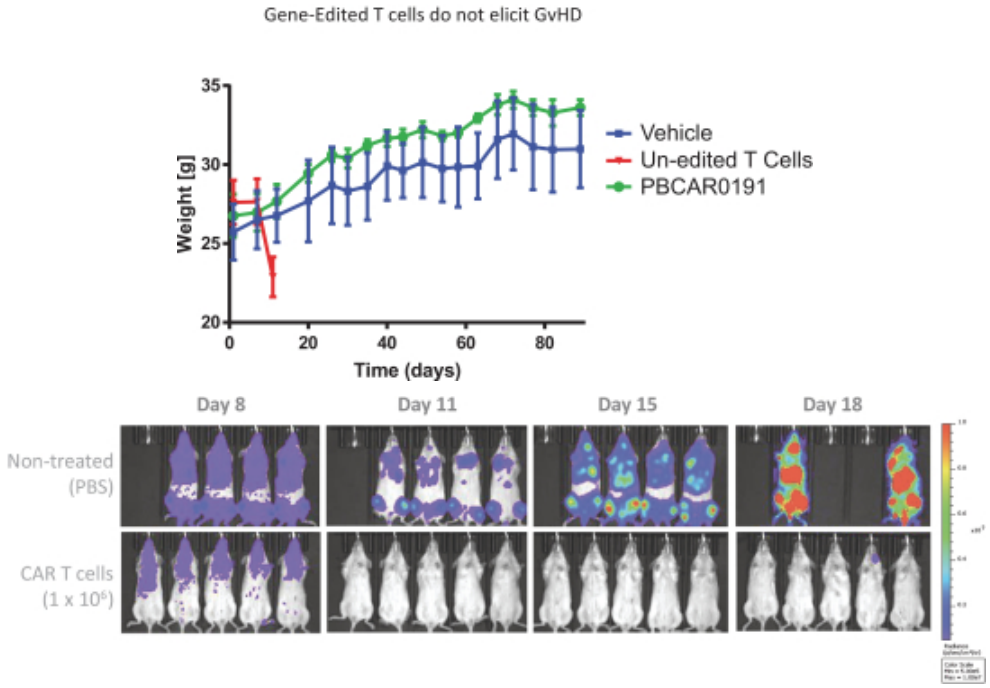
Taken together, we believe that these studies support the further development of PBCAR0191.

Nalm-6 Leukemia Model



Raji Sub-Q Lymphoma Model





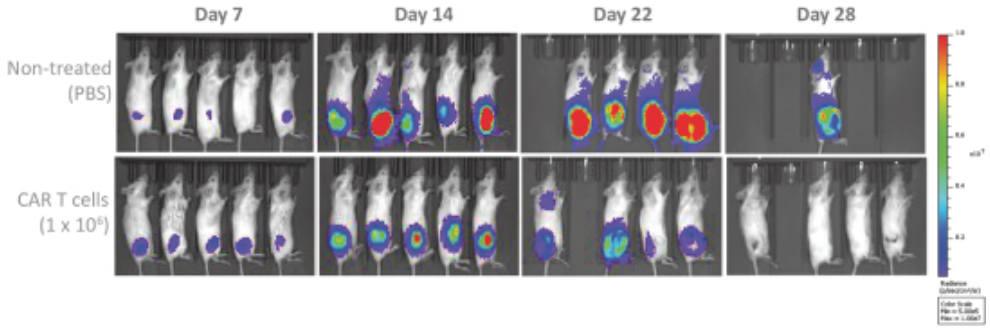
We expect to commence a Phase 1/2a open-label, multi-center, dose-escalation and dose expansion clinical trial in adult patients with R/R B-Cell precursor ALL and R/R NHL in the first half of 2019. The primary objective of this trial is to evaluate the safety and tolerability of PBCAR0191, as well as to determine the maximum tolerated dose. Secondary objectives will include evaluating the anti-tumor activity of PBCAR0191. We will also evaluate the expansion, trafficking and persistence of PBCAR0191 in this trial. We expect to enroll a total of 9-18 patients in the Phase 1 portion of this trial in both the ALL and the NHL cohorts and we will investigate up to three dose levels: 3.0 x 10^5 cells/kg, 1.0 x 10^5 cells/kg and 3.0 x 10^6 cells/kg. Patients will be further evaluated for a follow-up period of 11 months. The trial will be conducted at four clinical sites across the United States.

- **PBCAR20A.** We are developing PBCAR20A as an allogeneic anti-CD20 CAR T cell product candidate for the treatment of Chronic Lymphocytic Leukemia, or CLL, and Small Lymphocytic Lymphoma, or SLL. Like CD19, CD20 is a protein expressed on the surface of B cells. It is an established target for cancer treatment and several CD20-targeted therapies, such as the monoclonal antibody Rituxan, have long histories of clinical success. Because CD19 and CD20 are expressed on similar cell types, PBCAR20A will also be evaluated as an option for leukemia/lymphoma patients who relapse with CD19-negative disease following autologous anti-CD19 CAR T failure. Success in this patient population would potentially enable a combination product comprising both PBCAR0191 and PBCAR20A. We have selected a development candidate for our anti-CD20 CAR T cell product and IND-enabling efficacy and toxicology studies are underway.

  We have conducted a preclinical study in PBCAR20A in mice to measure cell proliferation, cytotoxic killing, and production of effector cytokines in response to co-culture with CD20+ or CD20- target cells. PBCAR20A CAR T cells were observed to proliferate in response to stimulation by CD20+ K20 cells (K562 myelogenous leukemia cells transfected to express human CD20) at a wide range of doses (effector to target ratios ranging from 1:1 to 9:1). These observations show that, in this study, PBCAR20A cells became activated by and killed

CD20+ cells at a wide range of cell doses. In this study, we observed that PBCAR20A cells did not proliferate in response to co-culture with CD20 negative cell K562 cells.

We also evaluated the potency of PBCAR20A *in vivo*. As shown below, PBCAR20A was observed to prolong survival in a mouse model of lymphoma (Raji Sub-Q model) at both doses tested (1 x 10^6 and 5 x 10^6 cells per mouse), which we believe supports further development. PBCAR20A was observed to be well-tolerated in this study.

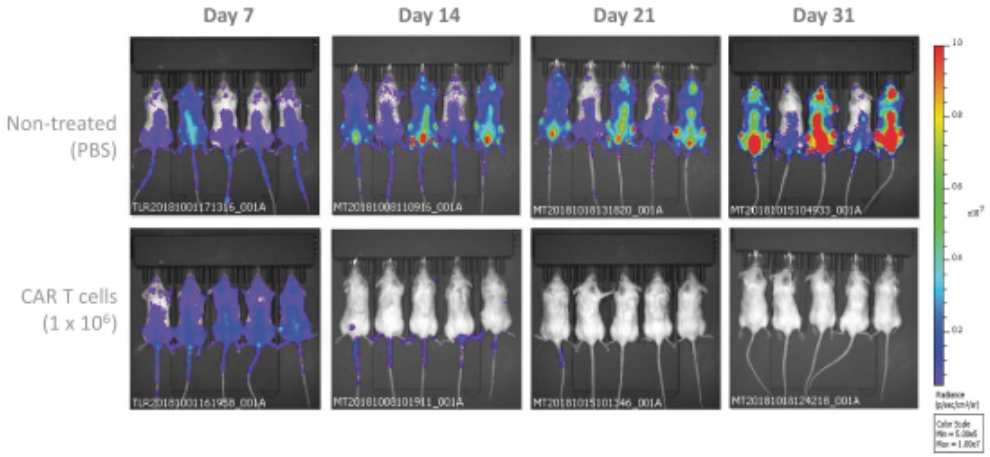


We anticipate submitting an IND to the FDA for PBCAR20A in the fourth quarter of 2019 and commencing a Phase 1 open-label, multi-center, dose escalation clinical trial in patients with R/R CLL.

- **PBCAR269A.** We are developing PBCAR269A as an allogeneic anti-BCMA CAR T cell product candidate for the treatment of multiple myeloma. BCMA is a protein that is expressed on the surface of mature B cells called “plasma cells” that are responsible for the disease and is a validated CAR T cell target. We have selected a development candidate for our anti-BCMA product.

  We evaluated the potency of PBCAR269A CAR T cells in a preclinical study in mice by measuring cell proliferation, cytotoxic killing and production of effector cytokines in response to co-culture with BCMA+ or BCMA-target cells. In this study, PBCAR269A CAR T cells were observed to proliferate in response to stimulation by BCMA+ target cells including MM.1S (human multiple myeloma) and KBCMA (K562 myelogenous leukemia cells transfected to express human BCMA) at a wide range of doses (effector to target ratios ranging from 1:1 to 1:8). These observations show that, in this study, PBCAR269A cells became activated by and killed BCMA+ cells at a wide range of cell doses. We further observed that PBCAR269A cells did not proliferate in response to co-culture with BCMA- K562 cells.

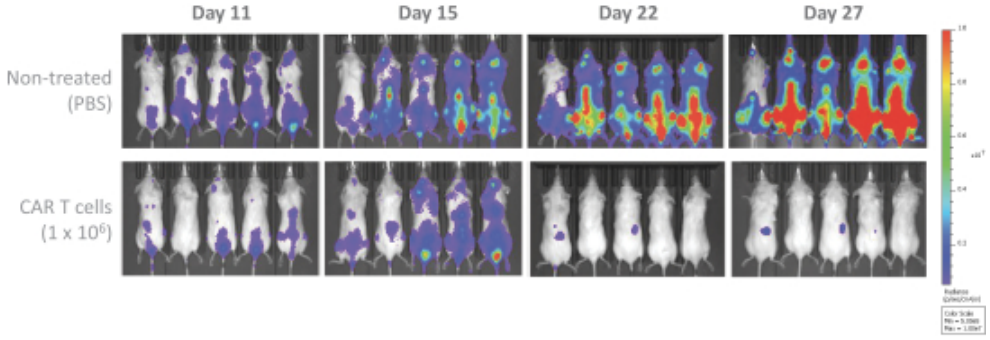
  We also evaluated the potency of PBCAR269A *in vivo*. As shown below, PBCAR269A was observed to prolong survival in a mouse model of multiple myeloma, which we believe supports further development. PBCAR269A was observed to be well-tolerated in this study.



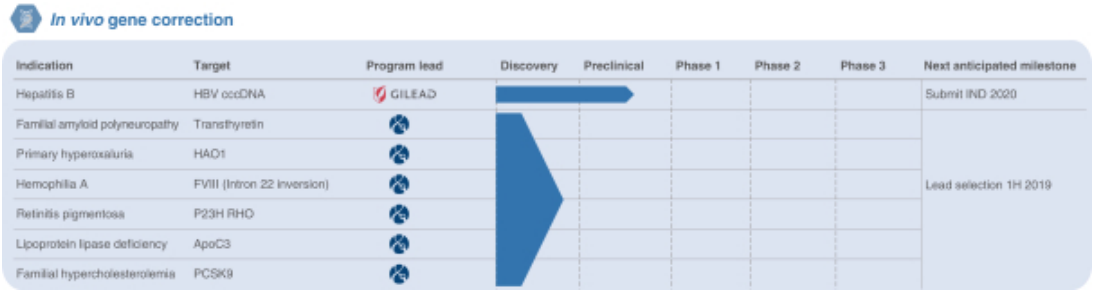
We anticipate submitting an IND to the FDA for PBCAR269A in 2020 and commencing a Phase 1 open-label, multi-center, dose-escalation clinical trial in patients with R/R multiple myeloma.

- **PBCAR371A.** We are developing PBCAR371A as an allogeneic anti-CLL-1 CAR T cell product candidate for the treatment of acute myeloid leukemia, or AML. CLL-1 is a protein that is expressed on myeloid cells, including many AML cancer cells. We believe AML represents a significant unmet need.

  We are currently evaluating multiple anti-CLL-1 therapeutic candidates for *in vitro* and *in vivo* potency in mice to identify a candidate for preclinical development. As shown below, multiple candidates have already been identified that efficiently kill the AML cell line HL-60 *in vitro* and in mice and have been observed to be well tolerated. We anticipate submitting an IND to the FDA for PBCAR371A in 2020 and commencing a Phase 1 open-label, multi-center, dose-escalation clinical trial in patients with R/R AML.



Our *in vivo* gene correction platform



Overview

We expect *in vivo* genome editing to be a significant focus of our operations long-term because the differentiated attributes of ARCUS are particularly advantageous for this type of application. *In vivo* gene correction involves the delivery of ARCUS nucleases directly into a patient's cells to treat disease at the level of the underlying DNA. *In vivo* genome editing is more complex and challenging than *ex vivo* approaches like CAR T cells due to the need to safely deliver ARCUS directly to cells in the body. We believe that *in vivo* applications are particularly well suited to ARCUS because they require extremely low levels of off-target editing and efficient delivery.

Due to the demands of *in vivo* editing, we are taking a highly disciplined approach to managing our project portfolio that emphasizes studies in large animals, using both viral and non-viral delivery technologies. We believe that there is a remarkable lack of large animal data in the genome editing field and that demonstrating safety and efficacy in large animals is an important gating step prior to beginning human clinical studies. Thus, we are advancing an extensive and diverse portfolio of programs toward *in vivo* efficacy and toxicity studies and are generating a large animal dataset that, we believe, will be the most comprehensive of any in the field.

Treatment of genetic disease

Genetic diseases are caused by errors in the DNA that lead to misfunction of a cell or tissue. While the underlying cause of a particular genetic disease can often be complex and variable, DNA errors generally fall into two categories: loss-of-function or gain-of-function. Genetic diseases are most frequently caused by loss-of-function errors in which a particular gene is mutated at the DNA level in such a way that it is either non-functional or less functional than it should be. In these cases, treating the disease requires *adding* the function that the cell or tissue is otherwise lacking. Gain of function genetic disorders are the result of DNA errors that cause a gene to acquire a new, harmful function that leads to disease. In these cases, it is necessary to remove the unwanted function to treat the disorder.

Genetic disease is a very active area of therapeutic development, and the therapies that are available or in development are, to a large extent, as variable and specialized as the diseases themselves. There are, however, two gene therapy platform approaches that are being broadly applied to the treatment of multiple genetic disorders. For the treatment of loss-of-function diseases, AAV-based gene therapy can often be an effective treatment. AAV is a non-integrating virus that can be used to deliver DNA to a wide range of different cell types in a patient. The virus can be engineered to deliver a functional copy of a gene that is otherwise missing or under-performing in the cell. This approach can, in some cases, restore normal function to the cell and alleviate the symptoms of the disease.

While a number of AAV-based gene therapies appear to be showing great promise in clinical trials, the approach is subject to a number of limitations. Many patients have antibodies in their blood that recognize and

inactivate the AAV virus before it can deliver the DNA into the patient's cells. In addition, among patients who do *not* have antibodies upon initial treatment with the virus, most will develop antibodies following the first dose. Therefore, in most cases, it is only possible to dose a patient one time. Most importantly, although AAV-based gene therapy can be an effective treatment, it is probably not a permanent *cure* because AAV-delivered genes do not generally persist for more than a few years in the body. While the duration of virus persistence varies from cell-to-cell and from patient-to-patient, it is not believed to be permanent and symptoms of the disease can return once the virus is no longer present in the body.

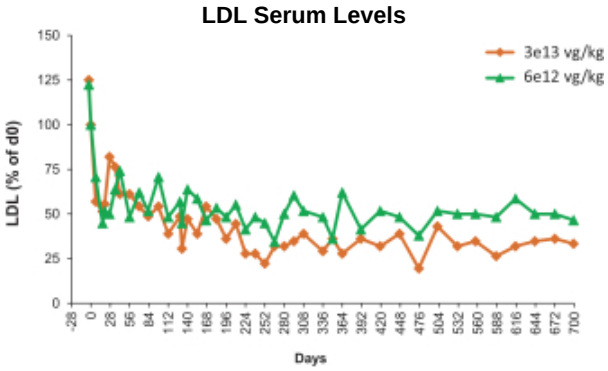
A second platform gene therapy approach, RNA interference, or RNAi, has been shown to be an effective treatment strategy for many gain-of-function genetic disorders. These therapies usually take the form of a small-interfering RNA, or siRNA, which is a short piece of synthetic RNA that can "silence" or partially inactivate a deleterious gene if it is delivered to a cell in sufficient quantities. Therapeutic siRNA is most frequently used to silence genes with gain-of-function mutations that are expressed in the liver. This is because the siRNA molecules can be delivered efficiently to liver cells following IV infusion using a variety of different delivery approaches. Like AAV-based gene therapy, the primary limitation of RNAi approaches is that they lack permanence. siRNA drugs have a limited lifetime and, therefore, must be administered repeatedly for the life of the patient in order to be effective. While longer half-life siRNA drugs are showing persistence for up to six months, we believe there is a need for therapeutic options that untether the patient from regular drug treatments by addressing the underlying cause of the disease.

Our approach to* in vivo *gene correction

Our goal is to cure genetic diseases by correcting the DNA errors responsible for causing them. In principle, *in vivo* genome editing can likely be used to cure any genetic disorder. In practice, however, *in vivo* genome editing is limited by several challenges that, we believe, are best addressed using ARCUS:

- **Specificity.** *In vivo* genome editing requires an extremely high degree of precision to minimize the occurrence of any unwanted off-target editing. Off-target changes to the DNA could, potentially, have significant safety implications that may not manifest themselves until well after administration of the therapy. As enumerated above, we believe that the differentiated attributes of ARCUS enable us to create endonucleases that have a high degree of specificity and minimal levels of off-target editing to address this significant safety concern.
- **Delivery.** Gene delivery technologies suitable for the delivery of genome editing endonucleases to tissues *in vivo* have not been developed for all tissues. Delivery challenges are particularly pronounced for editing applications that require promoting DNA repair by HDR because it is necessary to deliver both the nuclease and the DNA "donor" template for HDR. We have focused our initial development efforts on genetic disorders of the eye and liver, two tissues for which we believe we have good options for delivery and in which we have shown ARCUS to be effective in preclinical studies. We believe the small size of our ARCUS nucleases and their ability to efficiently promote HDR will enable us to address a greater variety of genetic diseases requiring more complex delivery strategies.
- **Efficiency.** Genome editing efficiency is a critical parameter for *in vivo* therapeutic efficacy because the requisite edit must be achieved in a sufficient number of cells to have therapeutic benefit. Efficiency is best measured *in vivo* in animals because it is affected by multiple parameters including delivery, endonuclease activity and the accessibility of the DNA target site in the organism. Moreover, we believe that only large animals such as non-human primates accurately model these different parameters and are representative of the human condition. As such, we have placed a good deal of emphasis on large animal studies and have demonstrated, we believe, therapeutic levels of editing efficiency using ARCUS in the most relevant models. This gives us greater confidence that ARCUS will translate from the lab bench to the clinic.

The potential of ARCUS for *in vivo* genome editing is highlighted in a July 2018 publication in *Nature Biotechnology* that describes a research project performed as part of a sponsored research collaboration between our company and Dr. Jim Wilson's Orphan Disease Center at the University of Pennsylvania. Co-authors of the publication include Derek Jantz and Jeff Smith, two of our co-founders. This publication is, to our knowledge, the first peer-reviewed publication of *in vivo* genome editing data in non-human primates. We reported well-tolerated, long-term, high-efficiency editing of the PCSK9 gene in non-human primates using ARCUS. A single IV administration of an AAV vector encoding a PCSK9-specific ARCUS nuclease was able to efficiently knock out the gene in the livers of Rhesus macaques, a species of monkey, resulting in up to approximately 85% reduced levels of PCSK9 protein in the blood. This reduction in PCSK9 then resulted in significantly reduced levels of LDL-C, commonly known as "bad cholesterol," in the blood of treated animals. Because this therapeutic effect is due to modifications to the DNA itself, the benefit of the treatment appeared to be permanent. The first animals that were treated have maintained reduced levels of PCSK9 and LDL-C since they were treated in February 2017. Importantly, even at the highest dose the treatment was observed to be well tolerated in the study. These peer reviewed data exemplify the power of ARCUS for *in vivo* editing at therapeutically meaningful levels of efficiency.



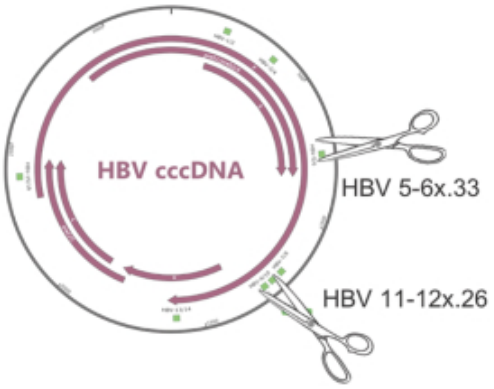
We believe that establishing collaborations with other groups that have domain expertise and access to the most relevant animal models will be important to advancing our *in vivo* gene correction platform, and we have entered into a number of collaborations and licensing agreements with third parties to help us advance our *in vivo* editing portfolio. In particular, in September 2018 we announced a sponsored research agreement with the Orphan Disease Center at the University of Pennsylvania. This organization, led by Dr. Jim Wilson, is dedicated to curing rare genetic diseases and has access to unique expertise and resources, including AAV vector production and non-human primate models. Several of our liver-directed projects are being conducted in collaboration with Dr. Wilson under this agreement.

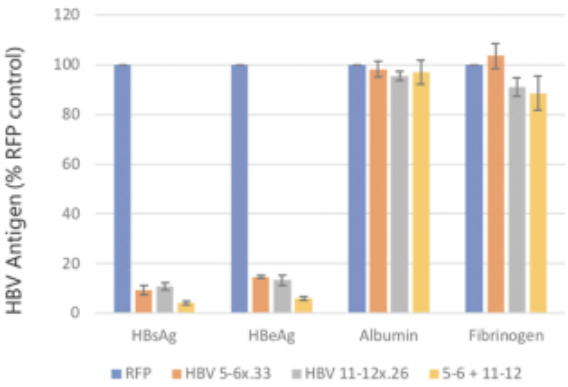
Hepatitis B program

In September 2018, we announced a partnership with Gilead to co-develop an ARCUS-based treatment for chronic Hepatitis B infection. Infection by the Hepatitis B Virus, or HBV, is in many ways analogous to a gain-of-function genetic disorder. In this case, the deleterious DNA that needs to be eliminated is the genome of the virus itself. To this end, we are collaborating with Gilead to develop an ARCUS-based product candidate that is designed to specifically target and eliminate virus DNA, either integrated or cccDNA, from infected liver cells. We intend to submit an IND to the FDA in 2020 for this product candidate.

In preclinical studies, we developed a pair of ARCUS nucleases called "HBV 5-6x.33" and "HBV 11-12x.26" that recognized and cut conserved DNA sequences in the Hepatitis B genome. We observed that these nucleases, if

administered to HBV-infected primary human hepatocytes, selectively eliminated virus DNA from the cells. As shown below, this resulted in a loss of the virus-produced antigens HBsAg and HBeAg from the culture without affecting the expression of normal hepatocyte genes.

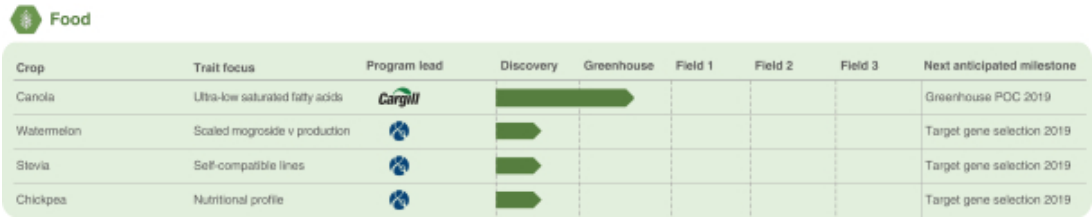




We believe that our proprietary ARCUS genome editing platform, strong collaborations and a disciplined approach to preclinical development that emphasizes large animal studies will help position us to unlock the enormous potential of therapeutic *in vivo* editing.

We are also in the discovery stage for other *in vivo* indications: familial amyloid polyneuropathy, primary hyperoxaluria, hemophilia A, retinitis pigmentosa, lipoprotein lipase deficiency and familial hypercholesterolemia. We intend to select an indication and target for our next *in vivo* product candidate in the first half of 2019.

Our food platform



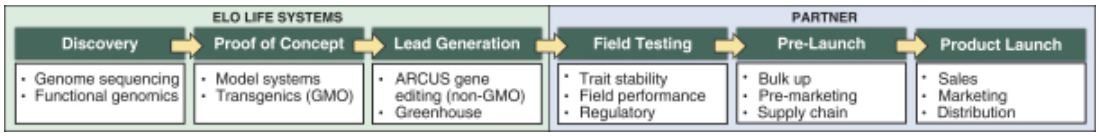
Technology-centric solutions to meet changing demands in food and agriculture

The total global food and agriculture market, estimated to be at $5 trillion (2015), is heavily influenced by the availability of critical raw material ingredients and changing consumer behavior. With the global population projected to reach 8.5 billion by 2030, demand for basic food and nutrition needs has already put a lot of pressure on traditional food production systems. In response, the food and agriculture industry is currently in the process of a slow, but massive, repositioning effort to reinvent its capital-intensive infrastructure, complex business structures and product pipelines. This is creating new opportunities to disrupt the otherwise archaic food industry by introducing technology solutions that address unmet needs. Of particular concern to the industry is the agronomic impact of climate change. Many staple foods and critical ingredients, such as citrus, bananas and coffee, are under threat from environmental changes and the new pathogens it can bring. The food and agriculture industry has also seen significant shifts in consumer preferences in which consumers are actively transitioning to high quality and healthier foods and beverages, while rejecting artificial ingredients,

sugar and salt, creating a demand for natural and holistic ingredients built on a sustainable supply chain. Traditional approaches to agricultural innovation are slow, siloed, rely heavily on non-scalable academic advancements and continue to use inefficient crop improvement practices. We believe that many of the current pressures on the food and agriculture industry from climate-related threats and changing consumer preferences can be effectively addressed using biotechnology. However, consumers are generally opposed to genetically modified organisms, or GMOs, which makes food companies reluctant to incorporate them into their products. Elo was created to help food companies "thread the needle" between competing pressures to improve the genetics of their ingredients while avoiding the incorporation of GMO organisms.

Elo Life Systems: Innovation-focused technology platform and business model

Elo Life Systems is our wholly owned subsidiary, dedicated to addressing the needs of consumers and consumer-facing industries in the food and agriculture sector. Our business model is heavily partner-focused. In the food and agriculture industry, timelines to market are long and the field is dominated by a relatively small number of entrenched companies. Therefore, it is a very difficult to bring a product to market without a larger partner. Thus, we seek partnerships early in the product development process to optimize our chances of market success. Under this partnership model, we are responsible for the early phases of the project, starting from concept through production of a "lead," which is typically a gene edited plant that has the desired trait in greenhouse testing and is ready for scale-up and testing in the field. At that point, our partners typically assume responsibility for subsequent development and commercialization. Because large consumer-facing food companies are often not directly responsible for producing their own starting ingredients, this transfer may involve an intermediate in the supply chain such as a seed producer or grower who is responsible for pre-commercial activities. Whenever possible, we try to partner with the entire supply chain early in the project to ensure a smooth transition across phases of development. In general, our partners are responsible for financing all or a portion of our development costs, which greatly reduces our capital requirements. We are then generally eligible to share in revenues derived from successfully commercialized products developed under these partnerships.



Elo's technology platform

Our end-to-end food platform is built to support rapid innovation across multiple crop species. With the ARCUS genome editing platform as our cornerstone technology, we have integrated complementary tools and technologies both upstream and downstream to potentially be a complete solutions provider.

At the core of our food platform is our ARCUS editing technology. We are one of the first to apply genome editing technology to crop plants and we believe we have the most in-depth experience in crop genome editing in the industry. Over the last decade, we have developed highly efficient methods to improve delivery and functionality of ARCUS nucleases in plants to edit DNA. These nucleases have been successfully validated in collaborative projects with major food and agriculture companies like Cargill, BASF, Bayer CropScience and DuPont Pioneer Hi-bred. Importantly, ARCUS can be used to create small deletions or insertions in plants using a non-plant pest- or pathogen-based delivery approach. As such, we believe that many of the food and agriculture product candidates we may develop have the potential to obtain nonregulated status in the United States and other territories and thereby avoid GMO labels. This aspect of the technology platform is critical to food producers, particularly as they respond to consumer demands for healthier products. Because Elo partners

with large companies that generally lack significant biotechnology capabilities, it was necessary for us to build these capabilities in-house to complete Elo's portion of the development process. This end-to-end platform is unusual in the industry and, we believe, makes Elo an attractive partner. In addition to ARCUS, Elo's in-house capabilities include:

- **Genomics.** Many of the most attractive opportunities for Elo involve emerging and under-studied crops, such as stevia and monk fruit. We have integrated genome sequencing and bioinformatic platforms in-house in order to identify the genome sequence of plants, enabling us to identify targets for editing with ARCUS nucleases.
- **Target discovery and validation.** Our informatics platform is built on principles of machine learning that allow us to synthesize, sequence and phenotype information from both public and internal datasets to correlate genome sequence with plant characteristics. This allows us to identify genetic targets for ARCUS editing that are predicted to yield a desired phenotype. These targets can then be validated in specific crops and at least partially validated in model systems such as tobacco and Arabidopsis using different molecular approaches such as editing or RNAi.
- **Multi-crop transformation.** Most of the crops of interest to Elo and our partners do not have established transformation protocols and are not readily amenable to gene editing. To this end, we have developed a sophisticated collection of plant transformation vectors and protocols over the last decade that allow us to rapidly develop gene-edited variants of otherwise intractable species. This technology allows us to overcome what is otherwise a significant barrier to entry into a new crop species.
- **Plant growth infrastructure.** Elo has a dedicated facility and capabilities of cultivating gene edited plants from incubator to greenhouse.

Ultra-low saturated fatty acid canola oil (in collaboration with Cargill Inc.)

Canola oil is the third largest vegetable oil by volume after palm and soybean oil. In the United States, canola oil is one of the most widely consumed oils, second only to soybean oil. With worldwide production at 30 million metric tons in 2017, the global canola oil is estimated to be a $20 billion industry.

Cargill is one of the world's largest growers and processors of canola. Since 2014, Elo and Cargill are engaged in a collaboration to produce ARCUS-optimized canola varieties and have achieved significantly lower levels (less than 4.5%) of saturated fatty acids compared to the current levels (7%) in greenhouse studies. This oil with the desirable premium trait is intended for the quick-service restaurants and food ingredients industries, and products made with it—particularly fried foods—may be able to use front-of-package nutrient content claims on saturated fat levels, such as "Low in Saturated Fat" or "No Saturated Fat," depending on their overall nutritional profile.

This program has generated canola varieties with up to an approximately 33% decrease in total saturated fats compared to un-edited varieties in greenhouse studies and we have not observed any less desirable traits in these canola varieties in these greenhouse studies to date. We expect to commence Field 1 trials in 2019.

Low-calorie sweeteners from stevia and monk fruit

Low calorie sweeteners are a rapidly growing segment of the food and beverage industry as companies respond to consumer demands for low-sugar snack foods and soda alternatives. In addition, the adoption of "sugar taxes" by many cities across the United States and Europe are significantly impacting profit margins and creating an acute need for alternatives to cane sugar and corn syrup such as the natural, high intensity sweeteners in stevia and monk fruit.

Over the past decade, stevia has emerged as a preferred low-calorie sugar substitute. However, stevia is subject to a number of disadvantages, including undesirable aftertaste, complex biology, unsustainable production practices and supply chain issues. Self-incompatibility, or a genetic condition that prevents self-fertilization and promotes outcrossing for flowering plants, has been identified as one of the main impediments to improving stevia as a crop. We are working to produce self-compatible stevia lines suitable for breeding and domestication. We believe that changing this property of stevia will enable new breeding strategies that will allow Elo and its partners to rapidly domesticate and improve the crop.

We believe that the best low calorie sweetener comes from monk fruit. The monk fruit compound mogroside V is approximately 300 times sweeter than cane sugar and has been identified as an excellent alternative to cane sugar and stevia. Monk fruit is a low biomass species that grows exclusively in southeast Asia and is frequently harvested and processed using questionable labor practices. This makes mogroside V expensive, difficult to obtain and controversial. However, monk fruit is closely related to watermelon and the genes encoding all components of the mogroside V pathway are present, though inactive, in watermelon. We are currently collaborating with a large beverage company to re-activate the latent mogroside V pathway in watermelon to produce this high value metabolite in a crop that is readily cultivated across North America and Europe.

Plant-based proteins

Shifting consumer preferences across the globe towards higher protein diets has created unprecedented demand for plant-based protein sources. We do not believe that this demand for plant-based proteins, projected to grow to a $10.5 billion global industry by 2020, can be met without the application of biotechnology to increase protein content in different crop species.

In November 2018, we launched Elo Life Systems Australia, a subsidiary of Elo that will support research programs in Australia. Elo Life Systems Australia's primary focus is developing improved protein and nutritional profiles in legumes starting with chickpea. We aim for the resulting products to make a significant contribution towards the increasing demand for sustainable plant-based proteins as a healthful alternative to animal protein.

Citrus varieties resistant to Citrus Greening Disease

Citrus greening is one of the most serious citrus plant diseases in the world. Rising global temperatures have shortened the life cycle of the insect pests that carry the citrus greening pathogen and enabled rapid spread of the disease to most citrus producing areas of the world. Infected trees produce fruits that are unsuitable for sale as produce, and once a tree is infected, there is no cure. In the state of Florida alone, the economic impacts of citrus greening since the disease was first detected in 2005 were estimated at a loss of more than $8 billion.

At Elo, we are leveraging recent insights into citrus-pathogen interactions to generate novel citrus varieties with resistance to citrus greening. Our citrus greening program is designed to utilize ARCUS nucleases to disrupt plant-pathogen interactions to, we believe, generate non-GMO, citrus greening resistant trees. Citrus greening is one of many examples of how the food industry was caught off-guard by the impact of global warming.

Manufacturing

We currently contract with third parties for the manufacturing of materials used in the production of our product candidates. To date, our third-party manufacturers have met our manufacturing requirements. We believe that there are alternate sources of supply that can satisfy our requirements.

The manufacturing process for our allogeneic CAR T immunotherapy platform utilizes a one-step cell engineering method in which a CAR gene is targeted directly into the T cell receptor alpha constant, or TRAC, locus. We believe

this approach greatly streamlines the manufacturing process. Commercial raw materials and reagents for this production are readily available. Our manufacturing strategy for our *in vivo* gene correction platform and our food platform is to internally control process development and manufacturing to safeguard the proprietary nature of our technology and facilitate our ability to function as an integrated life sciences company.

We are building strong internal scientific process development and manufacturing capabilities, including investing in building a cGMP-compliant manufacturing facility to support our therapeutic product development platforms. We believe that having internal manufacturing capacity and expertise will be a competitive advantage that enables enhanced control over process development timelines, costs and intellectual property.

We are in the process of building a cGMP-compliant manufacturing facility. We have leased approximately 17,300 feet of space for our manufacturing facility at a location approximately seven miles from our headquarters in Durham, North Carolina. We expect to have a modular, three suite cleanroom setup, for CAR T cell, mRNA and AAV production, to process development for our allogeneic CAR T immunotherapy platform. We expect that our manufacturing facility will leverage single use, disposable, closed system operations aligned to our technology platforms to ensure both flexibility and cost effectiveness. The initial scope will be for preclinical through Phase 1/2a manufacturing. We expect the facility to be operational in the second half of 2019.

License and collaboration agreements

Servier

In February 2016, we entered into the Servier Agreement with Baxalta (now Shire). This agreement was assigned to Servier in connection with Servier's acquisition of Shire's oncology business in August 2018. Pursuant to this agreement, we have agreed to develop allogeneic chimeric antigen receptor T cell therapies for up to six unique antigen targets, the first of which was selected by Baxalta at the inception of the agreement and the remaining five of which may be selected by Servier over the first four years of the agreement. Upon selection of an antigen target, we perform early-stage research and development on individual T cell modifications for the selected target, develop the resulting therapeutic product candidates through Phase 1 clinical trials and manufacture clinical trial material for use in Phase 2 clinical trials.

We received an upfront payment of $105.0 million under the Servier Agreement. At Phase 2 readiness for any product candidate covered by the Servier Agreement, Servier may exercise a commercial option to proceed with development and commercialization of the product candidate, subject to option fees. Following the exercise of any such commercial option, Servier must use commercially reasonable efforts to develop and commercialize the product candidate. We have the ability to receive total payments, including the upfront payment, option fees and milestone payments, in the aggregate across all six targets that may be selected, of up to approximately $1.6 billion. This includes up to $1.5 billion in milestone payments, consisting of up to $401.3 million in development milestone payments and up to $1.1 billion in commercial milestone payments. We are also entitled to receive tiered royalties ranging from the mid-single digit percentages to sub-teen percentages on worldwide net sales of any products developed under the Servier Agreement, subject to customary potential reductions. Servier's obligation to pay royalties to us expires on a country-by-country and licensed product-by-licensed product basis upon the latest of (1) the expiration of the last to expire valid claim of all Precision patents covering a licensed product, (2) expiration of all regulatory exclusivity with respect to a licensed product in the applicable country of sale, and (3) the expiration of a certain number of years following the first commercial sale of a licensed product in a country. We also have the right to participate in the development and commercialization of any licensed products resulting from the collaboration through a 50/50 co-development and co-promotion option in the United States, subject to our payment of an option fee, which is exercisable after Servier's commercial option exercise. So long as Servier holds a commercial license with respect to any particular licensed product, we may not develop, manufacture or commercialize any engineered human T cells with chimeric antigen receptors for use in humans directed to the same antigen target as the target of that licensed product.

Unless terminated earlier, the Servier Agreement expires upon the first to occur of (1) the expiration of the period in which Servier may nominate antigen targets, if there are no included targets under the agreement, (2) the expiration of the period in which Servier may exercise a commercial option on a licensed product candidate, if no commercial options have been exercised by Servier, or (3) the expiration of the last to expire royalty term for the licensed products and satisfaction of all of Servier's payment obligations under the agreement. Servier has the right to terminate the agreement for convenience, either in its entirety or on a target-by-target or product-by-product basis, by providing advance notice to us. We may terminate immediately upon notice to Servier if Servier (itself or through the use of certain affiliates or a third party) or any sublicensee initiates or participates in a patent challenge against our patents licensed by Servier under the agreement. In addition, the Servier Agreement may be terminated (a) by either party for the other party's material breach that remains uncured as specified in the agreement, (b) by either party upon the occurrence of certain insolvency-related events of the other party and (c) upon mutual agreement of the parties in the event either party suffers an event of force majeure as specified in the agreement. If Servier terminates the agreement for our uncured material breach of provisions in the agreement that restrict development, manufacture or commercialization of engineered human T cells with chimeric antigen receptors for use in humans directed to a target selected by Servier, certain licenses we grant to Servier will become royalty-free, fully paid-up, perpetual and irrevocable with respect to the licensed product candidates and licensed products directed to the target that was the subject of such breach, and Servier will be deemed to have previously exercised its commercial option for any then-existing licensed product candidates directed to such target.

Gilead

In September 2018, we entered into the Gilead Agreement to develop genome editing tools using ARCUS to target viral DNA associated with the Hepatitis B virus. Pursuant to the terms of the agreement, Gilead received an exclusive license to exploit the resulting synthetic nucleases and products that use them to treat the Hepatitis B virus in humans, and we are entitled to receive up to approximately $40 million in research funding over an initial three year term and milestone payments of up to an aggregate of $445 million, consisting of up to $105.0 million in development milestone payments and up to $340.0 million in commercial milestone payments. We are also entitled to receive tiered royalties ranging from the high single digit percentages to the mid-teen percentages on worldwide net sales of the products developed through the term of the agreement, subject to customary potential reductions. Gilead's obligation to pay royalties to us expires on a country-by-country and licensed product-by-licensed product basis, upon the latest to occur of certain events related to patents, regulatory exclusivity or first commercial sale of the product.

Unless terminated earlier, the Gilead Agreement will continue, on a licensed-product-by-licensed-product and country-by-country basis until the expiration of a defined royalty term for each licensed product and country. Gilead has the right to terminate the Gilead Agreement for convenience by providing advance notice to us as specified in the Gilead Agreement. Gilead may also terminate the agreement during the collaboration term if we enter into certain change of control transactions with a third party that is clinically developing or commercializing products in the field of the Hepatitis B virus. In addition, either party may terminate the Gilead Agreement (1) for material breach by the other party and a failure to cure such breach within the time period specified in the Gilead Agreement and (2) upon the occurrence of certain insolvency-related events of the other party.

Duke University

In April 2006, we entered into the Duke License, pursuant to which Duke granted us an exclusive (subject to certain non-commercial rights reserved by Duke), sublicensable, worldwide license under certain patents related to certain meganucleases and methods of making such meganucleases owned by Duke to develop, manufacture, use and commercialize products and processes that are covered by such patents, in all fields and in all applications. The patents that we license pursuant to the Duke License have been generated through the

use of U.S. government funding and are therefore subject to certain federal regulations. See “Risk factors— Risks related to intellectual property—Some of our in-licensed intellectual property has been discovered through government funded programs and thus may be subject to federal regulations such as “march-in” rights, certain reporting requirements and a preference for U.S.-based companies, and compliance with such regulations may limit our exclusive rights, and limit our ability to contract with non-U.S. manufacturers.”

Under the Duke License, in addition to upfront licensing fees, we are also required to pay Duke (1) a total of $0.3 million in milestone payments, a portion of which we paid upon the completion of our Series A financing, a further portion of which we paid upon our first signed partnership in excess of $1 million, and the remainder of which we will be required to pay upon successful commercialization of seed traits and human therapeutics, (2) royalties in the low single digit percentages on net sales of licensed products and licensed processes sold by us and our affiliates, subject to certain reductions in certain circumstances, with certain annual minimum royalties, and (3) certain percentages of sublicensing revenue received under sublicenses granted to third parties, which are creditable against annual minimum royalties and are subject to certain reductions in certain circumstances. For sublicenses of non-commercial products, the percentage of sublicensing revenue payable to Duke is in the mid-teen percentages for sublicense revenues owed from royalties received and low double-digits for sublicense revenues owed from non-royalty payments. For sublicenses of commercial products created by us and derivatives thereof, the percentage is determined by the highest negotiated royalty rate in such sublicense. If the highest negotiated royalty rate between us and our sublicensee exceeds a mid-single digit percentage, the percentage of sublicensing revenue payable to Duke will be high single digit, decreasing to low single digit as the highest negotiated royalty rate in such sublicense increases. The Duke License will expire upon the expiration of the last-to-expire patent that is licensed to us. We may terminate the Duke License by providing advance written notice as specified in the Duke License. Either party may terminate the Duke License in the event of the other party’s uncured material breach or for the other party’s fraud, willful misconduct or illegal conduct with respect to the subject matter of the Duke License.

Cellectis S.A.

In January 2014, we entered into a cross-license agreement with Cellectis S.A., which we refer to as the Cellectis License, in connection with a settlement of litigation matters (1) between Cellectis and us and (2) among Cellectis, Duke and us. Cellectis granted us a non-exclusive, sublicensable, worldwide, fully paid, royalty-free license to certain modified I-CreI homing endonuclease patents and Cellectis patents asserted in the litigation, to make, use and commercialize modified I-CreI homing nucleases and products developed using such nucleases, in all fields. The license we received from Cellectis is subject to the rights of a preexisting license agreement that Cellectis entered into with a third party, and the license granted to us excludes any rights exclusively granted by Cellectis under such preexisting license, which preexisting license is limited to certain specific applications unrelated to the fields of human therapeutics and plant agriculture, for so long as the rights under the preexisting license remain exclusive.

We granted Cellectis a non-exclusive, sublicensable, worldwide, fully paid-up, royalty-free license to certain modified I-CreI homing endonuclease patents and our patents asserted in the litigation matters (1) between Cellectis and us and (2) among Cellectis, Duke and us to make, use and commercialize modified I-CreI homing nucleases and products developing using such nucleases, in all fields except those for which we did not receive rights from Cellectis due to the preexisting license.

The Cellectis License will expire upon the expiration of the last-to-expire valid claim of all of the patents licensed to or from each of the parties to the agreement. Either party may terminate any of the licenses granted under the agreement (1) in the event of the other party’s material breach, subject to an opportunity to cure within the time period specified in the Cellectis License, or (2) if the other party directly or indirectly challenges a patent licensed to it by the other party.

Competition

As a diversified life sciences company, we compete in multiple different fields. The biotechnology, pharmaceutical and agricultural biotechnology industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on intellectual property and proprietary products. We principally compete with others developing and utilizing genome editing technology in the human health and plant sciences sectors, including companies such as Cellectis S.A., CRISPR Therapeutics, AG, Editas Medicine, Inc., Intellia Therapeutics, Inc. and Sangamo Therapeutics, Inc.

We compete with many biotechnology and pharmaceutical companies, academic research institutions, governmental agencies and public and private research institutions. We expect that our operations focused on CAR T cell product development and commercialization will face substantial competition from those focusing on immunotherapy solutions. Several companies, including Novartis Pharmaceuticals Corp. and Gilead Sciences, Inc., have obtained FDA approval for autologous cell therapies, and a number of companies, including Cellectis S.A., Celgene Corp., Allogene Therapeutics and CRISPR Therapeutics AG, are pursuing allogeneic cell therapies. We expect that our operations focused on developing products for *in vivo* treatment of genetic disease will face substantial competition from others focusing on gene therapy treatments, especially those that may focus on conditions that our product candidates target. Moreover, any human therapeutics products that we may develop will compete with existing standards of care for the diseases and conditions that our product candidates target and other types of treatments, such as small molecule, antibody or protein therapies.

Many of our current or potential competitors in the therapeutics space, either alone or with their collaboration partners, have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials and marketing approved products than we do. In addition to competing on the bases of safety, efficacy, timing of development and commercialization, convenience, cost, availability of reimbursement and rate of adoption of potential product candidates, we may also compete with these competitors in recruiting and retaining qualified personnel, establishing clinical sites, establishing relationships with collaborators or other third parties, registering patients for clinical trials and acquiring technologies complementary to, or necessary for, our product development platforms. Our commercial opportunity could be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than any products that we may develop. Our competitors also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in our competitors establishing a strong market position before we are able to enter the market.

We also compete with participants in the agricultural biotechnology space, including Pairwise Plants, LLC, Caribou Biosciences, Inc., Corteva Agriscience, Tropic Biosciences UK LTD, Calyxt, Inc. and Cibus. Competition for improving plant genetics comes from conventional and advanced plant breeding techniques, as well as from the development of genetically modified traits. Competition for providing more nutritious ingredients for food companies comes from chemical-based ingredients, additives and substitutes, which are developed by various companies. We also face less direct competition from trait research and development companies and agricultural research universities and institutions. We compete with respect to many aspects of the product development cycle in the plant sciences space, such as computational capabilities for identifying relevant gene targets, access to germplasm and enabling technologies and entry into strategic relationships to facilitate product development and commercialization.

Many of our current or potential competitors in the agricultural biotechnology space, either alone or with others, have significantly greater financial resources and expertise in research and development, manufacturing, testing and marketing approved products than we do. Mergers and acquisitions in the plant science, specialty food ingredient and agricultural biotechnology, seed and chemical industries may result in

even more resources being concentrated among a smaller number of our competitors. Smaller or early-stage companies may also prove to be significant competitors, particularly through strategic relationships with large and established companies. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel, as well as in acquiring technologies complementary to, or necessary for, our food platform.

Furthermore, we rely upon a combination of patents and trade secret protection, as well as license and confidentiality agreements to protect the intellectual property related to our proprietary technologies, product candidate development programs and product candidates. Our success depends in large part on our ability to secure and maintain patent protection in the United States and other countries with respect to the ARCUS nucleases used in our existing allogeneic CAR T immunotherapy, *in vivo* gene correction and food programs, as well as any future product candidates. Moreover, the industries in which we operate are characterized by the existence of large numbers of patents and frequent allegations of patent infringement. If, therefore, we are unable to obtain and maintain patent protection for our technology and product candidates, or if the scope of the patent protection obtained or in-licensed is not sufficiently broad or if the validity of such patent is threatened, we may not be able to compete effectively, as it could create opportunities for competitors to enter the market or dissuade other companies from collaborating with us to develop products and technology, any of which would hurt our competitive position and could impair our ability to successfully commercialize our product candidates in any indication for which they are approved.

Intellectual property

Our success depends in part on our abilities to (1) obtain and maintain proprietary protection for ARCUS, (2) defend and enforce our intellectual property rights, in particular, our patent rights, (3) preserve the confidentiality of our know-how and trade secrets, and (4) operate without infringing valid and enforceable intellectual property rights of others. We seek to protect our proprietary position by, among other things, exclusively licensing U.S. and certain foreign patent applications, and filing U.S. and certain foreign patent applications, related to ARCUS, existing and planned programs, and improvements that are important to the development of our business, where patent protection is available. We also rely on trademarks, trade secrets, know-how, continuing technological innovation and confidential information, and the pursuit of licensing opportunities, to develop and maintain our proprietary position and protect aspects of our business that are not amenable to, or that we do not consider appropriate for, patent protection. We seek to protect our proprietary technology and processes, in part, by confidentiality agreements and invention assignment agreements with our employees, consultants, scientific advisors, contractors and others who may have access to proprietary information, under which they are bound to assign to us inventions made during the term of their employment or term of service. We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems.

We cannot be sure that patents will be granted with respect to any patent applications we have licensed or filed or may license or file in the future, and we cannot be sure that any patents we have licensed or which have been granted to us, or patents that may be licensed or granted to us in the future, will not be challenged, invalidated or circumvented or that such patents will be commercially useful in protecting our technology. Moreover, trade secrets can be difficult to protect. While we have confidence in the measures we take to protect and preserve our trade secrets, such measures can be breached, and we may not have adequate remedies for any such breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. For more information regarding the risks related to our intellectual property, see “Risk factors—Risks related to intellectual property.”

Our patent portfolio consists of a combination of issued patents and pending patent applications that are owned by us or licensed by us from third parties. As of December 31, 2018, we have an exclusive license from Duke University under 12 issued U.S. patents and two pending U.S. patent applications. In addition, as of December 31, 2018, we own 16 issued U.S. patents, 12 pending non-provisional U.S. patent applications, and eight pending PCT international patent applications. We also exclusively license from Duke or own many corresponding patents and patent applications outside the United States, as described below. We intend to pursue, when possible, additional patent protection, including composition of matter, method of use and process claims, related to ARCUS. We also intend to obtain rights to existing delivery technologies through one or more licenses from third parties.

ARCUS platform patent families

We license one patent family from Duke and own two patent families that are directed to the core technologies employed in our ARCUS platform for nuclease design. Thus, each of our product candidates is protected by one or more patents in these families.

The first family, licensed from Duke, includes 12 issued U.S. patents, eight issued European patents, three issued Japanese patents, and one issued patent in each of Australia and Canada. This family also includes one pending patent application in each of the United States, Europe, Japan and Canada. Patents in this family include claims directed to (1) recombinant meganucleases having altered cleavage specificity, altered heterodimer formation, and/or altered DNA binding affinity, (2) methods for cleaving target recognition sites in DNA using such meganucleases, and (3) methods for producing genetically modified eukaryotic cells using such meganucleases. Patents in this family have a standard expiration date of October 18, 2026, subject to potential extensions.

The second family, which we own, includes four issued U.S. patents, two issued patents in each of Europe and Japan, and one issued Australian patent. This family also includes one pending patent application in each of the United States, Europe, Japan and Australia. Patents in this family include claims directed to (1) recombinant single-chain meganucleases, and (2) methods for producing isolated genetically modified eukaryotic cells using such meganucleases. Patents in this family have a standard expiration date of October 31, 2028, subject to potential extensions.

The third family, which we own, includes one issued patent in the United States, and two issued patents in each of Europe and Australia. This family also includes two pending patent applications in the United States and one pending patent application in Europe. Patents in this family include claims directed to methods of cleaving DNA at specific four base pair sites using a recombinant meganuclease. Patents in this family have a standard expiration date of July 14, 2029, subject to potential extensions.

Immunotherapy patent families

We own nine patent families that are directed to immunotherapy, including CAR T cell therapies. Some of these are applicable to immunotherapies and/or CAR T cells directed to killing a variety of different types of infected or cancerous cells. Others are directed to specific indications in which cells expressing particular antigens are targeted. Each of our immunotherapy product candidates is protected by one or more patents in these families.

The first family includes nine issued U.S. patents, and pending patent applications in each of the United States, Europe, Australia, Canada, China, Israel, Japan, Mexico and South Korea. Patents in this family include claims directed to (1) populations of genetically modified human T cells in which 20%-65% of the cells have reduced expression of an endogenous TCR and express an anti-cancer antigen CAR from DNA inserted into the cells' TCR alpha constant region (TRAC) gene, (2) methods for using such populations of genetically modified

human T cells for cancer immunotherapy, (3) pharmaceutical compositions comprising such populations of genetically modified human T cells, (4) genetically modified human T cells which have reduced expression of an endogenous TCR and express an anti-cancer antigen CAR from DNA inserted into the cells' TRAC gene, (5) methods for using such genetically modified human T cells for cancer immunotherapy, and (6) pharmaceutical compositions comprising such genetically modified human T cells. Patents in this family have a standard expiration date of October 5, 2036, subject to potential extensions.

The second family includes pending patent applications in each of the United States, Europe, Australia, Canada and Japan. Patent applications in this family include claims directed to (1) first-generation recombinant meganucleases that cleave a target in the TRAC gene, (2) nucleic acids and vectors encoding such recombinant meganucleases, (3) methods for producing genetically modified eukaryotic cells, including CAR T cells, using such meganucleases, and (4) methods of using such genetically modified eukaryotic cells for cancer immunotherapy. Patents in this family, if issued, will have a standard expiration date of October 5, 2036, subject to potential extensions.

The third family includes a pending provisional patent application in the United States. That provisional patent application includes claims directed to (1) second-generation engineered meganucleases that cleave a specific target in the TRAC gene, (2) nucleic acids and vectors encoding such recombinant meganucleases, (3) methods for producing genetically modified eukaryotic cells, including CAR T cells, using such meganucleases, (4) genetically modified eukaryotic cells or populations of cells prepared by such methods, (5) pharmaceutical compositions comprising such cells or populations of cells, and (6) methods of treating diseases using such cells, populations of cells or pharmaceutical compositions to treat diseases, including cancer immunotherapy. Patents in this family, if issued, will likely have a standard expiration date of April 12, 2039, subject to potential extensions.

The fourth family includes a pending PCT international patent application. That PCT patent application includes claims directed to (1) nucleic acids encoding co-stimulatory domains having certain amino acid sequences, (2) recombinant DNA constructs and vectors comprising such nucleic acids, (3) nucleic acids and vectors encoding such recombinant meganucleases, (4) genetically modified cells comprising such nucleic acids, (5) methods for producing such genetically modified cells, (6) pharmaceutical compositions comprising such cells, and (7) methods of immunotherapy using such cells. Patents in this family, if issued, will have a standard expiration date of October 4, 2037, subject to potential extensions.

The fifth family includes a pending PCT international patent application. That PCT patent application includes claims directed to (1) methods of reducing cytotoxicity associated with DNA transfection in primary eukaryotic cells, (2) methods for increasing the number of gene-edited primary eukaryotic cells following DNA transfection, (3) methods for increasing gene editing frequency in primary eukaryotic cells following DNA transfection, (4) methods for increasing the number of primary eukaryotic cells comprising targeted insertion of an exogenous sequence of interest into the genome following DNA transfection, (5) methods for increasing insertion frequency of an exogenous sequence of interest into the genome in primary eukaryotic cells following DNA transfection, (6) methods for high throughput screening of primary human T cells expressing a CAR or exogenous TCR, (7) methods for high throughput screening of primary human T cells expressing a CAR or exogenous TCR, and (8) genetically modified primary eukaryotic cells produced by such methods. Patents in this family, if issued, will have a standard expiration date of April 30, 2038, subject to potential extensions.

The sixth family includes pending patent applications in the United States, Europe, Australia, Canada and Japan. Patent applications in this family include claims directed to (1) recombinant meganucleases that recognize and cleave a recognition sequence within the human beta-2-microglobulin gene, (2) nucleic acids and vectors encoding such recombinant meganucleases, (3) methods for producing genetically modified eukaryotic cells, including CAR T cells, using such meganucleases, (4) populations of genetically modified eukaryotic cells in

which 80% of the cells have reduced expression of an endogenous TCR and 80% of the cells have reduced expression of beta-2-microglobulin, (5) pharmaceutical compositions comprising such populations of genetically modified eukaryotic cells, and (6) methods for using such genetically modified eukaryotic cells for cancer immunotherapy. Patents in this family, if issued, will have a standard expiration date of December 22, 2036, subject to potential extensions.

The seventh family includes a pending PCT international patent application. That PCT patent application includes claims directed to (1) nucleic acids encoding an engineered antigen receptor (e.g., a CAR) and an inhibitory molecule (e.g., an RNA interfering with beta-2-microglobulin expression), (2) genetically modified eukaryotic cells comprising such nucleic acids, (3) methods for producing such genetically modified eukaryotic cells using such nucleic acids and an engineered nuclease that promotes insertion of such nucleic acids, (4) genetically modified eukaryotic cells expressing an engineered antigen receptor and having expression of beta-2-microglobulin or MHC Class I molecules reduced by 10%-95%, (5) pharmaceutical compositions comprising such genetically modified eukaryotic cells, and (6) methods for using such genetically modified eukaryotic cells for immunotherapy. Patents in this family, if issued, will have a standard expiration date of May 8, 2038, subject to potential extensions.

The eighth family includes a pending PCT international patent application. That PCT patent application includes claims directed to (1) engineered meganucleases that recognize and cleave a recognition sequence in an upstream intron of the human TRAC gene, (2) nucleic acids and vectors encoding such engineered meganucleases, (3) methods for producing genetically modified T cells using such nucleic acids or vectors, (4) genetically modified T cells in which an exogenous sequence is inserted into an upstream intron of the human TRAC gene and endogenous TCR expression is reduced, (5) populations of such genetically modified T cells, (6) pharmaceutical compositions comprising such genetically modified T cells, and (7) methods of treating disease using such genetically modified T cells and pharmaceutical compositions, including cancer immunotherapy. Patents in this family, if issued, will have a standard expiration date of June 27, 2038, subject to potential extensions.

The ninth family includes a pending PCT international patent application. That PCT patent application includes claims directed to (1) nucleic acids and vectors encoding certain modified human epidermal growth factor receptor, or EGFRs, (2) genetically modified cells and populations of cells, including T cells and CAR T cells, expressing such modified EGFRs, (3) methods for producing such genetically modified cells using such nucleic acids or vectors encoding such modified EGFRs, (4) pharmaceutical compositions comprising such genetically modified cells, (5) methods for isolating such genetically modified cells, (6) methods of treating disease using such genetically modified cells and pharmaceutical compositions, including cancer immunotherapy, and (7) methods of depleting such genetically modified cells in a subject using anti-modified EGFR antibodies. Patents in this family, if issued, will likely have a standard expiration date of October 3, 2038, subject to potential extensions.

Hepatitis B virus gene therapy patent families

We own two patent families that are directed to gene therapy for Hepatitis B Virus.

The first family includes a pending PCT international patent application. That PCT patent application includes claims directed to (1) engineered meganucleases that recognize and cleave recognition sites in the Hepatitis B virus (HBV) genome, (2) nucleic acids and vectors encoding such engineered meganucleases, (3) pharmaceutical compositions comprising such nucleic acids or meganucleases, and (4) methods for treating HBV infection using such meganucleases, nucleic acids and/or pharmaceutical compositions. Patents in this family, if issued, will have a standard expiration date of October 13, 2037, subject to potential extensions.

The second family includes a pending U.S. provisional patent application. That provisional patent application includes claims directed to (1) second-generation engineered meganucleases that recognize and cleave recognition sites in the Hepatitis B virus, or HBV genome, (2) nucleic acids and vectors encoding such engineered meganucleases, (3) pharmaceutical compositions comprising such nucleic acids or meganucleases, and (4) methods for treating HBV infection using such meganucleases, nucleic acids and/or pharmaceutical compositions. Patents in this family, if issued, will likely have a standard expiration date of April 12, 2039, subject to potential extensions.

Hemophilia A gene therapy patent families

We own two patent families that are directed to gene therapy for Hemophilia A.

The first family includes pending patent applications in the United States, Europe, Australia, Canada, and Japan. Patent applications in this family include claims directed to (1) engineered meganucleases that recognize and cleave recognition sites in a mutant Factor VIII gene, (2) nucleic acids and vectors encoding such engineered meganucleases, (3) pharmaceutical compositions comprising such nucleic acids or meganucleases, and (4) methods for treating Hemophilia A using such meganucleases, nucleic acids and/or pharmaceutical compositions. Patents in this family, if issued, will have a standard expiration date of May 3, 2037, subject to potential extensions.

The second family includes a pending PCT international patent application. That PCT patent application includes claims directed to (1) engineered meganucleases that recognize and cleave non-methylated recognition sites in a mutant Factor VIII gene, (2) nucleic acids and vectors encoding such engineered meganucleases, (3) pharmaceutical compositions comprising such nucleic acids or meganucleases, and (4) methods for treating Hemophilia A using such meganucleases, nucleic acids and/or pharmaceutical compositions. Patents in this family, if issued, will likely have a standard expiration date of November 1, 2038, subject to potential extensions.

Other patent families

We own a pending PCT international patent application directed to engineered meganucleases and methods of treatment targeting the PCSK9 gene, which is associated with familial hypercholesterolemia. Patents in this family, if issued, will have a standard expiration date of April 20, 2038, subject to potential extensions.

We own pending patent applications in the United States, Europe, Australia, Canada and Japan directed to engineered meganucleases and methods of treatment targeting the rhodopsin gene, which is associated with retinitis pigmentosa. Patents in this family, if issued, will have a standard expiration date of September 8, 2036, subject to potential extensions.

We own pending patent applications in the United States, Europe, Australia, Canada and Japan directed to engineered meganucleases and methods of treatment targeting the dystrophin gene, which is associated with Duchenne Muscular Dystrophy. Patents in this family, if issued, will have a standard expiration date of March 12, 2035, subject to potential extensions.

We own pending patent applications in the United States and Europe directed to engineered meganucleases and methods of treatment targeting genomic trinucleotide repeats, which are associated with several trinucleotide repeat disorders. Patents in this family, if issued, will have a standard expiration date of May 2, 2036, subject to potential extensions.

We own a pending United States provisional patent application directed to the genetic modification of the hydroxyacid oxidase 1 gene for the treatment of primary hyperoxaluria. Patents in this family, if issued, will likely have a standard expiration date of December 21, 2039, subject to potential extensions.

We license from Duke a pending patent application in the United States directed to engineered fusion proteins comprising engineered meganuclease domains and effector domains which may be useful in controlling gene expression. Patents in this family, if issued, will have a standard expiration date of October 18, 2026, subject to potential extensions.

We own one patent and one pending patent application in each of the United States and Europe, directed to engineered meganucleases that target amplifiable genetic loci and may be useful in producing cells with amplified transgenes. Patents in this family will have a standard expiration date of June 1, 2032, subject to potential extensions.

We own pending patent applications in the United States and Europe directed to self-limiting viral vectors (e.g., AAV vectors) that encode engineered meganucleases which eliminate the vector after gene delivery. Patents in this family, if issued, will have a standard expiration date of June 20, 2036, subject to potential extensions.

We own, through our Elo Life Systems subsidiary, an issued U.S. patent directed to engineered meganucleases which target a genetic locus in maize and methods for genetically modifying that locus in maize. That patent has a standard expiration date of March 2, 2029, subject to potential extensions.

For any individual patent, the term depends on the applicable law in the country in which the patent is granted. In most countries where we have filed patent applications or in-licensed patents and patent applications, patents have a term of 20 years from the application filing date or earliest claimed non-provisional priority date. In the United States, the patent term is 20 years but may be shortened if a patent is terminally disclaimed over another patent that expires earlier. The term of a U.S. patent may also be lengthened by a patent term adjustment to address administrative delays by the USPTO in granting a patent.

In the United States, the term of a patent that covers an FDA-approved drug or biologic may be eligible for patent term extension in order to restore the period of a patent term lost during the premarket FDA regulatory review process. The Hatch-Waxman Act permits a patent term extension of up to five years beyond the natural expiration of the patent. The patent term restoration period is generally equal to the portion of the FDA regulatory review period for the approved product that occurs after the date the patent issued, subject to certain exceptions. Only one patent may be extended for a regulatory review period for any product, and the application for the extension must be submitted prior to the expiration of the patent. In the future, we may decide to apply for restoration of patent term for one of our currently owned or licensed patents to extend its current expiration date, depending on the expected length of the clinical studies and other factors involved in the filing of the relevant BLA.

We or our licensors may be subject to claims that former employees, collaborators or other third parties have an interest in our owned or in-licensed patents or other intellectual property as an inventor or co-inventor. If we are required to and unable to obtain an exclusive license to any such third party co-owners' interest in such patent applications, such co-owners may be able to license their rights to other third parties, including our competitors. In addition, we may need the cooperation of any such co-owners to enforce any patents that issue from such patent applications against third parties, and such cooperation may not be provided to us. We or our licensors are subject to and may also become a party to similar proceedings or priority disputes in Europe or other foreign jurisdictions.

Our registered trademark portfolio currently contains two registered trademarks, specifically ARC nuclease and ARCUS, in the United States. In addition, there are two pending applications in the United States for the marks Elo Life Systems and Precision Breeding Technologies. Finally, our international portfolio contains seven registered trademarks around the world for ARC nuclease and ARCUS.

Licensed intellectual property

Duke University

In April 2006, we exclusively licensed from Duke families of patents and patent applications related to certain meganucleases and methods of making such nucleases owned by Duke. The patent family covered by the Duke License comprises the core patents covering ARCUS described above. See "—License and collaboration agreements—Duke University" above for additional information regarding the Duke License.

Cellectis S.A.

In January 2014, we entered into the Cellectis License, which relates to certain modified I-Crel homing endonuclease patents and patents that had been subject to litigation between us and Cellectis. The patents to which we have rights under the cross-license include at least eight issued patents in each of the United States and Australia, seven issued patents in Europe, two issued patents in Canada and one issued patent in Japan. These patents have standard expiration dates prior to January 29, 2034, subject to potential extensions. See "—License and collaboration agreements—Cellectis S.A." above for additional information regarding the Cellectis License.

Government regulation

The FDA and other regulatory authorities at federal, state, and local levels, as well as in foreign countries, extensively regulate, among other things, the research, development, testing, manufacture, quality control, import, export, safety, effectiveness, labeling, packaging, storage, distribution, record keeping, approval, advertising, promotion, marketing, post-approval monitoring, and post-approval reporting of biological product candidates such as those we are developing. We, along with third-party contractors, will be required to navigate the various preclinical, clinical and commercial approval requirements of the governing regulatory agencies of the countries in which we wish to conduct studies or seek approval or licensure of our product candidates. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources.

U.S. biologics regulation

The process required by the FDA before biologic product candidates may be marketed in the United States generally involves the following:

- completion of preclinical laboratory tests and animal studies performed in accordance with the FDA's Good Laboratory Practice requirements, or GLPs;
- submission to the FDA of an Investigational New Drug application, or IND, which must become effective before clinical trials may begin;
- approval by an IRB or ethics committee at each clinical site before the trial is commenced;
- performance of adequate and well-controlled human clinical trials to establish the safety, purity and potency of the proposed biologic product candidate for its intended purpose;
- preparation of and submission to the FDA of a BLA after completion of all pivotal clinical trials;
- satisfactory completion of an FDA Advisory Committee review, if applicable;
- a determination by the FDA within 60 days of its receipt of a BLA to file the application for review;

- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities at which the proposed product is produced to assess compliance with cGMP and to assure that the facilities, methods and controls are adequate to preserve the biological product's continued safety, purity and potency, and of selected clinical investigation sites to assess compliance with GCPs; and
- FDA review and approval of the BLA to permit commercial marketing of the product for particular indications for use in the United States.

Prior to beginning the first clinical trial with a product candidate in the United States, we must submit an IND to the FDA. An IND is a request for authorization from the FDA to administer an investigational new drug product to humans. The central focus of an IND submission is on the general investigational plan and the protocol(s) for clinical studies. The IND also includes results of animal and *in vitro* studies assessing the toxicology, pharmacokinetics, pharmacology, and pharmacodynamic characteristics of the product; chemistry, manufacturing, and controls information; and any available human data or literature to support the use of the investigational product. An IND must become effective before human clinical trials may begin. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises safety concerns or questions about the proposed clinical trial. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before the clinical trial can begin. Submission of an IND therefore may or may not result in FDA authorization to begin a clinical trial.

In addition to the submission of an IND to the FDA before initiation of a clinical trial in the United States, certain human clinical trials involving recombinant or synthetic nucleic acid molecules had historically been subject to review by the Recombinant DNA Advisory Committee, or the RAC, of the NIH Office of Biotechnology Activities, or the OBA, pursuant to the NIH Guideline. On August 17, 2018, the NIH issued a notice in the Federal Register and issued a public statement proposing changes to the oversight framework for gene therapy trials, including changes to the applicable NIH Guidelines to modify the roles and responsibilities of the RAC with respect to human clinical trials of gene therapy products, and requesting public comment on its proposed modifications. During the public comment period, which closes October 16, 2018, the NIH has announced that it will no longer accept new human gene transfer protocols for review as a part of the protocol registration process or convene the RAC to review individual clinical protocols. These trials will remain subject to the FDA's oversight and other clinical trial regulations, and oversight at the local level will continue as set forth in the NIH Guidelines. Specifically, under the NIH Guidelines, supervision of human gene transfer trials includes evaluation and assessment by an IBC, a local institutional committee that reviews and oversees research utilizing recombinant or synthetic nucleic acid molecules at that institution. The IBC assesses the safety of the research and identifies any potential risk to public health or the environment, and such review may result in some delay before initiation of a clinical trial. While the NIH Guidelines are not mandatory unless the research in question is being conducted at or sponsored by institutions receiving NIH funding of recombinant or synthetic nucleic acid molecule research, many companies and other institutions not otherwise subject to the NIH Guidelines voluntarily follow them.

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with GCPs, which include the requirement that all research subjects provide their informed consent for their participation in any clinical study. Clinical trials are conducted under protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A separate submission to the existing IND must be made for each successive clinical trial conducted during product development and for any subsequent protocol amendments. Furthermore, an independent IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial and its informed consent form before the clinical trial begins at that site, and must monitor the study until completed. Regulatory authorities, the IRB or the sponsor may suspend a

clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk or that the trial is unlikely to meet its stated objectives. Some studies also include oversight by an independent group of qualified experts organized by the clinical study sponsor, known as a data safety monitoring board, which provides authorization for whether or not a study may move forward at designated check points based on access to certain data from the study and may halt the clinical trial if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy. There are also requirements governing the reporting of ongoing clinical studies and clinical study results to public registries.

For purposes of BLA approval, human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- Phase 1—The investigational product is initially introduced into healthy human subjects or patients with the target disease or condition. These studies are designed to test the safety, dosage tolerance, absorption, metabolism and distribution of the investigational product in humans, the side effects associated with increasing doses, and, if possible, to gain early evidence on effectiveness.
- Phase 2—The investigational product is administered to a limited patient population with a specified disease or condition to evaluate the preliminary efficacy, optimal dosages and dosing schedule and to identify possible adverse side effects and safety risks. Multiple Phase 2 clinical trials may be conducted to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- Phase 3—The investigational product is administered to an expanded patient population to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety, generally at multiple geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the investigational product and to provide an adequate basis for product approval.
- Phase 4—In some cases, the FDA may require, or companies may voluntarily pursue, additional clinical trials after a product is approved to gain more information about the product. These so-called Phase 4 studies may be made a condition to approval of the BLA.

Concurrent with clinical trials, companies may complete additional animal studies and develop additional information about the biological characteristics of the product candidate, and must finalize a process for manufacturing the product in commercial quantities in accordance with cGMP. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, must develop methods for testing the identity, strength, quality and purity of the final product, or for biologics, the safety, purity and potency. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

BLA submission and review by the FDA

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, the results of product development, nonclinical studies and clinical trials are submitted to the FDA as part of a BLA requesting approval to market the product for one or more indications. The BLA must include all relevant data available from pertinent preclinical and clinical studies, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's chemistry, manufacturing, controls, and proposed labeling, among other things. Data can come from company-sponsored clinical studies intended to test the safety and effectiveness of a use of the product, or from a

number of alternative sources, including studies initiated by investigators. The submission of a BLA requires payment of a substantial user fee to FDA, and the sponsor of an approved BLA is also subject to an annual program fee. These fees are typically increased annually. A waiver of user fees may be obtained under certain limited circumstances. Additionally, no user fees are assessed on BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

Once a BLA has been submitted, the FDA's goal is to review standard applications within ten months after it accepts the application for filing, or, if the application qualifies for priority review, six months after the FDA accepts the application for filing. Priority review designation will direct overall attention and resources to the evaluation of applications for products that, if approved, would be significant improvements in the safety or effectiveness of the treatment, diagnosis, or prevention of serious conditions. In both standard and priority reviews, the review process is often significantly extended by FDA requests for additional information or clarification. The FDA reviews a BLA to determine, among other things, whether a product is safe, pure and potent and the facility in which it is manufactured, processed, packed, or held meets standards designed to assure the product's continued safety, purity and potency. The FDA may convene an advisory committee to provide clinical insight on application review questions. Before approving a BLA, the FDA will typically inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP and adequate to assure consistent production of the product within required specifications. Additionally, before approving a BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. If the FDA determines that the application, manufacturing process or manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information. Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

After the FDA evaluates a BLA and conducts inspections of manufacturing facilities where the investigational product and/or its drug substance will be produced, the FDA may issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A Complete Response Letter will describe all of the deficiencies that the FDA has identified in the BLA, except that where the FDA determines that the data supporting the application are inadequate to support approval, the FDA may issue the Complete Response Letter without first conducting required inspections, testing submitted product lots, and/or reviewing proposed labeling. In issuing the Complete Response Letter, the FDA may recommend actions that the applicant might take to place the BLA in condition for approval, including requests for additional information or clarification. The FDA may delay or refuse approval of a BLA if applicable regulatory criteria are not satisfied, require additional testing or information and/or require post-marketing testing and surveillance to monitor safety or efficacy of a product.

If regulatory approval of a product is granted, such approval will be granted for particular indications and may entail limitations on the indicated uses for which such product may be marketed. For example, the FDA may approve the BLA with a REMS to ensure the benefits of the product outweigh its risks. A REMS is a safety strategy to manage a known or potential serious risk associated with a medicine and to enable patients to have continued access to such medicines by managing their safe use, and could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries, and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. Once approved, the FDA may withdraw the product approval if compliance with pre- and post-marketing requirements is not maintained or if problems occur after the product reaches the marketplace. The FDA may require one or more Phase IV post-market studies and surveillance to further assess and monitor the product's safety and effectiveness after commercialization, and may limit further marketing of the product based on the results of

these post-marketing studies. In addition, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could impact the timeline for regulatory approval or otherwise impact ongoing development programs. For example, in December 2016, the 21st Century Cures Act was signed into law. The Act is intended, among other things, to modernize the regulation of drugs and biologics and to spur innovation.

Expedited development and review programs

A sponsor may seek approval of its product candidate under programs designed to accelerate FDA's review and approval of new drugs and biological products that meet certain criteria. Specifically, new drugs and biological products are eligible for fast track designation if they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. For a fast track product, the FDA may consider sections of the BLA for review on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the application, the FDA agrees to accept sections of the application and determines that the schedule is acceptable and the sponsor pays any required user fees upon submission of the first section of the application. A fast track designated product candidate may also qualify for priority review, under which the FDA sets the target date for FDA action on the BLA at six months after the FDA accepts the application for filing. Priority review is granted when there is evidence that the proposed product would be a significant improvement in the safety or effectiveness of the treatment, diagnosis, or prevention of a serious disease or condition. If criteria are not met for priority review, the application is subject to the standard FDA review period of 10 months after FDA accepts the application for filing. Priority review designation does not change the scientific/medical standard for approval or the quality of evidence necessary to support approval.

Under the accelerated approval program, the FDA may approve a BLA on the basis of either a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. Post-marketing studies or completion of ongoing studies after marketing approval are generally required to verify the biologic's clinical benefit in relationship to the surrogate endpoint or ultimate outcome in relationship to the clinical benefit. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product. FDA may withdraw approval of a drug or indication approved under accelerated approval if, for example, the confirmatory trial fails to verify the predicted clinical benefit of the product.

In addition, the Food and Drug Administration Safety and Innovation Act, or the FDASIA, which was enacted and signed into law in 2012, established the breakthrough therapy designation. A sponsor may seek FDA designation of its product candidate as a breakthrough therapy if the product candidate is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the therapy may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. If the FDA designates a breakthrough therapy, it may take actions appropriate to expedite the development and review of the application, which may include holding meetings with the sponsor and the review team throughout the development of the therapy; providing timely advice to, and interactive communication with, the sponsor regarding the development of the drug to ensure that the development program to gather the nonclinical and clinical data necessary for approval is as efficient as practicable; involving senior managers and experienced review staff, as appropriate, in a collaborative, cross-disciplinary review; assigning a cross-disciplinary project lead for the FDA review team to facilitate an

efficient review of the development program and to serve as a scientific liaison between the review team and the sponsor; and considering alternative clinical trial designs when scientifically appropriate, which may result in smaller trials or more efficient trials that require less time to complete and may minimize the number of patients exposed to a potentially less efficacious treatment. Breakthrough therapy designation comes with all of the benefits of fast track designation, which means that the sponsor may file sections of the BLA for review on a rolling basis if certain conditions are satisfied, including an agreement with the FDA on the proposed schedule for submission of portions of the application and the payment of applicable user fees before the FDA may initiate a review.

Fast Track designation, priority review and breakthrough therapy designation do not change the standards for approval but may expedite the development or approval process. Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Orphan drug designation and exclusivity

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biologic intended to treat a rare disease or condition, defined as a disease or condition with a patient population of fewer than 200,000 individuals in the United States, or a patient population greater than 200,000 individuals in the United States and when there is no reasonable expectation that the cost of developing and making available the drug or biologic in the United States will be recovered from sales in the United States for that drug or biologic. Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA.
If a product that has orphan drug designation subsequently receives the first FDA approval for a particular active ingredient for the disease for which it has such designation, the product is entitled to orphan product exclusivity, which means that the FDA may not approve any other applications, including a full BLA, to market the same biologic for the same indication for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity or if the FDA finds that the holder of the orphan drug exclusivity has not shown that it can assure the availability of sufficient quantities of the orphan drug to meet the needs of patients with the disease or condition for which the drug was designated. Orphan drug exclusivity does not prevent the FDA from approving a different drug or biologic for the same disease or condition, or the same drug or biologic for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the BLA application user fee.

A designated orphan drug many not receive orphan drug exclusivity if it is approved for a use that is broader than the indication for which it received orphan designation. In addition, orphan drug exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or, as noted above, if the second applicant demonstrates that its product is clinically superior to the approved product with orphan exclusivity or the manufacturer of the approved product is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition. We plan to seek orphan drug designation for some or all of our product candidates in specific orphan indications in which there is a medically plausible basis for the use of these products.

Post-approval requirements

Any products manufactured or distributed by us pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to record-keeping, reporting of adverse experiences, periodic reporting, product sampling and distribution, and advertising and promotion of the product. After approval, most changes to the approved product, such as adding new

indications or other labeling claims, are subject to prior FDA review and approval. There also are continuing, annual program fees for any marketed products. Biologic manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP, which impose certain procedural and documentation requirements upon us and our third-party manufacturers. Changes to the manufacturing process are strictly regulated, and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMP and impose reporting requirements upon us and any third-party manufacturers that we may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market studies or clinical studies to assess new safety risks; or imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical studies;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of product license approvals;
- product seizure or detention, or refusal to permit the import or export of products;
- consent decrees, corporate integrity agreements, debarment or exclusion from federal healthcare programs;
- mandated modification of promotional materials and labeling and the issuance of corrective information;
- the issuance of safety alerts, Dear Healthcare Provider letters, press releases and other communications containing warnings or other safety information about the product; or
- injunctions or the imposition of civil or criminal penalties.

The FDA closely regulates the marketing, labeling, advertising and promotion of biologics. A company can make only those claims relating to safety and efficacy, purity and potency that are approved by the FDA and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe legally available products for uses that are not described in the product's labeling and that differ from those tested by us and approved by the FDA. Such off-label uses are common across medical specialties. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict manufacturer's communications on the subject of off-label use of their products.

Biosimilars and exclusivity

The Affordable Care Act, signed into law in 2010, includes a subtitle called the BPCIA, which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an

FDA-licensed reference biological product. The FDA has issued several guidance documents outlining an approach to review and approval of biosimilars.

Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency, can be shown through analytical studies, animal studies, and a clinical study or studies. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. However, complexities associated with the larger, and often more complex, structures of biological products, as well as the processes by which such products are manufactured, pose significant hurdles to implementation of the abbreviated approval pathway that are still being worked out by the FDA.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing that applicant's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. At this juncture, it is unclear whether products deemed "interchangeable" by the FDA will, in fact, be readily substituted by pharmacies, which are governed by state pharmacy law.

A biological product can also obtain pediatric market exclusivity in the United States. Pediatric exclusivity, if granted, adds six months to existing exclusivity periods and patent terms. This six-month exclusivity, which runs from the end of other exclusivity protection or patent term, may be granted based on the voluntary completion of a pediatric study in accordance with an FDA-issued "Written Request" for such a study.

The BPCIA is complex and continues to be interpreted and implemented by the FDA. In addition, government proposals have sought to reduce the 12-year reference product exclusivity period. Other aspects of the BPCIA, some of which may impact the BPCIA exclusivity provisions, have also been the subject of recent litigation. As a result, the ultimate impact, implementation, and impact of the BPCIA is subject to significant uncertainty.

Genetically engineered food products

In the United States, the FDA and the USDA are primarily responsible for overseeing food regulation and safety, although many other federal agencies also play a role in food regulation.

USDA has jurisdiction over certain genetically engineered crops through the Animal and Plant Health Inspection Services, or APHIS. Under the Plant Protection Act and APHIS' Part 340 regulations, USDA requires anyone who wishes to import, transport interstate, or release into the environment a "regulated article" to apply for a permit or, in some cases, notify APHIS that the introduction will be made. Regulated articles are defined as "any organism which has been altered or produced through genetic engineering … which USDA determines is a plant pest or has reason to believe is a plant pest." Regulated articles may be subject to extensive regulation, including both permitting requirements and inspections. However, to the extent products are subject to APHIS regulation, APHIS may make a determination of nonregulated status for a product following the submission of a petition requesting such a determination. The petition process can be a multi-year process that varies based on a number of factors, including APHIS's familiarity with similar products, the type and scope of the

environmental review conducted, and the number and types of public comments received. APHIS conducts a comprehensive science-based review of the petition to assess, among other things, plant pest risk, environmental considerations pursuant to the National Environmental Policy Act of 1969, or NEPA, and any potential impact on endangered species. If, upon the completion of the review, APHIS grants the petition, the product is no longer deemed a “regulated article” and the petitioner may commercialize the product, subject to any conditions set forth in the decision. In January 2017, APHIS proposed significant amendments to its Part 340 regulatory framework that would, among other things, clarify the types of genetically engineered plants subject to regulation thereunder. In November 2017, however, APHIS withdrew its proposed rule and stated that it would “begin a fresh stakeholder engagement aimed at exploring alternative policy approaches.” That process appears to remain ongoing.

On May 4, 2018, the USDA issued a proposed rule implementing the National Bioengineered Food Disclosure Standard, with a proposed compliance date of January 1, 2020. Under this proposed rule, the label of a bioengineered, or BE, food must include a disclosure that the food is a BE food or contains a BE ingredient, with certain exceptions. This proposed rule defines BE food as “a food that contains genetic material that was has been modified through in vitro recombinant deoxyribonucleic acid, or DNA, techniques and for which the modification could not otherwise be obtained through conventional breeding or found in nature,” except in the case of an incidental additive present in food at an insignificant level and that does not have any technical or functional effect in the food. The USDA’s proposed rule may change significantly prior to being finalized.

The FDA’s oversight of food safety and security is primarily carried out by the Center for Food Safety and Applied Nutrition. To execute its responsibilities, the FDA conducts inspections and collects and analyzes product samples. Foods are typically not subject to premarket review and approval requirements, with limited exceptions, such as the requirement for premarket review and approval of food additives. Under Section 201(s) and 409 of the FDCA, any substance that is reasonably expected to become a component of food is considered a “food additive” that is subject to premarket approval by the FDA, unless it is already subject to a food additive regulation. Ingredients that are GRAS are exempt from the definition of food additive and from the premarket approval requirements. Under section 201(s), and FDA’s implementing regulations, the use of a food substance may be GRAS either through a determination by qualified experts or, for a substance used in food before 1958, through experience based on common use in food.

Manufacturers of GRAS substances may voluntarily provide the FDA with a notification of GRAS determination, which includes, among other things, a description of the substance, the applicable conditions of use, the dietary exposure and an explanation of how the substance was determined to be safe for the intended use. Upon review of such a notification, the FDA may respond with a “no questions” letter stating that while it has not made its own GRAS determination, it has no questions at the time regarding the applicant’s own GRAS determination. Alternatively, manufacturers may self-affirm that a given substance is GRAS without the voluntary FDA notification. A company may market a new food ingredient based on its independent determination that the substance is GRAS; however, the FDA can disagree with this determination and take enforcement action.

The FDA regulates foods made with genetically modified organisms under the approach summarized in its 1992 “Statement of Policy: Foods Derived from New Plant Varieties.” Under this policy, updated in 2017, the FDA regulates foods derived from genetically modified plant varieties consistent with the framework for non-genetically modified foods. Under this framework, the FDA offers a voluntary consultation process to determine whether a food derived from a genetically modified plant variety raises any safety or other regulatory issues, such as whether any substance in the food from the plant may require premarket approval as a food additive.

Other U.S. healthcare laws and compliance requirements

In the United States, our activities are potentially subject to regulation under various federal and state healthcare laws including, among others, the federal Anti-Kickback Statute, the federal False Claims Act and HIPAA.

The U.S. federal Anti-Kickback Statute prohibits, among other things, any person or entity, from knowingly and willfully offering, paying, soliciting or receiving any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or in return for purchasing, leasing, ordering or arranging for the purchase, lease or order of any item or service reimbursable under Medicare, Medicaid or other federal healthcare programs. The term remuneration has been interpreted broadly to include anything of value. A person does not need to have knowledge of the statute or specific intent to violate it to have committed a violation. In addition, the government may assert that a claim including items or services resulting from a violation of the U.S. federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act.

The U.S. federal civil and criminal false claims laws and civil monetary penalties laws, including the civil False Claims Act, which can be enforced through civil whistleblower or qui tam actions, prohibits, among other things, any person or entity from knowingly presenting, or causing to be presented, a false claim for payment to, or approval by, the federal government or knowingly making, using, or causing to be made or used a false record or statement material to a false or fraudulent claim to the federal government, or from knowingly making a false statement to avoid, decrease or conceal an obligation to pay money to the U.S. government.

The U.S. Health Insurance Portability and Accountability Act of 1996, or HIPAA, created additional federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud or to obtain, by means of false or fraudulent pretenses, representations or promises, any money or property owned by, or under the control or custody of, any healthcare benefit program, including private third-party payors and knowingly and willfully falsifying, concealing or covering up by trick, scheme or device, a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services. Similar to the U.S. federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation.

HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their implementing regulations, impose obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information without appropriate authorization by covered entities subject to the rule, such as health plans, healthcare clearinghouses and certain healthcare providers, as well as their business associates that perform certain services for or on their behalf involving the use or disclosure of individually identifiable health information.

Additionally, the federal Physician Payments Sunshine Act, and its implementing regulations, require that certain manufacturers of drugs, devices, biological and medical supplies for which payment is available under Medicare, Medicaid or the Children’s Health Insurance Program (with certain exceptions) to report annually to CMS information related to certain payments or other transfers of value made or distributed to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, or to entities or individuals at the request of, or designated on behalf of, the physicians and teaching hospitals and to report annually to CMS certain ownership and investment interests held by physicians and their immediate family members.

Moreover, analogous state and non-U.S. laws and regulations may apply to our activities, such as state anti-kickback and false claims laws, which may apply to our business practices, including, but not limited to, research, distribution, sales and marketing arrangements and claims involving healthcare items or services

reimbursed by non-governmental third-party payors, including private insurers, or by the patients themselves, state laws that require pharmaceutical and device companies to comply with the industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the U.S. government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources, state laws and regulations that require manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures and pricing information, state and local laws which require the registration of pharmaceutical sales representatives and state and non-U.S. laws, such as the EU General Data Protection Regulation 2016/679, governing the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts.

Efforts to ensure that current and future business arrangements with third parties complies with applicable healthcare laws and regulations involves substantial costs. If a business is found to be in violation of any of these or any other health regulatory laws that may apply to it, it may be subject to significant penalties, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgement, individual imprisonment, possible exclusion from participation in Medicare, Medicaid and other U.S. healthcare programs, additional reporting requirements and oversight if subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, contractual damages, reputational harm, diminished profits and future earnings, and curtailment or restructuring of operations.

Coverage, pricing and reimbursement

Significant uncertainty exists as to the coverage and reimbursement status for newly approved therapeutics. In the United States and markets in other countries, sales of any products for which we receive regulatory approval for commercial sale will depend, in part, on the extent to which third-party payors provide coverage, and establish adequate reimbursement levels for such products. In the United States, third-party payors include federal and state healthcare programs, private managed care providers, health insurers and other organizations. Third-party payors may limit coverage to specific products on an approved list, or also known as a formulary, which might not include all of the FDA-approved products for a particular indication. A payor's decision to provide coverage for a product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a product does not assure that other payors will also provide coverage for the product. Moreover, the coverage provided may be more limited than the purposes for which the product is approved by the FDA. It is also possible that a third-party payor may consider a product as substitutable and only offer to reimburse patients for the less expensive product. Adequate third-party payor reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development. Coverage policies and third-party payor reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

Healthcare reform

In the United States and some foreign jurisdictions, there have been, and continue to be, several legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of product candidates, restrict or regulate post-approval activities, and affect the ability to profitably sell product candidates for which marketing approval is obtained. Among policy makers and payors in the United States and elsewhere, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. The Patient

Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, collectively the Affordable Care Act, enacted in March 2010, has substantially changed healthcare financing and delivery by both governmental and private insurers. Among other things the Affordable Care Act included the following provisions:

- an annual, nondeductible fee on any entity that manufactures or imports certain specified branded prescription drugs and biologic agents apportioned among these entities according to their market share in some government healthcare programs;
- an increase in the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program;
- a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts, which through subsequent legislative amendments, will be increased to 70%, starting in 2019, off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturers' outpatient drugs to be covered under Medicare Part D;
- extension of manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations;
- expansion of eligibility criteria for Medicaid programs;
- expansion of the entities eligible for discounts under the 340B Drug Discount Program;
- a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research;
- a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted, or injected; and
- a licensure framework for follow on biologic products.

Some of the provisions of the Affordable Care Act have yet to be implemented, and there have been legal and political challenges to certain aspects of the Affordable Care Act. Since January 2017, President Trump has signed two executive orders and other directives designed to delay, circumvent, or loosen certain requirements mandated by the Affordable Care Act. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the Affordable Care Act. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the Affordable Care Act have been signed into law. The Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the Affordable Care Act on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Additionally, on January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain Affordable Care Act-mandated fees, including the so-called "Cadillac" tax on certain high cost employer-sponsored insurance plans, the annual fee imposed on certain health insurance providers based on market share. Further, the Bipartisan Budget Act of 2018, among other things, amends the Affordable Care Act, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole." More recently, in July 2018, CMS published a final rule permitting further collections and payments to and from certain Affordable Care Act qualified health plans and health insurance issuers under the Affordable Care Act risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment.

In addition, other legislative changes have been proposed and adopted since the Affordable Care Act was enacted. On August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, created the Joint Select Committee on Deficit Reduction to recommend to Congress proposals for spending reductions. The Joint Select Committee did not achieve a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, triggering the legislation's automatic reduction to several government programs. This includes reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2027 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Further, there has been heightened governmental scrutiny recently over pharmaceutical pricing practices in light of the rising cost of prescription drugs and biologics. Such scrutiny has resulted in several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for pharmaceutical products, some of which are included in the Trump administration's budget proposal for fiscal year 2019. Additionally, the Trump administration released a "Blueprint" to lower drug prices and reduce out of pocket costs of drugs that contains additional proposals to increase manufacturer competition, increase the negotiating power of certain federal healthcare programs, incentivize manufacturers to lower the list price of their products and reduce the out of pocket costs of drug products paid by consumers. The U.S. Department of Health and Human Services has begun the process of soliciting feedback on some of these measures and, at the same, is immediately implementing others under its existing authority. Although a number of these, and other potential, proposed measures will require authorization through additional legislation to become effective, Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control drug costs. At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical product and medical device pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and medical devices to purchase and which suppliers will be included in their prescription drug and other healthcare programs.

Additionally, on May 30, 2018, the Right to Try Act was signed into law. The law, among other things, provides a federal framework for certain patients to access certain investigational new drug products that have completed a Phase 1 clinical trial and that are undergoing investigation for FDA approval. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA permission under the FDA expanded access program. There is no obligation for a drug manufacturer to make its drug products available to eligible patients as a result of the Right to Try Act.

Facilities

We currently occupy approximately 49,000 square feet of office and laboratory space at our corporate headquarters in Durham, North Carolina under a lease that expires in 2024. This lease provides us the option to lease an additional 20,000 square feet of office space. We also occupy approximately 15,500 square feet of laboratory and office space in Research Triangle Park, North Carolina under a lease that expires in 2026, and we occupy approximately 17,300 square feet of laboratory and office space in Research Triangle Park, North

Carolina under a lease that expires in 2026. We believe that our facilities are sufficient to meet our current needs and that suitable additional space will be available as and when needed.

Employees

As of December 31, 2018, we had 127 full-time Precisioneers, over half of whom have advanced degrees, including 49 with Ph.D. degrees. Of these full-time employees, 94 are engaged in research and development activities. None of our employees is represented by a labor union or covered by a collective bargaining agreement. We consider our relationships with our employees to be good.

Legal proceedings

We are not currently party to any material legal proceedings.

Management

Executive officers and directors

The following table sets forth the name, age and position of each of our executive officers and directors as of the date of this prospectus.

Name	Age	Position
Executive officers		
Matthew Kane	42	President, Chief Executive Officer and Director
Derek Jantz, Ph.D.	43	Chief Scientific Officer and Director
Abid Ansari	41	Chief Financial Officer
Fayaz Khazi, Ph.D.	46	Chief Executive Officer, Elo Life Systems
David Thomson, Ph.D.	58	Chief Development Officer
Non-employee directors		
Robert Adelman, M.D.	55	Director
Shalini Sharp	44	Director
Tony Yao, M.D., Ph.D.	47	Director

(1) Member of the audit committee.

(2) Member of the compensation committee.

(3) Member of the nominating and corporate governance committee.

Executive officers

Matthew Kane, a co-founder of Precision, has served as our President and Chief Executive Officer and a director since our inception in 2006. Mr. Kane has nearly 20 years of experience in the life sciences industry, most of which has been spent specifically working in genome editing. Prior to co-founding Precision, Mr. Kane was with Suros Surgical Systems. Mr. Kane received a B.S. in mechanical engineering and an M.S. in biomedical engineering from the Rose-Hulman Institute of Technology and an M.B.A. from Duke University.

We believe that Mr. Kane is qualified to serve on our board of directors because of the perspective and experience he provides as one of our founders and as our President and Chief Executive Officer, as well as his many years of experience within the life sciences and agricultural biotechnology industries.

Derek Jantz, *Ph.D.*, a co-founder of Precision, has been our Chief Scientific Officer since August 2013 and has served on our board of directors since January 2006. He previously served as our Vice President of Scientific Development from our inception to August 2013. Dr. Jantz is the co-inventor of several of our foundational patents and other intellectual property. As a protein engineer, he was an early developer of zinc finger technology and has spent most of his research career designing proteins for genome editing applications. Dr. Jantz received a B.A. in biology from the University of Colorado at Boulder and a Ph.D. in biophysics from the Johns Hopkins University School of Medicine.

We believe that Dr. Jantz's extensive experience in genome editing and as an inventor of ARCUS, in addition to his perspective as one of our founders and senior executives, qualifies him to serve on our board of directors.

Abid Ansari has served as our Chief Financial Officer since February 2019. Mr. Ansari previously served as our Vice President, Finance & Operations from July 2016 to February 2019. Prior to joining us, Mr. Ansari served as Senior Director, Deal Finance and M&A from November 2013 to July 2016 and Senior Director, Head of Portfolio

Analysis Group from September 2011 to November 2013 for GlaxoSmithKline plc. Before that, he served for five years in commercial and capital finance roles at MedImmune, LLC and three years as a plant controller at Uniqema (previously a division of Imperial Chemical Industries Plc). Mr. Ansari received a B.S. in chemical engineering and an M.B.A. from Purdue University. Mr. Ansari is also a Certified Public Accountant.

Fayaz Khazi, *Ph.D.*, has served as the CEO of our food-focused subsidiary, Elo Life Systems, since May 2018 and, prior to that, served as President of Elo Life Systems beginning in May 2017. From May 2014 to April 2017, Dr. Khazi served as the CEO of Key Gene USA. Dr. Khazi also held several executive leadership positions at Intrexon Corporation directing translation programs in the food, human health and agricultural biotechnology sectors, including serving as Vice President, Business Analytics and Strategy from January 2012 to January 2014, and also serving as Intrexon's founding Director of Translational Medicine. Dr. Khazi received a B.Sc. from the University of Agricultural Sciences, Bangalore, and a Ph.D. in biological sciences from Auburn University. He trained as a Howard Hughes Medical Institute post-doctoral fellow and a senior researcher at the Children's Hospital of Philadelphia, where he studied the genotoxicity of gene therapy vectors and developed *in vivo* genome-editing technologies to treat genetic diseases.

David Thomson, Ph.D., has served as our Chief Development Officer since June 2017. Prior to joining us, he served as Senior Vice President Research and Nonclinical Development for Shire plc beginning in May 2016 until May 2017 where he was responsible for the strategy and operational direction of the Global Research and Nonclinical Development Organization, including transitioning programs from research into clinical development and support of programs through commercialization. Prior to that, he served as Senior Vice President and Global Head, Research and Development Operations for Shire from February 2015 to May 2016. From May 2014 to January 2015, Dr. Thomson served as the Director of the Biomanufacturing Research Institute and Technology Enterprise and a Professor in the Department of Pharmaceutical Sciences of North Carolina Central University. From September 2012 to April 2014, Dr. Thomson served as Vice President, Shire Human Genetic Therapies and later Senior Vice President, Global Head of Research and Nonclinical Development for Shire plc. He received a B.Sc. in chemistry from the University of Strathclyde and a Ph.D. in organic chemistry from the University of Toronto, and he completed post-doctoral work at Yale University.

Non-employee directors

Robert Adelman, M.D., has served on our board of directors since April 2015. Since 2011, Dr. Adelman has been Managing Partner of venBio Partners LLC, a venture capital firm Dr. Adelman founded in 2011. Dr. Adelman currently serves on the board of directors of Metacrine, Inc., ALX Oncology and TP Therapeutics, Inc. Prior to founding venBio, Dr. Adelman had a seven-year tenure as a Private Equity Partner at OrbiMed Advisors LLC. Dr. Adelman has also previously co-founded a number of biotechnology companies and practiced surgery in New York and New Jersey. Dr. Adelman received a B.A. in biochemistry from the University of California at Berkeley and a M.D. from Yale University, and he completed his residency at Cornell University Medical Center.

We believe that Dr. Adelman's medical background and experience in the venture capital industry, particularly with biotechnology and pharmaceutical companies, qualify him to serve as a member of our board of directors.

Shalini Sharp has served on our board of directors since December 2018. Since 2012, Ms. Sharp has served as Executive Vice President and Chief Financial Officer of Ultragenyx Pharmaceutical Inc., a biopharmaceutical company. Between May 2012 and January 2016, she served as Senior Vice President of Ultragenyx. Prior to Ultragenyx, Ms. Sharp served in various executive capacities, and ultimately as Chief Financial Officer, of Agenus Inc., a biotechnology company, from August 2003 until May 2012. Ms. Sharp currently serves on the board of directors of Array BioPharma Inc. and Sutro Biopharma, Inc. and previously served on the board of directors of Agenus, Inc. from May 2012 to June 2018. Ms. Sharp received a B.A. in English literature and an M.B.A. from Harvard University.

We believe that Ms. Sharp's more than 20 years of experience in the life sciences industry including both executive and board roles as well as her expertise in biotechnology, corporate strategy and finance qualify her to serve as a member of our board of directors.

Tony Yao, M.D., Ph.D., has served on our board of directors since May 2018. Since April 2012, Dr. Yao has served as a portfolio manager at ArrowMark Partners, where he leads the healthcare team and manages the healthcare portfolio. Dr. Yao currently serves on the board of directors of 4D Molecular Therapeutics, Inc. and NexImmune, Inc. Dr. Yao began his investment career in February 2002 as an analyst and later an assistant portfolio manager at Janus Capital Group. Dr. Yao received a B.Sc. in biochemistry from Brown University and a M.D. and Ph.D. in immunology from Stanford University.

We believe that Dr. Yao's medical background and experience in private equity investing, particularly with healthcare companies, qualify him to serve as a member of our board of directors.

Board composition and election of directors

The primary responsibility of our board of directors is to provide oversight, strategic guidance, counseling and direction to our management. Our board of directors meets on a regular basis and additionally as required. Our board of directors currently consists of five directors. The members of our board of directors were elected in compliance with the provisions of our amended and restated certificate of incorporation in effect at such time and an amended and restated voting agreement, which we refer to as our voting agreement, among us and certain of our stockholders. Our voting agreement will terminate upon the closing of this offering and none of our stockholders will have any special rights regarding the election or designation of members of our board of directors following the closing of this offering. See "Certain relationships and related party transactions—Voting agreement" for a discussion of our voting agreement.

Director independence

Our board of directors currently consists of five members. Our board of directors has determined that, of our five directors, and do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and that each of these directors is "independent" as that term is defined under the applicable listing rules of The Nasdaq Stock Market LLC, or the Nasdaq rules. There are no family relationships among any of our directors or executive officers.

Classified board of directors

In accordance with our amended and restated certificate of incorporation that will go into effect upon the closing of this offering, our board of directors will be divided into three classes with staggered, three-year terms. At each annual meeting of stockholders, the successors to directors whose terms then expire will be elected to serve from the time of election and qualification until the third annual meeting following election. Effective upon the closing of this offering, our directors will be divided among the three classes as follows:

- the Class I directors will be , and , and their terms will expire at our first annual meeting of stockholders following this offering;
- the Class II directors will be , and , and their terms will expire at our second annual meeting of stockholders following this offering; and

- the Class III directors will be , and , and their terms will expire at the third annual meeting of stockholders following this offering.

Our amended and restated certificate of incorporation and amended and restated bylaws that will go into effect upon the closing of this offering will provide that the authorized number of directors may be changed only by resolution of the board of directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors. The division of our board of directors into three classes with staggered three-year terms may delay or prevent a change of our management or a change in control of our company. Our directors may be removed only for cause by the affirmative vote of the holders of at least two-thirds of our outstanding voting stock entitled to vote in the election of directors.

Role of the board in risk oversight

One of the key functions of our board of directors is informed oversight of our risk management process. Our board of directors does not have a standing risk management committee, but rather administers this oversight function directly through our board of directors as a whole, as well as through various standing committees of our board of directors that address risks inherent in their respective areas of oversight. In particular, our board of directors is responsible for monitoring and assessing strategic risk exposure and our audit committee has the responsibility to consider and discuss our major financial risk exposures and the steps our management has taken to monitor and control these exposures, including guidelines and policies to govern the process by which risk assessment and management are undertaken. Our audit committee also monitors compliance with legal and regulatory requirements. Our nominating and corporate governance committee monitors the effectiveness of our corporate governance practices, including whether they are successful in preventing illegal or improper liability-creating conduct. Our compensation committee assesses and monitors whether any of our compensation policies and programs has the potential to encourage excessive risk-taking. While each committee is responsible for evaluating certain risks and overseeing the management of such risks, our entire board of directors is regularly informed through committee reports about such risks.

Board committees

Our board of directors has established three standing committees—audit, compensation, and nominating and corporate governance—each of which operates under a charter that has been approved by our board of directors. Upon our listing on The Nasdaq Global Market, each committee's charter will be available under the Corporate Governance section of our website at www.precisionbiosciences.com. The reference to our website address does not constitute incorporation by reference of the information contained at or available through our website, and you should not consider it to be a part of this prospectus.

Audit committee

Our audit committee's responsibilities include:

- appointing, approving the compensation of and assessing the independence of our registered public accounting firm;
- overseeing the work of our independent registered public accounting firm, including through the receipt and consideration of reports from such firm;
- reviewing and discussing with management and our independent registered public accounting firm our annual and quarterly financial statements and related disclosures;

- coordinating our board of directors' oversight of our internal control over financial reporting, disclosure controls and procedures and code of business conduct and ethics;
- establishing procedures for the receipt, retention and treatment of complaints we receive regarding financial controls, accounting or auditing matters and other matters;
- discussing our risk management policies;
- meeting independently with our internal auditing staff, if any, independent registered public accounting firm and management;
- reviewing on a periodic basis our investment policy;
- reviewing and approving or ratifying any related person transactions; and
- preparing the audit committee report required by SEC rules.

The members of our audit committee are , and . serves as the chairperson of the committee. All members of our audit committee meet the requirements for financial literacy under the Nasdaq rules. Our board of directors has determined that and meet the independence requirements of Rule 10A-3 under the Exchange Act and the applicable Nasdaq rules. Our board of directors has determined that is an "audit committee financial expert" as defined by applicable SEC rules and has the requisite financial sophistication as defined under the applicable Nasdaq rules.

Compensation committee

Our compensation committee's responsibilities include:

- reviewing and approving, or recommending for approval by the board of directors, the compensation of our CEO and our other executive officers;
- overseeing and administering our cash and equity incentive plans;
- reviewing and making recommendations to our board of directors with respect to director compensation;
- reviewing and discussing annually with management our "Compensation discussion and analysis," to the extent required; and
- preparing the annual compensation committee report required by SEC rules, to the extent required.

The members of our compensation committee are , and . serves as the chairperson of the committee. Our board of directors has determined that each of , and is independent under the applicable Nasdaq rules, including the Nasdaq rules specific to membership on our compensation committee, and is a "non-employee director" as defined in Rule 16b-3 promulgated under the Exchange Act.

Nominating and corporate governance committee

Our nominating and corporate governance committee's responsibilities include:

- identifying individuals qualified to become board members;
- recommending to our board of directors the persons to be nominated for election as directors and to each board committee;

- developing and recommending to our board of directors corporate governance guidelines, and reviewing and recommending to our board of directors proposed changes to our corporate governance guidelines from time to time; and
- overseeing a periodic evaluation of our board of directors.

The members of our nominating and corporate governance committee are , and .. serves as the chairperson of the committee. Our board of directors has determined that , and are independent under the applicable Nasdaq rules.

Compensation committee interlocks and insider participation

No member of our compensation committee is or has been our current or former officer or employee. None of our executive officers served as a director or a member of a compensation committee (or other committee serving an equivalent function) of any other entity, one of whose executive officers served as a director or member of our compensation committee during the fiscal year ended December 31, 2018.

Code of ethics and code of conduct

We have adopted a written code of business conduct and ethics that applies to our directors, officers and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. Upon our listing on The Nasdaq Global Market, our code of business conduct and ethics will be available under the Corporate Governance section of our website at www.precisionbiosciences.com. In addition, we intend to post on our website all disclosures that are required by law or the Nasdaq rules concerning any amendments to, or waivers from, any provision of the code. The reference to our website address does not constitute incorporation by reference of the information contained at or available through our website, and you should not consider it to be a part of this prospectus.

Executive compensation

This section discusses the material components of our 2018 compensation program for our principal executive officer and next two most highly compensated executive officers who are named in the Summary compensation table below. These “named executive officers” and their positions are:

- Matthew Kane, President and Chief Executive Officer;
- Abid Ansari, Chief Financial Officer; and
- David Thomson, Chief Development Officer.

This discussion may contain forward-looking statements that are based on our current plans, considerations, expectations and determinations regarding future compensation programs. Actual compensation programs that we adopt following the completion of this offering may differ materially from the currently planned programs summarized in this discussion.

Summary compensation table

The following table sets forth information concerning the compensation of our named executive officers for the years ended December 31, 2017 and 2018:

Name and principal position	Year	Salary ($)	Bonus ($)(1)	Option awards ($)(2)	All other compensation($)	Total ($)
Matthew Kane President and Chief Executive Officer	2018 2017	350,000 350,000	157,500 124,900	1,068,616 18,041	11,016(3) 8,863	1,587,131 501,804
Abid Ansari Chief Financial Officer(4)	2018	250,000	87,500	1,068,616	10,048(5)	1,416,164
David Thomson Chief Development Officer	2018 2017	355,000 176,346	124,250 176,000	1,367,919 173,178	11,000(6) 16,962	1,858,169 542,486

(1) The amounts reported represent bonuses based upon our board’s assessment of the achievement of company and individual performance objectives for 2018, which were paid in January 2019.

(2) The amounts reported reflect the grant date fair value of stock options computed in accordance with Accounting Standards Codification 718, Compensation—Stock Compensation, or ASC 718, rather than the amounts paid to or realized by the named individual. We provide information regarding the assumptions used to calculate the value of the option awards in Note 7 to our consolidated financial statements included in this prospectus.

(3) The amount reported includes 401(k) matching contributions by us of $11,000 and tax gross-ups of $16 in connection with nondiscriminatory wellness reimbursements for 2018.

(4) Mr. Ansari was not one of our named executive officers in 2017, and accordingly, compensation information for 2017 is not included in the table above.

(5) The amount reported includes 401(k) matching contributions by us of $10,000 and tax gross-ups of $48 in connection with nondiscriminatory wellness reimbursements.

(6) The amount reported in 2018 represents 401(k) matching contributions by us of $11,000.

Annual base salaries

Our named executive officers receive a base salary to compensate them for services rendered to us. The base salary payable to each named executive officer is intended to provide a fixed component of compensation reflecting the executive’s skill set, experience, role and responsibilities. None of our named executive officers is currently party to an employment agreement or other agreement or arrangement that provides for automatic

or scheduled increases in base salary. The following table shows the annual base salaries for 2017, 2018 and 2019 of our named executive officers:

Name and principal position	2017 Base salary ($)	2018 Base salary ($)	2019 Base salary ($) (1)
Matthew Kane President and Chief Executive Officer	350,000	350,000	523,000
Abid Ansari Chief Financial Officer	235,000	250,000	316,000
David Thomson Chief Development Officer	350,000	355,000	370,000

(1) These amounts reflect base salaries effective upon the effectiveness of the registration statement of which this prospectus forms a part. See "—Employment agreements."

Bonuses

In addition to base salaries, our named executive officers were eligible to receive a cash bonus based on company and individual performance for 2018. Pursuant to the employment arrangements entered into with our named executive officers, during 2018 Mr. Kane was eligible to receive an annual bonus of up to 30% of his base salary; Mr. Ansari was eligible to receive an annual bonus in the discretion of our board; and Dr. Thomson was eligible to receive an annual bonus of up to 35% of his base salary. In January 2019, we paid performance bonuses of $157,500 to Mr. Kane, $87,500 to Mr. Ansari and $124,250 to Dr. Thomson with respect to 2018. Upon the effectiveness of the registration statement of which this prospectus forms apart, Mr. Kane, Mr. Ansari and Dr. Thomson will be eligible to receive an annual bonus of up to 50%, 35% and 35% of their respective base salaries. See "—Employment agreements."

Equity compensation

Our equity award program is the primary vehicle for offering long-term incentives to our executives. We believe that equity awards provide our executives with a strong link to our long-term performance, create an ownership culture and help to align the interests of our executives and our stockholders. To date, we have used stock option grants for this purpose because we believe they are an effective means by which to align the long-term interests of our executive officers with those of our stockholders. The use of options also can provide tax and other advantages to our executive officers relative to other forms of equity compensation. We believe that our equity awards are an important retention tool for our executive officers, as well as for our other employees.

We award stock options broadly to our employees, including to our non-executive employees. Grants to our executives and other employees are made at the discretion of our board of directors and are not made at any specific time period during a year.

We granted the following stock options to our named executive officers during 2018 under our 2015 Plan, which is described below:

Named executive officers	Stock options granted
Matthew Kane	300,000
Abid Ansari	300,000
David Thomson	400,000

In connection with this offering, we intend to adopt our 2019 Plan to facilitate the grant of cash and equity incentives to directors, employees (including our named executive officers) and consultants of our company and

to enable our company to obtain and retain services of these individuals, which we believe are essential to our long-term success. Following the effective date of our 2019 Plan, we will not make any further grants under our 2015 Plan. However, our 2015 Plan will continue to govern the terms and conditions of the outstanding awards granted under it. For additional information about our 2019 Plan, see "—Incentive plans" below.

Retirement plans

We currently maintain the Precision BioSciences, Inc. 401(k) Plan, a defined contribution retirement savings plan, or the 401(k) Plan, for the benefit of our employees, including our named executive officers, who satisfy certain eligibility requirements. Our named executive officers are eligible to participate in the 401(k) Plan on the same terms as other full-time employees. The Code allows eligible employees to defer a portion of their compensation, within prescribed limits, on a pre-tax basis through contributions to the 401(k) Plan. We have historically matched participants' elective salary deferral contributions to the 401(k) Plan up to 50% of the first 6% of the employee's salary deferred. Matching contributions made by us vest 25% each year and are fully vested after four years. We believe that providing a vehicle for tax-deferred retirement savings though our 401(k) Plan, and making matching contributions, adds to the overall desirability of our executive compensation package and further incentivizes our employees, including our named executive officers, in accordance with our compensation policies.

Employee benefits and perquisites

Our named executive officers are eligible to participate in our employee benefit plans and programs, which include medical, dental and vision benefits, health and flexible spending accounts, life, short-term, long-term and supplemental individual disability, and supplemental insurance and wellness and tuition reimbursement to the same extent as our other full-time employees generally, subject to the terms and eligibility requirements of those plans. We also provide Messrs. Kane and Ansari and Dr. Thomson, along with certain other executive officers and senior employees, with certain supplemental disability insurance benefits. We also provide relocation benefits to our named executive officers as determined in our board's discretion.

Outstanding equity awards at 2018 fiscal year-end

The following table summarizes the number of shares of common stock underlying outstanding equity incentive plan awards for each of our named executive officers as of December 31, 2018.

	Option awards			
Name	**Number of securities underlying unexercised options (#) exercisable**	**Number of securities underlying unexercised options (#) unexercisable**	**Option exercise price ($)**	**Option expiration date**
Matthew Kane	688,888	—	0.0145	5/17/2021
	21,875	28,125(1)	0.55	3/23/2027
	—	300,000(2)	5.61	9/27/2028
Abid Ansari	168,750	131,250(3)	0.56	8/10/2026
	13,125	16,875(1)	0.55	3/23/2027
	—	300,000(2)	5.61	9/27/2028
David Thomson	187,500	312,500(1)	0.55	6/29/2027
	136,000	264,000(2)	5.61	9/27/2028

(1) Award vested as to 25% of the underlying shares on March 24, 2018 with respect to Mr. Kane, March 24, 2018 with respect to Mr. Ansari and May 31, 2018 with respect to Dr. Thomson and will vest in equal installments at the end of each three-month period over the following 36 months, subject to the named executive officer's continued employment with us.

(2) Award vests as to 25% of the underlying shares on September 28, 2019 and in equal installments at the end of each three-month period over the following 36 months for Messrs. Kane and Ansari and vested as to 34% of the underlying shares on October 12, 2018, and will vest in equal installments at the end of each three-month period over the following 24 months for Dr. Thomson, in each case subject to the named executive officer's continued employment with us.

(3) Award vested as to 25% of the underlying shares on August 11, 2017 and will vest in equal installments at the end of each three-month period over the following 36 months, subject to the named executive officer's continued employment with us.

Employment agreements

In February 2019, we entered into new employment agreements with each of our named executive officers that set forth the terms and conditions of each executive's employment with us.

Each employment agreement establishes an annual base salary for each named executive officer, which is subject to our discretionary review and adjustment in accordance with our policies, procedures and practices as they may exist from time to time provided that no named executive officer's base salary may be decreased unless the decrease is an across-the-board decrease in the base salaries of all senior management employees of our company. See "Summary compensation table—Annual base salaries" above for the base salaries in effect for 2018 and 2019. Each of our named executive officers is also eligible to receive an annual bonus in the discretion of our board. Effective as of the closing of this offering, the employment agreements with each executive officer provide for new terms for base salary and bonus potential. Mr. Kane's annual base salary will be $523,000; Mr. Ansari's annual base salary will be $316,000; and Mr. Thomson's annual base salary will be $370,000. Mr. Kane will be eligible to receive an annual bonus of up to 50% of his base salary, Mr. Ansari will be eligible to receive an annual bonus of up to 35% of his base salary, and Dr. Thomson will be eligible to receive an annual bonus of up to 35% of his base salary. The named executive officers are eligible to participate in all medical, dental and disability insurance, the 401(k), personal leave and other employee benefit plans and programs for which the named executive officer is eligible, subject to the terms and conditions of such plans and programs. Each employment agreement further provides for the reimbursement of reasonable and necessary business expenses actually incurred by the named executive officer in performing services for us.

Each named executive officer's employment agreement and employment are terminable by either the named executive officer or us without cause on 30-days' notice, or upon shorter notice by us for cause. In the event that a named executive officer's employment is terminated by us without cause or by the executive for good reason, in each case as defined in the employment agreements, then in addition to any accrued amounts and subject to such named executive officer's timely executing a release of claims and continuing to comply with obligations under his proprietary information, inventions, non-competition and non-solicitation agreement, he will be entitled to receive (1) payment of an amount equal to 12 months of the named executive officer's base salary in the case of Mr. Kane or nine months in the case of Mr. Ansari and Dr. Thomson, paid in substantially similar installments on same payroll applicable to him immediately prior to his separation from service, subject to certain exceptions, and (2) reimbursement for additional costs the executive incurs for continued coverage under our group health insurance under the Consolidated Budget Reconciliation Act of 1985, or COBRA, for the applicable severance period or, if sooner, until comparable coverage is available in connection with subsequent employment. Upon termination of the employment of any of the named executive officers by us for cause or due to death or disability, or termination of employment by a named executive officer other than for good reason, the named executive officer will not be entitled to any additional compensation beyond any earned but unpaid salary or other accrued obligations.

Notwithstanding the foregoing, the employment agreements provide that, in the event a named executive officer's employment is terminated by us without cause or by the named executive officer for good reason three months prior or 12 months after the occurrence of a change in control, as defined in the employment agreements, then, subject to his timely executing a release of claims and continuing to comply with obligations under his proprietary information, inventions, non-competition and non-solicitation agreement, then such named executive officer shall be entitled to (1) in the case of Mr. Kane, an amount equal to 18 months of his then current monthly base salary plus 1.5 times his target bonus for the year during which separation occurs, payable in a lump sum, and in the case of Mr. Ansari and Dr. Thomson, 12 months of monthly base salary plus one times their target bonus for the year, payable in a lump sum, (2) reimbursement of the additional costs the executive incurs for continued coverage under our group health insurance under COBRA until, in the case of Mr. Kane, the 18-month anniversary of the executive's separation date, and in the case of Mr. Ansari and

Dr. Thomson, the 12-month anniversary of the executive's separation date, or earlier if the executive becomes eligible to receive substantially similar coverage from another source or is no longer eligible to receive COBRA, and (3) accelerated vesting of all unvested time-based equity grants.

Under the separate proprietary information, inventions, non-competition and non-solicitation agreement with each of Mr. Kane, Mr. Ansari and Dr. Thomson, each named executive officer has agreed to refrain from competing with us or soliciting our employees, in each case, while employed and following the termination of his employment for any reason for a period of one year and has acknowledged our ownership rights in any intellectual property and assigned any such ownership rights to us.

In connection with this offering, we are evaluating entering into amended and restated employment agreements with our named executive officers.

Incentive plans

The following summarizes the material terms of the long-term incentive compensation plan in which our named executive officers will be eligible to participate following the consummation of this offering and our 2015 Plan and 2006 Plan under which we have previously made periodic grants of equity and equity-based awards to our named executive officers and other key employees.

2019 Incentive award plan

We intend to adopt and ask our stockholders to approve our 2019 Plan to be effective upon the effectiveness of the registration statement of which this prospectus forms a part, under which we may grant cash and equity-based incentive awards to eligible service providers in order to attract, retain and motivate the persons who make important contributions to our company. The material terms of our 2019 Plan are summarized below.

Eligibility and administration

Our employees, consultants and directors, and employees and consultants of our subsidiaries, will be eligible to receive awards under our 2019 Plan. Our 2019 Plan will be administered by our board of directors, which may delegate its duties and responsibilities to one or more committees of our directors and/or officers (referred to collectively as the plan administrator below), subject to the limitations imposed under our 2019 Plan, Section 16 of the Exchange Act, stock exchange rules and other applicable laws. The plan administrator will have the authority to take all actions and make all determinations under our 2019 Plan, to interpret our 2019 Plan and award agreements and to adopt, amend and repeal rules for the administration of our 2019 Plan as it deems advisable. The plan administrator will also have the authority to determine which eligible service providers receive awards, grant awards and set the terms and conditions of all awards under our 2019 Plan, including any vesting and vesting acceleration provisions, subject to the conditions and limitations in our 2019 Plan.

Shares available for awards

An aggregate of shares of our common stock will initially be available for issuance under our 2019 Plan. The number of shares initially available for issuance will be increased by an annual increase on January 1 of each calendar year beginning in 2020 and ending in and including 2029, equal to the least of (1) and (2) a smaller number of shares determined by our board of directors. No more than shares of common stock may be issued under our 2019 Plan upon the exercise of incentive stock options, or ISOs. Shares issued under our 2019 Plan may be authorized but unissued shares, shares purchased on the open market or treasury shares.

If an award under our 2019 Plan, our 2015 Plan or our 2006 Plan expires, lapses or is terminated, exchanged for cash, surrendered, repurchased, canceled without having been fully exercised or forfeited, any unused shares subject to the award will, as applicable, become or again be available for new grants under our 2019 Plan. Awards granted under our 2019 Plan in substitution for any options or other stock or stock-based awards granted by an entity before the entity's merger or consolidation with us or our acquisition of the entity's property or stock will not reduce the shares available for grant under our 2019 Plan, but will count against the maximum number of shares that may be issued upon the exercise of ISOs, as applicable.

In addition, the maximum aggregate grant date fair value as determined in accordance with ASC 718 (or any successor thereto), of awards granted to any non-employee director for services as a director pursuant to our 2019 Plan during any fiscal year may not exceed $750,000. The plan administrator may, however, make exceptions to such limit on director compensation in extraordinary circumstances, subject to the limitations in our 2019 Plan.

Awards

Our 2019 Plan provides for the grant of stock options, including ISOs, and nonqualified stock options, or NSOs, stock appreciation rights, or SARs, restricted stock, dividend equivalents, restricted stock units, or RSUs, and other stock or cash based awards. Certain awards under our 2019 Plan may constitute or provide for payment of "nonqualified deferred compensation" under Section 409A of the Code. All awards under our 2019 Plan will be set forth in award agreements, which will detail the terms and conditions of awards, including any applicable vesting and payment terms and post-termination exercise limitations. A brief description of each award type follows.

- Stock Options and SARs. Stock options provide for the purchase of shares of our common stock in the future at an exercise price set on the grant date. ISOs, by contrast to NSOs, may provide tax deferral beyond exercise and favorable capital gains tax treatment to their holders if certain holding periods and other requirements of the Code are satisfied. SARs entitle their holder, upon exercise, to receive from us an amount equal to the appreciation of the shares subject to the award between the grant date and the exercise date. The plan administrator will determine the number of shares covered by each option and SAR, the exercise price of each option and SAR and the conditions and limitations applicable to the exercise of each option and SAR. The exercise price of a stock option or SAR will not be less than 100% of the fair market value of the underlying share on the grant date (or 110% in the case of ISOs granted to certain significant stockholders), except with respect to certain substitute awards granted in connection with a corporate transaction. The term of a stock option or SAR may not be longer than ten years (or five years in the case of ISOs granted to certain significant stockholders).
- Restricted Stock and RSUs. Restricted stock is an award of nontransferable shares of our common stock that remain forfeitable unless and until specified conditions are met and which may be subject to a purchase price. RSUs are contractual promises to deliver shares of our common stock in the future, which may also remain forfeitable unless and until specified conditions are met and may be accompanied by the right to receive the equivalent value of dividends paid on shares of our common stock prior to the delivery of the underlying shares. The plan administrator may provide that the delivery of the shares underlying RSUs will be deferred on a mandatory basis or at the election of the participant. The terms and conditions applicable to restricted stock and RSUs will be determined by the plan administrator, subject to the conditions and limitations contained in our 2019 Plan.
- Other Stock or Cash Based Awards. Other stock or cash based awards are awards of cash, fully vested shares of our common stock and other awards valued wholly or partially by referring to, or otherwise based on, shares of our common stock or other property. Other stock or cash based awards may be granted to

participants and may also be available as a payment form in the settlement of other awards, as standalone payments and as payment in lieu of compensation to which a participant is otherwise entitled. The plan administrator will determine the terms and conditions of other stock or cash based awards, which may include any purchase price, performance goal, transfer restrictions and vesting conditions.

Performance criteria

The plan administrator may select performance criteria for an award to establish performance goals for a performance period. Performance criteria under our 2019 Plan may include, but are not limited to, the following: net earnings or losses (either before or after one or more of interest, taxes, depreciation, amortization, and non-cash equity-based compensation expense); gross or net sales or revenue or sales or revenue growth; net income (either before or after taxes) or adjusted net income; profits (including but not limited to gross profits, net profits, profit growth, net operation profit or economic profit), profit return ratios or operating margin; budget or operating earnings (either before or after taxes or before or after allocation of corporate overhead and bonus); cash flow (including operating cash flow and free cash flow or cash flow return on capital); return on assets; return on capital or invested capital; cost of capital; return on stockholders' equity; total stockholder return; return on sales; costs, reductions in costs and cost control measures; expenses; working capital; earnings or loss per share; adjusted earnings or loss per share; price per share or dividends per share (or appreciation in or maintenance of such price or dividends); regulatory achievements or compliance; implementation, completion or attainment of objectives relating to research, development, regulatory, commercial, or strategic milestones or developments; market share; economic value or economic value added models; division, group or corporate financial goals; customer satisfaction/growth; customer service; employee satisfaction; recruitment and maintenance of personnel; human resources management; supervision of litigation and other legal matters; strategic partnerships and transactions; financial ratios (including those measuring liquidity, activity, profitability or leverage); debt levels or reductions; sales-related goals; financing and other capital raising transactions; cash on hand; acquisition activity; investment sourcing activity; and marketing initiatives, any of which may be measured in absolute terms or as compared to any incremental increase or decrease. Such performance goals also may be based solely by reference to the company's performance or the performance of a subsidiary, division, business segment or business unit of the company or a subsidiary, or based upon performance relative to performance of other companies or upon comparisons of any of the indicators of performance relative to performance of other companies. When determining performance goals, the plan administrator may provide for exclusion of the impact of an event or occurrence which the plan administrator determines should appropriately be excluded, including, without limitation, non-recurring charges or events, acquisitions or divestitures, changes in the corporate or capital structure, events unrelated to the business or outside of the control of management, foreign exchange considerations, and legal, regulatory, tax or accounting changes.

Certain transactions

In connection with certain corporate transactions and events affecting our common stock, including a change in control, or change in any applicable laws or accounting principles, the plan administrator has broad discretion to take action under our 2019 Plan to prevent the dilution or enlargement of intended benefits, facilitate the transaction or event or give effect to the change in applicable laws or accounting principles. This includes canceling awards for cash or property, accelerating the vesting of awards, providing for the assumption or substitution of awards by a successor entity, adjusting the number and type of shares subject to outstanding awards and/or with respect to which awards may be granted under our 2019 Plan and replacing or terminating awards under our 2019 Plan. In addition, in the event of certain non-reciprocal transactions with our stockholders, the plan administrator will make equitable adjustments to our 2019 Plan and outstanding awards as it deems appropriate to reflect the transaction.

Plan amendment and termination

Our board of directors may amend or terminate our 2019 Plan at any time; however, no amendment, other than an amendment that increases the number of shares available under our 2019 Plan, may materially and adversely affect an award outstanding under our 2019 Plan without the consent of the affected participant, and stockholder approval will be obtained for any amendment to the extent necessary to comply with applicable laws. Further, the plan administrator cannot, without the approval of our stockholders, amend any outstanding stock option or SAR to reduce its price per share. Our 2019 Plan will remain in effect until the tenth anniversary of its effective date, unless earlier terminated by our board of directors. No awards may be granted under our 2019 Plan after its termination.

Foreign participants, claw-back provisions, transferability and participant payments

The plan administrator may modify awards granted to participants who are foreign nationals or employed outside the United States or establish subplans or procedures to address differences in laws, rules, regulations or customs of such foreign jurisdictions. All awards will be subject to any company claw-back policy as set forth in such claw-back policy or the applicable award agreement. Except as the plan administrator may determine or provide in an award agreement, awards under our 2019 Plan are generally non-transferrable, except by will or the laws of descent and distribution, or, subject to the plan administrator's consent, pursuant to a domestic relations order, and are generally exercisable only by the participant. With regard to tax withholding obligations arising in connection with awards under our 2019 Plan, and exercise price obligations arising in connection with the exercise of stock options under our 2019 Plan, the plan administrator may, in its discretion, accept cash, wire transfer or check, shares of our common stock that meet specified conditions, a promissory note, a "market sell order," such other consideration as the plan administrator deems suitable or any combination of the foregoing.

2015 Stock incentive plan

Our board of directors and stockholders have approved our 2015 Plan, under which we may grant stock options, restricted stock, RSUs and other stock-based awards to employees, officers, directors, consultants, advisors, advisory board members and other service providers. A total of 11,250,000 shares of our common stock have been authorized for issuance under our 2015 Plan. As of the date of this prospectus, awards of stock options are outstanding under our 2015 Plan.

Following the effectiveness of our 2019 Plan, we will not make any further grants under our 2015 Plan. However, our 2015 Plan will continue to govern the terms and conditions of the outstanding awards granted under it. Shares of our common stock subject to awards granted under our 2015 Plan that are forfeited, lapse unexercised or are settled in cash and which following the effective date of our 2019 Plan are not issued under our 2015 Plan will be available for issuance under our 2019 Plan.

Administration

Our 2015 Plan is administered by our board of directors, which may delegate its duties and responsibilities to one or more committees of our directors (referred to collectively as our board of directors below) to the extent permitted by applicable law. Our board of directors has the authority to grant awards under our 2015 Plan and to adopt, amend, and repeal such administrative rules, guidelines, and practices relating to our 2015 Plan as it shall deem advisable. Our board of directors may correct any defect, supply any omission, or reconcile any inconsistency in our 2015 Plan or any award thereunder in the manner and to the extent it deems expedient to carry our 2015 Plan into effect.

Types of awards

Our 2015 Plan provides for the grant of stock options, including NSOs and ISOs, restricted stock, RSUs and other stock-based awards to employees, officers, directors, consultants, advisors, advisory board members or other service providers, except that stock options intended to qualify as ISOs under the Code may only be granted to employees.

Certain adjustments

In the event of certain changes in capitalization, or any dividend or distribution to holders of our common stock other than an ordinary cash dividend, the number and class of securities available under our 2015 Plan and the number and class of securities and exercise price per share of each outstanding option will be equitably adjusted by us (or substituted awards may be made, if applicable) in the manner determined by our board of directors.

Change in control

Unless otherwise specifically provided in an award agreement, our board of directors may take any one or more of the following actions as to all (or any portion of) outstanding options on such terms as our board of directors determines in connection with a change in control, as defined in our 2015 Plan: (1) provide for the assumption or substitution of the award; (2) upon written notice to a participant, provide for the termination of all unexercised options unless exercised within a specific period; (3) provide that outstanding options will become exercisable prior to or upon such change in control; (4) in the event of a change in control in which holders of our common stock will receive cash payment for shares surrendered, make or provide for a cash payment to participants based on the excess, if any of (a) the change in control consideration times the number of shares subject to outstanding options less (b) the aggregate exercise price of the outstanding options, in exchange for termination of such options; (5) provide that, in connection with our liquidation or dissolution, awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise price thereof); or (c) any combination of the foregoing.

Plan amendment and termination

Our board of directors may amend, suspend or terminate our 2015 Plan at any time; provided, however, that if at any time the approval of our stockholders is required as to any modification or amendment under Section 422 of the Code or any successor provision with respect to ISOs, our board may not effect such modification or amendment without such approval. Unless otherwise specified in the amendment, any amendment to our 2015 Plan will apply to, and be binding on the holders of, all awards outstanding under our 2015 Plan at the time the amendment is adopted, provided our board determines that such amendment does not materially and adversely affect the rights of participants under our 2015 Plan. Our 2015 Plan will remain in effect until the tenth anniversary of its effective date, unless earlier terminated by our board of directors. No awards may be granted under our 2015 Plan after its termination.

Transferability of awards

Except as our board may otherwise expressly determine or provide in an award, awards under our 2015 Plan may not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an ISO, pursuant to a qualified domestic relations order, and, during the life of the participant, shall be exercisable only by the participant.

2006 Stock incentive plan

Our board of directors previously adopted and our stockholders approved our 2006 Plan in May 2006. Our 2006 Plan expired in accordance with its terms in May 2016 and no further stock awards may be granted under our 2006 Plan. Any awards granted under our 2006 Plan remain subject to the terms of our 2006 Plan and applicable award agreements, until such outstanding awards that are stock options are exercised, or until they terminate or expire by their terms.

Administration

Our 2006 Plan is administered by our board of directors, which may delegate its duties and responsibilities to one or more committees of our directors (referred to collectively as our board of directors below) to the extent permitted by applicable law. Prior to the expiration of our 2006 plan, our board of directors had the authority to grant awards under our 2006 Plan, and our board of directors has the authority to adopt, amend, and repeal such administrative rules, guidelines, and practices relating to our 2006 Plan as it shall deem advisable. Our board of directors may correct any defect, supply any omission, or reconcile any inconsistency in our 2006 Plan or any award thereunder in the manner and to the extent it deems expedient to carry our 2006 Plan into effect.

Types of awards

Our 2006 Plan provided for the grant of stock options, including NSOs and ISOs, restricted stock, RSUs and other stock-based awards to employees, officers, directors, consultants and advisors, except that stock options intended to qualify as ISOs under the Code were only permitted to be granted to employees. As of the date of this prospectus, awards of stock options are outstanding under our 2006 Plan.

Certain adjustments

In the event of certain changes in capitalization, or any dividend or distribution to holders of our common stock other than an ordinary cash dividend, the number and class of securities available under our 2006 Plan and the number and class of securities and exercise price per share of each outstanding option will be equitably adjusted by us (or substituted awards may be made, if applicable) in the manner determined by our board of directors.

Reorganization

Our board of directors may take any one or more of the following actions as to all (or any portion of) outstanding awards on such terms as our board of directors determines in connection with a reorganization, as defined in our 2006 Plan: (1) provide for the assumption or substitution of the award, (2) upon written notice to a participant, provide for the termination of all unexercised options unless exercised within a specific period, (3) provide that outstanding options will become exercisable prior to or upon such reorganization, (4) in the event of a reorganization in which holders of our common stock will receive cash payment for shares surrendered, make or provide for a cash payment to participants equal to (a) the reorganization consideration times the number of shares subject to outstanding options minus (b) the aggregate exercise price of the outstanding options, in exchange for termination of such options, (5) provide that, in connection with our liquidation or dissolution, awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise price thereof) and (6) any combination of the foregoing.

Transferability of awards

Except as our board may otherwise have expressly determined or provided in an award, awards under our 2006 Plan may not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are

granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an ISO, pursuant to a qualified domestic relations order, and, during the life of the participant, shall be exercisable only by the participant.

2019 Employee stock purchase plan

We intend to adopt and ask our stockholders to approve our 2019 ESPP to be effective upon the effectiveness of the registration statement of which this prospectus forms a part. The material terms of our 2019 ESPP are summarized below.

Shares available for awards; administration

A total of shares of our common stock will initially be reserved for issuance under our 2019 ESPP. In addition, the number of shares available for issuance under our 2019 ESPP will be annually increased on January 1 of each calendar year beginning in 2020 and ending in and including 2029, by an amount equal to the least of (1) % of the shares outstanding on the final day of the immediately preceding calendar year and (2) such smaller number of shares as is determined by our board of directors, provided that no more than shares of our common stock may be issued under our 2019 ESPP. The foregoing numbers are subject to adjustment in certain events, as described below. Our board of directors or a committee of our board of directors will have authority to interpret the terms of our 2019 ESPP and determine eligibility of participants. We expect that the compensation committee will be the initial administrator of our 2019 ESPP.

Eligibility

Our employees are eligible to participate in our 2019 ESPP if they are customarily employed by us or a participating subsidiary for more than twenty hours per week and more than five months in any calendar year. However, an employee may not be granted rights to purchase stock under our 2019 ESPP if the employee, immediately after the grant, would own (directly or through attribution) stock possessing 5% or more of the total combined voting power or value of all classes of our stock.

Grant of rights

Our 2019 ESPP is intended to qualify under Section 423 of the Code and stock will be offered under our 2019 ESPP during offering periods. The length of the offering periods under our 2019 ESPP will be determined by the plan administrator and may be up to twenty-seven months long. Employee payroll deductions will be used to purchase shares on each purchase date during an offering period. The purchase dates for each offering period will be the final trading day in the offering period. Offering periods under our 2019 ESPP will commence when determined by the plan administrator. The plan administrator may, in its discretion, modify the terms of future offering periods.

Our 2019 ESPP permits participants to purchase common stock through payroll deductions of up to 25% of their eligible compensation, which includes a participant's gross base compensation for services to us, including overtime payments and excluding sales commissions, incentive compensation, bonuses, expense reimbursements, fringe benefits and other special payments. The plan administrator will establish a maximum number of shares that may be purchased by a participant during any offering period, which, in the absence of a contrary designation, will be shares. In addition, no employee will be permitted to accrue the right to purchase stock under our 2019 ESPP at a rate in excess of $25,000 worth of shares during any calendar year during which such a purchase right is outstanding (based on the fair market value per share of our common stock as of the first day of the offering period).

On the first trading day of each offering period, each participant will automatically be granted an option to purchase shares of our common stock. The option will expire at the end of the applicable offering period, and will be exercised at that time to the extent of the payroll deductions accumulated during the offering period. The purchase price of the shares, in the absence of a contrary designation, will be 85% of the lower of the fair market value of our common stock on the first trading day of the offering period or on the purchase date. Participants may voluntarily end their participation in our 2019 ESPP at any time at least one week prior to the end of the applicable offering period, and will be paid their accrued payroll deductions that have not yet been used to purchase shares of common stock. Participation ends automatically upon a participant's termination of employment.

A participant may not transfer rights granted under our 2019 ESPP other than by will or the laws of descent and distribution.

Certain transactions

In the event of certain non-reciprocal transactions or events affecting our common stock known as "equity restructurings," the plan administrator will make equitable adjustments to our 2019 ESPP and outstanding rights. In the event of certain unusual or non-recurring events or transactions, including a change in control, the plan administrator may provide for (1) either the replacement of outstanding rights with other rights or property or termination of outstanding rights in exchange for cash, (2) the assumption or substitution of outstanding rights by the successor or survivor corporation or parent or subsidiary thereof, if any, (3) the adjustment in the number and type of shares of stock subject to outstanding rights, (4) the use of participants' accumulated payroll deductions to purchase stock on a new purchase date prior to the next scheduled purchase date and termination of any rights under ongoing offering periods or (5) the termination of all outstanding rights.

Plan amendment

The plan administrator may amend, suspend or terminate our 2019 ESPP at any time. However, stockholder approval will be obtained for any amendment that increases the aggregate number or changes the type of shares that may be sold pursuant to rights under our 2019 ESPP, changes the corporations or classes of corporations whose employees are eligible to participate in our 2019 ESPP or changes our 2019 ESPP in any manner that would cause our 2019 ESPP to no longer be an employee stock purchase plan within the meaning of Section 423(b) of the Code.

Director compensation

2018 director compensation

Except as described below, we only provide compensation to our non-employee directors who are not designated by holders of our preferred stock. In 2018, our only such director was Ms. Sharp. In connection with her appointment in December 2018, our board of directors determined that Ms. Sharp would receive annual cash compensation in an amount equal to $35,000 until such time as our board of directors adopted a non-employee director compensation policy and that she would receive an award of stock options to purchase up to 315,000 shares of our common stock pursuant to the 2015 Plan in connection with her appointment. Ms. Sharp's award vests as to 34% of the underlying shares on the first anniversary of the date of grant and in equal installments at the end of each three-month period over the following 24 months.

The following table provides information related to the 2018 compensation of Ms. Sharp, who was the only director who received compensation from us during 2018.

Name	Fees earned or paid in cash	Option awards(1)	Total
Shalini Sharp	$ 8,750	$1,212,086	$1,220,836

(1) Amount reflects the grant date Black-Scholes value of option awards granted during 2018, computed in accordance with ASC Topic 718 as further described in Note 4 to our audited consolidated financial statements included elsewhere in this prospectus. As of December 31, 2018, 315,000 shares of our common stock were subject to this award. Award vests as to 34% of the underlying shares on December 5, 2019 and in equal installments at the end of each three-month period over the following 24 months.

Non-employee director compensation policy

Effective on the effectiveness of the registration statement of which this prospectus forms a part, we intend to adopt and ask our stockholders to approve a compensation program for our non-employee directors under which each non-employee director will receive the following amounts for their services on our board of directors:

- Upon the director's initial election or appointment to our board of directors that occurs after our initial public offering, an option to purchase shares of our common stock having an aggregate fair value of $350,000 (as determined under the policy);
- If the director has served on our board of directors for at least six months as of the date of an annual meeting of stockholders and will continue to serve as a director immediately following such meeting, an option to purchase shares of our common stock on the date of the annual meeting having an aggregate fair value of $175,000 (as determined under the policy);
- An annual director fee of $40,000;
- If the director serves on a committee of our board of directors, an additional annual fee as follows:
    - Chairman of the audit committee: $15,000
    - Audit committee member other than the chairman, $7,500;
    - Chairman of the compensation committee, $12,250;
    - Compensation committee member other than the chairman, $6,000;
    - Chairman of the nominating and corporate governance committee, $8,250; and
    - Nominating and corporate governance committee member other than the chairman, $4,500.

Director fees under the program will be payable in arrears in four equal quarterly installments not later than the fifteenth day following the final day of each calendar quarter, provided that the amount of each payment will be prorated for any portion of a quarter that a director is not serving on our board and no fee will be payable in respect of any period prior to the effective date of the registration statement of which this prospectus is a part.

Stock options granted to our non-employee directors under the program will have an exercise price equal to the fair market value of our common stock on the date of grant and will expire not later than ten years after the date of grant. The stock options granted upon a director's initial election or appointment will vest in thirty-six substantially equal monthly installments following the date of grant. The stock options granted annually to directors will vest in a single installment on the earlier of the day before the next annual meeting or the first anniversary of the date of grant. In addition, all unvested stock options will vest in full upon the occurrence of a change in control.

Certain relationships and related party transactions

The following includes a summary of transactions since January 1, 2016, to which we have been a party in which the amount involved exceeded or will exceed $120,000, and in which any of our directors or executive officers or, to our knowledge, beneficial owners of more than 5% of our capital stock or any member of the immediate family of any of the foregoing persons had or will have a direct or indirect material interest, other than equity and other compensation, termination, change in control and other arrangements, which are described under “Executive compensation.” We also describe below certain other transactions with our directors, executive officers and stockholders.

Series B preferred stock financing

From May 2018 to July 2018, we issued and sold to investors in a private placement 21,956,095 shares of our Series B preferred stock at a price per share of $5.01, for aggregate gross proceeds of approximately $110.0 million.

The following table summarizes the Series B preferred stock purchased by directors, executive officers, beneficial owners of more than 5% of our capital stock or any member of the immediate family of any of the foregoing persons.

Participants	Series B preferred stock	Total purchase price
5% or greater stockholders and directors		
Amgen Investments Ltd.(1)	499,002	$ 2,500,000
F-Prime Capital Partners Healthcare Fund IV LP(2)	873,253	$ 4,374,997
RA Capital Healthcare Fund, L.P.	399,202	$ 2,000,002
venBio Global Strategic Fund, L.P.(3)	998,004	$ 5,500,000
Tony Yao(4)	9,500	$ 47,595

(1) Series B preferred stock was purchased by Amgen Ventures LLC, an affiliate of Amgen Investment Ltd.

(2) Ben Auspitz, a former member of our board of directors, is a partner at F-Prime Capital Partners. Mr. Auspitz does not hold voting or dispositive power over the shares held by F-Prime Capital Partners Healthcare Fund IV LP. See “Principal stockholders” below for more information.

(3) Robert Adelman, M.D., a member of our board of directors, is a partner at venBio Global Strategic Fund, L.P. See “Principal stockholders” below for more information.

(4) Tony Yao, M.D., Ph.D. is a current member of our board of directors. Dr. Yao is associated with the ArrowMark Funds (as defined below). See “Principal stockholders” below for more information.

Convertible note financing

In March 2019, we entered into a convertible note purchase agreement for the issuance and sale of approximately $39.6 million aggregate principal amount of convertible promissory notes, or the 2019 Notes, in a private placement transaction. ArrowMark Fundamental Opportunity Fund, L.P. purchased $0.6 million of 2019 Notes, and ArrowMark Life Science Fund, L.P. purchased $0.5 million of 2019 Notes. Tony Yao, M.D., Ph.D. is a current member of our board of directors and associated with the Arrowmark Funds (as defined below). See “Principal stockholders” below for more information.

Investors’ rights agreement

We are party to an amended and restated investors’ rights agreement, which we refer to as our investors’ rights agreement, with each holder of our convertible preferred stock and certain holders of our common stock (Derek Jantz, Matthew Kane and Jeff Smith), which includes each holder of more than 5% of our capital stock and each

of our directors (or, in some cases, entities affiliated therewith). Our investors' rights agreement imposes certain affirmative obligations on us and also grants certain rights to the holders, including certain registration rights with respect to the registrable securities held by them that will survive this offering. See "Description of capital stock—Registration rights" for additional information. This right of first offer does not apply to this offering and will terminate by its terms in connection with the closing of this offering.

Voting agreement

We are a party to an amended and restated voting agreement with certain of our stockholders, pursuant to which the following directors were elected to serve as members on our board of directors and, as of the date of this prospectus, continue to so serve: Matthew Kane, Derek Jantz, Robert Adelman and Tony Yao. Our voting agreement will terminate by its terms in connection with the closing of this offering, and members previously elected to our board of directors pursuant to this voting agreement will continue to serve as directors until they resign, are removed or their successors are duly elected by the holders of our common stock. The composition of our board of directors after this offering is described in more detail under "Management—Board composition and election of directors."

Right of first refusal and co-sale agreement

We are party to an amended and restated right of first refusal and co-sale agreement with each holder of our convertible preferred stock and certain holders of our common stock (Derek Jantz, Matthew Kane and Jeff Smith), which includes each holder of more than 5% of our capital stock and certain of our directors (or, in some cases, entities affiliated therewith), pursuant to which we have a right of first refusal in respect of certain sales of securities by Drs. Jantz and Smith and Mr. Kane. To the extent we do not exercise such right in full, the holders of our convertible preferred stock are granted certain rights of first refusal and co-sale in respect of such sale. The right of first refusal and co-sale agreement will terminate by its terms in connection with the closing of this offering.

Director and officer indemnification and insurance

We have agreed to indemnify each of our directors and executive officers against certain liabilities, costs and expenses and have purchased directors' and officers' liability insurance. See "Description of capital stock—Limitations on liability and indemnification matters."

Employment agreements

We have entered into employment agreements with our certain of our executive officers, including our named executive officers. For more information regarding the agreements with our named executive officers, see "Executive compensation—Employment agreements."

Stock option grants to executive officers and directors

We have granted stock options to our executive officers as more fully described in "Executive compensation."

Other transactions

In April 2017, in connection with a repurchase program approved by our board of directors, we repurchased 1,282,226 shares of common stock from J. Christopher Rhodes, a beneficial owner of more than 5% of our common stock, for aggregate proceeds of approximately $0.7 million.

Chelsea Lynam, Mr. Kane's wife, serves as our Manager, Facilities Planning & Design. Ms. Lynam received total compensation of $273,375 in 2018 in respect of base salary, bonus and the grant date fair value of options to purchase 45,000 shares of our common stock that were granted in April 2018. Ms. Lynam also participates in other employee benefit plans and arrangements that are made generally available to other employees.

Policies and procedures for related person transactions

Our board of directors has adopted a written related person transaction policy, to be effective upon the closing of this offering, setting forth the policies and procedures for the review and approval or ratification of related person transactions. This policy will cover, with certain exceptions set forth in Item 404 of Regulation S-K under the Securities Act, any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships, in which we were or are to be a participant, where the amount involved exceeds $120,000 in any fiscal year and a related person had, has or will have a direct or indirect material interest, including, without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest as well as indebtedness, guarantees of indebtedness and our employment of a related person. In reviewing and approving any such transactions, our audit committee is tasked to consider all relevant facts and circumstances, including, but not limited to, whether the transaction is on terms comparable to those that could be obtained in an arm's length transaction and the extent of the related person's interest in the transaction. All of the transactions described in this section occurred prior to the effectiveness of this policy.

Principal stockholders

The following table sets forth information with respect to the beneficial ownership of our common stock as of December 31, 2018 by:

- each person or group of affiliated persons known by us to beneficially own more than 5% of our common stock;
- each of our named executive officers;
- each of our directors; and
- all of our executive officers and directors as a group.

The number of shares beneficially owned by each stockholder is determined under rules promulgated by the SEC. Under these rules, beneficial ownership includes any shares as to which the individual or entity has sole or shared voting power or investment power. Each stockholder's percentage ownership is based on 81,561,865 shares of common stock outstanding as of December 31, 2018, assuming the conversion of all outstanding shares of preferred stock into 47,606,095 shares of our common stock upon the closing of this offering and the automatic settlement of the 2019 Notes into shares of our common stock in connection with the closing of this offering, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus. In computing the number of shares beneficially owned by an individual or entity and the percentage ownership of that person, shares of common stock subject to options or other rights held by such person that are currently exercisable or will become exercisable within 60 days of December 31, 2018 are considered outstanding, although these shares are not considered outstanding for purposes of computing the percentage ownership of any other person. Unless otherwise noted, the address of all listed stockholders is c/o Precision BioSciences, 302 East Pettigrew St., Suite A-100, Durham, North Carolina 27701. Each of the stockholders listed has sole voting and investment power with respect to the shares beneficially owned by the stockholder unless otherwise noted, subject to community property laws where applicable.

		Percentage of shares beneficially owned	
Name of beneficial owner	Number of shares beneficially owned	Before offering	After offering
5% or Greater Stockholders			
venBio Global Strategic Fund, L.P.(1)	8,998,004	11.0%	
Jeff Smith, Ph.D.(2)	8,918,994	10.8%	
F-Prime Capital Partners Healthcare Fund IV LP(3)	7,873,253	9.7%	
Named Executive Officers and Directors			
Matthew Kane(4)	4,590,914	5.6%	
Abid Ansari (5)	200,625	*	
David Thomson, Ph.D.(6)	354,750	*	
Robert Adelman, M.D.(1)	8,998,004	11.0%	
Derek Jantz, Ph.D.(7)	8,918,994	10.8%	
Shalini Sharp	—	—	
Tony Yao, M.D., Ph.D.(8)	1,996,008	2.4%	
All executive officers and directors as a group (8 persons)(9)	25,212,420	30.1%	

* Less than 1%.

(1) Consists of 8,000,000 shares of Series A preferred stock and 998,004 shares of Series B preferred stock. VenBio Global Strategic GP, L.P., or venBio GP, is the sole general partner of venBio Global Strategic Fund, L.P., or venBio, and venBio Global Strategic GP, Ltd., or venBio GP Ltd., is the sole general partner of venBio GP. Robert Adelman, one of our directors, and Corey Goodman are directors of venBio GP Ltd. and share voting and dispositive control over the shares held by venBio. The mailing address of venBio Global Strategic Fund, L.P. is c/o venBio Partners, LLC, 1700 Owens Street, Suite 595, San Francisco, CA 94158.

(2) Consists of (a) 8,208,231 shares of common stock and (b) 710,763 shares of common stock underlying options exercisable within 60 days of December 31, 2018.

(3) Consists of 7,000,000 shares of Series A preferred stock and 873,253 shares of Series B preferred stock. The general partner of F-Prime Capital Partners Healthcare Fund IV LP is F-Prime Capital Partners Healthcare Advisors Fund IV LP. F-Prime Capital Partners Healthcare Advisors Fund IV LP is solely managed by Impresa Management LLC, the managing member of its general partner and investment manager. Impresa Management LLC is owned, directly or indirectly, by various shareholders and employees of FMR LLC. Each of the entities listed above expressly disclaims beneficial ownership of the securities listed above except to the extent of any pecuniary interest therein. The mailing address of F-Prime Capital Partners Healthcare Fund IV LP is 245 Summer Street, Boston, MA 02210.

(4) Consists of (a) 3,847,616 shares of common stock held directly by Mr. Kane, (b) 17,222 shares of common stock held by Chelsea Lynam, Mr. Kane's wife, (c) 710,763 shares of common stock underlying options held by Mr. Kane exercisable within 60 days of December 31, 2018 and (d) 15,313 shares of common stock underlying options held by Ms. Lynam exercisable within 60 days of December 31, 2018.

(5) Consists of 200,625 shares of common stock underlying options exercisable within 60 days of December 31, 2018.

(6) Consists of 354,750 shares of common stock underlying options exercisable within 60 days of December 31, 2018.

(7) Consists of (a) 8,208,231 shares of common stock and (b) 710,763 shares of common stock underlying options exercisable within 60 days of December 31, 2018.

(8) Consists of 9,500 of Series B preferred stock held directly by Dr. Yao and 200,000 shares of Series B preferred stock held by ArrowMark Fundamental Opportunity Fund, L.P., 244,572 shares of Series B preferred stock held by ArrowMark Life Science Fund, 10,000 of Series B preferred stock held by CF Ascent LLC, 149,451 of Series B preferred stock held by Iron Horse Investments, LLC, or Iron Horse, 39,920 of Series B preferred stock held by Lookfar Investments, LLC, 624,759 of Series B preferred stock held by Meridian Growth Fund, or Meridian Growth, 558,855 of Series B preferred stock held by Meridian Small Cap Growth Fund, or Meridian Small Cap, 149,451 of Series B preferred stock held by THB Iron Rose, LLC, or THB Iron Rose, 9,500 of Series B preferred stock held by THB Iron Rose, LLC Life Science Portfolio, or THB Iron Rose Life Science, which are referred to collectively as the ArrowMark Funds. ArrowMark Colorado Holdings LLC, or ArrowMark Colorado, is investment advisor to ArrowMark Funds. Dr. Yao, one of our directors, is employed as a portfolio manager for ArrowMark Colorado and has direct voting and dispositive control over the shares held by ArrowMark Life Science Fund and THB Iron Rose Life Science. Mr. Yao may be considered the beneficial owner of the shares held by ArrowMark Life Science Fund and THB Iron Rose Life Science and disclaims beneficial ownership of such shares, except to the extent of any pecuniary interest therein. The principal business address of the ArrowMark Funds is 100 Fillmore Street, Suite 325, Denver, Colorado 80206.

(9) Consists of (a) 12,073,069 shares of common stock, (b) 2,145,339 shares of common stock underlying options exercisable within 60 days of December 31, 2018, (c) 8,000,000 shares of Series A preferred stock and (d) 2,994,012 of Series B preferred stock.

Description of capital stock

Capital structure

The following description of our capital stock and certain provisions of our amended and restated certificate of incorporation and amended and restated bylaws are summaries and are qualified by reference to the amended and restated certificate of incorporation and the amended and restated bylaws that will go into effect upon the closing of this offering. Copies of these documents will be filed with the SEC as exhibits to our registration statement, of which this prospectus forms a part. The descriptions of our common stock and preferred stock reflect changes to our capital structure that will occur upon the closing of this offering.

General

Upon the completion of this offering, our authorized capital stock will consist of shares of common stock, par value $0.000005 per share, and shares of preferred stock, par value $0.0001 per share, all of which will be undesignated.

Common stock

As of December 31, 2018, assuming the conversion of all outstanding shares of our convertible preferred stock into 47,606,095 shares of our common stock upon the closing of this offering, we had outstanding 81,561,865 shares of common stock held of record by 119 stockholders. Additionally, in connection with the closing of this offering, the 2019 Notes will automatically settle into shares of our common stock, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus.

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. An election of directors by our stockholders shall be determined by a plurality of the votes cast by the stockholders entitled to vote on the election. Holders of common stock are entitled to receive proportionately any dividends as may be declared by our board of directors, subject to any preferential dividend rights of any series of preferred stock that we may designate and issue in the future.

In the event of our liquidation or dissolution, the holders of our common stock are entitled to receive proportionately our net assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock. Holders of our common stock have no preemptive, subscription, redemption or conversion rights. Our outstanding shares of common stock are, and the shares offered by us in this offering will be, when issued and paid for, validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Preferred stock

As of December 31, 2018, there were 47,606,095 shares of our convertible preferred stock outstanding. Upon the closing of this offering, all outstanding shares of our convertible preferred stock will convert into 47,606,095 shares of our common stock.

Under the terms of our amended and restated certificate of incorporation that will go into effect upon the closing of this offering, our board of directors will be authorized to direct us to issue shares of preferred stock in one or more series without stockholder approval. Our board of directors has the discretion to determine the rights, preferences, privileges and restrictions, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences, of each series of preferred stock.

The purpose of authorizing our board of directors to issue preferred stock and determine its rights and preferences is to eliminate delays associated with a stockholder vote on specific issuances. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions, future financings and other corporate purposes, could have the effect of making it more difficult for a third-party to acquire, or could discourage a third-party from seeking to acquire, a majority of our outstanding voting stock. Upon the closing of this offering, there will be no shares of preferred stock outstanding, and we have no present plans to issue any shares of preferred stock.

Options

As of December 31, 2018, options to purchase 13,590,261 shares of our common stock were outstanding under our 2015 Plan, of which 4,315,913 options were vested as of that date, and options to purchase 2,982,600 shares of our common stock were outstanding under our 2006 Plan, all of which options were vested as of that date.

Registration rights

Our investors' rights agreement grants the parties thereto certain registration rights in respect of the "registrable securities" held by them, which securities include (1) the shares of our common stock issued upon the conversion of shares of our convertible preferred stock, (2) the shares of our common stock issued to certain of our founders, (3) the shares of our common stock issued upon the settlement of the 2019 Notes, and (4) any shares of our common stock issued as a dividend or other distribution with respect to the shares described in the foregoing clauses (1), (2) and (3).

Demand registration rights

Upon the closing of this offering, certain holders of our registrable securities are entitled to demand registration rights. Under the terms of our investors' rights agreement, we will be required, upon the request of holders of at least 60% of our outstanding registrable securities issued or issuable upon conversion of our convertible preferred stock, to file a registration statement with an anticipated offering amount of at least $15.0 million and use our best efforts to effect the registration of these shares for public resale. We are required to effect up to three registrations pursuant to this provision of our investors' rights agreement. A demand for registration may not be made until six months after the effective date of the registration statement for which this prospectus forms a part.

Short form registration rights

Upon the closing of this offering, the holders of our registrable securities are also entitled to short form registration rights. Pursuant to our investors' rights agreement, if we are eligible to file a registration statement on Form S-3, upon the request of holders of at least 25% of our outstanding registrable securities to sell registrable securities with an anticipated aggregate offering amount of at least $1.0 million net of certain expenses related to the offering, we will be required to use our best efforts to effect a registration of such shares. We are required to effect up to two registrations in any 12-month period and no more than one registration in any four-month period pursuant to this provision of our investors' rights agreement.

Piggyback registration rights

The holders of our registrable securities are also entitled to piggyback registration rights. If we register any of our securities either for our own account or for the account of other security holders, the holders of our outstanding registrable securities are entitled to include their shares in the registration (other than a demand

registration, a registration in connection with an initial public offering that becomes effective on or before June 30, 2019, or a registration pursuant to a registration statement on Form S-4 or S-8). Subject to certain exceptions contained in our investors' rights agreement, we and the underwriters may limit the number of shares included in an underwritten offering if the underwriters determine that marketing factors require a limitation of the number of shares to be underwritten.

Expenses and indemnification

Ordinarily, other than underwriting discounts and commissions, we will be required to pay all expenses incurred by us related to any registration effected pursuant to the exercise of these registration rights. These expenses may include all registration and filing fees, printing expenses, fees and disbursements of our counsel, reasonable fees and disbursements of a single counsel for the selling security holders and blue sky fees and expenses. Our investors' rights agreement also includes customary indemnification and procedural terms.

Termination of registration rights

The registration rights will expire on the earlier of (1) the date that is five years after the closing of this offering or (2) with respect to each stockholder following the closing of this offering, at such time as such stockholder holds 1% or less of our outstanding common stock and can sell all of its registrable securities without volume limitations pursuant to Rule 144 of the Securities Act during any three-month period.

Anti-takeover provisions

Some provisions of Delaware law and our amended and restated certificate of incorporation and our amended and restated bylaws that will go into effect upon the closing of this offering could make the following transactions more difficult: an acquisition of us by means of a tender offer; an acquisition of us by means of a proxy contest or otherwise; or the removal of our incumbent officers and directors. It is possible that these provisions could make it more difficult to accomplish or could deter transactions that stockholders may otherwise consider to be in their best interests or in our best interests, including transactions that provide for payment of a premium over the market price for our shares.

These provisions, summarized below, are intended to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of the increased protection of our potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us outweigh the disadvantages of discouraging these proposals because negotiation of these proposals could result in an improvement of their terms.

Undesignated preferred stock

The ability of our board of directors, without action by our stockholders, to issue up to shares of undesignated preferred stock with voting or other rights or preferences as designated by our board of directors could impede the success of any attempt to effect a change in control of our company. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our company.

Stockholder meetings

Our amended and restated bylaws will provide that a special meeting of stockholders may be called only by the chairman of our board of directors, our chief executive officer or president (in the absence of a chief executive officer), or by a resolution adopted by a majority of our board of directors.

Requirements for advance notification of stockholder nominations and proposals

Our amended and restated bylaws will establish advance notice procedures with respect to stockholder proposals to be brought before a stockholder meeting and the nomination of candidates for election as directors, other than nominations made by or at the direction of our board of directors or a committee of our board of directors.

Elimination of stockholder action by written consent

Our amended and restated certificate of incorporation will eliminate the right of stockholders to act by written consent without a meeting.

Staggered board

Our board of directors will be divided into three classes. The directors in each class will serve for a three-year term, with one class being elected each year by our stockholders. For more information on our classified board, see “Management—Board composition and election of directors.” This system of electing and removing directors may tend to discourage a third party from making a tender offer or otherwise attempting to obtain control of us, because it generally makes it more difficult for stockholders to replace a majority of the directors.

Removal of directors

Our amended and restated certificate of incorporation will provide that no member of our board of directors may be removed from office by our stockholders except for cause and, in addition to any other vote required by law, upon the approval of the holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote in the election of directors.

Stockholders not entitled to cumulative voting

Our amended and restated certificate of incorporation will not permit stockholders to cumulate their votes in the election of directors. Accordingly, the holders of a majority of the outstanding shares of our common stock entitled to vote in any election of directors will be able to elect all of the directors standing for election, if they choose, other than any directors that holders of our convertible preferred stock may be entitled to elect.

Choice of forum

Our amended and restated certificate of incorporation will provide that, unless we consent in writing to the selection of an alternative forum to the fullest extent permitted by law, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty or other wrongdoing by any of our directors, officers, employees or agents to us or our stockholders, (3) any action asserting a claim against us arising pursuant to any provision of the General Corporation Law of the State of Delaware or our certificate of incorporation or bylaws, (4) any action to interpret, apply, enforce or determine the validity of our certificate of incorporation or bylaws, or (5) any action asserting a claim governed by the internal affairs doctrine. Under our amended and restated certificate of incorporation, this exclusive forum provision will not apply to claims which are vested in the exclusive jurisdiction of a court or forum other than the Court of Chancery of the State of Delaware, or for which the Court of Chancery of the State of Delaware does not have subject matter jurisdiction. For instance, the provision would not apply to actions arising under federal securities laws, including suits brought to enforce any liability or duty created by the Exchange Act or the rules and regulations thereunder.

This provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act. Our amended and restated certificate of incorporation will also provide that any person or entity holding, purchasing or otherwise acquiring any interest in shares of our capital stock will be deemed to have notice of and to have consented to this choice of forum provision. It is possible that a court of law could rule that the choice of forum provision contained in our amended and restated certificate of incorporation is inapplicable or unenforceable if it is challenged in a proceeding or otherwise.

Amendment of charter provisions

The amendment of any of the above provisions, except for the provision making it possible for our board of directors to issue preferred stock and the provision prohibiting cumulative voting, would require approval by holders of at least two-thirds in voting power of the outstanding shares of stock entitled to vote thereon.

Section 203 of the Delaware General Corporation Law

We are subject to Section 203 of the General Corporation Law of the State of Delaware, which prohibits persons deemed to be "interested stockholders" from engaging in a "business combination" with a publicly held Delaware corporation for three years following the date these persons become interested stockholders unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. Generally, an "interested stockholder" is a person who, together with affiliates and associates, owns, or within three years prior to the determination of interested stockholder status did own, 15% or more of a corporation's voting stock. Generally, a "business combination" includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. The existence of this provision may have an anti-takeover effect with respect to transactions not approved in advance by our board of directors.

Limitations on liability and indemnification matters

Our amended and restated certificate of incorporation, which will go into effect upon the closing of this offering, will limit our directors' liability to the fullest extent permitted under Delaware law, which prohibits our amended and restated certificate of incorporation from limiting the liability of our directors for the following:

- any breach of the director's duty of loyalty to us or our stockholders;
- acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;
- unlawful payment of dividends or unlawful stock repurchases or redemptions; or
- any transaction from which the director derived an improper personal benefit.

If Delaware law is amended to authorize corporate action further eliminating or limiting the personal liability of a director, then the liability of our directors will be eliminated or limited to the fullest extent permitted by Delaware law, as so amended. This limitation of liability does not apply to liabilities arising under the federal securities laws and does not affect the availability of equitable remedies such as injunctive relief or rescission.

Our amended and restated bylaws, which will go into effect upon the closing of this offering, will provide that we will indemnify our directors and officers to the fullest extent permitted under Delaware law and that we shall have the power to indemnify our employees and agents to the fullest extent permitted by law. Our amended and restated bylaws will also permit us to secure insurance on behalf of any officer, director,

employee or other agent for any liability arising out of his or her actions in this capacity, regardless of whether we would have the power to indemnify such person against such expense, liability or loss under the General Corporation Law of the State of Delaware.

We have also entered into separate indemnification agreements with our directors and executive officers, in addition to indemnification provided for in our amended and restated bylaws. These agreements, among other things, provide for indemnification of our directors and executive officers for expenses, judgments, fines and settlement amounts incurred by such persons in any action or proceeding arising out of this person's services as a director or executive officer or at our request. We believe that these provisions in our amended and restated certificate of incorporation and amended and restated bylaws and indemnification agreements are necessary to attract and retain qualified persons as directors and executive officers.

The above description of the limitation of liability and indemnification provisions of our amended and restated certificate of incorporation, our amended and restated bylaws and our indemnification agreements is not complete and is qualified in its entirety by reference to these documents, each of which will be filed as an exhibit to this registration statement to which this prospectus forms a part.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation and amended and restated bylaws may discourage stockholders from bringing a lawsuit against our directors for breach of their fiduciary duties. They may also reduce the likelihood of derivative litigation against directors and officers, even though an action, if successful, might benefit us and our stockholders. A stockholder's investment may be harmed to the extent we pay the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions. Insofar as indemnification for liabilities under the Securities Act may be permitted to directors, officers or persons controlling us pursuant to the foregoing provisions, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is therefore unenforceable. There is no pending litigation or proceeding naming any of our directors or officers as to which indemnification is being sought, nor are we aware of any pending or threatened litigation that may result in claims for indemnification by any director or officer.

Listing

We have applied to list our common stock on The Nasdaq Global Market under the symbol "DTIL."

Transfer agent and registrar

The transfer agent and registrar for our common stock will be American Stock Transfer & Trust Company, LLC.

Shares eligible for future sale

Immediately prior to this offering, there was no public market for our common stock, and no predictions can be made about the effect, if any, that market sales of our common stock or the availability of such shares for sale will have on the market price prevailing from time to time. Nevertheless, future sales of our common stock in the public market, or the perception that such sales may occur, could adversely affect the market price of our common stock and could impair our ability to raise capital through future sales of our securities. See “Risk factors—Risks related to this offering and owning our common stock—A significant portion of our total outstanding shares is restricted from immediate resale but may be sold into the market in the near future, which could cause the market price of our common stock to decline significantly, even if our business is doing well.” Furthermore, although we have applied to have our common stock listed on the Nasdaq Global Market, we cannot assure you that there will be an active public trading market for our common stock.

Upon the closing of this offering, based on the number of shares of our common stock outstanding as of December 31, 2018 and after giving effect to the automatic conversion of all outstanding shares of our convertible preferred stock into 47,606,095 shares of our common stock upon the closing of this offering and the automatic settlement of the 2019 Notes into shares of our common stock in connection with the closing of this offering, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus, and assuming no exercise of options after December 31, 2018, we will have an aggregate of shares of our common stock outstanding (or shares of our common stock if the underwriters exercise in full their option to purchase additional shares). Of these shares of our common stock, all of the shares sold in this offering (or shares if the underwriters exercise in full their option to purchase additional shares) will be freely tradable without restriction or further registration under the Securities Act, except for any shares purchased by our “affiliates,” as that term is defined in Rule 144 under the Securities Act, whose sales would be subject to the Rule 144 resale restrictions described below, other than the holding period requirement.

The remaining shares of our common stock, including shares of our common stock issued upon the automatic settlement of the 2019 Notes in connection with the closing of this offering, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus, will be “restricted securities,” as that term is defined in Rule 144 under the Securities Act. These restricted securities are eligible for public sale only if they are registered under the Securities Act or if they qualify for an exemption from registration under Rules 144 or 701 under the Securities Act, which are summarized below. We expect that substantially all of these shares will be subject to the 180-day lock-up period under the lock-up agreements described below. Upon expiration of the lock-up period, we estimate that all of these restricted securities will be available for sale in the public market, subject in some cases to applicable volume limitations under Rule 144.

Lock-up agreements

We and each of our directors and executive officers and holders of substantially all of our outstanding capital stock, who will collectively own shares of our common stock upon the closing of this offering (after giving effect to the automatic conversion of all outstanding shares of our convertible preferred stock into shares of our common stock upon the closing of this offering and the automatic settlement of the 2019 Notes in connection with the closing of this offering, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus), have agreed not to sell or transfer any common stock or securities convertible into, exchangeable for, exercisable for or repayable with common stock, for 180 days after the date of this prospectus without first obtaining the written consent of J.P. Morgan Securities LLC, Goldman Sachs & Co. LLC and Jefferies LLC.

Upon the expiration of the lock-up period, substantially all of the shares subject to such lock-up restrictions will become eligible for sale, subject to the limitations discussed above. For a further description of these lock-up agreements, see “Underwriting.”

Rule 144

Affiliate resales of restricted securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is an affiliate of ours, or who was an affiliate at any time during the 90 days before a sale, who has beneficially owned shares of our common stock for at least six months would be entitled to sell in “broker’s transactions” or certain “riskless principal transactions” or to market makers, a number of shares within any three-month period that does not exceed the greater of:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately shares of our common stock immediately after this offering; or
- the average weekly trading volume in shares of our common stock on the Nasdaq Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Affiliate resales under Rule 144 are also subject to the availability of current public information about us. In addition, if the number of shares being sold under Rule 144 by an affiliate during any three-month period exceeds 5,000 shares or has an aggregate sale price in excess of $50,000, the seller must file a notice on Form 144 with the SEC and Nasdaq concurrently with either the placing of a sale order with the broker or the execution directly with a market maker.

Non-affiliate resales of restricted securities

In general, beginning 90 days after the effective date of the registration statement of which this prospectus is a part, a person who is not an affiliate of ours at the time of sale, and has not been an affiliate at any time during the three months preceding a sale, and who has beneficially owned shares of our common stock for at least six months but less than a year, is entitled to sell such shares subject only to the availability of current public information about us. If such person has held our shares for at least one year, such person can resell under Rule 144(b)(1) without regard to any Rule 144 restrictions, including the 90-day public company requirement and the current public information requirement.

Non-affiliate resales are not subject to the manner of sale, volume limitation or notice filing provisions of Rule 144.

Rule 701

In general, under Rule 701, any of an issuer’s employees, directors, officers, consultants or advisors who purchases shares from the issuer in connection with a compensatory stock or option plan or other written agreement before the effective date of a registration statement under the Securities Act is entitled to sell such shares 90 days after such effective date in reliance on Rule 144. An affiliate of the issuer can resell shares in reliance on Rule 144 without having to comply with the holding period requirement, and non-affiliates of the issuer can resell shares in reliance on Rule 144 without having to comply with the current public information and holding period requirements.

The SEC has indicated that Rule 701 will apply to typical options granted by an issuer before it becomes subject to the reporting requirements of the Exchange Act, along with the shares acquired upon exercise of such options, including exercises after an issuer becomes subject to the reporting requirements of the Exchange Act.

Equity plans

We intend to file one or more registration statements on Form S-8 under the Securities Act to register all shares of our common stock subject to outstanding options and shares of our common stock issued or issuable under our incentive plans. We expect to file the registration statement covering shares offered pursuant to our incentive plans shortly after the date of this prospectus, permitting the resale of such shares by non-affiliates in the public market without restriction under the Securities Act and the sale by affiliates in the public market, subject to compliance with the resale provisions of Rule 144.

Registration rights

Upon the closing of this offering, the holders of shares of our common stock (including shares of our common stock issuable upon the conversion of all outstanding shares of our convertible preferred stock upon the closing of this offering and the automatic settlement of the 2019 Notes into shares of our common stock in connection with the closing of this offering, assuming an initial public offering price per share of $, which is the midpoint of the price range set forth on the cover page of this prospectus) or their transferees will be entitled to various rights with respect to the registration of these shares under the Securities Act. Registration of these shares under the Securities Act would result in these shares becoming fully tradable without restriction under the Securities Act immediately upon the effectiveness of the registration, except for shares purchased by affiliates. See “Description of capital stock—Registration rights” for additional information. Shares covered by a registration statement will be eligible for sale in the public market upon the expiration or release from the terms of any applicable lock-up agreement.

Material U.S. federal income tax consequences to Non-U.S. Holders

The following discussion is a summary of the material U.S. federal income tax consequences to Non-U.S. Holders (as defined below) of the purchase, ownership and disposition of our common stock issued pursuant to this offering, but does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non-U.S. tax laws are not discussed. This discussion is based on the U.S. Internal Revenue Code of 1986, as amended, or the Code, Treasury Regulations promulgated thereunder, judicial decisions, and published rulings and administrative pronouncements of the U.S. Internal Revenue Service, or the IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a Non-U.S. Holder of our common stock. We have not sought and will not seek any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax consequences of the purchase, ownership and disposition of our common stock.

This discussion is limited to Non-U.S. Holders that hold our common stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to a Non-U.S. Holder's particular circumstances, including the impact of the Medicare contribution tax on net investment income or the alternative minimum tax. In addition, it does not address consequences relevant to Non-U.S. Holders subject to special rules, including, without limitation:

- U.S. expatriates and former citizens or long-term residents of the United States;
- persons holding our common stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies, and other financial institutions;
- brokers, dealers or traders in securities;
- "controlled foreign corporations," "passive foreign investment companies," and corporations that accumulate earnings to avoid U.S. federal income tax;
- partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- tax-exempt organizations or governmental organizations;
- persons deemed to sell our common stock under the constructive sale provisions of the Code;
- persons who hold or receive our common stock pursuant to the exercise of any employee stock option or otherwise as compensation;
- tax-qualified retirement plans;
- "qualified foreign pension funds" as defined in Section 897(l)(2) of the Code and entities all of the interests of which are held by qualified foreign pension funds;
- persons who own, or are deemed to own, more than 5% of our capital stock (except to the extent specifically set forth below); and
- persons subject to special tax accounting rules as a result of any item of gross income with respect to the stock being taken into account in an applicable financial statement.

If an entity treated as a partnership for U.S. federal income tax purposes holds our common stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships (or other entities treated as a partnership for U.S. federal income tax purposes) holding our common stock and the partners in such partnerships or other entities should consult their tax advisors regarding the U.S. federal income tax consequences to them.

THIS DISCUSSION IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT TAX ADVICE. INVESTORS SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK ARISING UNDER THE U.S. FEDERAL ESTATE OR GIFT TAX LAWS OR UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

Definition of a Non-U.S. Holder

For purposes of this discussion, a “Non-U.S. Holder” is any beneficial owner of our common stock that is neither a “U.S. person” nor an entity treated as a partnership for U.S. federal income tax purposes.

A U.S. person is any person that, for U.S. federal income tax purposes, is or is treated as any of the following:

- an individual who is a citizen or resident of the United States;
- a corporation, or an entity treated as a corporation, created or organized under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (1) is subject to the primary supervision of a U.S. court and the control of one or more “United States persons” (within the meaning of Section 7701(a)(30) of the Code), or (2) has a valid election in effect to be treated as a United States person for U.S. federal income tax purposes.

Distributions

As described in the section entitled “Dividend policy,” we do not anticipate declaring or paying dividends to holders of our common stock in the foreseeable future. However, if we do make distributions of cash or property on our common stock, such distributions will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts not treated as dividends for U.S. federal income tax purposes will constitute a return of capital and will first be applied against and reduce a Non-U.S. Holder’s adjusted tax basis in our common stock, but not below zero. Any excess will be treated as capital gain and will be treated as described below under “—Sale or other taxable dispositions of common stock.”

Subject to the discussion below on effectively connected income, dividends paid to a Non-U.S. Holder of our common stock will be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends (or such lower rate specified by an applicable income tax treaty, provided the Non-U.S. Holder timely furnishes a valid IRS Form W-8BEN or W-8BEN-E (or other applicable documentation) certifying qualification for the lower treaty rate). A Non-U.S. Holder that does not timely furnish the required documentation, but that qualifies for a reduced treaty rate, may obtain a refund of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS. Non-U.S. Holders should consult their tax advisors regarding their entitlement to benefits under any applicable income tax treaty.

If dividends paid to a Non-U.S. Holder are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the Non-U.S. Holder maintains a permanent establishment in the United States to which such dividends are attributable), the Non-U.S. Holder will be exempt from the U.S. federal withholding tax described above. To claim the exemption, the Non-U.S. Holder must timely furnish to the applicable withholding agent a valid IRS Form W-8ECI (or applicable successor form), certifying that the dividends are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States.

Any such effectively connected dividends will be subject to U.S. federal income tax on a net income basis at the regular graduated rates. A Non-U.S. Holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected dividends, as adjusted for certain items. Non-U.S. Holders should consult their tax advisors regarding any applicable tax treaties that may provide for different rules.

Sales or other taxable dispositions of common stock

A Non-U.S. Holder will not be subject to U.S. federal income tax on any gain realized upon the sale or other taxable disposition of our common stock unless:

- the gain is effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States (and, if required by an applicable income tax treaty, the Non-U.S. Holder maintains a permanent establishment in the United States to which such gain is attributable);
- the Non-U.S. Holder is a nonresident alien individual present in the United States for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our common stock constitutes a U.S. real property interest, or USRPI, by reason of our status as a U.S. real property holding corporation, or USRPHC, for U.S. federal income tax purposes.

Gain described in the first bullet point above generally will be subject to U.S. federal income tax on a net income basis at the regular graduated rates. A Non-U.S. Holder that is a corporation also may be subject to a branch profits tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty) on such effectively connected gain, as adjusted for certain items.

Gain described in the second bullet point above will be subject to U.S. federal income tax at a rate of 30% (or such lower rate specified by an applicable income tax treaty), which may be offset by U.S. source capital losses of the Non-U.S. Holder (even though the individual is not considered a resident of the United States), provided the Non-U.S. Holder has timely filed U.S. federal income tax returns with respect to such losses.

With respect to the third bullet point above, we believe we currently are not, and do not anticipate becoming, a USRPHC. Generally, a corporation is a U.S. real property holding corporation only if the fair market value of its U.S. real property interests equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests plus its other assets used or held for use in a trade or business. Because the determination of whether we are a USRPHC depends, however, on the fair market value of our USRPIs relative to the fair market value of our non-U.S. real property interests and our other business assets, there can be no assurance we currently are not a USRPHC or will not become one in the future. Even if we are or were to become a USRPHC, gain arising from the sale or other taxable disposition by a Non-U.S. Holder of our common stock will not be subject to U.S. federal income tax if our common stock is "regularly traded," as defined by applicable Treasury Regulations, on an established securities market, and such Non-U.S. Holder owned, actually and constructively, 5% or less of our common stock throughout the shorter of the five-year period ending on the date of the sale or other taxable disposition or the Non-U.S. Holder's holding period.

Non-U.S. Holders should consult their tax advisors regarding potentially applicable income tax treaties that may provide for different rules.

Information reporting and backup withholding

Payments of dividends on our common stock will not be subject to backup withholding, provided the applicable withholding agent does not have actual knowledge or reason to know the holder is a United States person and the holder either certifies its non-U.S. status, such as by furnishing a valid IRS Form W-8BEN, W-8BEN-E or W-8ECI, or otherwise establishes an exemption. However, information returns are required to be filed with the IRS in connection with any dividends on our common stock paid to the Non-U.S. Holder, regardless of whether any tax was actually withheld.

In addition, proceeds of the sale or other taxable disposition of our common stock within the United States, or conducted through certain U.S.-related brokers generally will not be subject to backup withholding or information reporting, if the applicable withholding agent receives the certification described above and does not have actual knowledge or reason to know that such holder is a United States person, or the holder otherwise establishes an exemption. Proceeds of a disposition of our common stock conducted through a non-U.S. office of a non-U.S. broker generally will not be subject to backup withholding or information reporting. Non-U.S. holders should consult their tax advisors regarding the application of the information reporting and backup withholding rules to them.

Copies of information returns that are filed with the IRS may also be made available under the provisions of an applicable treaty or agreement to the tax authorities of the country in which the Non-U.S. Holder resides or is established.

Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules may be allowed as a refund or a credit against a Non-U.S. Holder's U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

Additional withholding tax on payments made to foreign accounts

Withholding taxes may be imposed under Sections 1471 to 1474 of the Code (such Sections commonly referred to as the Foreign Account Tax Compliance Act, or FATCA) on certain types of payments made to non-U.S. financial institutions and certain other non-U.S. entities. Specifically, a 30% withholding tax may be imposed on dividends on, or gross proceeds from the sale or other disposition of, our common stock paid to a "foreign financial institution" or a "non-financial foreign entity" (each as defined in the Code), unless (1) the foreign financial institution undertakes certain diligence and reporting obligations, (2) the non-financial foreign entity either certifies it does not have any "substantial United States owners" (as defined in the Code) or furnishes identifying information regarding each substantial United States owner, or (3) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. If the payee is a foreign financial institution and is subject to the diligence and reporting requirements in (1) above, it must enter into an agreement with the U.S. Department of the Treasury requiring, among other things, that it undertake to identify accounts held by certain "specified United States persons" or "United States-owned foreign entities" (each as defined in the Code), annually report certain information about such accounts, and withhold 30% on certain payments to non-compliant foreign financial institutions and certain other account holders. Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States governing FATCA may be subject to different rules.

Under the applicable Treasury Regulations and administrative guidance, withholding under FATCA generally applies to payments of dividends on our common stock, and subject to the recently released proposed Treasury

Regulations described below, will apply to payments of gross proceeds from the sale or other disposition of such stock on or after January 1, 2019. The Treasury Department recently released proposed Treasury Regulations which, if finalized in their present form, would eliminate the federal withholding tax of 30% applicable to the gross proceeds of a sale or other disposition of our common stock. In its preamble to such proposed Treasury Regulations, the Treasury Department stated that taxpayers may generally rely on the proposed Treasury Regulations until final Treasury Regulations are issued.

Prospective investors should consult their tax advisors regarding the potential application of withholding under FATCA to their investment in our common stock.

Underwriting

We are offering the shares of common stock described in this prospectus through a number of underwriters. J.P. Morgan Securities LLC, Goldman Sachs & Co. LLC, Jefferies LLC and Barclays Capital Inc. are acting as joint book-running managers of the offering and as representatives of the underwriters. We have entered into an underwriting agreement with the underwriters. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriters, and each underwriter has severally agreed to purchase, at the public offering price less the underwriting discounts and commissions set forth on the cover page of this prospectus, the number of shares of common stock listed next to its name in the following table:

Name	Number of shares
J.P. Morgan Securities LLC	
Goldman Sachs & Co. LLC	
Jefferies LLC	
Barclays Capital Inc.	
Total	

The underwriters are committed to purchase all the shares of common stock offered by us if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may also be increased or the offering may be terminated.

The underwriters propose to offer the common stock directly to the public at the initial public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of $ per share. Any such dealers may resell shares to certain other brokers or dealers at a discount of up to $ per share from the initial public offering price. After the initial offering of the shares to the public, if all of the shares of common stock are not sold at the initial public offering price, the underwriters may change the offering price and the other selling terms. Sales of shares made outside of the United States may be made by affiliates of the underwriters.

The underwriters have an option to buy up to additional shares of common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters have 30 days from the date of this prospectus to exercise this option to purchase additional shares. If any shares are purchased with this option to purchase additional shares, the underwriters will purchase shares in approximately the same proportion as shown in the table above. If any additional shares of common stock are purchased, the underwriters will offer the additional shares on the same terms as those on which the shares are being offered.

The underwriting fee is equal to the public offering price per share of common stock less the amount paid by the underwriters to us per share of common stock. The underwriting fee is $ per share. The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters assuming both no exercise and full exercise of the underwriters' option to purchase additional shares.

	Without option to purchase additional shares exercise	With full option to purchase additional shares exercise
Per Share	$	$
Total	$	$

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses, but excluding the underwriting discounts and commissions, will be approximately $. We have agreed to reimburse the underwriters for expenses relating to the clearance of this offering with the Financial Industry Regulatory Authority, Inc. in an amount up to $.

A prospectus in electronic format may be made available on the web sites maintained by one or more underwriters, or selling group members, if any, participating in the offering. The underwriters may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters and selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that, subject to certain exceptions, we will not (1) offer, pledge, announce the intention to sell, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase or otherwise dispose of, directly or indirectly, or file with, the SEC a registration statement under the Securities Act relating to, any shares of our common stock or securities convertible into or exchangeable or exercisable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing, or (2) enter into any swap or other arrangement that transfers all or a portion of the economic consequences associated with the ownership of any shares of common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of common stock or such other securities, in cash or otherwise), in each case without the prior written consent of J.P. Morgan Securities LLC, Goldman Sachs & Co. LLC and Jefferies LLC for a period of 180 days after the date of this prospectus.

Our directors and executive officers, and substantially all of our securityholders have entered into lock-up agreements with the underwriters prior to the commencement of this offering pursuant to which each of these persons or entities, with limited exceptions, for a period of 180 days after the date of this prospectus, may not, without the prior written consent of J.P. Morgan Securities LLC, Goldman Sachs & Co. LLC and Jefferies LLC (1) offer, pledge, announce the intention to sell, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock (including, without limitation, common stock or such other securities which may be deemed to be beneficially owned by such directors, executive officers, managers and members in accordance with the rules and regulations of the SEC and securities which may be issued upon exercise of a stock option or warrant) or (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the common stock or such other securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of common stock or such other securities, in cash or otherwise, or (3) make any demand for or exercise any right with respect to the registration of any shares of our common stock or any security convertible into or exercisable or exchangeable for our common stock.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act.

We have applied to have our common stock approved for listing on The Nasdaq Global Market under the symbol “DTIL.”

In connection with this offering, the underwriters may engage in stabilizing transactions, which involves making bids for, purchasing and selling shares of common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of the common stock, which involves the sale by the underwriters

of a greater number of shares of common stock than they are required to purchase in this offering, and purchasing shares of common stock on the open market to cover positions created by short sales. Short sales may be "covered" shorts, which are short positions in an amount not greater than the underwriters' option to purchase additional shares referred to above, or may be "naked" shorts, which are short positions in excess of that amount. The underwriters may close out any covered short position either by exercising their option to purchase additional shares, in whole or in part, or by purchasing shares in the open market. In making this determination, the underwriters will consider, among other things, the price of shares available for purchase in the open market compared to the price at which the underwriters may purchase shares through the option to purchase additional shares. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market that could adversely affect investors who purchase in this offering. To the extent that the underwriters create a naked short position, they will purchase shares in the open market to cover the position.

The underwriters have advised us that, pursuant to Regulation M of the Securities Act, they may also engage in other activities that stabilize, maintain or otherwise affect the price of the common stock, including the imposition of penalty bids. This means that if the representatives of the underwriters purchase common stock in the open market in stabilizing transactions or to cover short sales, the representatives can require the underwriters that sold those shares as part of this offering to repay the underwriting discount received by them.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriters commence these activities, they may discontinue them at any time. The underwriters may carry out these transactions on The Nasdaq Global Market, in the over-the-counter market or otherwise.

Prior to this offering, there has been no public market for our common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In determining the initial public offering price, we and the representatives of the underwriters expect to consider a number of factors including:

- the information set forth in this prospectus and otherwise available to the representatives;
- our prospects and the history and prospects for the industry in which we compete;
- an assessment of our management;
- our prospects for future earnings;
- the general condition of the securities markets at the time of this offering;
- the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the underwriters and us.

Neither we nor the underwriters can assure investors that an active trading market will develop for our common stock, or that shares of our common stock will trade in the public market at or above the initial public offering price.

Other relationships

The underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include sales and trading, commercial and investment banking, advisory, investment

management, investment research, principal investment, hedging, market making, brokerage and other financial and non-financial activities and services. Certain of the underwriters and their respective affiliates have provided, and may in the future provide, a variety of these services to us and to persons and entities with relationships with us, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the underwriters and their respective affiliates, officers, directors and employees may purchase, sell or hold a broad array of investments and actively trade securities, derivatives, loans, commodities, currencies, credit default swaps and other financial instruments for their own account and for the accounts of their customers, and such investment and trading activities may involve or relate to assets, securities and/or instruments of ours (directly, as collateral securing other obligations or otherwise) and/or persons and entities with relationships with us, including long or short positions in our debt or equity securities or loans. The underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of such assets, securities or instruments and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in such assets, securities and instruments.

Selling restrictions

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

Notice to prospective investors in the European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive, (each, a “Relevant Member State”), with effect from and including the date on which the Prospectus Directive is implemented in that Relevant Member State, no offer of shares may be made to the public in that Relevant Member State other than:

(1) to any legal entity which is a qualified investor as defined in the Prospectus Directive;

(2) to fewer than 150 natural or legal persons (other than qualified investors as defined in the Prospectus Directive), subject to obtaining the prior consent of the underwriters; or

(3) in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of shares shall require the Company or any underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive and each person who initially acquires any shares or to whom any offer is made will be deemed to have represented, acknowledged and agreed to and with each of the underwriters and the Company that it is a “qualified investor” within the meaning of the law in that Relevant Member State implementing Article 2(1)(e) of the Prospectus Directive.

In the case of any shares being offered to a financial intermediary as that term is used in Article 3(2) of the Prospectus Directive, each such financial intermediary will be deemed to have represented, acknowledged and agreed that the shares acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer of any shares to the public other than their offer or resale in a Relevant Member State to qualified investors as so defined or in circumstances in which the prior consent of the representatives has been obtained to each such proposed offer or resale.

For the purposes of this provision, the expression an “offer of shares to the public” in relation to any shares in any Relevant Member State means the communication in any form and by means of sufficient information on the terms of the offer and the shares to be offered so as to enable an investor to decide to purchase shares, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State, the expression “Prospectus Directive” means Directive 2003/71/EC (as amended, including by Directive 2010/73/EU), and includes any relevant implementing measure in the Relevant Member State.

Notice to prospective investors in the United Kingdom

In addition, in the United Kingdom, this document is being distributed only to, and is directed only at, and any offer subsequently made may only be directed at persons who are “qualified investors” (as defined in the Prospectus Directive) (1) who have professional experience in matters relating to investments falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the “Order”) and/or (2) who are high net worth companies (or persons to whom it may otherwise be lawfully communicated) falling within Article 49(2)(a) to (d) of the Order (all such persons together being referred to as “relevant persons”) or otherwise in circumstances which have not resulted and will not result in an offer to the public of the shares in the United Kingdom within the meaning of the Financial Services and Markets Act 2000.

Any person in the United Kingdom that is not a relevant person should not act or rely on the information included in this document or use it as basis for taking any action. In the United Kingdom, any investment or investment activity that this document relates to may be made or taken exclusively by relevant persons.

Notice to prospective investors in Canada

The shares may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations. Any resale of the shares must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser’s province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser’s province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 Underwriting Conflicts, or NI 33-105, the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

Notice to prospective investors in Switzerland

The shares may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or the SIX, or on any other stock exchange or regulated trading facility in Switzerland. This document does not constitute a prospectus within the meaning of, and has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document nor any other offering or marketing material relating to the shares or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this document nor any other offering or marketing material relating to the offering, the Company or the shares has been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or the CISA. The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

Notice to prospective investors in the Dubai International Financial Centre (“DIFC”)

This document relates to an Exempt Offer in accordance with the Markets Rules 2012 of the Dubai Financial Services Authority, or the DFSA. This document is intended for distribution only to persons of a type specified in the Markets Rules 2012 of the DFSA. It must not be delivered to, or relied on by, any other person. The DFSA has no responsibility for reviewing or verifying any documents in connection with Exempt Offers. The DFSA has not approved this prospectus supplement nor taken steps to verify the information set forth herein and has no responsibility for this document. The securities to which this document relates may be illiquid and/or subject to restrictions on their resale. Prospective purchasers of the securities offered should conduct their own due diligence on the securities. If you do not understand the contents of this document you should consult an authorized financial advisor.

In relation to its use in the DIFC, this document is strictly private and confidential and is being distributed to a limited number of investors and must not be provided to any person other than the original recipient, and may not be reproduced or used for any other purpose. The interests in the securities may not be offered or sold directly or indirectly to the public in the DIFC.

Notice to prospective investors in the United Arab Emirates

The shares have not been, and are not being, publicly offered, sold, promoted or advertised in the United Arab Emirates (including the Dubai International Financial Centre) other than in compliance with the laws of the United Arab Emirates (and the Dubai International Financial Centre) governing the issue, offering and sale of securities. Further, this prospectus does not constitute a public offer of securities in the United Arab Emirates (including the Dubai International Financial Centre) and is not intended to be a public offer. This prospectus has not been approved by or filed with the Central Bank of the United Arab Emirates, the Securities and Commodities Authority or the Dubai Financial Services Authority.

Notice to prospective investors in Australia

This prospectus:

- does not constitute a product disclosure document or a prospectus under Chapter 6D.2 of the Corporations Act 2001 (Cth), or the Corporations Act;

- has not been, and will not be, lodged with the Australian Securities and Investments Commission, or ASIC, as a disclosure document for the purposes of the Corporations Act and does not purport to include the information required of a disclosure document under Chapter 6D.2 of the Corporations Act;
- does not constitute or involve a recommendation to acquire, an offer or invitation for issue or sale, an offer or invitation to arrange the issue or sale, or an issue or sale, of interests to a "retail client" (as defined in section 761G of the Corporations Act and applicable regulations) in Australia; and
- may only be provided in Australia to select investors who are able to demonstrate that they fall within one or more of the categories of investors, or Exempt Investors, available under section 708 of the Corporations Act.

The shares may not be directly or indirectly offered for subscription or purchased or sold, and no invitations to subscribe for or buy the shares may be issued, and no draft or definitive offering memorandum, advertisement or other offering material relating to any shares may be distributed in Australia, except where disclosure to investors is not required under Chapter 6D of the Corporations Act or is otherwise in compliance with all applicable Australian laws and regulations. By submitting an application for the shares, you represent and warrant to us that you are an Exempt Investor.

As any offer of shares under this document will be made without disclosure in Australia under Chapter 6D.2 of the Corporations Act, the offer of those securities for resale in Australia within 12 months may, under section 707 of the Corporations Act, require disclosure to investors under Chapter 6D.2 if none of the exemptions in section 708 applies to that resale. By applying for the shares you undertake to us that you will not, for a period of 12 months from the date of issue of the shares, offer, transfer, assign or otherwise alienate those securities to investors in Australia except in circumstances where disclosure to investors is not required under Chapter 6D.2 of the Corporations Act or where a compliant disclosure document is prepared and lodged with ASIC.

Notice to prospective investors in Japan

The shares have not been and will not be registered pursuant to Article 4, Paragraph 1 of the Financial Instruments and Exchange Act. Accordingly, none of the shares nor any interest therein may be offered or sold, directly or indirectly, in Japan or to, or for the benefit of, any "resident" of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to or for the benefit of a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Act and any other applicable laws, regulations and ministerial guidelines of Japan in effect at the relevant time.

Notice to prospective investors in Hong Kong

The shares have not been offered or sold and will not be offered or sold in Hong Kong, by means of any document, other than (1) to "professional investors" as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong and any rules made under that Ordinance or (2) in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32) of Hong Kong or which do not constitute an offer to the public within the meaning of that Ordinance. No advertisement, invitation or document relating to the shares has been or may be issued or has been or may be in the possession of any person for the purposes of issue, whether in Hong Kong or elsewhere, which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to shares which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" as defined in the Securities and Futures Ordinance and any rules made under that Ordinance.

Notice to prospective investors in Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (1) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore, or the SFA, (2) to a relevant person pursuant to Section 275(1), or any person pursuant to Section 275(1A), and in accordance with the conditions specified in Section 275 of the SFA, or (3) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

(a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or

(b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities (as defined in Section 239(1) of the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the shares pursuant to an offer made under Section 275 of the SFA except:

(a) to an institutional investor or to a relevant person defined in Section 275(2) of the SFA, or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(i)(B) of the SFA;

(b) where no consideration is or will be given for the transfer;

(c) where the transfer is by operation of law;

(d) as specified in Section 276(7) of the SFA; or

(e) as specified in Regulation 32 of the Securities and Futures (Offers of Investments) (Shares and Debentures) Regulations 2005 of Singapore.

Solely for the purposes of its obligations pursuant to Section 309B of the SFA, we have determined, and hereby notify all relevant persons (as defined in the CMP Regulations 2018), that the shares are ''prescribed capital markets products'' (as defined in the CMP Regulations 2018) and Excluded Investment Products (as defined in MAS Notice SFA 04-N12: Notice on the Sale of Investment Products and MAS Notice FAA-N16: Notice on Recommendations on Investment Products).

Notice to prospective investors in Bermuda

Shares may be offered or sold in Bermuda only in compliance with the provisions of the Investment Business Act of 2003 of Bermuda which regulates the sale of securities in Bermuda. Additionally, non-Bermudian persons (including companies) may not carry on or engage in any trade or business in Bermuda unless such persons are permitted to do so under applicable Bermuda legislation.

Notice to prospective investors in Saudi Arabia

This document may not be distributed in the Kingdom of Saudi Arabia except to such persons as are permitted under the Offers of Securities Regulations as issued by the board of the Saudi Arabian Capital Market Authority,

or the CMA, pursuant to resolution number 2-11-2004 dated 4 October 2004 as amended by resolution number 1-28-2008, as amended, or the CMA Regulations. The CMA does not make any representation as to the accuracy or completeness of this document and expressly disclaims any liability whatsoever for any loss arising from, or incurred in reliance upon, any part of this document. Prospective purchasers of the securities offered hereby should conduct their own due diligence on the accuracy of the information relating to the securities. If you do not understand the contents of this document, you should consult an authorised financial adviser.

Notice to prospective investors in the British Virgin Islands

The shares are not being, and may not be offered to the public or to any person in the British Virgin Islands for purchase or subscription by or on behalf of the Company. The Company may be offered to companies incorporated under the BVI Business Companies Act, 2004 (British Virgin Islands), but only where the offer will be made to, and received by, the relevant BVI Company entirely outside of the British Virgin Islands. This prospectus has not been, and will not be, registered with the Financial Services Commission of the British Virgin Islands. No registered prospectus has been or will be prepared in respect of the shares for the purposes of the Securities and Investment Business Act, 2010 or the Public Issuers Code of the British Virgin Islands.

Notice to prospective investors in China

This prospectus does not constitute a public offer of shares, whether by sale or subscription, in the People's Republic of China, or the PRC. The shares are not being offered or sold directly or indirectly in the PRC to or for the benefit of, legal or natural persons of the PRC.

Further, no legal or natural persons of the PRC may directly or indirectly purchase any of the shares or any beneficial interest therein without obtaining all prior PRC's governmental approvals that are required, whether statutorily or otherwise. Persons who come into possession of this document are required by the issuer and its representatives to observe these restrictions.

Notice to prospective investors in Korea

The shares have not been and will not be registered under the Financial Investments Services and Capital Markets Act of Korea and the decrees and regulations thereunder, or the FSCMA, and the shares have been and will be offered in Korea as a private placement under the FSCMA. None of the shares may be offered, sold or delivered directly or indirectly, or offered or sold to any person for re-offering or resale, directly or indirectly, in Korea or to any resident of Korea except pursuant to the applicable laws and regulations of Korea, including the FSCMA and the Foreign Exchange Transaction Law of Korea and the decrees and regulations thereunder, or the FETL. Furthermore, the purchaser of the shares shall comply with all applicable regulatory requirements (including but not limited to requirements under the FETL) in connection with the purchase of the shares. By the purchase of the shares, the relevant holder thereof will be deemed to represent and warrant that if it is in Korea or is a resident of Korea, it purchased the shares pursuant to the applicable laws and regulations of Korea.

Notice to prospective investors in Malaysia

No prospectus or other offering material or document in connection with the offer and sale of the shares has been or will be registered with the Securities Commission of Malaysia, or the Commission, for the Commission's approval pursuant to the Capital Markets and Services Act 2007. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an

invitation for subscription or purchase, whether directly or indirectly, to persons in Malaysia other than (1) a closed end fund approved by the Commission, (2) a holder of a Capital Markets Services Licence, (3) a person who acquires the shares, as principal, if the offer is on terms that the shares may only be acquired at a consideration of not less than RM250,000 (or its equivalent in foreign currencies) for each transaction, (4) an individual whose total net personal assets or total net joint assets with his or her spouse exceeds RM3 million (or its equivalent in foreign currencies), excluding the value of the primary residence of the individual, (5) an individual who has a gross annual income exceeding RM300,000 (or its equivalent in foreign currencies) per annum in the preceding 12 months, (6) an individual who, jointly with his or her spouse, has a gross annual income of RM400,000 (or its equivalent in foreign currencies), per annum in the preceding 12 months, (7) a corporation with total net assets exceeding RM10 million (or its equivalent in a foreign currencies) based on the last audited accounts, (8) a partnership with total net assets exceeding RM10 million (or its equivalent in foreign currencies), (9) a bank licensee or insurance licensee as defined in the Labuan Financial Services and Securities Act 2010, (10) an Islamic bank licensee or takaful licensee as defined in the Labuan Financial Services and Securities Act 2010, and (11) any other person as may be specified by the Commission; provided that, in the each of the preceding categories (1) to (11), the distribution of the shares is made by a holder of a Capital Markets Services Licence who carries on the business of dealing in securities. The distribution in Malaysia of this prospectus is subject to Malaysian laws. This prospectus does not constitute and may not be used for the purpose of public offering or an issue, offer for subscription or purchase, invitation to subscribe for or purchase any securities requiring the registration of a prospectus with the Commission under the Capital Markets and Services Act 2007.

Notice to prospective investors in Taiwan

The shares have not been and will not be registered with the Financial Supervisory Commission of Taiwan pursuant to relevant securities laws and regulations and may not be sold, issued or offered within Taiwan through a public offering or in circumstances which constitutes an offer within the meaning of the Securities and Exchange Act of Taiwan that requires a registration or approval of the Financial Supervisory Commission of Taiwan. No person or entity in Taiwan has been authorised to offer, sell, give advice regarding or otherwise intermediate the offering and sale of the shares in Taiwan.

Notice to prospective investors in South Africa

Due to restrictions under the securities laws of South Africa, the shares are not offered, and the offer shall not be transferred, sold, renounced or delivered, in South Africa or to a person with an address in South Africa, unless one or other of the following exemptions applies:

(1) the offer, transfer, sale, renunciation or delivery is to:

(a) persons whose ordinary business is to deal in securities, as principal or agent;

(b) the South African Public Investment Corporation;

(c) persons or entities regulated by the Reserve Bank of South Africa;

(d) authorised financial service providers under South African law;

(e) financial institutions recognised as such under South African law;

(f) a wholly-owned subsidiary of any person or entity contemplated in (c), (d) or (e), acting as agent in the capacity of an authorised portfolio manager for a pension fund or collective investment scheme (in each case duly registered as such under South African law); or

(g) any combination of the person in (a) to (f); or

(2) the total contemplated acquisition cost of the securities, for any single addressee acting as principal is equal to or greater than ZAR1,000,000.

No “offer to the public” (as such term is defined in the South African Companies Act, No. 71 of 2008 (as amended or re-enacted), or the South African Companies Act, in South Africa is being made in connection with the issue of the shares. Accordingly, this document does not, nor is it intended to, constitute a “registered prospectus” (as that term is defined in the South African Companies Act) prepared and registered under the South African Companies Act and has not been approved by, and/or filed with, the South African Companies and Intellectual Property Commission or any other regulatory authority in South Africa. Any issue or offering of the shares in South Africa constitutes an offer of the shares in South Africa for subscription or sale in South Africa only to persons who fall within the exemption from “offers to the public” set out in section 96(1)(a) of the South African Companies Act. Accordingly, this document must not be acted on or relied on by persons in South Africa who do not fall within section 96(1)(a) of the South African Companies Act (such persons being referred to as “SA Relevant Persons”). Any investment or investment activity to which this document relates is available in South Africa only to SA Relevant Persons and will be engaged in South Africa only with SA relevant persons.

Legal matters

The validity of the shares of common stock offered hereby and certain other legal matters will be passed upon for us by Smith, Anderson, Blount, Dorsett, Mitchell & Jernigan, LLP, Raleigh, North Carolina, and certain other legal matters in connection with this offering will be passed upon for us by Latham & Watkins LLP. Certain legal matters in connection with this offering will be passed upon for the underwriters by Cooley LLP, New York, New York.

Experts

The financial statements included in this prospectus have been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report appearing herein. Such financial statements are included in reliance upon the report of such firm given upon their authority as experts in accounting and auditing.

Where you can find more information

We have filed with the SEC a registration statement on Form S-1 under the Securities Act with respect to the shares of common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. For further information about us and the common stock offered hereby, we refer you to the registration statement and the exhibits and schedules filed therewith. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement. Upon completion of this offering, we will be required to file periodic reports, proxy statements, and other information with the SEC pursuant to the Exchange Act. You can read our SEC filings, including the registration statement, at the SEC's website at www.sec.gov. We also maintain a website at www.precisionbiosciences.com. The information contained in, or accessible through, our website does not constitute a part of this prospectus.

Precision BioSciences, Inc.
Index to consolidated financial statements

Report of independent registered public accounting firm

To the stockholders and the Board of Directors of Precision BioSciences, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Precision BioSciences, Inc. (the “Company”) as of December 31, 2018 and 2017, the related consolidated statements of operations, changes in stockholders’ equity (deficit) and cash flows, for each of the two years in the period ended December 31, 2018, and the related notes (collectively referred to as the “financial statements”). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company’s internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Deloitte & Touche LLP

Raleigh, North Carolina
February 21, 2019 (March 1, 2019 as to Note 15)

We have served as the Company’s auditor since 2017.

Precision BioSciences, Inc.
Consolidated balance sheets

(In thousands, except share and per share amounts)	December 31, 2017	December 31, 2018	Pro forma December 31, 2018 (unaudited)
Assets			
Current assets:			
Cash and cash equivalents	$ 62,802	$103,193	$ 103,193
Accounts receivable	—	523	523
Prepaid expenses	1,437	8,913	8,913
Other current assets	92	3,046	3,046
Total current assets	64,331	115,675	115,675
Property, equipment, and software—net	8,137	21,147	21,147
Intangible assets—net	90	1,466	1,466
Other assets	124	312	312
Total assets	$ 72,682	$138,600	$ 138,600
Liabilities and Stockholders' Equity (Deficit)			
Current liabilities:			
Accounts payable	$ 1,806	$ 2,218	$ 2,218
Accrued expenses and other current liabilities	1,573	3,421	3,421
Deferred revenue	5,824	8,436	8,436
Total current liabilities	9,203	14,075	14,075
Deferred revenue—noncurrent	88,596	82,807	82,807
Deferred rent—noncurrent	1,252	1,758	1,758
Total liabilities	99,051	98,640	98,640
Commitments and contingencies (Note 9)			
Stockholders' equity (deficit):			
Series A convertible preferred stock; $0.0001 par value—25,650,000 shares authorized as of December 31, 2017 and 2018; 25,650,000 shares issued and outstanding as of December 31, 2017 and 2018; no shares issued and outstanding as of December 31, 2018, pro forma (unaudited)	3	3	—
Series B convertible preferred stock; $0.0001 par value—no shares authorized, issued and outstanding as of December 31, 2017; 21,956,100 shares authorized and 21,956,095 shares issued and outstanding as of December 31, 2018; no shares issued or outstanding as of December 31, 2018, pro forma (unaudited)	—	2	—
Common stock; $0.000005 par value—100,000,000 shares authorized, 35,215,548 shares issued and 33,485,443 shares outstanding as of December 31, 2017; 130,000,000 shares authorized, 35,685,875 shares issued and 33,955,770 shares outstanding as of December 31, 2018; 83,291,970 issued and 81,561,865 outstanding, pro forma (unaudited)	—	—	—
Additional paid-in capital	13,691	126,094	126,099
Accumulated deficit	(39,111)	(85,187)	(85,187)
Treasury stock (at cost, 1,730,105 shares of common stock at December 31, 2017 and 2018)	(952)	(952)	(952)
Total stockholders' equity (deficit)	(26,369)	39,960	39,960
Total liabilities and stockholders' equity (deficit)	$ 72,682	$138,600	$ 138,600

See notes to consolidated financial statements

Precision BioSciences, Inc.
Consolidated statements of operations

(In thousands, except share and per share amounts)	Years ended December 31, 2017	2018
Revenue	$ 6,484	$ 10,883
Operating expenses:		
Research and development	20,324	45,122
General and administrative	8,016	13,673
Impairment of intangible assets	118	—
Total operating expenses	28,458	58,795
Loss from operations	(21,974)	(47,912)
Other income:		
Interest income	872	1,875
Net loss and net loss attributable to common stockholders	$ (21,102)	$ (46,037)
Net loss per share attributable to common stockholders-basic and diluted	$ (0.62)	$ (1.37)
Weighted-average shares of common stock outstanding-basic and diluted	33,956,010	33,675,834
Pro forma net loss per share attributable to common stockholders-basic and diluted (unaudited)		$ (0.64)
Pro forma weighted-average shares of common stock outstanding-basic and diluted (unaudited)		71,840,382

See notes to consolidated financial statements

Precision BioSciences, Inc.
Consolidated statements of changes in stockholders' equity (deficit)

(In thousands, except share amounts)	Series A convertible preferred stock		Series B convertible preferred stock		Common stock		Additional paid-in capital	Accumulated deficit	Treasury stock	Total stockholders' equity (deficit)
	Shares	Amount	Shares	Amount	Shares	Amount				
Balance—January 1, 2017	25,650,000	$ 3	—	$ —	35,132,923	$ —	$ 13,257	$ (18,009)	$ —	$ (4,749)
Repurchase of common stock	—	—	—	—	—	—	—	—	(952)	(952)
Stock option exercises	—	—	—	—	82,625	—	15	—	—	15
Share-based compensation expense	—	—	—	—	—	—	419	—	—	419
Net loss	—	—	—	—	—	—	—	(21,102)	—	(21,102)
Balance—December 31, 2017	25,650,000	$ 3	—	$ —	35,215,548	$ —	$ 13,691	$ (39,111)	$ (952)	$ (26,369)
Issuance of Series B convertible preferred stock, net of offering costs	—	—	21,956,095	2	—	—	109,740	—	—	109,742
Stock option exercises	—	—	—	—	470,327	—	171	—	—	171
Share-based compensation expense	—	—	—	—	—	—	2,492	(39)	—	2,453
Net loss	—	—	—	—	—	—	—	(46,037)	—	(46,037)
Balance—December 31, 2018	25,650,000	$ 3	21,956,095	$ 2	35,685,875	$ —	$ 126,094	$ (85,187)	$ (952)	$ 39,960

See notes to consolidated financial statements

Precision BioSciences, Inc.
Consolidated statements of cash flows

(In thousands)	Years ended December 31, 2017	2018
Cash flows from operating activities:		
Net loss	$ (21,102)	$ (46,037)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	1,435	2,354
Share-based compensation	419	2,453
Loss on disposal of assets	56	14
Impairment of intangible assets	118	—
Changes in operating assets and liabilities:		
Prepaid expenses	(550)	(7,476)
Other current assets	—	(260)
Accounts receivable	—	(523)
Other assets	63	(188)
Accounts payable	864	(673)
Accrued expenses and other current liabilities	707	1,790
Deferred revenue	(6,179)	(3,177)
Net cash used in operating activities	(24,169)	(51,723)
Cash flows from investing activities:		
Acquisition of license rights	—	(1,400)
Purchases of property, equipment, and software	(5,565)	(14,278)
Proceeds from disposal of equipment	50	15
Net cash used in investing activities	(5,515)	(15,663)
Cash flows from financing activities:		
Issuance of Series B convertible preferred stock, net of offering costs	—	109,742
Deferred offering costs	—	(2,136)
Proceeds from stock option exercises	15	171
Repurchases of common stock	(952)	—
Net cash (used in) provided by financing activities	(937)	107,777
Net (decrease) increase in cash and cash equivalents	(30,621)	40,391
Cash and cash equivalents—beginning of period	93,423	62,802
Cash and cash equivalents—end of period	$ 62,802	103,193
Supplemental disclosures of noncash financing and investing activities:		
Deferred offering costs included in accrued expenses and other current liabilities	$ —	$ 406
Property, equipment and software additions included in accounts payable and accrued expenses and other current liabilities	$ 218	$ 1,340

See notes to consolidated financial statements

Precision BioSciences, Inc.
Notes to consolidated financial statements

Note 1: Description of business and summary of significant accounting policies

Description of business and basis of presentation

Precision BioSciences, Inc. (the “Company”) was incorporated on January 26, 2006 under the laws of the State of Delaware and is based in Durham, North Carolina. The Company is focused on utilizing its proprietary genome editing platform to help overcome cancers, cure genetic diseases and enable the development of safer, more productive food sources.

The Company’s 100% owned subsidiary, Precision PlantSciences, Inc., was incorporated on January 4, 2012. Precision PlantSciences, Inc. amended its certificate of incorporation on January 16, 2018 to change its name to ELO Life Systems, Inc. The accompanying consolidated financial statements include the accounts of the Company and ELO Life Systems, Inc. Intercompany balances and transactions have been eliminated in consolidation.

Since its inception, the Company has devoted substantially all of its efforts to research and development activities, recruiting skilled personnel, developing manufacturing processes, establishing its intellectual property portfolio and providing general and administrative support for these operations. The Company is subject to a number of risks similar to those of other companies conducting high-risk, early-stage research and development of product candidates. Principal among these risks are dependence on key individuals and intellectual property, competition from other products and companies and the technical risks associated with the successful research, development and clinical manufacturing of its and its collaborators’ product candidates. The Company’s success is dependent upon its ability to continue to raise additional capital in order to fund ongoing research and development, obtain regulatory approval of its products, successfully commercialize its products, generate revenue, meet its obligations and, ultimately, attain profitable operations.

Use of estimates

The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States of America (“GAAP”) requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and disclosures made in the accompanying notes to the consolidated financial statements. Actual results could differ from those estimates. Significant estimates include recording revenue for multiple element arrangements, determination of the fair value of share-based compensation grants and estimating services expended by third-party service providers used to recognize research and development expense.

Basis of presentation

These financial statements have been prepared in accordance with GAAP. Additionally, the accompanying consolidated financial statements have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business. To date, the Company has not generated any revenue from product sales and does not expect to generate any revenue from the sale of product in the foreseeable future. During the year ended December 31, 2018, the Company incurred a net loss of $46.0 million and, as of December 31, 2018, has an accumulated deficit of $85.2 million. The Company has financed operations to date primarily through the issuance of preferred stock (see Note 6) and with proceeds from its development and commercial license agreement with Les Laboratoires Servier (“Servier”)

Precision BioSciences, Inc.
Notes to consolidated financial statements

(see Note 13). The Company expects to incur additional operating losses and negative operating cash flows for the foreseeable future.

Management believes that existing cash and cash equivalents will allow the Company to continue its operations for at least a year from the issuance date of these consolidated financial statements. In the absence of a significant source of recurring revenue, the continued viability of the Company beyond that point is dependent on its ability to continue to raise additional capital to finance its operations. There can be no assurance that the Company will be able to obtain sufficient capital to cover its costs on acceptable terms, if at all.

Unaudited pro forma consolidated balance sheet

The unaudited pro forma consolidated balance sheet statement presents the Company's capitalization as of December 31, 2018 giving effect to adjustments arising upon the completion of a qualified initial public offering. The adjustments relate to the automatic conversion of all outstanding shares of convertible preferred stock into shares of common stock as if the proposed initial public offering occurred on December 31, 2018.

Cash and cash equivalents

The Company considers all highly liquid investments with an original maturity of three months or less at the date of purchase to be cash equivalents. As of December 31, 2017 and 2018, the Company held cash equivalents composed of money market funds and repurchase agreements that were collateralized by deposits in the form of government securities and obligations.

Concentrations of credit risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist principally of cash and cash equivalents. All of the Company's cash and cash equivalents are held at financial institutions that management believes to be of high credit quality. The Company may maintain cash deposits in financial institutions in excess of government insured limits. The Company regularly invests excess cash deposits in money market funds and repurchase agreements. The Company believes that the credit risk arising from the holdings of these financial instruments is mitigated by the fact that these securities are of short duration, government backed and of high credit rating. The Company has not experienced any losses on cash and cash equivalents to date.

Revenue from two development and license agreements accounted for 89% and 6% of revenue during 2017 and 53% and 34% of revenue during 2018, as well as 97% and 2% of deferred revenue as of December 31, 2018.

Deferred offering costs

The Company capitalizes incremental legal, professional accounting and other third-party fees that are directly associated with the Company's planned initial public offering ("IPO") as other current assets until the IPO is consummated. After consummation of the IPO, these costs will be recorded in stockholders' equity (deficit) as a reduction of additional paid-in capital generated as a result of the offering. If the IPO is not completed, any costs deferred will be expensed immediately.

Precision BioSciences, Inc.
Notes to consolidated financial statements

Property, equipment and software

Property, equipment and software are stated at cost, net of depreciation and amortization. Depreciation and amortization are calculated using the straight-line method over the estimated useful lives of the assets ranging from three to seven years. Leasehold improvements are amortized on a straight-line basis over the shorter of the lease term or estimated useful life of the asset.

The depreciation and amortization periods for the Company's significant property, equipment and software categories are as follows:

Computer hardware and software	3 years
Lab equipment	5 to 7 years
Furniture and office equipment	3 to 5 years
Leasehold improvements	Lesser of remaining lease term or useful life

Repairs and maintenance are charged to operations as incurred, and expenditures for additions and improvements that extend the useful life of the asset are capitalized.

Intangible assets

Intangible assets primarily include licenses and patents. The Company capitalizes license fees paid to acquire access to proprietary technology if the technology is expected to have alternative future use in multiple research and development projects. The cost of licensed technology rights is amortized using the straight-line method over the estimated useful life of the technology. If the access to use the technology rights is one year or less, the cost is recorded as a prepaid expense and amortized over the period identified in the agreement. Amortization expense for licensed technology and capitalized patent costs is included in research and development expenses within the accompanying consolidated statement of operations.

Impairment of long-lived assets

Long-lived assets, such as property, equipment and software and intangible assets, subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. An impairment loss is assessed when future undiscounted cash flows are less than the assets' carrying value and recognized when the carrying value of the asset exceeds fair value. Fair value is calculated by estimating the undiscounted future cash flows expected to be generated by the asset as well as other valuation techniques. An impairment charge is recognized for the amount by which the carrying amount exceeds the fair value of the asset.

Revenue recognition

The Company's revenues are generated primarily through collaborative research, license, development and commercialization agreements. The terms of these agreements generally contain multiple elements, or deliverables, which may include (i) licenses, or options to obtain licenses, to the Company's technology, (ii) research and development activities to be performed on behalf of the collaborative partner, and (iii) in certain cases, services in connection with the manufacturing of preclinical and clinical material. Payments to the Company under these arrangements typically include one or more of the following: non-refundable, upfront license fees; option exercise fees; funding of research and development efforts; clinical and development, regulatory, and sales milestone payments; and royalties on future product sales.

Precision BioSciences, Inc.
Notes to consolidated financial statements

Revenue is recognized when all of the following conditions are met: (i) persuasive evidence of an arrangement exists, (ii) delivery has occurred or services have been rendered, (iii) fees are fixed or determinable and (iv) collection of fees is reasonably assured.

The Company analyzes its collaboration arrangements to assess whether they are within the scope of Accounting Standards Codification *808, Collaborative Arrangements* ("ASC 808") to determine whether such arrangements involve joint operating activities performed by parties that are both active participants in the activities and exposed to significant risks and rewards dependent on the commercial success of such activities. This requires the Company to determine whether elements of the collaboration are deemed to be within the scope of ASC 808 and those that are more reflective of a vendor-customer relationship and therefore within the scope of Accounting Standards Codification *605-25, Revenue Recognition—Multiple-Element Arrangements* ("ASC 605"). To date, the Company has no arrangements that are within the scope of ASC 808.

When evaluating multiple element arrangements under ASC 605, the Company determines whether the arrangement should be divided into separate units of accounting and how the arrangement consideration should be measured and allocated among the separate units of accounting. An element qualifies as a separate unit of accounting when the delivered element has stand-alone value to the customer. Any delivered elements that do not qualify as separate units of accounting are combined with other undelivered elements within the arrangement as a single unit of accounting. The Company determines the revenue recognition method for the combined unit of accounting and recognizes the revenue over the period from inception through the date the last deliverable within the single unit of accounting is delivered. The Company's arrangements do not include a general right of return relative to delivered elements.

Cash received prior to satisfying all revenue recognition criteria are recorded as deferred revenue in the accompanying consolidated balance sheets. The Company's deferred revenue primarily includes nonrefundable up-front license fees and advance payments for research and development funding. The deferred revenue is recognized into revenue on a proportional or straight-line basis over the estimated period of the Company's substantive performance obligations or the period the rights granted are in effect. Analyzing the arrangement to identify deliverables requires the use of judgment and each deliverable may be an obligation to deliver services, a right or a license to use an asset or some other performance obligation.

In arrangements that include license rights and other noncontingent deliverables, these deliverables do not have stand-alone value because the noncontingent deliverables are dependent on the license rights, are not sold separately and cannot be resold. In addition, when noncontingent deliverables are sold with up-front license rights, the sale of license rights do not represent the culmination of a separate earnings process. As such, the Company accounts for the license and the noncontingent deliverables as a single unit of accounting. In such instances, the license revenue in the form of nonrefundable up-front payments is deferred and recognized over the applicable relationship period, which historically has been the estimated period of the Company's substantive performance obligations or the period the rights granted are in effect.

The Company will recognize clinical and development, regulatory, and sales milestone payments as revenue when earned if they are substantive and the Company has no ongoing performance obligations related to the milestone payment. A milestone payment is considered substantive if it (i) is commensurate with either the Company's performance to achieve the milestone or the enhanced value of the delivered item as a result of a specific outcome from the Company's performance to achieve the milestone; (ii) relates solely to past performance; and (iii) is reasonable relative to all of the deliverables and payment terms, including other potential milestone consideration, within the arrangement.

Precision BioSciences, Inc.
Notes to consolidated financial statements

Royalties earned on product sales, if any, are recognized based on contractual terms of the agreement when reported sales are reliably measurable and collectibility is reasonably assured, provided that there are no performance obligations then remaining. To date, none of the Company's product candidates have been approved or commercialized, and therefore, the Company has not earned any royalty revenue from product sales.

In the event that an agreement was to be terminated and the Company had no further performance obligations at that time, the Company would recognize as revenue at the date of such termination any portion of the non-refundable upfront payment and other payments that had not previously been recorded as revenue and were classified as deferred revenue at the date of such termination.

Research and development

Research and development costs are expensed as incurred. Research and development expenses are comprised of costs incurred in performing research and development activities including salaries, benefits, share-based compensation, allocations for rent and facility costs, depreciation, preclinical manufacturing expenses, costs of services provided by contract research organizations ("CROs") in connection with preclinical trials and contract manufacturing organizations ("CMOs") engaged to manufacture clinical trial material, costs of licensing technology, and costs of services provided by research organizations and service providers. Upfront payments and milestone payments made for the licensing of technology are expensed as research and development in the period in which they are incurred if the technology is not expected to have any alternative future uses other than the specific research and development project for which it was intended. Nonrefundable advance payments for goods or services to be received in the future for use in research and development activities are recorded as prepaid expenses. The prepaid amounts are expensed as the related goods are delivered or the services are performed rather than when the payment is made.

The Company is required to estimate accrued research and development expenses resulting from its obligations under contracts with CROs, CMOs, research organizations, service providers, vendors and consultants in connection with research and development activities. The financial terms of these contracts are subject to negotiations and vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided to the Company under such contracts. The Company's objective is to reflect the appropriate research and development expenses in its consolidated financial statements by matching those expenses with the period in which the services and efforts are expended. There may be instances in which payments made to the Company's vendors will exceed the level of services provided and result in a prepayment of the expense. In accruing fees, the Company estimates the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from the Company's estimate, the Company adjusts the accrual or amount of prepaid expense accordingly. Accrued amounts are disclosed in Note 5.

Although the Company does not expect its estimates to be materially different from amounts actually incurred, the Company's understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in the Company reporting amounts that are too high or too low in any particular period. To date, the Company has not made any material adjustments to prior estimates of accrued research and development expenses.

Precision BioSciences, Inc.
Notes to consolidated financial statements

Common stock valuation

Due to the absence of an active market for the Company's common stock, the Company utilized methodologies in accordance with the framework of the American Institute of Certified Public Accountants Technical Practice Aid, Valuation of Privately-Held Company Equity Securities Issued as Compensation, to estimate the fair value of its common stock. In determining the exercise prices for stock options granted, the Company has considered the estimated fair value of the common stock as of the measurement date. The estimated fair value of the common stock has been determined based upon a variety of factors, including the illiquid nature of the common stock, the Company's financial position and historical financial performance, the status of technological developments within the Company's research, the composition and ability of the current research and management team, an evaluation or benchmark of the Company's competition and the current business climate in the marketplace. Significant changes to the key assumptions underlying the factors used could result in different fair values of common stock at each valuation date.

Comprehensive loss

Comprehensive loss includes net loss as well as other changes in stockholders' equity (deficit) that result from transactions and economic events other than those with stockholders. For the years ended December 31, 2017 and 2018, there was no difference between net loss and comprehensive loss in the accompanying consolidated financial statements.

Net loss per share

Basic net loss per share is computed by dividing net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period. Diluted net loss per share is computed using the weighted-average number of shares of common stock outstanding during the period and, if dilutive, the weighted-average number of potential shares of common stock. Diluted net loss per share is the same as basic net loss per share for the years ended December 31, 2017 and 2018 since all potential shares of common stock instruments are anti-dilutive as a result of the net loss.

The Company's convertible preferred stock contractually entitles the holders of such shares to participate in dividends but does not contractually require the holders of such shares to participate in losses of the Company. Accordingly, in periods in which the Company reports a net loss, such losses are not allocated to such participating securities. In periods in which the Company reports a net loss attributable to common stockholders, diluted net loss per share attributable to common stockholders is the same as basic net loss per share attributable to common stockholders, since dilutive shares of common stock are not assumed to have been issued if their effect is anti-dilutive. The Company reported a net loss attributable to common stockholders for the years ended December 31, 2017 and 2018.

Share-based compensation

Employees—The Company determines the fair value of stock options issued to employees as of the grant date. Share-based compensation expense equal to the grant-date fair value of the stock options is recognized over the requisite service period, which is equal to the vesting period.

Nonemployees—For nonemployees, the Company determines the fair value of stock options as of the measurement date, which is the earlier of the performance commitment date or the date on which the

Precision BioSciences, Inc.
Notes to consolidated financial statements

nonemployees' performance is complete. Share-based compensation expense equal to the measurement date fair value of the stock options is recognized over the period services are received.

Income taxes

Deferred tax assets and liabilities are determined based on the temporary differences between the consolidated financial statement carrying amounts and the tax basis of assets and liabilities using the enacted tax rates in effect in the years in which the differences are expected to reverse. In estimating future tax consequences, all expected future events are considered other than the enactment of changes in the tax law or rates. Changes in deferred tax assets and liabilities are recorded in the provision for income taxes.

The Company may recognize the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by the taxing authorities based on the technical merits of the position. The tax benefits recognized in the consolidated financial statements from such a position is measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement.

The Company assesses the likelihood that its deferred tax assets will be recovered from future taxable income and, to the extent it believes, based upon the weight of available evidence, that it is more likely than not that all or a portion of the deferred tax assets will not be realized, a valuation allowance is established through a charge to income tax expense. Potential for recovery of deferred tax assets is evaluated by estimating the future taxable profits expected and considering prudent and feasible tax planning strategies.

Recent accounting pronouncements

The Company is an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, and may take advantage of reduced reporting requirements that are otherwise applicable to public companies. Section 107 of the JOBS Act exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies are required to comply with those standards. The Company has elected to use the extended transition period for complying with new or revised accounting standards; and as a result of this election, its financial statements may not be comparable to companies that comply with public company effective dates. The JOBS Act also exempts the Company from having to provide an auditor attestation of internal controls over financial reporting under Sarbanes-Oxley Act Section 404(b).

The Company will remain an "emerging growth company" until the earliest of (i) the last day of the fiscal year in which it has total annual gross revenues of $1.07 billion or more, (ii) the last day of the fiscal year following the fifth anniversary of the completion of its IPO, (iii) the date on which it has issued more than $1.0 billion in nonconvertible debt during the previous three years or (iv) the date on which it is deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission ("SEC"), which generally is when it has more than $700 million in market value of its stock held by non-affiliates, has been a public company for at least 12 months and have filed one annual report on Form 10-K.

In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU"), No. 2014-09, Revenue (Topic 606): Revenue from Contracts with Customers ("ASU 2014-09"), which will replace existing revenue recognition standards and significantly expand the disclosure requirements for revenue arrangements. The new standard and the subsequent amendments, which are codified in ASC 606, will be

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effective for the Company beginning on January 1, 2019. The guidance permits two methods of adoption: retrospectively to each prior reporting period presented (the full retrospective method), or retrospectively with the cumulative effect of initially applying the guidance recognized at the date of initial application (the modified retrospective method). The Company currently anticipates adopting the new standard effective January 1, 2019 under the modified retrospective method. The Company has engaged outside advisors and is in the process of evaluating the impact of the adoption of ASC 606 on its consolidated financial statements. The Company will continue to assess the potential impact that ASC 606 may have on its financial position and results of operations as it relates to the Company's February 2016 development and commercial license agreement with Servier and the September 2018 collaboration and license agreement with Gilead Sciences, Inc. ("Gilead") (see Note 13 to the consolidated financial statements). The Company has performed an assessment of revenue recognition under the agreements with Servier, for the up-front payment, certain early-stage nonsubstantive development milestones, less fees to exercise the codevelopment and copromotion option, and with Gilead, for research funding. The Company believes revenue recognition under both agreements may not be materially different under ASC 606 as compared to ASC 605. Further, the Company's assessment of revenue for development milestones that are considered substantive under this agreement is that they be recognized over time when the amount of the milestone can be reasonably estimated without a significant reversal under ASC 606. Any prior assessments made by the Company regarding the impact of ASU 2014-09 are subject to change pending the outcome of the Company's final assessment at the conclusion of the first quarter of 2019.

In February 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*, in order to improve comparability among organizations by recognizing lease assets and liabilities in the consolidated balance sheets for those leases previously classified as operating leases under GAAP. The update requires a lessee to recognize in its consolidated balance sheet a liability to make lease payments and also a right-of-use asset representing its right to use the underlying asset for the lease term. In July 2018, the FASB issued amendments in ASU 2018-11, which provide a transition election to not restate comparative periods for the effects of applying the new standard. This transition election permits entities to change the date of initial application to the beginning of the year of adoption and to recognize the effects of applying the new standard as a cumulative-effect adjustment to the opening balance of retained earnings. The Company currently anticipates adopting the new standard effective January 1, 2019 under the modified retrospective method. ASU 2016-02 is effective for the Company for annual periods beginning after December 15, 2019 and early adoption is permitted. The Company is evaluating the impact of adoption of this standard on the consolidated financial statements.

In March 2016, the FASB issued ASU No. 2016-09, *Compensation—Stock Compensation: Improvements to Employee Share-Based Payment Accounting* ("ASU 2016-09"), which amends ASC 718, *Compensation—Stock Compensation*. The amendments simplify several aspects of the accounting for share-based payment transactions, including the income tax consequences, classification of awards as either equity or liabilities, forfeitures, and classification in the consolidated statements of cash flows. ASU No. 2016-09 was adopted by the Company on January 1, 2018 and the adoption did not have a material impact on the consolidated financial statements. The Company elected to account for the impact of pre-vesting forfeitures as they occur rather than applying an estimated forfeiture rate and to adopt this standard using the modified retrospective adoption method.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation-Stock Compensation*, or ASU 2017-09. The new guidance is an update to ASC 718 and simplifies the modification accounting for share-based payment awards. ASU 2017-09 is effective for annual periods beginning after December 15, 2017. The Company adopted this standard as of January 1, 2018. The adoption of this guidance had no impact on the consolidated financial statements.

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Note 2: Other current assets

Other current assets consisted of the following as of December 31 (in thousands):

	2017	2018
Deferred offering costs	$ —	$ 2,542
Deferred rent asset	70	—
Noncustomer receivables	22	504
Total other current assets	$ 92	$ 3,046

Note 3: Property, equipment and software

Property, equipment and software consisted of the following as of December 31 (in thousands):

	2017	2018
Construction in progress	$ 12	$ 8,600
Leasehold improvements	4,541	5,733
Software	86	278
Laboratory equipment	5,370	10,057
Office equipment	570	839
Furniture and fixtures	751	1,124
Total property, equipment and software	11,330	26,631
Less accumulated depreciation and amortization	3,193	5,484
Property, equipment and software—net	$ 8,137	$21,147

As of December 31, 2018, construction in progress includes $0.6 million related to the construction of additional office and laboratory space at 302 East Pettigrew Street, Durham, North Carolina, $5.4 million related to the construction of additional office and laboratory space at 5 Laboratory Drive, Research Triangle Park, North Carolina, and $2.5 million related to the construction of a cleanroom at 20 TW Alexander Drive, Research Triangle Park, North Carolina.

Depreciation expense, including amortization of leasehold improvements and software, was $1.4 million and $2.3 million for the years ended December 31, 2017 and 2018, respectively. Please refer to Note 9, “Commitments and contingencies,” for further information.

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Note 4: Intangible assets

Intangible assets, net, consisted of the following as of December 31 (in thousands):

	2017	2018
License cost	$ 431	$1,831
Less: accumulated amortization	(223)	(247)
Less: impairments	(118)	(118)
Intangible assets, net	$ 90	$1,466

Amortization expense of the intangible assets was $0.1 million for the years ended December 31, 2017 and 2018.

In September 2018, the Company entered into a license agreement to obtain the rights to intellectual property for the production of biological materials for use in its development programs. The Company paid the licensor a one-time, non-refundable license fee of $1.4 million for rights to a cell line that can be used on up to four product candidates. The intellectual property rights are being amortized on a straight-line basis over 216 months.

Note 5: Accrued expenses and other current liabilities

Accrued expenses and other current liabilities consisted of the following as of December 31 (in thousands):

	2017	2018
Accrued compensation	$ 983	$ 965
Accrued research and development expenses	500	1,569
Accrued property, equipment and software	—	219
Accrued deferred offering costs	—	193
Deferred rent	—	198
Accrued legal fees	23	107
Other	67	170
Total accrued expenses and other current liabilities	$1,573	$3,421

Note 6: Stockholders' equity (deficit)

Capital structure

In April 2015, the Company amended and restated its certificate of incorporation and authorized 125,650,000 shares, of which 100,000,000 shares were designated as $0.000005 par value common stock and 25,650,000 shares were designated as $0.0001 par value Series A preferred stock.

In May 2018, the Company amended and restated its certificate of incorporation and authorized 177,606,100 shares, of which 130,000,000 shares were designated as $0.000005 par value common stock, 25,650,000 shares were designated as $0.0001 par value Series A preferred stock, and 21,956,100 shares were designated as $0.0001 par value Series B preferred stock.

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Preferred stock

In 2015, the Company issued 25,650,000 shares of Series A preferred stock for gross proceeds of $25.7 million and incurred stock issuance costs of $0.3 million. The Series A preferred stock shares were sold for $1.00 per share (the “Series A Original Issue Price”).

From May 2018 to July 2018, the Company issued 21,956,095 shares of its Series B preferred stock and received approximately $110.0 million in gross proceeds, less $0.3 million in aggregate offering costs. The Series B preferred stock shares were sold for $5.01 per share (the “Series B Original Issue Price”, together with the Series A Original Issue Price, the “Original Issue Price”).

The rights and privileges of the Series A and Series B preferred stockholders include the following:

Conversion—Each share of Series A and Series B preferred stock may be converted at any time, at the option of the holder, into shares of common stock. Each share of the Series A and Series B preferred stock will be automatically converted into shares of common stock, at the applicable conversion rate then in effect, upon the earlier of (i) the closing of an initial public offering of the Company’s common stock at a price of at least $6.01 per share and with net proceeds of at least $50.0 million, subject to adjustment as set forth in the Company’s amended and restated certificate of incorporation (a “Qualified IPO”), (ii) in connection with any stock split, stock dividend, combination or other similar events and (iii) in accordance with anti-dilution provisions.

The conversion rate of the Series A and Series B preferred stock is determined by dividing the Original Issue Price by the conversion price for each series of stock. The initial conversion price for the Series A and Series B preferred stock is the Original Issue Price of $1.00 per share and $5.01 per share, respectively, subject to appropriate adjustment in the event of any stock split, stock dividend, combination or other similar recapitalization and other adjustments as set forth in the Company’s amended and restated certificate of incorporation.

Voting rights—Preferred stock and common stock vote together as one class on an as-converted basis. Holders are entitled to vote on all matters and shall have the number of votes equal to the number of shares of common stock into which the shares of preferred stock held by such holder are then convertible. The Company cannot perform any of the following actions without a vote of approval from at least 60% of outstanding preferred stockholders: execute a liquidation event, amend the Company’s certificate of incorporation in a manner detrimental to Series A and Series B preferred stockholders, create or amend any securities to be senior to the Series A and Series B preferred stockholders, issue or increase the amount of the Company’s common stock, or change the size of the board of directors. The Company’s board of directors is currently comprised of five directors: two directors designated by the common stockholders, two directors designated by the preferred stock stockholders and one independent director. The Company’s current shareholder agreements require the board of directors to have seven members. The remaining two directors, neither of whom may have any affiliation with any class of stockholder, will be designated by the four common and preferred directors.

Dividends—No classes of stock are entitled to receive dividends unless preferred stockholders first receive dividends on outstanding shares in an amount at least equal to the amount of dividends payable to the other classes of stock. The preferred shares do not accrue dividends.

Liquidation—Upon liquidation, dissolution, or winding-up of the Company, Series A and Series B preferred stockholders do not receive a liquidation preference in priority to holders of common stock. Assets available for

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distribution will be allocated ratably among the preferred, on a fully converted basis, and the common stockholders based on their pro rata holdings.

Redemption—The Series A and Series B preferred stock can only be redeemed at the option of the holder for cash or other assets upon the occurrence of specific events following a “Deemed Liquidation Event” (as defined in the Company’s amended and restated certificate of incorporation) involving the sale, transfer, lease or other disposition of all or substantially all of the Company’s assets.

A Deemed Liquidation Event that would give rise to a preferred stockholder’s right of redemption cannot be triggered without approval of the Company’s board of directors, because under applicable legal and contractual requirements, the Company’s board of directors is required to approve (i) any closing of the sale, transfer, lease or other disposition, of all or substantially all of the Company’s assets, (ii) any consummation of the merger or consolidation of the Company with or into another entity and (iii) the Company’s participation in any closing of the transfer (whether by merger, consolidation, or otherwise), in which the Company is a constituent party to a person or group of affiliated persons, of the Company’s securities, in which, after such closing, such person or group of affiliated persons would hold a majority of the outstanding voting stock of the Company (or the surviving or acquiring entity).

The holders of the Series A and Series B preferred stock do not have the ability to control whether the Company will redeem the preferred stock or cause the preferred stock to become redeemable (including through a Deemed Liquidation Event) through representation on the Company’s board of directors, voting rights or other rights, and there is no event not solely within the Company’s control that contractually could cause the holders of the Series A and Series B preferred stock to obtain such control.

Common stock

In March 2017, the Company’s board of directors authorized the repurchase of up to 9,090,909 shares of its common stock at a price of $0.55 per share in a solicited offer to non-employees. The Company accounts for its common stock repurchases as treasury stock under the cost method. In April 2017, the Company repurchased 1,730,105 shares of common stock at a cost of $1.0 million pursuant to this repurchase program.

Voting, dividend and liquidation rights of the holders of the common stock are subject to and qualified by the rights, powers and preferences of the holders of the preferred stock.

The rights and privileges of the holders of common stock include the following:

Voting—Each holder of outstanding shares of common stock shall be entitled to one vote in respect of each share. The number of authorized shares of common stock may be increased or decreased by the affirmative vote of a majority of the outstanding shares of common stock and preferred stock voting together as a single class.

Dividends—Subject to preferred stockholders’ right to receive at least an equal amount of dividends payable to the other classes of stock in the event of a dividend, the holders of common stock shall be entitled to receive dividends out of funds legally available at such times and in such amounts as the Company’s board of directors may determine in its sole discretion.

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Liquidation—Upon liquidation, dissolution, or winding-up of the Company, the common stockholders are entitled to receive assets available for distribution ratably with the preferred stockholders, on a fully converted basis, based on their pro rata holdings.

Redemption—The common stock is not redeemable at the option of the holder.

Note 7: Stock options

Under the terms of its stock option plans, the Company's board of directors may grant stock options to employees, directors and service providers. The Company issued stock options under the 2006 Stock Incentive Plan ("2006 plan") until April 2015, when the 2015 Stock Incentive Plan ("2015 plan") was adopted. The 2006 plan expired in 2016; there are no remaining shares available to be granted under the 2006 plan. There were 3,327,044 and 2,982,600 stock options outstanding under the 2006 Plan as of December 31, 2017 and 2018, respectively.

Upon adoption of the 2015 plan, there were 11,250,000 shares of common stock reserved for issuance. In May 2018, the Company amended the 2015 plan to increase the number of shares of common stock reserved for issuance to 17,530,000. There were 2,910,250 and 3,364,287 shares of common stock available for future grants under the 2015 plan as of December 31, 2017 and 2018, respectively, and 8,234,625 and 13,590,261 stock options outstanding as of December 31, 2017 and 2018, respectively. The Company's board of directors determines the terms of stock options granted under the 2015 plan, including option exercise prices and vesting.

The Company recorded $0.4 million and an amount less than $0.1 million in employee and nonemployee share-based compensation expense, respectively, during the year ended December 31, 2017 and $2.4 million and an amount less than $0.1 million in employee and nonemployee share-based compensation expense, respectively, during the year ended December 31, 2018.

Share-based compensation expense related to stock options is included in the following line items in the consolidated statements of operations for the year ended December 31 (in thousands):

	2017	2018
Research and development	$286	$1,817
General and administrative	133	636
	$419	$2,453

Determining the appropriate fair value model and the related assumptions requires judgment. The fair value of each option grant is estimated using a Black-Scholes option-pricing model on the date of grant as follows:

	2017		2018	
	Nonemployees	Employees	Nonemployees	Employees
Estimated dividend yield	0.00%	0.00%	0.00%	0.00%
Weighted-average expected stock price volatility	70.28%	73.35%	68.00%	68.44%
Weighted-average risk-free interest rate	1.75%	1.99%	3.03%	2.95%
Expected life of options (in years)	4.60	6.10	6.09	6.01
Weighted-average fair value per option	$ 0.31	$ 0.36	$ 3.56	$ 3.45

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The expected volatility rates are estimated based on the actual volatility of comparable public companies over the expected term. The expected life represents the average time that stock options that vest are expected to be outstanding.

The Company does not have sufficient history of exercising stock options to estimate the expected term of employee stock options and thus continues to calculate expected life based on the midpoint between the vesting date and the contractual term which is in accordance with the simplified method. The expected term for share-based compensation granted to nonemployees is the contractual life. The risk-free rate is based on the United States Treasury yield curve during the expected life of the option.

The following table summarizes activity in the Company's stock option plans during the years ended December 31, 2017 and 2018:

	Outstanding option shares	Weighted-average exercise price
Balance as of January 1, 2017	8,650,488	$ 0.16
Granted	3,766,000	0.55
Exercised	(82,625)	0.19
Forfeited/canceled	(772,194)	0.29
Balance as of December 31, 2017	11,561,669	0.29
Granted	6,746,000	5.46
Exercised	(470,327)	0.36
Forfeited/canceled	(920,037)	1.29
Expired	(344,444)	0.00
Balance as of December 31, 2018	16,572,861	$ 2.34

The intrinsic value of options exercised was $27,720 and $2,735,441 during 2017 and 2018, respectively.

The following table summarizes certain information about stock options granted under the stock option plans which are vested or expected to vest as of December 31, 2017 and 2018.

		Number of options	Weighted-average remaining contractual life (in years)	Weighted-average exercise price
2017	Expected to be exercisable	11,266,180	6.96	$ 0.28
2017	Currently exercisable	5,566,256	5.06	0.11
2018	Expected to be exercisable	16,572,861	7.50	$ 2.34
2018	Currently exercisable	7,298,513	5.37	0.35

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The following table summarizes certain information about stock options outstanding under the stock option plans as of December 31:

	2017		
Exercise price	Number of options outstanding	Weighted-average remaining life	Number of options exercisable
$0.0006 — $0.0058	554,270	2.38	554,270
$0.0145	2,772,774	3.38	2,772,774
$0.1900	3,453,125	7.65	1,896,711
$0.5600	4,781,500	9.19	342,501
	11,561,669		5,566,256

	2018		
Exercise price	Number of options outstanding	Weighted-average remaining life	Number of options exercisable
$0.0006 — $0.01	2,982,600	2.49	2,982,600
$0.19	3,075,937	6.65	2,490,333
$0.55 — $0.56	3,941,261	8.24	1,598,704
$4.21	621,250	9.30	71,250
$4.76	617,813	9.56	12,188
$5.61	4,419,000	9.78	143,438
$6.18	915,000	9.93	0
	16,572,861		7,298,513

There was approximately $1.5 million and $21.6 million of total unrecognized compensation cost related to unvested stock options as of December 31, 2017, and 2018, respectively, which is expected to be recognized over a weighted-average period of 3.03 and 3.50 years, respectively.

Note 8: Retirement plan

In January 2011, the Company established a defined contribution 401(k) retirement savings plan (the “Retirement Plan”) to all full-time employees. Employee contributions to the Retirement Plan can be 100% of annual compensation up to the prescribed annual maximum under the Internal Revenue Code. Administrative fees of less than $0.1 million were paid by the Company for the years ended December 31, 2017 and 2018.

The Retirement Plan includes a discretionary matching employer contribution equal to 100% of participants’ deferral contributions up to a certain percentage amount to be determined by the Company on an annual basis. The Company made contributions of $0.2 million and $0.4 million to the Retirement Plan during the years ended December 31, 2017 and 2018, respectively.

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Note 9: Commitments and contingencies

Litigation

The Company is subject to various legal matters and claims in the ordinary course of business. Although the results of legal proceedings and claims cannot be predicted with certainty, in the opinion of management, there are currently no such known matters that will have a material effect on the consolidated financial condition, results of operations or cash flows of the Company.

Leases

The Company leases office and laboratory space under long-term operating leases. All the leases provide tenant improvement allowances and rent abatements as incentives for the Company to either enter into the initial lease agreement or expand within an existing premises already under lease. The Company leases office and laboratory space at 302 East Pettigrew Street, Durham, North Carolina, which is the Company's corporate headquarters. The property is leased through July 2024 with the option to extend. The Company leases laboratory and office space at 5 Laboratory Drive, Research Triangle Park, North Carolina. The property is leased through April 2026 with the option to extend. The Company leases laboratory space at 20 TW Alexander Drive, Research Triangle Park, North Carolina. The property is leased through August 2026 with the option to extend.

The following is a schedule of future minimum lease payments for all leases as of December 31, 2018 (in thousands):

	Operating leases
2019	$ 1,999
2020	2,157
2021	2,227
2022	2,299
2023	2,364
2024 and beyond	3,484

Future minimum lease payments due under certain operating lease arrangements contain fixed rent increases over the term of the lease. Rent expense on these operating leases is recognized over the term of the lease on a straight-line basis. The excess of rent expense over lease payments made has been reported in deferred rent and deferred rent-noncurrent in the consolidated balance sheets. Rent expense was $0.8 million and $1.5 million during the years ended December 31, 2017 and 2018, respectively, and apportioned between the "Research and development" and "General and administrative" lines items in the consolidated statements of operations.

Supply agreements

The Company enters into contracts in the ordinary course of business with CMOs for the manufacturing of clinical trial materials. These agreements provide for termination at the request of either party with less than one-year notice and are, therefore, cancelable contracts and, if canceled, are not anticipated to have a material effect on the consolidated financial condition, results of operations or cash flows of the Company.

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Note 10: Net loss per share and unaudited pro forma net loss per share

Net loss per share

Basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	Years ended December 31,	
	2017	2018
Numerator:		
Net loss attributable to common stockholders	$ (21,102)	$ (46,037)
Denominator:		
Weighted-average shares of common stock outstanding—basic and diluted	33,956,010	33,675,834
Net loss per share attributable to common stockholders—basic and diluted	$ (0.62)	$ (1.37)

The Company's potential dilutive securities have been excluded from the computation of diluted net loss per share as the effect would be to reduce the net loss per share. Therefore, the weighted-average number of shares of common stock outstanding used to calculate both basic and diluted net loss per share attributable to common stockholders is the same.

The Company excluded the following potential shares of common stock from the computation of diluted net loss per share attributable to common stockholders because including them would have had an anti-dilutive effect:

	Years ended December 31,	
	2017	2018
Series A preferred stock (as converted to common stock)	25,650,000	25,650,000
Series B preferred stock (as converted to common stock)	—	21,956,095
Outstanding stock options converted to common stock	5,891,176	10,238,910
Total	31,541,176	57,845,005

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Unaudited pro forma net loss per share

The unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2018 has been prepared to give effect to adjustments arising upon the completion of a Qualified IPO. The unaudited pro forma net loss attributable to common stockholders, as well as basic and diluted weighted-average shares of common stock outstanding, used in the calculation of unaudited pro forma basic and diluted net loss per share attributable to common stockholders gives effect to the automatic conversion of all outstanding shares of convertible preferred stock as of January 1, 2018 into shares of common stock as if the proposed initial public offering had occurred on that date or the issuance date of the convertible preferred stock for issuances after January 1, 2018. Unaudited pro forma basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	Year ended December 31, 2018
Numerator:	
Net loss attributable to common stockholders	$ (46,037)
Denominator:	
Weighted-average shares of common stock outstanding—basic and diluted	33,675,834
Pro forma adjustment to reflect automatic conversion of convertible preferred stock to common stock upon the completion of the proposed initial public offering	38,164,548
Pro forma weighted average shares of common stock outstanding—basic and diluted	71,840,382
Pro forma net loss per share attributable to common stockholders—basic and diluted	$ (0.64)

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Note 11: Income taxes

The Company recorded no income tax expense due to the operating losses incurred for the years ended December 31, 2017 and 2018.

Significant components of the Company's deferred tax assets and deferred tax liabilities are as follows as of December 31 (in thousands):

	2017	2018
Noncurrent deferred tax assets:		
Net operating loss carryforwards	$ 4,498	$ 9,185
Contribution carryforwards	10	29
Deferred rent	272	449
Deferred revenue	4,429	9,454
Other assets	102	573
Tax credits	1,697	3,632
Less valuation allowance	(10,464)	(22,736)
Total deferred tax assets, noncurrent	544	586
Noncurrent deferred tax liability:		
Property and equipment	544	586
Total deferred tax liabilities, noncurrent	544	586
Net deferred tax assets	$ —	$ —

As of December 31, 2017 and 2018, the Company has provided a valuation allowance for the full amount of the net deferred tax assets as the realization of the net deferred tax assets is not determined to be more likely than not. The net increase in the valuation allowance for the year ended December 31, 2018 of $12.3 million is comprised of an increase in the valuation allowance recorded against the deferred tax assets, primarily deferred revenue, for the year.

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The reasons for the difference between actual income tax benefit for the years ended December 31, 2017 and 2018 and the amount computed by applying the statutory federal income tax rate to losses before income tax benefit are as follows (dollars in thousands):

	2017		2018	
	Amount	% of pretax earnings	Amount	% of pretax earnings
Income tax expense (benefit) at statutory rate	$ (7,174)	34.0%	$ (9,668)	21.0%
State income taxes, net of federal tax benefit	(417)	2.0%	(909)	2.0%
Non-deductible expenses	208	(1.0%)	270	(0.6%)
Credits	(1,039)	4.9%	(1,934)	4.2%
Change in federal tax rate	4,955	(23.5%)	—	—
Change in state tax rate	2	—	—	—
Current blended state tax rate versus deferred rate	—	—	1	0.0%
Other	(110)	0.5%	(32)	0.1%
Change in valuation allowance	3,575	(16.9%)	12,272	(26.7%)
Income tax (benefit) expense	$ —	0.0%	$ —	0.0%

At December 31, 2017, the Company had federal and state net operating loss (“NOL”) carryforwards of approximately $20.1 million and $19.4 million, respectively. As of December 31, 2018, the Company had federal and state NOL carryforwards of approximately $40.0 million and $39.8 million, respectively. The federal NOL carryforwards of $19.4 million will begin to expire in 2030 while the remaining federal NOL carryforwards of $20.6 million carry forward indefinitely. The state NOL carryforwards begin to expire in 2025. At December 31, 2017, the Company had federal and state research and development (“R&D”) tax credits of $1.7 million and an amount less than $0.1 million which begin to expire in 2027 and 2030, respectively. At December 31, 2018, the Company had federal and state R&D tax credits of $3.6 million and an amount less than $0.1 million, which begin to expire in 2027 and 2030, respectively. At December 31, 2017 and 2018, the Company had federal contribution carryforward amounts of less than $0.1 million and $0.1 million, respectively, which begin to expire in 2020.

The Company incorporated a subsidiary in Australia in 2018. However, the subsidiary has had no activity since inception. As such, the there are no undistributed earnings as of December 31, 2018.

The Company’s ability to utilize its NOL and R&D credit carryforwards may be substantially limited due to ownership changes that may have occurred or that could occur in the future, as required by Section 382 of the Internal Revenue Code of 1986, as amended (the Code), as well as similar state provisions. These ownership changes may limit the amount of NOL and R&D credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an “ownership change,” as defined by Section 382 of the Code, results from a transaction or series of transactions over a three-year period resulting in an ownership change of more than 50 percent of the outstanding stock of a company by certain stockholders or public groups. The Company has not completed a study to assess whether one or more ownership changes have occurred since the Company became a loss corporation under the definition of Section 382. If the Company has experienced an ownership change, utilization of the NOL or R&D credit carryforwards would be subject to an annual limitation, which is determined by first multiplying the value of the Company’s stock at the time of the ownership change by the applicable long-term, tax-exempt rate, and then could be subject to additional adjustments, as required. Any such limitation may result in the expiration of a portion of the NOL or R&D credit

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carryforwards before utilization. Until a study is completed and any limitation known, no amounts are being considered as an uncertain tax position or disclosed as an unrecognized tax benefit. Any carryforwards that expire prior to utilization as a result of such limitations will be removed from deferred tax assets with a corresponding reduction of the valuation allowance. Due to the existence of the valuation allowance, it is not expected that any possible limitation will have an impact on the results of operations of the Company.

The Company reflects in the accompanying consolidated financial statements the benefit of positions taken in a previously filed tax return or expected to be taken in a future tax return only if it is considered 'more-likely-than-not' that the position taken will be sustained by the appropriate taxing authority. As of December 31, 2017 and 2018, the Company had no unrecognized income tax benefits. The Company's policy for recording interest and penalties relating to uncertain income tax positions is to record them as a component of income tax expense in the accompanying consolidated statements of operations. As of December 31, 2017 and 2018, the Company had no such accruals.

On December 22, 2017, the Tax Cuts and Jobs Act was enacted into law, which reduced the federal corporate income tax rate to 21% for tax years beginning after December 31, 2017. As a result of the newly enacted tax rate, the Company adjusted its deferred tax assets as of December 31, 2017 by applying the new 21% rate, which resulted in a decrease to the deferred tax assets and a corresponding decrease to the valuation allowance of approximately $5 million for the year ended December 31, 2017.

The SEC staff issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act ("SAB 118"), which allows the Company to record provisional amounts during a measurement period which is similar to the measurement period used when accounting for business combinations. The measurement period has ended and the Company's accounting related to the 2017 Tax Cuts and Jobs Act is complete. The Company did not make any measurement-period adjustments related to the provision items recorded as of December 31, 2017.

Note 12: Fair value measurements

The carrying amounts of the Company's financial instruments, including accounts receivable, accounts payable, and accrued expenses and other current liabilities, approximate their respective fair values due to their short-term nature. The Company uses a three-tier fair value hierarchy to classify and disclose all assets and liabilities measured at fair value on a recurring basis and to minimize the use of unobservable inputs when determining their fair value. The three tiers are defined as follows:

Level 1—Observable inputs based on unadjusted quoted prices in active markets for identical assets or liabilities

Level 2—Inputs, other than quoted prices in active markets, that are observable either directly or indirectly

Level 3—Unobservable inputs for which there is little or no market data, which require the Company to develop its own assumptions

The Company classifies investments in money market funds within Level 1 as the prices are available from quoted prices in active markets. Investments in repurchase agreements are classified within Level 2 as these instruments are valued using observable market inputs including reported trades, broker/dealer quotes, bids and/or offers.

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As of December 31, 2017 and 2018, the Company held cash equivalents which is composed of money market funds and repurchase agreements that were purchased through repurchase intermediary banks and collateralized by deposits in the form of government securities and obligations.

The following represents assets measured at fair value on a recurring basis by the Company (in thousands):

December 31, 2017	Fair value	Level 1	Level 2	Level 3
Assets:				
Money market funds	$ 251	$ 251	$ —	$ —
Repurchase agreements	58,345	—	58,345	—
	$ 58,596	$ 251	$58,345	$ —

December 31, 2018	Fair value	Level 1	Level 2	Level 3
Assets:				
Money market funds	$ 781	$ 781	$ —	$ —
Repurchase agreements	94,500	—	94,500	—
	$ 95,281	$ 781	$94,500	$ —

Note 13: Collaboration and license agreements

Development and commercial license agreement with Servier

On February 24, 2016, the Company entered into a development and commercial license agreement, as subsequently amended, with Baxalta (now Shire), which was assigned to Servier in connection with its acquisition of Shire's oncology business in August 2018. This agreement establishes a collaboration between the Company and Servier to develop allogeneic chimeric antigen receptor T cell therapies for up to six unique antigen targets selected by Servier. Servier selected one target at the agreement's inception, and Servier is entitled to select the remaining five targets over the first four years of the agreement. Servier is required to make a milestone payment to the Company upon achievement of an early-stage pre- investigational new drug application ("IND") development milestone event completed for each of the remaining five targets selected, if any. The Company granted Servier a development license and will perform early-stage R&D on the selected targets and develop the resulting therapeutic product candidates through Phase 1 clinical trials and manufacture clinical trial material for use in Phase 2 clinical trials. Also, the Company and Servier have formed a joint steering committee ("JSC") to provide high-level oversight and decision making regarding the activities covered under the agreement.

The Company received an upfront payment of $105.0 million under the agreement. At the Phase 2 readiness stage for any product candidate, Servier may exercise a commercial option, subject to payment of commercial option exercise fees, to proceed with development and commercialization of the product candidate and perform late-stage R&D, including Phase 2 and Phase 3 clinical trials and obtaining regulatory approvals. The Company has the ability to receive total payments, in the aggregate across all six targets that may be selected by Servier, of up to approximately $1.6 billion, including the upfront payment of $105.0 million and up to $1.5 billion in milestone payments, consisting of up to $401.3 million in development milestone payments and up to $1.1 billion in commercial milestone payments. The Company is also entitled to receive tiered royalties ranging from the mid-single digit percentages to the sub-teen percentages on worldwide net sales of any products

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developed, subject to customary potential reductions. The Company also has the right to opt in and participate in the development and commercialization of any products resulting from the collaboration through a 50/50 codevelopment and co-promotion option in the United States. This will require the Company to pay a codevelopment and co-promotion option fee on each licensed product for which the Company elects to participate. This option is exercisable at the Phase 2 readiness stage and only after Servier exercises its commercial option.

The Company has determined that the targets are not separable because they are all based on the ARCUS proprietary genome editing platform and has assumed that Servier will nominate all six targets over the term of the agreement. The Company has concluded that the agreement with Servier contains the following deliverables: (i) a development license; (ii) performance of early-stage R&D services, which includes the early stage pre-IND development milestones that are deemed non-substantive and not subject to milestone method accounting, and (iii) JSC participation. The Company assessed whether any of these deliverables should be considered separate units of accounting and concluded that each of these deliverables has no standalone value other than performing early-stage R&D services on the Company's intellectual property and that the Company does not have a practice of selling its intellectual property or providing early-stage R&D services on a standalone basis to other parties. Also, none of these deliverables have any right of return. As a result, the Company concluded that these deliverables are considered a single unit of accounting.

The Company determined the consideration under the agreement consists of the $105.0 million up-front payment and milestone payments that may be earned for the early-stage pre-IND development milestones for the second through sixth antigen targets, if any, selected by Servier, less payment by the Company to exercise the 50/50 co-development and co-promotion option. The Company intends to opt in and participate on all selected targets with respect to the 50/50 co-development and co-promotion option. The Company can estimate its future cost based on the terms of the agreement. Thus, the option fees payable by the Company are considered an element that reduces the total arrangement consideration. The Company will not allocate consideration to the single unit of accounting to the extent of the total estimated future cost of the 50/50 codevelopment and co-promotion option fees it intends to pay. The total arrangement consideration through Phase 1 clinical trials for the single unit of accounting is recognized as revenue over the estimated performance period of 9.5 years, which includes the period of time Servier has to select the remaining 5 targets for development and the estimated time for the Company to complete early-stage R&D activities on all selected targets.

The Company has evaluated all of the milestones in connection with the agreement to determine if they are substantive and assess whether, for each milestone, (i) the consideration is commensurate with either the Company's performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the Company's performance to achieve the milestone, (ii) the consideration relates solely to past performance, and (iii) the consideration is reasonable relative to all of the deliverables and payment terms within the agreement. As noted, the early-stage pre-IND development milestones are deemed to be non-substantive and part of the single unit of accounting identified at the agreement's inception.

Because of the substantive uncertainty at the outset of the agreement that the Company will successfully achieve the development and sales milestones or that Servier will exercise its commercial option, the Company has determined that these are contingent deliverables. The manufacture of clinical trial material for use in Phase 2 clinical trials is also considered a contingent deliverable as the need for these materials will only occur

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if Servier exercises its commercial option. These future contingent deliverables do not contain any discounts that require allocation to the total arrangement consideration. As such, the milestones related to the contingent deliverables should not be allocated to the arrangement's consideration at the outset but rather be accounted for pursuant to ASC 605-28, Milestone Method. The contingent deliverables that are considered substantive are (i) the commercial option exercise fees, (ii) the manufacture of Phase 2 clinical trial material, (iii) development milestones based on specified regulatory and sales events, and (iv) sales-based milestones based on the achievement of specified sales amounts. The Company will recognize royalty revenue in the period of sale of the related product(s), based on the underlying contract terms, provided that the reported sales are reliably measurable and the Company has no remaining performance obligations, assuming all other revenue recognition criteria are met.

The Company recognized $5.8 million in revenues during 2017 and 2018 under the agreement with Servier. The amount recorded as deferred revenue was $94.4 and $88.6 million as of December 31, 2017 and 2018, respectively. No development or sales-based milestone payments were received for the years ended December 31, 2017 and 2018.

Sponsored research, collaboration and license agreement with the University of Pennsylvania

On January 1, 2018, the Company entered into a sponsored research, collaboration and license agreement with the University of Pennsylvania ("Penn") to collaborate on the preclinical development of six indications for gene editing products involving the delivery of an ARCUS nuclease. Unless the Company elects to terminate its funding obligations, the Company will provide semi-annual research funding payments of up to $5.0 million, with no minimum funding requirement, for up to a three-year term to fund the cost of the research program as specified in a mutually agreed-upon research budget and be responsible for post-IND enabling study development activities. The research funding payments will be expensed as incurred.

In addition to the research funding payments, if the Company elects to use certain Penn technology, including technology arising out of the collaboration, and achieves certain development and sales milestones, then the Company will be required to make certain development and sales milestone payments totaling up to $16.1 million per product in any one year, assuming the maximum development and sales milestones are met in any one year. An additional $12.3 million per product in sales milestone payments could be payable in other years if other sales thresholds are achieved, thus totaling $28.4 million in aggregate milestone payments per product. In addition to the development and sales milestone payments, low single-digit royalty percentages are also payable on net sales of certain products.

The Company may terminate the agreement by providing written notice at least 60 days prior to the due date of the next semi-annual research funding payment without making termination payments to Penn other than for non-cancelable costs and reasonable wind down costs. If such notice is provided during the research term, the agreement will terminate at the end of the current semi-annual funding period. Following completion or expiration of the three-year research term, the agreement remains in effect for the lifetime of certain patents, and the Company may terminate the agreement upon providing at least 90 days prior written notice.

Penn provided the Company a non-exclusive, worldwide, royalty-bearing license for certain patent rights and know-how to be used on the six indications in a defined field of use involving the delivery and use of an ARCUS nuclease in exchange for an upfront payment of $0.3 million. Once the Company has paid the first $15.0 million in research funding noted above, the license grant for such patent rights and know-how in the field of use will

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be expanded to remove the limitation on indications and the Company may, upon payment of a $1.0 million option fee, obtain a license for certain additional patent rights.

Collaboration and license agreement with Gilead

On September 10, 2018, the Company and Gilead Sciences, Inc. (“Gilead”) entered into a collaboration and license agreement to develop genome editing tools to target viral DNA associated with Hepatitis B. Pursuant to the terms of the agreement, Gilead will receive an exclusive license to exploit the resulting synthetic nucleases and products that use them to treat Hepatitis B in humans (“development license”), and the Company is entitled to receive up to $40.0 million in research funding for early-stage R&D services, paid in semi-annual increments, over an initial three year term and development and commercial milestone payments of up to an aggregate of $445.0 million, consisting of up to $105.0 million in development milestone payments and up to $340.0 million in commercial milestone payments. The Company is also entitled to receive tiered royalties ranging from the high single digit percentages to the mid-teen percentages on worldwide net sales of the products developed through the term of the agreement, subject to customary potential reductions. Gilead is responsible for obtaining regulatory approvals and, upon termination of the collaboration, will assume sole responsibility for the development and commercialization of such gene editing therapies and products. The Company will provide technology transfer of its development know-how prior to Gilead assuming responsibility. Also, the Company and Gilead will negotiate a separate supply agreement for Precision to manufacture specifically identified products for Gilead to use in clinical trials at price based on the Company’s costs. The Company and Gilead will form a joint steering committee (“JSC”) and a joint research and development committee (“JRDC”) that collectively will provide oversight, decision making and implementation guidance regarding the collaboration activities covered under the agreement.

The agreement with Gilead contains the following deliverables: (i) a development license; (ii) performance of early-stage R&D services, including technology transfer services, and (iii) JSC and JRDC participation. The Company assessed whether any of these deliverables should be considered separate units of accounting and concluded that each of these deliverables has no standalone value other than performing early-stage R&D services and that the Company does not have a practice of selling its intellectual property or providing early-stage R&D services on a standalone basis to other parties. None of these deliverables have any right of return. As a result, the Company concluded that these deliverables are considered a single unit of accounting. The Company will recognize revenue for each semi-annual research funding payment received on a straight-line basis over the six-month period the Company performs early-stage R&D services, as Gilead has the right to terminate the agreement at the conclusion of any six-month period. This method of revenue recognition most closely matches the pattern in which revenue is earned, the Company is paid, and obligations are fulfilled by the Company under the agreement.

The Company has evaluated all of the development and commercial milestones in connection with the agreement to determine if they are substantive and assess whether, for each milestone, (i) the consideration is commensurate with either the Company’s performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the Company’s performance to achieve the milestone, (ii) the consideration relates solely to past performance, and (iii) the consideration is reasonable relative to all of the deliverables and payment terms within the agreement. Because of the substantive uncertainty at the outset of the agreement that the Company will successfully achieve the development and commercial milestones, the Company has determined that these are contingent deliverables. These future contingent deliverables do not contain any discounts that require allocation to the total

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arrangement consideration. As such, the consideration related to the contingent deliverables should not be allocated to the arrangement's consideration at the outset but rather be accounted for pursuant to ASC 605-28, Milestone Method.

The Company recognized $3.7 million in revenues during 2018 under the agreement with Gilead. The amount recorded as deferred revenue was $2.3 million as of December 31, 2018. No development or commercial milestone payments were received for the year ended December 31, 2018.

Note 14: Segment reporting

The Company has developed a genome editing platform and performs related research for human therapeutic and agricultural applications. The Company's Chief Operating Decision Maker ("CODM") evaluates the Company's financial performance based on two reportable segments: Therapeutics and Food. The Therapeutics segment is focused on the development of products in the field of immuno-oncology and of novel products outside immuno-oncology to treat human diseases. The Food segment is focused on applying ARCUS to develop food and nutrition products through collaboration agreements with consumer-facing companies. The CODM reviews segment performance and allocates resources based upon segment revenue and segment operating loss of the Therapeutics and Food reportable segments.

Segment operating loss is derived by deducting operational cash expenditures, net, from GAAP revenue. Operational cash expenditures are cash disbursements made that are directly attributable to the reportable segment (including directly attributable research and development and property, equipment, and software expenditures) plus an allocation of centralized research and development expenditures for early stage research, nuclease development and the purchase of general laboratory supplies. These expenditures are allocated to the segments based on headcount. The reportable segment and centralized research and development operational cash expenditures include cash disbursements for compensation, lab supplies, purchases of property, equipment, and software and procuring services from CROs, CMOs, and research organizations.

Certain cost items are not allocated to the Company's reportable segments. These cost items primarily consist of compensation and general operational expenses associated with the Company's executive, business development, finance, operations, human resources and legal functions. The Company does not allocate non-cash income statement amounts to its reportable segments, such as share based compensation, depreciation and amortization, intangible asset impairment charges and losses on disposal of assets. When reconciling segment operating loss to consolidated loss from operations, the Company makes an adjustment to convert the cash expenditures to the accrual basis to reflect GAAP.

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All segment revenue is earned in the United States and there are no intersegment revenues. Additionally, the Company reports assets on a consolidated basis and does not allocate assets to its reportable segments for purposes of assessing segment performance or allocating resources. Presented below is the financial information with respect to the Company's reportable segments (in thousands):

	Years ended December 31,	
	2017	**2018**
Revenue:		
Therapeutics	$ 6,064	$ 9,523
Food	420	1,360
Total segment revenue	6,484	10,883
Segment operational cash expenditures:		
Therapeutics	$ 11,062	$ 35,045
Food	1,699	9,125
Total segment operational cash expenditures	12,761	44,170
Allocation of centralized research and development operational cash expenditures:		
Therapeutics	$ 6,948	$ 11,605
Food	1,164	2,901
Total allocation of centralized research and development operational cash expenditures	8,112	14,506
Segment operating loss:		
Therapeutics	$ (11,946)	$ (37,127)
Food	(2,443)	(10,666)
Total segment operating loss	(14,389)	(47,793)
Adjustments to reconcile segment operating loss to consolidated loss from operations:		
Corporate general and administrative cash expenditures	$ (9,117)	$ (15,892)
Interest income received	(872)	(1,875)
Impairment of intangible assets	(118)	—
Depreciation and amortization	(1,435)	(2,354)
Share-based compensation	(419)	(2,453)
Loss on disposal of assets	(56)	(14)
Adjustments to reconcile cash expenditures to GAAP expenses	4,432	22,469
Total consolidated loss from operations	$ (21,974)	$ (47,912)

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Note 15: Subsequent events

In August 2018, the Company entered into a letter of intent with a contractor to begin work on the design and construction of a cGMP facility for the manufacturing of the Company's clinical trial material and future commercial product. The cleanroom will be constructed at the 20 TW Alexander Drive, Research Triangle Park, North Carolina site. The letter of intent allowed the contractor to begin work on the earlier design and engineering phases of the project until the parties could execute an agreement. On February 1, 2019, the Company completed a binding agreement with the contractor. The cost of the cleanroom is $5.0 million and the estimated completion date is June 2019. The Company may terminate the agreement upon ten days written notice. Construction-in-progress as of December 31, 2018 includes $2.5 million related to the cleanroom.

In March 2019, we entered into a convertible note purchase agreement for the issuance and sale of approximately $39.6 million aggregate principal amount of convertible promissory notes (the "2019 Notes") in a private placement transaction. The 2019 Notes accrue interest at a rate of 6% per annum and mature on March 1, 2021, if not previously converted to common stock or preferred stock or repaid in cash prior to the maturity date.

The 2019 Notes will be automatically settled into shares of the Company's common stock in connection with the closing of an IPO by the Company with gross proceeds of at least $50.0 million at a settlement price equal to the lesser of (i) 85% of the IPO price per share or (ii) a price per share equal to $800.0 million divided by the Company's fully diluted capitalization as of immediately prior to the closing of such offering. If the gross proceeds of the IPO are less than $50.0 million, the holder of each note may elect to convert the then-outstanding principal and accrued interest into shares of the Company's common stock equal to 85% of the IPO price per share. If the Company completes a preferred stock financing round with gross proceeds of at least $50.0 million, excluding the conversion of the 2019 Notes, the 2019 Notes will be automatically converted into preferred stock at a settlement price equal to 85% of the lowest per share cash purchase price of preferred stock sold in the financing round.

If the Company sells all or substantially all of its assets, completes a merger or consolidation or transfers a majority of outstanding voting stock that results in a change of control or otherwise liquidates or dissolves (each, a "liquidation event"), the holder will receive 200% of the then-outstanding principal amount. If neither an IPO, nor a qualified preferred stock financing, nor a liquidation event occurs prior to the maturity date, at any time on or after the maturity date, each holder of a 2019 Notes may elect to convert such holder's 2019 Note into shares of newly authorized Series B-1 Preferred Stock of the Company at a settlement price per share that would be determined based on the then-outstanding principal and accrued interest divided by $6.40 per share, subject to certain recapitalization adjustments.
The Company has evaluated subsequent events through March 1, 2019, the date these consolidated financial statements were issued and has determined that there were no events which have occurred that would require adjustment to or disclosure in these consolidated financial statements other than those disclosed above.

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shares

Common stock

Prospectus

J.P. Morgan **Goldman Sachs & Co. LLC** **Jefferies** **Barclays**

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Part II
Information not required in prospectus

Item 13. Other expenses of issuance and distribution.

The following table indicates the expenses to be incurred in connection with the offering described in this registration statement, other than underwriting discounts and commissions, all of which will be paid by us. All amounts are estimated except the Securities and Exchange Commission registration fee, the Financial Industry Regulatory Authority, Inc., or FINRA, filing fee and the Nasdaq listing fee.

	Amount
Securities and Exchange Commission registration fee	$ 12,210
FINRA filing fee	14,850
Nasdaq initial listing fee	*
Legal fees and expenses	*
Accounting fees and expenses	*
Blue sky fees and expenses	*
Printing and engraving expenses	*
Transfer agent fees and expenses	*
Miscellaneous	*
Total expenses	$ *

* To be filed by amendment.

Item 14. Indemnification of directors and officers.

Section 102 of the General Corporation Law of the State of Delaware permits a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his or her duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of the General Corporation Law of the State of Delaware or obtained an improper personal benefit. Our amended and restated certificate of incorporation will provide that none of our directors shall be personally liable to us or to our stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability, except to the extent that the General Corporation Law of the State of Delaware prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty.

Section 145 of the General Corporation Law of the State of Delaware provides that a corporation has the power to indemnify a director, officer, employee or agent of the corporation, or a person serving at the request of the corporation for another corporation, partnership, joint venture, trust or other enterprise in related capacities, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he or she was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding by reason of such position, if such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation and, in any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in

view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Our amended and restated bylaws will provide that we will indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding (other than an action by or in the right of our company) by reason of the fact that he or she is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (all such persons being referred to as an "Indemnitee"), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding and any appeal therefrom, if such Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, and, with respect to any criminal action or proceeding, he or she had no reasonable cause to believe his or her conduct was unlawful. Our amended and restated certificate of incorporation and amended and restated bylaws will provide that we will indemnify any Indemnitee who was or is a party to an action or suit by or in the right of our company to procure a judgment in our favor by reason of the fact that the Indemnitee is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise, or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding, and any appeal therefrom, if the Indemnitee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, except that no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to us, unless a court determines that, despite such adjudication but in view of all of the circumstances, he or she is entitled to indemnification of such expenses. Notwithstanding the foregoing, to the extent that any Indemnitee has been successful, on the merits or otherwise, he or she will be indemnified by us against all expenses (including attorneys' fees) actually and reasonably incurred in connection therewith. Expenses must be advanced to an Indemnitee under certain circumstances.

We have entered into indemnification agreements with each of our directors and executive officers. These indemnification agreements may require us, among other things, to indemnify our directors and executive officers for expenses, including attorneys' fees, judgments, fines and settlement amounts, incurred by a director or executive officer in any action or proceeding arising out of his or her service as one of our directors or executive officers, or any of our subsidiaries or any other company or enterprise to which the person provides services at our request.

We maintain a general liability insurance policy that covers certain liabilities of directors and officers of our corporation arising out of claims based on acts or omissions in their capacities as directors or officers.

In any underwriting agreement we enter into in connection with the sale of common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us within the meaning of the Securities Act of 1933, as amended, or the Securities Act, against certain liabilities.

Item 15. Recent sales of unregistered securities.

Set forth below is information regarding shares of capital stock issued by us within the past three years. Also included is the consideration received by us for such shares and information relating to the section of the

Securities Act, or rule of the Securities and Exchange Commission, under which exemption from registration was claimed.

(a) Issuances of Capital Stock and Securities Convertible into Capital Stock.

From May 2018 to July 2018, we issued 21,956,095 shares of Series B Preferred Stock to certain accredited investors at a price of $5.01 per share for aggregate proceeds of approximately $110.0 million.

In March 2019, we entered into a note purchase agreement with certain individual and institutional accredited investors, pursuant to which we sold and issued, or agreed to sell and issue, approximately $39.6 million aggregate principal amount of convertible promissory notes in exchange for aggregate cash proceeds of approximately $39.6 million.

(b) Equity Grants and Issuances under Stock Incentive Plans.

Since January 1, 2016, we have granted stock option and restricted stock awards to purchase an aggregate of 13,042,000 shares of our common stock to employees, consultants and directors under our 2015 Stock Incentive Plan with exercise or purchase prices ranging between $0.19 and $6.46 per share, and we have issued 843,035 shares of restricted common stock to employees, consultants and directors under our 2015 Stock Incentive Plan. In addition, since January 1, 2016, we have also issued 682,911 shares of restricted common stock to employees, consultants and directors in connection with the exercise of stock options granted under our 2006 Stock Incentive Plan.

The issuances of the above securities were deemed to be exempt from registration under the Securities Act in reliance upon Section 4(a)(2) of the Securities Act or Regulation D promulgated thereunder, or Rule 701 promulgated under Section 3(b) of the Securities Act, as transactions by an issuer not involving any public offering or pursuant to benefit plans and contracts relating to compensation as provided under Rule 701. Individuals who purchased securities as described above represented their intention to acquire the securities for investment only and not with a view to or for sale in connection with any distribution thereof, and appropriate legends were affixed to the share certificates issued in such transactions.

None of the foregoing transactions involved any underwriters, underwriting discounts or commissions or any public offering.

Item 16. Exhibits and financial statement schedules.

(a) Exhibits.

Exhibit number	Description
1.1*	Form of Underwriting Agreement
3.1	Amended and Restated Certificate of Incorporation of the Registrant, as currently in effect
3.2*	Form of Amended and Restated Certificate of Incorporation of the Registrant, to be effective upon the closing of this offering
3.3	Amended and Restated By-laws of the Registrant, as currently in effect
3.4*	Form of Amended and Restated Bylaws of the Registrant, to be effective upon the closing of this offering
4.1*	Specimen Common Stock Certificate
4.2*	Amended and Restated Investors' Rights Agreement among the Registrant and certain of its stockholders, dated May 25, 2018, as amended

Exhibit number	Description
5.1*	Opinion of Smith, Anderson, Blount, Dorsett, Mitchell & Jernigan, LLP
10.1†	Development and Commercial License Agreement by and between Les Laboratoires Servier and the Registrant, dated February 24, 2016, as amended
10.2†	License Agreement by and between Duke University and the Registrant, dated April 17, 2006, as amended
10.3†	Patent Cross-License Agreement by and between Cellectis SA and the Registrant, dated January 23, 2014
10.4†	Collaboration and License Agreement by and between Gilead Sciences, Inc. and the Registrant, dated September 10, 2018
10.5*	Lease Agreement between the Registrant and VC Owner, dated April 5, 2010, as amended
10.6	Lease Agreement between Elo Life Systems, Inc. and ARE-NC Region No. 17, LLC, dated March 29, 2018, as amended
10.7	Lease Agreement between Registrant and Durham TW Alexander, LLC, dated October 2, 2018
10.8	2006 Stock Incentive Plan, as amended, and form of award agreements thereunder
10.9	2015 Stock Incentive Plan, as amended, and form of award agreements thereunder
10.10*	2019 Incentive Award Plan, and form of award agreements thereunder
10.11*	2019 Employee Stock Purchase Plan
10.12*	Employment Agreement between the Registrant and Matthew Kane, dated
10.13*	Employment Agreement between the Registrant and Derek Jantz, dated
10.14*	Employment Agreement between the Registrant and Abid Ansari, dated
10.15*	Employment Agreement between the Registrant and David Thomson, dated
10.16*	Employment Agreement between the Registrant and Fayaz Khazi, dated
10.17*	Form of Indemnification Agreement between the Registrant and its directors and officers
10.18*	Non-Employee Director Compensation Plan
21.1	Subsidiaries of the Registrant
23.1	Consent of Deloitte & Touche LLP
23.2*	Consent of Smith, Anderson, Blount, Dorsett, Mitchell & Jernigan, LLP (included as part of Exhibit 5.1)
24.1	Power of Attorney (included on signature page)

* To be filed by amendment.

† Portions of this exhibit (indicated by asterisks) have been omitted pursuant to a request for confidential treatment pursuant to Rule 406 under the Securities Act of 1933, as amended, and have been filed separately with the Securities and Exchange Commission.

(b) Financial Statement Schedules. Schedules not listed above have been omitted because the information required to be set forth therein is not applicable or is shown in the consolidated financial statements or notes thereto.

Item 17. Undertakings.

The undersigned registrant hereby undertakes to provide to the underwriter, at the closing specified in the underwriting agreement, certificates in such denominations and registered in such names as required by the underwriter to permit prompt delivery to each purchaser.

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

The undersigned hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

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Signatures

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Durham, State of North Carolina, on this 1st day of March, 2019.

PRECISION BIOSCIENCES, INC.
(Registrant)

By: /s/ Matthew Kane
Matthew Kane
President and Chief Executive Officer

Power of attorney and signatures

We, the undersigned officers and directors of Precision BioSciences, Inc., hereby severally constitute and appoint Matthew Kane and Abid Ansari, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for him and in his name, place and stead, and in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement (or any other registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933), and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities indicated.

Signature	Title	Date
/s/ Matthew Kane Matthew Kane	President, Chief Executive Officer and Director *(Principal Executive Officer)*	March 1, 2019
/s/ Abid Ansari Abid Ansari	Chief Financial Officer *(Principal Financial and Accounting Officer)*	March 1, 2019
/s/ Robert Adelman Robert Adelman, M.D.	Director	March 1, 2019
/s/ Derek Jantz Derek Jantz, Ph.D.	Director	March 1, 2019
/s/ Shalini Sharp Shalini Sharp	Director	March 1, 2019
/s/ Tony Yao Tony Yao, M.D., Ph.D.	Director	March 1, 2019

Exhibit 3.1

EXECUTION

THIRD AMENDED AND RESTATED CERTIFICATE OF INCORPORATION
OF
PRECISION BIOSCIENCES, INC.

(Pursuant to Sections 242 and 245 of the
General Corporation Law of the State of Delaware)

Precision BioSciences, Inc., a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the "General Corporation Law"),

DOES HEREBY CERTIFY:

FIRST: That the name of this Corporation is Precision BioSciences, Inc. and that this Corporation was originally incorporated pursuant to the General Corporation Law on January 26, 2006 under the name Precision BioSciences, Inc.

SECOND: That the Board of Directors duly adopted resolutions proposing to amend and restate the Certificate of Incorporation of this Corporation, declaring said amendment and restatement to be advisable and in the best interests of this Corporation and its stockholders, and authorizing the appropriate officers of this Corporation to solicit the consent of the stockholders therefor, which resolution setting forth the proposed amendment and restatement is as follows:

RESOLVED, that the Certificate of Incorporation of this Corporation be amended and restated in its entirety as follows:

ARTICLE I

The name of this Corporation is Precision BioSciences, Inc. (the "Corporation").

ARTICLE II

The address of the registered office of this Corporation in the State of Delaware is 1209 Orange Street, in the City of Wilmington, County of New Castle. The name of its registered agent at such address is The Corporation Trust Company.

ARTICLE III

The nature of the business or purposes to be conducted or promoted is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law.

ARTICLE IV

A. Authorization of Stock. This Corporation is authorized to issue two classes of stock to be designated, respectively, common stock and preferred stock. The total number of shares that this Corporation is authorized to issue is 177,606,100. The total number of shares of common stock authorized to be issued is 130,000,000, par value $0.000005 per share (the "Common Stock"). The total number of shares of preferred stock authorized to be issued is 47,606,100, par value $0.0001 per share (the "Preferred Stock"), 25,650,000 of which are designated as "Series A Preferred Stock" and 21,956,100 of which are designated as "Series B Preferred Stock". The Series A Preferred Stock and the Series B Preferred Stock are sometimes collectively referred to herein as the "Designated Preferred Stock".

B. Rights, Preferences and Restrictions of Preferred Stock. The rights, preferences, privileges and restrictions granted to and imposed on the Preferred Stock are as set forth below in this Article IV(B).

1. Dividend Provisions. The Corporation shall not declare, pay or set aside any dividends on shares of any other class or series of capital stock of the Corporation (other than dividends on shares of Common Stock payable in shares of Common Stock) unless (in addition to the obtaining of any consents required elsewhere in this Third Amended and Restated Certificate of Incorporation) the holders of the Designated Preferred Stock then outstanding shall first receive, or simultaneously receive, a dividend on each outstanding share of Designated Preferred Stock in an amount at least equal to (i) in the case of a dividend on Common Stock or any class or series that is convertible into Common Stock, that dividend per share of Series A Preferred Stock and Series B Preferred Stock, as applicable, as would equal the product of (A) the dividend payable on each share of such class or series determined, if applicable, as if all shares of such class or series had been converted into Common Stock and (B) the number of shares of Common Stock issuable upon conversion of a share of Series A Preferred Stock or Series B Preferred Stock, as applicable, in each case calculated on the record date for determination of holders entitled to receive such dividend or (ii) in the case of a dividend on any class or series that is not convertible into Common Stock, at a rate per share of Series A Preferred Stock and Series B Preferred Stock, as applicable, determined by (A) dividing the amount of the dividend payable on each share of such class or series of capital stock by the original issuance price of such class or series of capital stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to such class or series) and (B) multiplying such fraction by an amount equal to the Series A Original Issue Price (as defined below) or Series B Original Issue Price (as defined below), as applicable; provided that, if the Corporation declares, pays or sets aside, on the same date, a dividend on shares of more than one class or series of capital stock of the Corporation, the dividend payable to the holders of Series A Preferred Stock or Series B Preferred Stock, as the case may be, pursuant to this Section 1 shall be calculated based upon the dividend on the class or series of capital stock that would result in the highest Series A Preferred Stock dividend and Series B Preferred Stock dividend, respectively. The "Series A Original Issue Price" shall mean $1.00 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A Preferred Stock. The "Series B Original Issue Price" shall mean $5.01 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series B Preferred Stock.

2. Liquidation Event.

(a) In the event of any Liquidation Event (as defined below), after the payment of all preferential amounts (if any) required to be paid to the holders of shares of classes or series of capital stock senior to the Designated Preferred Stock, the remaining assets of the Corporation available for distribution to its stockholders shall be distributed among the holders of the shares of Designated Preferred Stock and Common Stock, pro rata based on the number of shares held by each such holder, treating for this purpose all such securities as if they had been converted to Common Stock pursuant to the terms of this Third Amended and Restated Certificate of Incorporation immediately prior to such liquidation, dissolution or winding up of the Corporation.

(b) For purposes of this Section 2, a "Liquidation Event" shall include (A) (1) the sale, lease, transfer, exclusive license or other disposition, in a single transaction or series of related transactions, by the Corporation or any subsidiary of the Corporation of all or substantially all the assets of the Corporation and its subsidiaries taken as a whole (including, without limitation, the Corporation's intellectual property rights), or (2) the sale or disposition (whether by merger, consolidation or otherwise, and whether in a single transaction or a series of related transactions) of one or more subsidiaries of the Corporation if substantially all of the assets of the Corporation and its subsidiaries taken as a whole are held by such subsidiary or subsidiaries, except where such sale, lease, transfer, exclusive license or other disposition is to a wholly owned subsidiary of the Corporation, (B) the consummation of the merger or consolidation of this Corporation with or into another entity (except a merger or consolidation in which the holders of capital stock of this Corporation immediately prior to such merger or consolidation continue to hold a majority of the voting power of the capital stock of this Corporation or the surviving or acquiring entity), (C) the closing of the transfer (whether by merger, consolidation or otherwise), in one transaction or a series of related transactions in which the Corporation is a constituent party, to a person or group of affiliated persons (other than an underwriter of this Corporation's securities), of this Corporation's securities if, after such closing, such person or group of affiliated persons would hold a majority of the outstanding voting stock of this Corporation (or the surviving or acquiring entity) (the preceding clauses (A), (B) and (C) of this subsection 2(b) being collectively referred to herein as a "**Deemed Liquidation Event**") or (D) a liquidation, dissolution or winding up of this Corporation; provided, however, that a transaction shall not constitute a Liquidation Event or Deemed Liquidation Event if its sole purpose is to change the state of this Corporation's incorporation, if its principal purpose is for bona fide equity financing purposes in which the Corporation issues new securities primarily for cash, if such transaction is to create a holding company that will be owned in substantially the same proportions by the persons who held this Corporation's securities immediately prior to such transaction, or if such transaction is a Qualified Public Offering (as defined below).

(c) Effecting a Deemed Liquidation Event.

(1) The Corporation shall not have the power to effect a Deemed Liquidation Event referred to in subsection 2(b) unless the agreement or plan of merger or consolidation for such transaction (the "**Merger Agreement**") provides that the consideration payable to the stockholders of the Corporation in such Deemed Liquidation Event shall be paid to the holders of capital stock of the Corporation in accordance with subsection 2(a).

(2) In the event of a Deemed Liquidation Event referred to in subsection 2(b) clause (A), if the Corporation does not effect a dissolution of the Corporation under the Delaware General Corporation Law within ninety (90) days after such Deemed Liquidation Event, then (i) the Corporation shall send a written notice to each holder of Designated Preferred Stock no later than the ninetieth (90th) day after the Deemed Liquidation Event advising such holders of their right (and the requirements to be met to secure such right) pursuant to the terms of the following clause; (ii) to require the redemption of such shares of Designated Preferred Stock, and (iii) if the holders of at least sixty percent (60%) of the then outstanding shares of Designated Preferred Stock so request in a written instrument delivered to the Corporation not later than one hundred twenty (120) days after such Deemed Liquidation Event, the Corporation shall use the consideration received by the Corporation for such Deemed Liquidation Event (net of any retained liabilities associated with the assets sold or technology licensed, as determined in good faith by the Board of Directors of the Corporation), together with any other assets of the Corporation available for distribution to its stockholders, all to the extent permitted by Delaware law governing distributions to stockholders (the "**Available Proceeds**"), on the one hundred fiftieth (150th) day after such Deemed Liquidation Event, to redeem all outstanding shares of Designated Preferred Stock and Common Stock at a price per share equal to the amount such shares would be entitled to receive under subsection 2(a). Prior to the distribution or redemption provided for in this subsection 2(c)(2), the Corporation shall not expend or dissipate the consideration received for such Deemed Liquidation Event, except to discharge expenses incurred in connection with such Deemed Liquidation Event or in the ordinary course of business.

3. Redemption. Except to the extent provided in subsection 2(c)(2), the Designated Preferred Stock is not redeemable at the option of the holder.

4. Conversion. The holders of the Designated Preferred Stock shall have conversion rights as follows:

(a) Right to Convert. Each share of Series A Preferred Stock shall be convertible, at the option of the holder thereof, at any time after the date of issuance of such share, at the office of this Corporation or any transfer agent for such stock, into such number of fully paid and nonassessable shares of Common Stock as is determined by dividing the Series A Original Issue Price by the Series A Conversion Price (the conversion rate for the Series A Preferred Stock into Common Stock is referred to herein as the "Series A Conversion Rate"), determined as hereafter provided, in effect on the date the certificate is surrendered for conversion. Each share of Series B Preferred Stock shall be convertible, at the option of the holder thereof, at any time after the date of issuance of such share, at the office of this Corporation or any transfer agent for such stock, into such number of fully paid and nonassessable shares of Common Stock as is determined by dividing the Series B Original Issue Price by the Series B Conversion Price (the conversion rate for the Series B Preferred Stock into

Common Stock is referred to herein as the "Series B Conversion Rate"), determined as hereafter provided, in effect on the date the certificate is surrendered for conversion. The initial Series A Conversion Price per share for the Series A Preferred Stock shall be the Series A Original Issue Price; provided, however, that the Series A Conversion Price for the Series A Preferred Stock shall be subject to adjustment as provided below. The initial Series B Conversion Price per share for the Series B Preferred Stock shall be the Series B Original Issue Price; provided, however, that the Series B Conversion Price for the Series B Preferred Stock shall be subject to adjustment as provided below. Each of the Series A Conversion Price and the Series B Conversion Price are sometimes referred to as the "Conversion Price" with respect to each such series and each of the Series A Conversion Rate and the Series B Conversion Rate are sometimes referred to as the "Conversion Rate" with respect to each such series.

(b) Automatic Conversion. Each share of Designated Preferred Stock shall automatically be converted into shares of Common Stock at the applicable Conversion Rate at the time in effect for the Designated Preferred Stock immediately upon the earlier of (i) the closing of this Corporation's sale of its Common Stock to the public at a price of at least $6.01 per share (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Common Stock) in a firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, the public offering price of which is not less than $50,000,000 in aggregate proceeds (net of the underwriting discounts or commissions and offering expenses) to this Corporation (a "Qualified Public Offering") or (ii) the date, or the occurrence of an event, specified in writing by the holders of at least sixty percent (60%) of the then outstanding shares of Designated Preferred Stock (the "Required Vote").

(c) Mechanics of Conversion. Before any holder of Designated Preferred Stock shall be entitled to voluntarily convert the same into shares of Common Stock, such holder shall surrender the certificate or certificates therefor, duly endorsed, at the office of this Corporation or of any transfer agent for the Designated Preferred Stock, and shall give written notice to this Corporation at its principal corporate office, of the election to convert the same and shall state therein the name or names in which the certificate or certificates for shares of Common Stock are to be issued. This Corporation shall, as soon as practicable thereafter, issue and deliver at such office to such holder of Designated Preferred Stock, or to the nominee or nominees of such holder, a certificate or certificates for the number of shares of Common Stock to which such holder shall be entitled as aforesaid. Such conversion shall be deemed to have been made immediately prior to the close of business on the date set forth for conversion in the written notice of the election to convert irrespective of the surrender of the shares of Designated Preferred Stock to be converted, and the person or persons entitled to receive the shares of Common Stock issuable upon such conversion shall be treated for all purposes as the record holder or holders of such shares of Common Stock as of such date. If the conversion is in connection with an underwritten offering of securities registered pursuant to the Securities Act of 1933, as amended, the conversion may, at the option of any holder tendering Designated Preferred Stock for conversion, be conditioned upon the closing with the underwriters of the sale of securities pursuant to such offering, in which event the persons entitled to receive the Common Stock upon conversion of the Designated Preferred Stock shall not be deemed to have converted such Designated Preferred Stock until immediately prior to the closing of such sale of securities. If the conversion is in connection with the automatic conversion provisions of subsection 4(b)(ii) above, such conversion shall be deemed to have been made on the conversion date described in the stockholder consent approving such conversion, and the persons entitled to receive shares of Common Stock issuable upon such conversion shall be treated for all purposes as the record holders of such shares of Common Stock as of such date.

(d) Conversion Price Adjustments of Designated Preferred Stock for Splits, Combinations, Other Distributions, Recapitalizations and Similar Events. The Conversion Price of the Designated Preferred Stock shall be subject to adjustment from time to time as follows:

(i) In the event this Corporation should at any time or from time to time after the date upon which this Third Amended and Restated Certificate of Incorporation is accepted for filing by the Secretary of State of the State of Delaware (the "Filing Date") fix a record date for the effectuation of a split or subdivision of the outstanding shares of Common Stock or the determination of holders of Common Stock entitled to receive a dividend or other distribution payable in additional shares of Common Stock or other securities or rights convertible into, or entitling the holder thereof to receive directly or indirectly, additional shares of Common Stock (hereinafter referred to as "Common Stock Equivalents") without payment of any consideration by such holder for the additional shares of Common Stock or the Common Stock Equivalents (including the additional shares of Common Stock issuable upon conversion or exercise thereof) and without a corresponding split, subdivision, dividend or other distribution with respect to the Designated Preferred Stock, then, as of such record date (or the date of such dividend distribution, split or subdivision if no record date is fixed), the applicable Conversion Price of the Designated Preferred Stock shall be appropriately decreased so that the number of shares of Common Stock issuable on conversion of each share of such series shall be increased in proportion to such increase of the aggregate of shares of Common Stock outstanding and those issuable with respect to such Common Stock Equivalents, with the number of shares issuable with respect to Common Stock Equivalents determined from time to time as follows:

(A) The aggregate maximum number of shares of Common Stock deliverable upon exercise (assuming the satisfaction of any conditions to exercisability, including without limitation, the passage of time, but without taking into account potential antidilution adjustments) of any exercisable Common Stock Equivalents shall be deemed to have been issued at the time such Common Stock Equivalents were issued.

(B) The aggregate maximum number of shares of Common Stock deliverable upon conversion or exercise of, or in exchange (assuming the satisfaction of any conditions to convertibility or exchangeability, including, without limitation, the passage of time, but without taking into account potential antidilution adjustments) for, any such Common Stock Equivalents and subsequent conversion or exercise or exchange thereof shall be deemed to have been issued at the time such Common Stock Equivalents were issued.

(C) In the event of any change in the number of shares of Common Stock deliverable upon exercise, conversion or exchange of such Common Stock Equivalents, the Conversion Price of the applicable series of Designated Preferred Stock, to the extent in any way affected by or computed using such, shall be recomputed to reflect such change, but no further adjustment shall be made for the actual issuance of Common Stock or any payment of such consideration upon the exercise of any such Common Stock Equivalents or the conversion or exchange of such Common Stock Equivalents.

(D) Upon the expiration of any such Common Stock Equivalents, the termination of any such Common Stock Equivalents or the expiration of any such Common Stock Equivalents, the Conversion Price of the applicable series of Designated Preferred Stock, to the extent in any way affected by or computed using such, shall be recomputed to reflect the issuance of only the number of shares of Common Stock (and convertible or exchangeable securities that remain in effect) actually issued upon the exercise, conversion or exchange of such Common Stock Equivalents or upon the exercise of the options or rights related to such Common Stock Equivalents.

(ii) If the number of shares of Common Stock outstanding at any time after the Filing Date is decreased by a combination of the outstanding shares of Common Stock without a corresponding combination of the outstanding shares of Designated Preferred Stock, then, following the record date of such combination, the applicable Conversion Price for the Designated Preferred Stock shall be appropriately increased so that the number of shares of Common Stock issuable on conversion of each share of such series shall be decreased in proportion to such decrease in outstanding shares of Common Stock.

(e) Other Distributions. In the event this Corporation shall declare a distribution payable in securities of other persons, evidences of indebtedness issued by this Corporation or other persons, assets (excluding cash dividends) or options or rights not referred to in subsection 4(d)(i), then, in each such case for the purpose of this subsection 4(e), the holders of the Designated Preferred Stock shall be entitled to a proportionate share of any such distribution as though they were the holders of the number of shares of Common Stock of this Corporation into which their shares of Designated Preferred Stock are convertible as of the record date fixed for the determination of the holders of Common Stock of this Corporation entitled to receive such distribution.

(f) Recapitalizations. If at any time or from time to time there shall be a recapitalization of the Common Stock (other than a subdivision or combination provided for elsewhere in this Section 4) provision shall be made so that the holders of the Designated Preferred Stock shall thereafter be entitled to receive upon conversion of the Designated Preferred Stock the number of shares of stock or other securities or property of this Corporation or otherwise, to which a holder of Common Stock deliverable upon conversion would have been entitled on such recapitalization. In any such case, appropriate adjustment shall be made in the application of the provisions of this Section 4 with respect to the rights of the holders of the Designated Preferred Stock after the recapitalization to the end that the provisions of this Section 4 (including adjustment of the applicable Conversion Price then in effect and the number of shares issuable upon conversion of the Designated Preferred Stock) shall be applicable after that event as nearly equivalently as may be practicable.

(g) No Fractional Shares and Certificate as to Adjustments.

(i) No fractional shares shall be issued upon the conversion of any share or shares of the Designated Preferred Stock and the aggregate number of shares of Common Stock to be issued to particular stockholders, shall be rounded down to the nearest whole share and this Corporation shall pay in cash the fair market value of any fractional shares as of the time when entitlement to receive such fractions is determined, as determined in good faith by the Board of Directors. Whether or not fractional shares would be issuable upon such conversion shall be determined on the basis of the total number of shares of Designated Preferred Stock the holder is at the time converting into Common Stock and the number of shares of Common Stock issuable upon such conversion.

(ii) Upon the occurrence of each adjustment or readjustment of the Conversion Price of the Designated Preferred Stock pursuant to this Section 4, the Corporation, at its expense, shall promptly compute such adjustment or readjustment in accordance with the terms hereof and prepare and furnish to each holder of the affected Designated Preferred Stock a certificate setting forth such adjustment or readjustment and showing in detail the facts upon which such adjustment or readjustment is based. This Corporation shall, upon the written request at any time of any holder of Designated Preferred Stock, furnish or cause to be furnished to such holder a like certificate setting forth (A) such adjustment and readjustment, (B) the Conversion Price of the Designated Preferred Stock at the time in effect, and (C) the number of shares of Common Stock and the amount, if any, of other property that at the time would be received upon the conversion of a share of Designated Preferred Stock.

(h) Notices of Record Date. In the event of any taking by this Corporation of a record of the holders of any class of securities for the purpose of determining the holders thereof who are entitled to receive any dividend (other than a cash dividend) or other distribution, this Corporation shall furnish to each holder of Designated Preferred Stock, at least ten (10) days prior to the date specified therein, a notice specifying the date on which any such record is to be taken for the purpose of such dividend or distribution, and the amount and character of such dividend or distribution.

(i) Reservation of Stock Issuable Upon Conversion. This Corporation shall at all times reserve and keep available out of its authorized but unissued shares of Common Stock, solely for the purpose of effecting the conversion of the shares of the Designated Preferred Stock, such number of its shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding shares of the Designated Preferred Stock; and if at any time the number of authorized but unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of the Designated Preferred Stock, in addition to such other remedies as shall be available to the holder of such Designated Preferred Stock, this Corporation will take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued shares of Common Stock to such number of shares as shall be sufficient for such purposes, including, without limitation, engaging in best efforts to obtain the requisite stockholder approval of any necessary amendment to this Third Amended and Restated Certificate of Incorporation.

(j) Taxes. The Corporation shall pay any and all issue and other similar taxes that may be payable in respect of any issuance or delivery of shares of Common Stock upon conversion of shares of Designated Preferred Stock pursuant to this Section 4. The Corporation shall not, however, be required to pay any tax which may be payable in respect of

any transfer involved in the issuance and delivery of shares of Common Stock in a name other than that in which the shares of Designated Preferred Stock so converted were registered, and no such issuance or delivery shall be made unless and until the person or entity requesting such issuance has paid to the Corporation the amount of any such tax or has established, to the satisfaction of the Corporation, that such tax has been paid.

5. Voting Rights.

(a) General Voting Rights. The holder of each share of Designated Preferred Stock shall have the right to one vote for each share of Common Stock into which such Designated Preferred Stock could then be converted, and with respect to such vote, such holder shall have full voting rights and powers equal to the voting rights and powers of the holders of Common Stock, and shall be entitled, notwithstanding any provision hereof, to notice of any stockholders' meeting in accordance with the Bylaws of this Corporation, and except as provided by law or in subsection 5(b) below with respect to the election of directors by the separate class vote of the holders of Common Stock, shall be entitled to vote, together with holders of Common Stock as a single class on an as-converted basis, with respect to any question upon which holders of Common Stock have the right to vote. Fractional votes shall not, however, be permitted and any fractional voting rights available on an as-converted basis (after aggregating all shares into which shares of each series of Designated Preferred Stock held by each holder could be converted) shall be rounded to the nearest whole number (with one-half being rounded upward).

(b) Voting for the Election of Directors. The holders of record of the shares of Designated Preferred Stock, exclusively and as a separate class, shall be entitled to elect two (2) directors of the Corporation (the "Preferred Directors") and the holders of record of the shares of Common Stock, exclusively and as a separate class, shall be entitled to elect two (2) directors of the Corporation. Any director elected as provided in the preceding sentence may be removed without cause by, and only by, the affirmative vote of the holders of the shares of the class or series of capital stock entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or pursuant to a written consent of stockholders. If the holders of shares of Designated Preferred Stock or Common Stock, as the case may be, fail to elect a sufficient number of directors to fill all directorships for which they are entitled to elect directors, voting exclusively and as a separate class, pursuant to the first sentence of this subsection 5(b), then any directorship not so filled shall remain vacant until such time as the holders of the Designated Preferred Stock or Common Stock, as the case may be, elect a person to fill such directorship by vote or written consent in lieu of a meeting; and no such directorship may be filled by stockholders of the Corporation other than by the stockholders of the Corporation that are entitled to elect a person to fill such directorship, voting exclusively and as a separate class. The holders of record of the shares of Common Stock and of any other class or series of voting stock (including the Designated Preferred Stock), exclusively and voting together as a single class, shall be entitled to elect the balance of the total number of directors of the Corporation. At any meeting held for the purpose of electing a director, the presence in person or by proxy of the holders of a majority of the outstanding shares of the class or series entitled to elect such director shall constitute a quorum for the purpose of electing such director. Except as otherwise provided in this subsection 5(b), a vacancy in any directorship filled by the holders of any class or series shall be filled only by vote or written consent in lieu of a meeting of the holders of such class or series or by any remaining director or directors elected by the

holders of such class or series pursuant to this subsection 5(b). The rights of the holders of the Designated Preferred Stock and the rights of the holders of the Common Stock under the first sentence of this subsection 5(b) shall terminate on the first date following the Filing Date on which there are issued and outstanding less than 6,000,000 shares of Designated Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination, or other similar recapitalization with respect to the Designated Preferred Stock).

6. Protective Provisions. At any time when, in the case of subsection 6(a), any shares of Designated Preferred Stock are outstanding, or, in the case of subsections 6(b)-(i) at least 3,763,310 shares of Designated Preferred Stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Designated Preferred Stock) are outstanding, the Corporation shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or this Third Amended and Restated Certificate of Incorporation) the Required Vote, given in writing or by vote at a meeting, and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(a) amend, alter or repeal any provision of this Third Amended and Restated Certificate of Incorporation or Bylaws of the Corporation in a manner that adversely affects the powers, preferences or rights of the Series A Preferred Stock or the Series B Preferred Stock;

(b) consummate a Liquidation Event;

(c) issue shares of Common Stock or increase the authorized number of shares of Common Stock, except for the issuance of shares of Common Stock (i) upon exercise of options or warrants, (ii) upon conversion of the Designated Preferred Stock, or (iii) pursuant to a transaction described in subsection 4(d)(i) hereof;

(d) increase the authorized number of shares of Series A Preferred Stock or the Series B Preferred Stock.

(e) authorize, create or issue any equity security (including any other security convertible into or exercisable for any such equity security) having rights, preferences or privileges senior to, or on a parity with, the Designated Preferred Stock, other than the issuance of any authorized but unissued shares of Series B Preferred Stock designated in this Third Amended and Restated Certificate of Incorporation (including any security convertible into or exercisable for such shares of Series B Preferred Stock);

(f) reclassify, alter or amend any existing security of the Corporation that is junior to the Designated Preferred Stock in respect of the distribution of assets on the liquidation, dissolution or winding up of the Corporation, the payment of dividends or rights of redemption, if such reclassification, alteration or amendment would render such other security senior to or pari passu with the Designated Preferred Stock in respect of any such right, preference or privilege;

(g) redeem, purchase or otherwise acquire any shares of capital stock or options; provided, however, that this restriction shall not apply to the repurchase of shares of Common Stock (i) from employees, officers, directors, consultants or other persons performing services for this Corporation or any subsidiary pursuant to agreements under which this Corporation has the option to repurchase such shares upon the occurrence of certain events, such as the termination of employment or service, or pursuant to a right of first refusal or (ii) as approved by the Board of Directors including the approval of a majority of the Preferred Directors;

(h) change the authorized number of directors of this Corporation or the procedures by which the directors of the Corporation are elected or appointed; or

(i) create, or hold capital stock in, any subsidiary that is not wholly owned (either directly or through one or more other subsidiaries) by the Corporation, or permit any subsidiary to create, or authorize the creation of, or issue or obligate itself to issue, any shares of any class or series of capital stock, or sell, transfer or otherwise dispose of any capital stock of any direct or indirect subsidiary of the Corporation, or permit any direct or indirect subsidiary to sell, lease, transfer, exclusively license or otherwise dispose (in a single transaction or series of related transactions) of all or substantially all of the assets of such subsidiary other than to another wholly-owned (directly or indirectly) subsidiary of the Corporation.

7. Separate Series Protective Provision. At any time when any shares of a series of Preferred Stock are outstanding, the Corporation shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, without first obtaining the approval of the holders of at least majority of such series of Preferred Stock, given in writing or by vote at a meeting, adversely alter or change the rights, preferences and privileges of such series of Preferred Stock in a manner different from the other series of Preferred Stock; provided that for the avoidance of doubt, that the authorization and issuance of a security by the Corporation having rights, preferences, and privileges on parity with, or senior to, such series of Preferred Stock shall not constitute an adverse alteration or change to the rights, preferences and privileges of such series of Preferred Stock.

8. Status of Converted Stock. In the event any shares of Preferred Stock shall be converted pursuant to Section 4 hereof, the shares so converted shall be cancelled and shall not be issuable by this Corporation. This Third Amended and Restated Certificate of Incorporation shall be appropriately amended to effect the corresponding reduction in this Corporation's authorized capital stock.

9. Notices. Any notice required by the provisions of this Article IV(B) to be given to the holders of shares of Preferred Stock shall be deemed given (i) if deposited in the United States mail, postage prepaid, and addressed to each holder of record at his, her or its address appearing on the books of this Corporation, (ii) if such notice is provided by electronic transmission in a manner permitted by Section 232 of the General Corporation Law, or (iii) if such notice is provided in another manner then permitted by the General Corporation Law.

C. Common Stock. The rights, preferences, privileges and restrictions granted to and imposed on the Common Stock are as set forth below in this Article IV(C).

1. Dividend Rights. Subject to the prior rights of holders of all classes of stock at the time outstanding having prior rights as to dividends, the holders of the Common Stock shall be entitled to receive, when, as and if declared by the Board of Directors, out of any assets of this Corporation legally available therefor, any dividends as may be declared from time to time by the Board of Directors.

2. Liquidation Rights. Upon the liquidation, dissolution or winding up of this Corporation, the assets of this Corporation shall be distributed as provided in Section 2 of Article IV(B) hereof.

3. Redemption. The Common Stock is not redeemable at the option of the holder.

4. Voting Rights. The holder of each share of Common Stock shall have the right to one vote for each such share, and shall be entitled to notice of any stockholders' meeting in accordance with the Bylaws of this Corporation, and shall be entitled to vote upon such matters and in such manner as may be provided by law. The number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the stock of this Corporation entitled to vote, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law.

ARTICLE V

Except as otherwise provided in this Third Amended and Restated Certificate of Incorporation, in furtherance and not in limitation of the powers conferred by statute, the Board of Directors is expressly authorized to make, repeal, alter, amend and rescind any or all of the Bylaws of this Corporation.

ARTICLE VI

The number of directors of this Corporation shall be determined in the manner set forth in the Bylaws of this Corporation.

ARTICLE VII

Elections of directors need not be by written ballot unless the Bylaws of this Corporation shall so provide.

ARTICLE VIII

Meetings of stockholders may be held within or without the State of Delaware, as the Bylaws of this Corporation may provide. The books of this Corporation may be kept (subject to any provision contained in the statutes) outside the State of Delaware at such place or places as may be designated from time to time by the Board of Directors or in the Bylaws of this Corporation.

ARTICLE IX

A director of this Corporation shall not be personally liable to this Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, except for liability (i) for any breach of the director's duty of loyalty to this Corporation or its stockholders, (ii) for acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the General Corporation Law, or (iv) for any transaction from which the director derived any improper personal benefit. In addition, any disinterested failure by a director of this Corporation to satisfy Section 365 of the General Corporation Law shall not, for the purposes of Sections 102(b)(7) or 145 of the General Corporation Law, constitute an act or omission not in good faith, or a breach of the duty of loyalty. If the General Corporation Law is amended after approval by the stockholders of this Article IX to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of this Corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law as so amended.

Any amendment, repeal or modification of the foregoing provisions of this Article IX by the stockholders of this Corporation shall not adversely affect any right or protection of a director of this Corporation existing at the time of, or increase the liability of any director of this Corporation with respect to any acts or omissions of such director occurring prior to, such amendment, repeal or modification.

ARTICLE X

Subject to any additional vote required by this Third Amended and Restated Certificate of Incorporation, this Corporation reserves the right to amend, alter, change or repeal any provision contained in this Third Amended and Restated Certificate of Incorporation, in the manner now or hereafter prescribed by statute, and all rights conferred upon stockholders herein are granted subject to this reservation.

ARTICLE XI

The Corporation shall provide indemnification as follows:

1. Actions, Suits and Proceedings Other than by or in the Right of the Corporation. The Corporation shall indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the Corporation) by reason of the fact that he or she is or was, or has agreed to become, a director or officer of the Corporation, or is or was serving, or has agreed to serve, at the request of the Corporation, as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (including any employee benefit plan), or who serves as an observer on the Board of Directors of the Corporation pursuant to the Corporation's Amended and Restated Investors' Rights Agreement dated on or about the date of the filing of this Amended and Restated Certificate of Incorporation by and among the Corporation and the Investors and Common Holders named therein (as such may be amended, modified, supplemented or restated from time to time) (all such persons being referred to

hereafter as an "Indemnitee"), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by or on behalf of Indemnitee in connection with such action, suit or proceeding and any appeal therefrom, if Indemnitee acted in good faith and in a manner which Indemnitee reasonably believed to be in, or not opposed to, the best interests of the Corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful. The termination of any action, suit or proceeding by judgment, order, settlement, conviction or upon a plea of *nolo contendere* or its equivalent, shall not, of itself, create a presumption that Indemnitee did not act in good faith and in a manner which Indemnitee reasonably believed to be in, or not opposed to, the best interests of the Corporation, and, with respect to any criminal action or proceeding, had reasonable cause to believe that his or her conduct was unlawful.

2. Actions or Suits by or in the Right of the Corporation. The Corporation shall indemnify any Indemnitee who was or is a party to or threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the Corporation to procure a judgment in its favor by reason of the fact that Indemnitee is or was, or has agreed to become, a director or officer of the Corporation, or is or was serving, or has agreed to serve, at the request of the Corporation, as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (including any employee benefit plan), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred by or on behalf of Indemnitee in connection with such action, suit or proceeding and any appeal therefrom, if Indemnitee acted in good faith and in a manner which Indemnitee reasonably believed to be in, or not opposed to, the best interests of the Corporation, except that no indemnification shall be made under this Article XI Section 2 in respect of any claim, issue or matter as to which Indemnitee shall have been adjudged to be liable to the Corporation, unless, and only to the extent, that the Court of Chancery of Delaware shall determine upon application that, despite the adjudication of such liability but in view of all the circumstances of the case, Indemnitee is fairly and reasonably entitled to indemnity for such expenses (including attorneys' fees) which the Court of Chancery of Delaware shall deem proper.

3. Indemnification for Expenses of Successful Party. Notwithstanding any other provisions of this Article, to the extent that an Indemnitee has been successful, on the merits or otherwise, in defense of any action, suit or proceeding referred to in Sections 1 and 2 of this Article XI, or in defense of any claim, issue or matter therein, or on appeal from any such action, suit or proceeding, Indemnitee shall be indemnified against all expenses (including attorneys' fees) actually and reasonably incurred by or on behalf of Indemnitee in connection therewith. Without limiting the foregoing, if any action, suit or proceeding is disposed of, on the merits or otherwise (including a disposition without prejudice), without (i) the disposition being adverse to Indemnitee, (ii) an adjudication that Indemnitee was liable to the Corporation, (iii) a plea of guilty or *nolo contendere* by Indemnitee, (iv) an adjudication that Indemnitee did not act in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the Corporation, and (v) with respect to any criminal proceeding, an adjudication that Indemnitee had reasonable cause to believe his conduct was unlawful, Indemnitee shall be considered for the purposes hereof to have been wholly successful with respect thereto.

4. Notification and Defense of Claim. As a condition precedent to an Indemnitee's right to be indemnified, such Indemnitee must notify the Corporation in writing as soon as practicable of any action, suit, proceeding or investigation involving such Indemnitee for which indemnification will or could be sought. With respect to any action, suit, proceeding or investigation of which the Corporation is so notified, the Corporation will be entitled to participate therein at its own expense and/or to assume the defense thereof at its own expense, with legal counsel reasonably acceptable to Indemnitee. After notice from the Corporation to Indemnitee of its election so to assume such defense, the Corporation shall not be liable to Indemnitee for any legal or other expenses subsequently incurred by Indemnitee in connection with such action, suit, proceeding or investigation, other than as provided below in this Section 4 of this Article XI. Indemnitee shall have the right to employ his or her own counsel in connection with such action, suit, proceeding or investigation, but the fees and expenses of such counsel incurred after notice from the Corporation of its assumption of the defense thereof shall be at the expense of Indemnitee unless (i) the employment of counsel by Indemnitee has been authorized by the Corporation, (ii) counsel to Indemnitee shall have reasonably concluded that there may be a conflict of interest or position on any significant issue between the Corporation and Indemnitee in the conduct of the defense of such action, suit, proceeding or investigation or (iii) the Corporation shall not in fact have employed counsel to assume the defense of such action, suit, proceeding or investigation, in each of which cases the fees and expenses of counsel for Indemnitee shall be at the expense of the Corporation, except as otherwise expressly provided by this Article. The Corporation shall not be entitled, without the consent of Indemnitee, to assume the defense of any claim brought by or in the right of the Corporation or as to which counsel for Indemnitee shall have reasonably made the conclusion provided for in clause (ii) above. The Corporation shall not be required to indemnify Indemnitee under this Article XI for any amounts paid in settlement of any action, suit, proceeding or investigation effected without its written consent. The Corporation shall not settle any action, suit, proceeding or investigation in any manner which would impose any penalty or limitation on Indemnitee without Indemnitee's written consent. Neither the Corporation nor Indemnitee will unreasonably withhold or delay its consent to any proposed settlement.

5. Advance of Expenses. Subject to the provisions of Section 6 of this Article XI, in the event of any action, suit, proceeding or investigation of which the Corporation receives notice under this Article, any expenses (including attorneys' fees) incurred by or on behalf of an Indemnitee in defending an action, suit, proceeding or investigation or any appeal therefrom shall be paid by the Corporation in advance of the final disposition of such matter; provided, however, that the payment of such expenses incurred by or on behalf of Indemnitee in advance of the final disposition of such matter shall be made only upon receipt of an undertaking by or on behalf of Indemnitee to repay all amounts so advanced in the event that it shall ultimately be determined that Indemnitee is not entitled to be indemnified by the Corporation as authorized in this Article; and further provided that no such advancement of expenses shall be made under this Article XI if it is determined (in the manner described in Section 6 of this Article XI) that (i) Indemnitee did not act in good faith and in a manner he or she reasonably believed to be in, or not opposed to, the best interests of the Corporation, or (ii) with respect to any criminal action or proceeding, Indemnitee had reasonable cause to believe his or her conduct was unlawful. Such undertaking shall be accepted without reference to the financial ability of Indemnitee to make such repayment.

6. Procedure for Indemnification. In order to obtain indemnification or advancement of expenses pursuant to Section 1, 2, 3 or 5 of this Article XI, an Indemnitee shall submit to the Corporation a written request. Any such advancement of expenses shall be made promptly, and in any event within 60 days after receipt by the Corporation of the written request of Indemnitee, unless (i) the Corporation has assumed the defense pursuant to Section 4 of this Article XI (and none of the circumstances described in Section 4 of this Article XI that would nonetheless entitle the Indemnitee to indemnification for the fees and expenses of separate counsel have occurred) or (ii) the Corporation determines within such 60-day period that Indemnitee did not meet the applicable standard of conduct set forth in Section 1, 2 or 5 of this Article XI, as the case may be. Any such indemnification, unless ordered by a court, shall be made with respect to requests under Section 1 or 2 of this Article XI only as authorized in the specific case upon a determination by the Corporation that the indemnification of Indemnitee is proper because Indemnitee has met the applicable standard of conduct set forth in Section 1 or 2 of this Article XI, as the case may be. Such determination shall be made in each instance (a) by a majority vote of the directors of the Corporation consisting of persons who are not at that time parties to the action, suit or proceeding in question ("disinterested directors"), whether or not a quorum, (b) by a committee of disinterested directors designated by majority vote of disinterested directors, whether or not a quorum, (c) if there are no disinterested directors, or if the disinterested directors so direct, by independent legal counsel (who may, to the extent permitted by law, be regular legal counsel to the Corporation) in a written opinion, or (d) by the stockholders of the Corporation.

7. Remedies. The right to indemnification or advancement of expenses as granted by this Article shall be enforceable by Indemnitee in any court of competent jurisdiction. Neither the failure of the Corporation to have made a determination prior to the commencement of such action that indemnification is proper in the circumstances because Indemnitee has met the applicable standard of conduct, nor an actual determination by the Corporation pursuant to Section 6 of this Article XI that Indemnitee has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that Indemnitee has not met the applicable standard of conduct. Indemnitee's expenses (including attorneys' fees) reasonably incurred in connection with successfully establishing Indemnitee's right to indemnification, in whole or in part, in any such proceeding shall also be indemnified by the Corporation.

8. Limitations. Notwithstanding anything to the contrary in this Article, except as set forth in Section 7 of this Article XI, the Corporation shall not indemnify an Indemnitee pursuant to this Article XI in connection with a proceeding (or part thereof) initiated by such Indemnitee unless the initiation thereof was approved by the Board of Directors of the Corporation. Notwithstanding anything to the contrary in this Article, the Corporation shall not indemnify an Indemnitee to the extent such Indemnitee is reimbursed from the proceeds of insurance, and in the event the Corporation makes any indemnification payments to an Indemnitee and such Indemnitee is subsequently reimbursed from the proceeds of insurance, Indemnitee shall promptly refund such indemnification payments to the Corporation to the extent of such insurance reimbursement.

9. Subsequent Amendment. No amendment, termination or repeal of this Article or of the relevant provisions of the General Corporation Law of Delaware or any other applicable laws shall affect or diminish in any way the rights of any Indemnitee to indemnification under the provisions hereof with respect to any action, suit, proceeding or investigation arising out of or relating to any actions, transactions or facts occurring prior to the final adoption of such amendment, termination or repeal.

10. Other Rights. The indemnification and advancement of expenses provided by this Article shall not be deemed exclusive of any other rights to which an Indemnitee seeking indemnification or advancement of expenses may be entitled under any law (common or statutory), agreement or vote of stockholders or disinterested directors or otherwise, both as to action in Indemnitee's official capacity and as to action in any other capacity while holding office for the Corporation, and shall continue as to an Indemnitee who has ceased to be a director or officer, and shall inure to the benefit of the estate, heirs, executors and administrators of Indemnitee. Nothing contained in this Article shall be deemed to prohibit, and the Corporation is specifically authorized to enter into, agreements with officers and directors providing indemnification rights and procedures different from those set forth in this Article. In addition, the Corporation may, to the extent authorized from time to time by its Board of Directors, grant indemnification rights to other employees or agents of the Corporation or other persons serving the Corporation and such rights may be equivalent to, or greater or less than, those set forth in this Article.

11. Partial Indemnification. If an Indemnitee is entitled under any provision of this Article to indemnification by the Corporation for some or a portion of the expenses (including attorneys' fees), judgments, fines or amounts paid in settlement actually and reasonably incurred by or on behalf of Indemnitee in connection with any action, suit, proceeding or investigation and any appeal therefrom but not, however, for the total amount thereof, the Corporation shall nevertheless indemnify Indemnitee for the portion of such expenses (including attorneys' fees), judgments, fines or amounts paid in settlement to which Indemnitee is entitled.

12. Insurance. The Corporation may purchase and maintain insurance, at its expense, to protect itself and any director, officer, employee or agent of the Corporation or another corporation, partnership, joint venture, trust or other enterprise (including any employee benefit plan) against any expense, liability or loss incurred by him in any such capacity, or arising out of his status as such, whether or not the Corporation would have the power to indemnify such person against such expense, liability or loss under the General Corporation Law.

13. Savings Clause. If this Article or any portion hereof shall be invalidated on any ground by any court of competent jurisdiction, then the Corporation shall nevertheless indemnify each Indemnitee as to any expenses (including attorneys' fees), judgments, fines and amounts paid in settlement in connection with any action, suit, proceeding or investigation, whether civil, criminal or administrative, including an action by or in the right of the Corporation, to the fullest extent permitted by any applicable portion of this Article that shall not have been invalidated and to the fullest extent permitted by applicable law.

14. Definitions. Terms used herein and defined in Section 145(h) and Section 145(i) of the General Corporation Law shall have the respective meanings assigned to such terms in such Section 145(h) and Section 145(i).

ARTICLE XII

The Corporation renounces, to the fullest extent permitted by law, any interest or expectancy of the Corporation in, or in being offered an opportunity to participate in, any Excluded Opportunity. An "Excluded Opportunity" is any matter, transaction or interest that is presented to, or acquired, created or developed by, or which otherwise comes into the possession of (i) any director of the Corporation who is not an employee of the Corporation or any of its subsidiaries, or (ii) any holder of Designated Preferred Stock or any partner, member, director, stockholder, employee or agent of any such holder, other than someone who is an employee of the Corporation or any of its subsidiaries (collectively, "Covered Persons"), unless such matter, transaction or interest is presented to, or acquired, created or developed by, or otherwise comes into the possession of, a Covered Person expressly and solely in such Covered Person's capacity as a director of the Corporation.

* * *

THIRD: The foregoing amendment and restatement was approved by the holders of the requisite number of shares of said corporation in accordance with Section 228 of the General Corporation Law.

FOURTH: That said Third Amended and Restated Certificate of Incorporation, which restates and integrates and further amends the provisions of this Corporation's Amended and Restated Certificate of Incorporation, has been duly adopted in accordance with Sections 242 and 245 of the General Corporation Law.

IN WITNESS WHEREOF, this Third Amended and Restated Certificate of Incorporation has been executed by a duly authorized officer of this Corporation on this 24th day of May, 2018.

/s/ Matthew Kane
Name: Matthew Kane
Title: President and Chief Executive Officer

Exhibit 3.3

AMENDED AND RESTATED BY-LAWS

OF

PRECISION BIOSCIENCES, INC.

(As Adopted and in Effect as of April 28, 2015)

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ARTICLE I

STOCKHOLDERS

1.1 Place of Meetings. All meetings of stockholders shall be held at such place as may be designated from time to time by the Board of Directors, the Chairman of the Board, the Chief Executive Officer or the President or, if not so designated, at the principal office of the corporation. The Board of Directors may, in its sole discretion, determine that a meeting shall not be held at any place, but may instead be held solely by means of remote communication in a manner consistent with the General Corporation Law of the State of Delaware.

1.2 Annual Meeting. Unless directors are elected by consent in lieu of an annual meeting, the annual meeting of stockholders for the election of directors and for the transaction of such other business as may properly be brought before the meeting shall be held on a date and at a time designated by the Board of Directors, the Chairman of the Board, the Chief Executive Officer or the President (which date shall not be a legal holiday in the place where the meeting is to be held). If no annual meeting is held in accordance with the foregoing provisions, a special meeting may be held in lieu of the annual meeting, and any action taken at that special meeting shall have the same effect as if it had been taken at the annual meeting, and in such case all references in these By-laws to the annual meeting of the stockholders shall be deemed to refer to such special meeting.

1.3 Special Meetings. Special meetings of stockholders for any purpose or purposes may be called at any time by the Board of Directors, the Chairman of the Board, the Chief Executive Officer or the President, but such special meetings may not be called by any other person or persons. Business transacted at any special meeting of stockholders shall be limited to matters relating to the purpose or purposes stated in the notice of meeting.

1.4 Notice of Meetings. Except as otherwise provided by law, notice of each meeting of stockholders, whether annual or special, shall be given not less than 10 nor more than 60 days before the date of the meeting to each stockholder entitled to vote at such meeting. Without limiting the manner by which notice otherwise may be given to stockholders, any notice shall be effective if given by a form of electronic transmission consented to (in a manner consistent with the General Corporation Law of the State of Delaware) by the stockholder to whom the notice is given. The notices of all meetings shall state the place, if any, date and time of the meeting and the means of remote communications, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at such meeting. The notice of a special meeting shall state, in addition, the purpose or purposes for which the meeting is called. If notice is given by mail, such notice shall be deemed given when deposited in the United States mail, postage prepaid, directed to the stockholder at such stockholder’s address as it appears on the records of the corporation. If notice is given by electronic transmission, such notice shall be deemed given at the time specified in Section 232 of the General Corporation Law of the State of Delaware.

1.5 Voting List. The Secretary shall prepare, at least 10 days before every meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting for a period of at least 10 days prior to the

meeting: (i) on a reasonably accessible electronic network, provided that the information required to gain access to such list is provided with the notice of the meeting, or (ii) during ordinary business hours, at the principal place of business of the corporation. If the meeting is to be held at a place, then the list shall be produced and kept at the time and place of the meeting during the whole time thereof; and may be inspected by any stockholder who is present. If the meeting is to be held solely by means of remote communication, then the list shall also be open to the examination of any stockholder during the whole time of the meeting on a reasonably accessible electronic network, and the information required to access such list shall be provided with the notice of the meeting.

1.6 Quorum. Except as otherwise provided by law, the Certificate of Incorporation or these By-laws, the holders of a majority in voting power of the shares of the capital stock of the corporation issued and outstanding and entitled to vote at the meeting, present in person, present by means of remote communication in a manner, if any, authorized by the Board of Directors in its sole discretion or represented by proxy, shall constitute a quorum for the transaction of business. A quorum, once established at a meeting, shall not be broken by the withdrawal of enough votes to leave less than a quorum.

1.7 Adjournments. Any meeting of stockholders may be adjourned from time to time to any other time and to any other place at which a meeting of stockholders may be held under these By-laws by the stockholders present or represented at the meeting and entitled to vote, although less than a quorum, or, if no stockholder is present, by any officer entitled to preside at or to act as secretary of such meeting. It shall not be necessary to notify any stockholder of any adjournment of less than 30 days if the time and place, if any, of the adjourned meeting, and the means of remote communication, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at such adjourned meeting, are announced at the meeting at which adjournment is taken, unless after the adjournment a new record date is fixed for the adjourned meeting. At the adjourned meeting, the corporation may transact any business which might have been transacted at the original meeting.

1.8 Voting and Proxies. Each stockholder shall have one vote for each share of stock entitled to vote held of record by such stockholder and a proportionate vote for each fractional share so held, unless otherwise provided by law or the Certificate of Incorporation. Each stockholder of record entitled to vote at a meeting of stockholders, or to express consent or dissent to corporate action without a meeting, may vote or express such consent or dissent in person (including by means of remote communications, if any, by which stockholders may be deemed to be present in person and vote at such meeting) or may authorize another person or persons to vote or act for such stockholder by a proxy executed or transmitted in a manner permitted by the General Corporation Law of the State of Delaware by the stockholder or such stockholder’s authorized agent and delivered (including by electronic transmission) to the Secretary of the corporation. No such. proxy shall be voted or acted upon after three years from the date of its execution, unless the proxy expressly provides for a longer period.

1.9 Action at Meeting. When a quorum is present at any meeting, any matter other than the election of directors to be voted upon by the stockholders at such meeting shall be decided by the affirmative vote of the holders of shares of stock having a majority in voting power of the votes cast by the holders of all of the shares of stock present or represented and

voting on such matter (or if there are two or more classes of stock entitled to vote as separate classes, then in the case of each such class, the holders of a majority in voting power of the stock of that class present or represented and voting on such matter), except when a different vote is required by law, the Certificate of Incorporation or these By-laws. When a quorum is present at any meeting, any election by stockholders of directors shall be determined by a plurality of the votes cast on the election.

1.10 Conduct of Meeting.

(a) Chairman of Meeting. Meetings of stockholders shall be presided over by the Chairman of the Board, if any, or in the Chairman's absence by the Vice Chairman of the Board, if any, or in the Vice Chairman's absence by the Chief Executive Officer, or in the Chief Executive Officer's absence by the President, or in the President's absence by a Vice President, or in the absence of all of the foregoing persons by a chairman designated by the Board of Directors, or in the absence of such designation by a chairman chosen by vote of the stockholders at the meeting. The Secretary shall act as secretary of the meeting, but in the Secretary's absence the chairman of the meeting may appoint any person to act as secretary of the meeting.

(b) Rules. Regulations and Procedures. The Board of Directors of the corporation may adopt by resolution such rules, regulations and procedures for the conduct of any meeting of stockholders of the corporation as it shall deem appropriate including, without limitation, such guidelines and procedures as it may deem appropriate regarding the participation by means of remote communication of stockholders and proxyholders not physically present at a meeting. Except to the extent inconsistent with such rules, regulations and procedures as adopted by the Board of Directors, the chairman of any meeting of stockholders shall have the right and authority to prescribe such rules, regulations and procedures and to do all such acts as, in the judgment of such chairman, are appropriate for the proper conduct of the meeting. Such rules, regulations or procedures, whether adopted by the Board of Directors or prescribed by the chairman of the meeting, may include, without limitation, the following: (1) the establishment of an agenda or order of business for the meeting; (ii) rules and procedures for maintaining order at the meeting and the safety of those present; (iii) limitations on attendance at or participation in the meeting to stockholders of record of the corporation, their duly authorized and constituted proxies or such other persons as shall be determined; (iv) restrictions on entry to the meeting after the time fixed for the commencement thereat and (v) limitations on the time allotted to questions or comments by participants. Unless and to the extent determined by the Board of Directors or the chairman of the meeting, meetings of stockholders shall not be required to be held in accordance with the rules of parliamentary procedure.

1.11 Action without Meeting.

(a) Taking of Action by Consent. Any action required or permitted to be taken at any annual or special meeting of stockholders of the corporation may be taken without a meeting, without prior notice and without a vote, if a consent in writing, setting forth the action so taken, is signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote on such action were present and voted. Except as otherwise provided by the Certificate of

Incorporation, stockholders may act by written consent to elect directors; provided, however, that, if such consent is less than unanimous, such action by written consent may be in lieu of holding an annual meeting only if all of the directorships to which directors could be elected at an annual meeting held at the effective time of such action are vacant and are filled by such action.

(b) Electronic Transmission of Consents. A telegram, cablegram or other electronic transmission consenting to an action to be taken and transmitted by a stockholder or proxyholder, or by a person or persons authorized to act for a stockholder or proxyholder, shall be deemed to be written, signed and dated for the purposes of this section, provided that any such telegram, cablegram or other electronic transmission sets forth or is delivered with information from which the corporation can determine (A) that the telegram, cablegram or other electronic transmission was transmitted by the stockholder or proxyholder or by a person or persons authorized to act for the stockholder or proxyholder and (B) the date on which such stockholder or proxyholder or authorized person or persons transmitted such telegram, cablegram or electronic transmission. The date on which such telegram, cablegram or electronic transmission is transmitted shall be deemed to be the date on which such consent was signed. No consent given by telegram, cablegram or other electronic transmission shall be deemed to have been delivered until such consent is reproduced in paper form and until such paper form shall be delivered to the corporation by delivery to its registered office in the State of Delaware, its principal place of business or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to a corporation's registered office shall be made by hand or by certified or registered mail, return receipt requested. Notwithstanding the foregoing limitations on delivery, consents given by telegram, cablegram or other electronic transmission may be otherwise delivered to the principal place of business of the corporation or to an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded if, to the extent and in the manner provided by resolution of the Board of Directors. Any copy, facsimile or other reliable reproduction of a consent in writing may be substituted or used in lieu of the original writing for any and all purposes for which the original writing could be used, provided that such copy, facsimile or other reproduction shall be a complete reproduction of the entire original writing.

(c) Notice of Taking of Corporate Action. Prompt notice of the taking of corporate action without a meeting by less than unanimous written consent shall be given to those stockholders who have not consented in writing and who, if the action had been taken at a meeting, would have been entitled to notice of the meeting if the record date for such meeting had been the date that written consents signed by a sufficient number of holders to take the action were delivered to the corporation.

ARTICLE II

DIRECTORS

2.1 General Powers. The business and affairs of the corporation shall be managed by or under the direction of a Board of Directors, who may exercise all of the powers of the corporation except as otherwise provided by law or the Certificate of Incorporation.

2.2 Number; Election and Qualification. The number of directors which shall constitute the whole Board of Directors shall be determined from time to time by resolution of the stockholders or the Board of Directors, but in no event shall be less than one. The number of directors may be decreased at any time and from time to time either by the stockholders or by a majority of the directors then in office, but only to eliminate vacancies existing by reason of the death, resignation, removal or expiration of the term of one or more directors. The directors shall be elected at the annual meeting of stockholders by such stockholders as have the right to vote on such election. Directors need not be stockholders of the corporation.

2.3 Enlargement of the Board. The number of directors may be increased at any time and from time to time by the stockholders or by a majority of the directors then in office.

2.4 Tenure. Each director shall hold office until the next annual meeting and until a successor is elected and qualified, or until such director's earlier death, resignation or removal.

2.5 Vacancies. Unless and until filled by the stockholders, any vacancy on the Board of Directors, however occurring, including a vacancy resulting from an enlargement of the Board, may be filled by vote of a majority of the directors then in. office, although less than a quorum, or by a sole remaining director. A director elected to fill a vacancy shall be elected for the unexpired term of such director's predecessor in office, and a director chosen to fill a position resulting from an increase in the number of directors shall hold office until the next annual meeting of stockholders and until a successor is elected and qualified, or until such director's earlier death, resignation or removal.

2.6 Resignation. Any director may resign by delivering a resignation in writing or by electronic transmission to the corporation at its principal office or to the Chairman of the Board, the Chief Executive Officer, the President or the Secretary. Such resignation shall be effective upon receipt unless it is specified to be effective at some later time or upon the happening of some later event.

2.7 Regular Meetings. Regular meetings of the Board of Directors may be held without notice at such time and place as shall be determined from time to time by the Board of Directors; provided that any director who is absent when such a determination is made shall be given notice of the determination. A regular meeting of the Board of Directors may be held without notice immediately after and at the same place as the annual meeting of stockholders.

2.8 Special Meetings. Special meetings of the Board of Directors may be held at any time and place designated in a call by the Chairman of the Board, the Chief Executive Officer, the President, two or more directors, or by one director in the event that there is only a single director in office.

2.9 Notice of Special Meetings. Notice of any special meeting of directors shall be given to each director by the Secretary or by the officer or one of the directors calling the meeting. Notice shall be duly given to each director (i) in person or by telephone at least 24 hours in advance of the meeting, (ii) by sending written notice via reputable overnight courier, telecopy or electronic mail, or delivering written notice by hand, to such director's last known business, home or electronic mail address at least 48 hours in advance of the meeting, or (iii) by sending written notice via first-class mail to such director's last known business or home address at least 72 hours in advance of the meeting. A notice or waiver of notice of a meeting of the Board of Directors need not specify the purposes of the meeting.

2.10 Meetings by Conference Communications Equipment. Directors may participate in meetings of the Board of Directors or any committee thereof by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and participation by such means shall constitute presence in person at such meeting.

2.11 Quorum. The greater of (a) a majority of the directors at any time in office and (b) one-third of the number of directors fixed pursuant to Section 2.2 of these By-laws shall constitute a quorum. In the absence of a quorum at any such meeting, a majority of the directors present may adjourn the meeting from time to time without further notice other than announcement at the meeting, until a quorum shall be present.

2.12 Action at Meeting. At any meeting of the Board of Directors at which a quorum is present, the vote of a majority of those present shall be sufficient to take any action, unless a different vote is specified by law or the Certificate of Incorporation.

2.13 Action by Consent. Any action required or permitted to be taken at any meeting of the Board of Directors or of any committee thereof may be taken without a meeting, if all members of the Board of Directors or committee, as the case maybe, consent to the action in writing or by electronic transmission, and the written consents or electronic transmissions are filed with the minutes of proceedings of the Board of Directors or committee.

2.14 Removal. Except as otherwise provided by the General Corporation Law of the State of Delaware, any one or more or all of the directors may be removed, with or without cause, by the holders of a majority of the shares then entitled to vote at an election of directors, except that the directors elected by the holders of a particular class or series of stock may be removed without cause only by vote of the holders of a majority of the outstanding shares of such class or series.

2.15 Committees. The Board of Directors may designate one or more committees, each committee to consist of one or more of the directors of the corporation. The Board of Directors may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. in the absence or disqualification of a member of a committee, the member or members of the committee present at any meeting and not disqualified from voting, whether or not such member or members constitute a quorum, may unanimously appoint another member of the Board of Directors to act at the meeting in the place of any such absent or disqualified member. Any such committee, to the extent provided in the resolution of the Board of Directors and subject to the provisions of law, shall have and may exercise all the powers and authority of the Board of Directors in the management of the business and affairs of the corporation and may authorize the seal of the corporation to be affixed to all papers which may require it. Each such committee shall keep minutes and make such reports as the Board of Directors may from time to time request. Except as the Board of Directors may otherwise determine, any committee may make rules for the

conduct of its business, but unless otherwise provided by the directors or in such rules, its business shall be conducted as nearly as possible in the same manner as is provided in these By-laws for the Board of Directors. Except as otherwise provided in the Certificate of Incorporation, these By-laws, or the resolution of the Board of Directors designating the committee, a committee may create one or more subcommittees, each subcommittee to consist of one or more members of the committee, and delegate a subcommittee any or all of the powers and authority of the committee.

2.16 Compensation of Directors. Directors may be paid such compensation for their services and such reimbursement for expenses of attendance at meetings as the Board of Directors may from time to time determine. No such payment shall preclude any director from serving the corporation or any of its parent or subsidiary entities in any other capacity and receiving compensation for such service.

ARTICLE III

OFFICERS

3.1 Titles. The officers of the corporation shall consist of a Chief Executive Officer, a President, a Secretary, a Treasurer and such other officers with such other titles as the Board of Directors shall determine, including a Chairman of the Board, a Vice Chairman of the Board, and one or more Vice Presidents, Assistant Treasurers, and Assistant Secretaries. The Board of Directors may appoint such other officers as it may deem appropriate.

3.2 Election. The Chief Executive Officer, President, Treasurer and Secretary shall be elected annually by the Board of Directors at its first meeting following the annual meeting of stockholders. Other officers may be appointed by the Board of Directors at such meeting or at any other meeting.

3.3 Qualification. No officer need be a stockholder. Any two or more offices may be held by the same person.

3.4 Tenure. Except as otherwise provided by law, by the Certificate of Incorporation or by these By-laws, each officer shall hold office until such officer's successor is elected and qualified, unless a different term is specified in the resolution electing or appointing such officer, or until such officer's earlier death, resignation or removal.

3.5 Resignation and Removal. Any officer may resign by delivering a written resignation to the corporation at its principal office or to the Chief Executive Officer, the President or the Secretary. Such resignation shall be effective upon receipt unless it is specified to be effective at some later time or upon the happening of some later event.

Any officer may be removed at any time, with or without cause, by vote of a majority of the directors then in office.

Except as the Board of Directors may otherwise determine, no officer who resigns or is removed shall have any right to any compensation as an officer for any period following such officer's resignation or removal, or any right to damages on account of such removal, whether such officer's compensation be by the month or by the year or otherwise, unless such compensation is expressly provided for in a duly authorized written agreement with the corporation.

3.6 Vacancies. The Board of Directors may fill any vacancy occurring in any office for any reason and may, in its discretion, leave unfilled for such period as it may determine any offices other than those of Chief Executive Officer, President, Treasurer and Secretary. Each such successor shall hold office for the unexpired term of such officer's predecessor and until a successor is elected and qualified, or until such officer's earlier death, resignation or removal.

3.7 Chairman of the Board. The Board of Directors may appoint from its members a Chairman of the Board, who need not be an employee or officer of the corporation. If the Board of Directors appoints a Chairman of the Board, such Chairman shall perform such duties and possess such powers as are assigned by the Board of Directors and, if the Chairman of the Board is also designated as the corporation's Chief Executive Officer, shall have the powers and duties of the Chief Executive Officer prescribed in Section 3.8 of these By-laws. Unless otherwise provided by the Board of Directors, the Chairman of the Board shall preside at all meetings of the Board of Directors and stockholders.

3.8 President; Chief Executive Officer. Unless the Board of Directors has designated the Chairman of the Board or another person as the corporation's Chief Executive Officer, the President shall be the Chief Executive Officer of the corporation. The Chief Executive Officer shall have general charge and supervision of the business of the corporation subject to the direction of the Board of Directors. The President shall perform such other duties and shall have such other powers as the Board of Directors or the Chief Executive Officer (if the President is not the Chief Executive Officer) may from time to time prescribe. In the event of the absence, inability or refusal to act of the Chief Executive Officer or the President (if the President is not the Chief Executive Officer), the Vice President (or if there shall be more than one, the Vice Presidents in the order determined by the Board of Directors) shall perform the duties of the Chief Executive Officer and when so performing such duties shall have all the powers of and be subject to all the restrictions upon the Chief Executive Officer.

3.9 Vice Presidents. Any Vice President shall perform such duties and possess such powers as the Board of Directors or the Chief Executive Officer may from time to time prescribe. The Board of Directors may assign to any Vice President the title of Executive Vice President, Senior Vice President or any other title selected by the Board of Directors.

3.10 Secretary and Assistant Secretaries. The Secretary shall perform such duties and shall have such powers as the Board of Directors or the Chief Executive Officer may from time to time prescribe. In addition, the Secretary shall perform such duties and have such powers as are incident to the office of the secretary, including without limitation the duty and power to give notices of all meetings of stockholders and special meetings of the Board of Directors, to attend all meetings of stockholders and. the Board of Directors and keep a record of the proceedings, to maintain a stock ledger and prepare lists of stockholders and their addresses as required, to be custodian of corporate records and the corporate seal and to affix and attest to the same on documents.

Any Assistant Secretary shall perform such duties and possess such powers as the Board of Directors, the Chief Executive Officer or the Secretary may from time to time prescribe. In the event of the absence, inability or refusal to act of the Secretary, the Assistant Secretary, (or if there shall be more than one, the Assistant Secretaries in the order determined by the Board of Directors) shall perform the duties and exercise the powers of the Secretary.

In the absence of the Secretary or any Assistant Secretary at any meeting of stockholders or directors, the chairman of the meeting shall designate a temporary secretary to keep a record of the meeting.

3.11 Treasurer and Assistant Treasurers. The Treasurer shall perform such duties and shall have such powers as may from time to time be assigned by the Board of Directors or the Chief Executive Officer. In addition, the Treasurer shall perform such duties and have such powers as are incident to the office of treasurer, including without limitation the duty and power to keep and be responsible for all funds and securities of the corporation, to deposit funds of the corporation in depositories selected in accordance with these By-laws, to disburse such funds as ordered by the Board of Directors, to make proper accounts of such funds, and to render as required by the Board of Directors statements of all such transactions and of the financial condition of the corporation.

The Assistant Treasurers shall perform such duties and possess such powers as the Board of Directors, the Chief Executive Officer or the Treasurer may from time to time prescribe. In the event of the absence, inability or refusal to act of the Treasurer, the Assistant Treasurer, (or if there shall be more than one, the Assistant Treasurers in the order determined by the Board of Directors) shall perform the duties and exorcise the powers of the Treasurer.

3.12 Salaries. Officers of the corporation shall be entitled to such salaries, compensation or reimbursement as shall be fixed or allowed from time to time by the Board of Directors.

ARTICLE IV

CAPITAL STOCK

4.1 Issuance of Stock. Subject to the provisions of the Certificate of Incorporation, the whole or any part of any unissued balance of the authorized capital stock of the corporation or the whole or any part of any shares of the authorized capital stock of the corporation held in the corporation's treasury may be issued, sold, transferred or otherwise disposed of by vote of the Board of Directors in such manner, for such lawful consideration and on such terms as the Board of Directors may determine.

4.2 Certificates of Stock. Every holder of stock of the corporation shall be entitled to have a certificate, in such form as may be prescribed by law and by the Board of Directors, certifying the number and class of shares owned by such holder in the corporation, Each such certificate shall be signed by, or in the name of the corporation by, the Chairman or Vice-Chairman, if any, of the Board of Directors, or the President or a Vice President, and the Treasurer or an Assistant Treasurer, or the Secretary or an Assistant Secretary of the corporation. Any or all of the signatures on the certificate may be a facsimile.

Each certificate for shares of stock which are subject to any restriction on transfer pursuant to the Certificate of Incorporation, these By-laws, applicable securities laws or any agreement among any number of stockholders or among such holders and the corporation shall have conspicuously noted on the face or back of the certificate either the full text of the restriction or a statement of the existence of such restriction.

If the corporation shall be authorized to issue more than one class of stock or more than one series of any class, the powers, designations, preferences and relative, participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights shall be set forth in full or summarized on the face or back of each certificate representing shares of such class or series of stock, provided that in lieu of the foregoing requirements there may be set forth on the face or back of each certificate representing shares of such class or series of stock a statement that the corporation will furnish without charge to each stockholder who so requests a copy of the full text of the powers, designations, preferences and relative, participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights.

4.3 Transfers. Except as otherwise established by rules and regulations adopted by the Board of Directors, and subject to applicable law, shares of stock may be transferred on the books of the corporation by the surrender to the corporation or its transfer agent of the certificate representing such shares properly endorsed or accompanied by a written assignment or power of attorney properly executed, and with such proof of authority or the authenticity of signature as the corporation or its transfer agent may reasonably require. Except as may be otherwise required by law, by the Certificate of Incorporation or by these By-laws, the corporation shall be entitled to treat the record holder of stock as shown on its books as the owner of such stock for all purposes, including the payment of dividends and the right to vote with respect to such stock, regardless of any transfer, pledge or other disposition of such stock until the shares have been transferred on the books of the corporation in accordance with the requirements of these By-laws.

4.4 Lost, Stolen or Destroyed Certificates. The corporation may issue a new certificate of stock in place of any previously issued certificate alleged to have been lost, stolen or destroyed, upon such terms and conditions as the Board of Directors may prescribe, including the presentation of reasonable evidence of such loss, theft or destruction and the giving of such indemnity and posting of such bond as the Board of Directors may require for the protection of the corporation or any transfer agent or registrar.

4.5 Record Date. The Board of Directors may fix in advance a date as a record date for the determination of the stockholders entitled to notice of or to vote at any meeting of stockholders or to express consent (or dissent) to corporate action without a meeting, or entitled to receive payment of any dividend or other distribution or allotment of any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action. Such record date shall not be more than 60 nor less than 10 days before the date of such meeting, nor more than 10 days after the date of adoption of a record date for a consent without a meeting, nor more than 60 days prior to any other action to which such record date relates.

If no record date is fixed, the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day before the day on which notice is given, or, if notice is waived, at the close of business on the day before the day on which the meeting is held. If no record date is fixed, the record date for determining stockholders entitled to express consent to corporate action without a meeting, when no prior action by the Board of Directors is necessary, shall be the day on which the first consent is properly delivered to the corporation. If no record date is fixed, the record date for determining stockholders for any other purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating to such purpose.

A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting; provided, however, that the Board of Directors may fix a new record date for the adjourned meeting.

ARTICLE V

GENERAL PROVISIONS

5.1 Fiscal Year. Except as from time to time otherwise designated by the Board of Directors, the fiscal year of the corporation shall begin on the first day of January of each year and end on the last day of December in each year.

5.2 Corporate Seal. The corporate seal shall be in such form as shall be approved by the Board of Directors.

5.3 Waiver of Notice. Whenever notice is required to be given by law, by the Certificate of Incorporation or by these By-laws, a written waiver, signed by the person entitled to notice, or a waiver by electronic transmission by the person entitled to notice, whether before, at or after the time stated in such notice, shall be deemed equivalent to notice. Attendance of a person at a meeting shall constitute a waiver of notice of such meeting, except when the person attends a meeting for the express purpose of objecting at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

5.4 Voting of Securities. Except as the Board of Directors may otherwise designate, the Chief Executive Officer, the President or the Treasurer may waive notice of, and act as, or appoint any person or persons to act as, proxy or attorney-in-fact for this corporation (with or without power of substitution) at, any meeting of stockholders or securityholders of any other entity, the securities of which may be held by this corporation.

5.5 Evidence of Authority. A certificate by the Secretary, or an Assistant Secretary, or a temporary Secretary, as to any action taken by the stockholders, directors, a committee or any officer or representative of the corporation shall as to all persons who rely on the certificate in good faith be conclusive evidence of such action.

5.6 Certificate of Incorporation. All references in these By-laws to the Certificate of Incorporation shall be deemed to refer to the Certificate of Incorporation of the corporation, as amended and in. effect from time to time.

5.7 Severability. Any determination that any provision of these By-laws is for any reason inapplicable, illegal or ineffective shall not affect or invalidate any other provision of these By-laws.

5.8 Pronouns. All pronouns used in these By-laws shall be deemed to refer to the masculine, feminine or neuter, singular or plural, as the identity of the person or persons may require.

5.9 Exclusive Forum for Certain Disputes. Unless the corporation consents in writing to the selection of an alternative forum, the United States District Court for the Middle District of North Carolina or any North Carolina state court that has jurisdiction, shall, to the fullest extent permitted by law, be the sole and exclusive forum for (1) any derivative action or proceeding brought on behalf of the corporation, (2) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of the corporation to the corporation or the corporation's stockholders, (3) any action asserting a claim arising pursuant to any provision of the General Corporation Law of the State of Delaware, and (4) any action asserting a claim governed by the internal affairs doctrine, in each case subject to said court having personal jurisdiction over the indispensable parties named as defendants therein.

ARTICLE VI

AMENDMENTS

6.1 By the Board of Directors. These By-laws may be altered, amended or repealed or new by-laws may be adopted by the affirmative vote of a majority of the directors present at any regular or special meeting of the Board of Directors at which a quorum is present.

6.2 By the Stockholders. These By-laws may be altered, amended or repealed or new by-laws may be adopted by the affirmative vote of the holders of a majority of the shares of the capital stock of the corporation issued and outstanding and entitled to vote at any regular meeting of stockholders, or at any special meeting of stockholders, provided notice of such alteration, amendment, repeal or adoption of new by-laws shall have been stated in the notice of such special meeting.

Exhibit 10.1

FINAL EXECUTION VERSION
CONFIDENTIAL

DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT

By and Among

BAXALTA INCORPORATED,

BAXALTA US INC.,

BAXALTA GMBH,

and

PRECISION BIOSCIENCES, INC.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

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(continued)

EXHIBITS

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT

This DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT (together with the exhibits and schedules hereto, as may be amended pursuant hereto, collectively, this "Agreement") is entered into on this 24th day of February, 2016 (the "Effective Date"), by and among BAXALTA INCORPORATED, a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BI"), BAXALTA US INC., a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BUSI"), BAXALTA GMBH, a company organized under the laws of Switzerland with its principal place of business at Postfach 8010, Zurich, Switzerland ("BGMBH" and, together jointly and severally with BI and BUSI, collectively, "Baxalta"), and PRECISION BIOSCIENCES, INC., a Delaware corporation with its principal place of business at 302 E Pettigrew St A-100, Durham, NC 27701 ("Precision"). Baxalta and Precision may each be referred to herein individually as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, Precision has expertise in and owns or controls proprietary nuclease-based genome engineering technology (known as ARCUS™) and other technologies relating to genetically engineering novel human T cells with chimeric antigen receptors for allogeneic use (as further defined below, "CAR-T") to enable such cells to target and destroy cancer cells; and

WHEREAS, Baxalta is a global biopharmaceutical company that clinically develops and commercializes products in oncology and other therapeutic areas; and

WHEREAS, Precision and Baxalta desire to establish a collaboration whereby Precision conducts research and development activities on specified CAR-T product candidates directed to antigen targets selected by Baxalta and, if successful, Baxalta has the Commercial Option (as defined below) to conduct further clinical development and commercialization of such product candidates for the treatment of cancer and other indications in humans, all under the terms and conditions set forth herein.

AGREEMENT

NOW, THEREFORE, in consideration of the mutual promises and covenants set forth below and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

ARTICLE I.
DEFINITIONS

The following terms as used in this Agreement shall have the meanings set forth in this Article I:

1.1 "Acquirer" means, collectively, (a) any Third Party that acquires Precision after the Effective Date (whether by transfer or sale of all or any portion of Precision's assets, equity or business, or by a merger, consolidation or similar business combination transaction or otherwise) and (b) the Affiliates of such Third Party, but excluding Precision and Precision's Affiliates existing immediately prior to the closing of such acquisition of Precision.

1.2 "Affiliate" means, with respect to a particular Person, any other Person that directly or indirectly is controlled by, controls or is under common control with such Person. For the purposes of this definition only, the term "control" (including, with correlative meanings, the terms "controlled by" and "under common control with"), as used with respect to a particular Person that is an entity, means (a) if such Person is a corporate entity, direct or indirect ownership of voting securities entitled to cast at least fifty percent (50%) of the votes in the election of directors of such Person, (b) if such Person is a non-corporate entity, direct or indirect ownership of at least fifty percent (50%) of the equity interests of such Person or (c) the power to direct the management and policies of such Person.

1.3 "Agents" has the meaning set forth in Section 13.1.

1.4 "Agreement" has the meaning set forth in the preamble.

1.5 "Alliance Manager" has the meaning set forth in Section 3.2.

1.6 "Allogeneic" means the treatment of a patient with human cells derived from a donor other than the patient, where such donor is genetically non-identical. "Allogeneic" does not include the treatment of a patient with human cells derived from such patient's own cells (autologous treatment).

1.7 "Antitrust Laws" has the meaning set forth in Section 17.17.2.

1.8 "Antitrust Clearance" means, with respect to any Commercial Option, (a) that any applicable waiting periods (and any extensions thereof) for exercise of such Commercial Option under the HSR Act and any other applicable Antitrust Laws will have expired or otherwise been terminated and (b) that there exists (i) no requirement for a waiver, consent or approval of the FTC, the DOJ or any other applicable Governmental Authority with respect to the exercise of such Commercial Option, (ii) no judgment, injunction, decree or any other order in any suit or proceeding preventing the exercise of such Commercial Option, and (iii) no other matter relating to actions under any Antitrust Laws that would preclude, impede or delay materially the grant of the rights and licenses that would be granted upon the exercise of such Commercial Option.

1.9 "Background IP" has the meaning set forth in Section 9.1.1.

1.10 "Bankruptcy Laws" has the meaning set forth in Section 17.14.1.

1.11 "Batch Success Achievement Plan" has the meaning set forth in Section 4.1.3.

1.12 "Baxalta" has the meaning set forth in the preamble.

1.13 "Baxalta Confidential Information" has the meaning set forth in Section 12.2.1(a).

1.14 "Baxalta-Developed Included Target" has the meaning set forth in Section 16.3.

1.15 "Baxalta-Developed Licensed Product" has the meaning set forth in Section 16.2.

1.16 "Baxalta-Developed Licensed Product Candidate" has the meaning set forth in Section 16.2.

1.17 "Baxalta Indemnitees" has the meaning set forth in Section 13.1.

1.18 "Baxalta Invention" has the meaning set forth in Section 9.1.3(b).

1.19 "Baxalta Know-How" means the Know-How Controlled by Baxalta or any of its Affiliates as of the Effective Date, or that comes to be Controlled by Baxalta or any of its Affiliates at any time during the Term that is reasonably necessary or useful to Develop, manufacture, use and Commercialize Licensed Product Candidates or Licensed Product(s) in the Field, but excluding Know-How Controlled by Baxalta specifically related to the Isolex Platform Technology. Baxalta Know-How shall include Baxalta's interest in any Joint Inventions. For clarity, Baxalta Know-How does not include Patent Rights claiming Baxalta Know-How.

1.20 "Baxalta Parent Group" has the meaning set forth in Section 9.10.

1.21 "Baxalta Patents" means the Patent Rights Controlled by Baxalta or any of its Affiliates as of the Effective Date, or that come to be Controlled by Baxalta or any of its Affiliates at any time during the Term, that claim Baxalta Know-How. Baxalta Patents shall include Baxalta's interest in any Joint Patents. Baxalta Patents do not include Isolex Platform Patents.

1.22 "Baxalta Restrictive Covenants" has the meaning set forth in Section 11.2.2(a).

1.23 "BI" has the meaning set forth in the preamble.

1.24 "BGMBH" has the meaning set forth in the preamble.

1.25 [***]

1.26 "BUSI" has the meaning set forth in the preamble.

1.27 "Business Day" means a day other than Saturday, Sunday or other day on which commercial banks in New York, New York are authorized or required by applicable Law to close.

1.28 "Calendar Quarter" means the successive periods of three (3) consecutive calendar months ending on March 31, June 30, September 30 or December 31, for so long as this Agreement is in effect.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.29 "Calendar Year" means any year beginning on January 1 and ending on December 31 of such year.

1.30 "Candidate Proposal Date" has the meaning set forth in Section 2.1.5(a).

1.31 "CAR-T" means genetically engineered human T cells with Chimeric Antigen Receptor(s) for Allogeneic use.

1.32 "CD19" has the meaning set forth in Section 2.1.2.

1.33 "CDCP Agreement" has the meaning set forth in Section 7.3.2(a).

1.34 "CDCP Option" has the meaning set forth in Section 7.3.1.

1.35 "CDCP Option Fee" has the meaning set forth in Section 7.3.2(b).

1.36 "Cellectis Agreement" has the meaning set forth in Section 4.5.

1.37 "Cellectis Patents" has the meaning set forth in Section 4.5.

1.38 "Change" means any change with respect to manufacturing, quality system or validation/qualification status, including the list of changes set forth in the Quality Agreement.

1.39 "Change of Control of Precision" means the occurrence of any of the following: (i) a sale of all or substantially all of the assets of Precision to a Third Party, (ii) a Third Party acquires beneficial ownership of more than fifty percent (50%) of the stock of Precision or stock possessing fifty percent (50%) or more of the total voting power of the stock of Precision, or (iii) the merger, consolidation or similar business combination transaction of Precision into a Third Party.

1.40 "Chimeric Antigen Receptor" means a genetically engineered molecule that (a) when present on the surface of human T cells, enables the T cells to recognize and bind to specific antigens that are present on the surface of cells, and (b) comprises a single-chain antibody fragment (scFv), a transmembrane domain, and at least one intracellular signaling domain.

1.41 "Clinical Trial" means a clinical study conducted on certain numbers of human subjects (depending on the phase of the trial) that is designed to (a) establish that a product for the treatment of human diseases and conditions is reasonably safe for continued testing, (b) investigate the safety and efficacy of the product for its intended use, and to define warnings, precautions and adverse reactions that may be associated with the product in the dosage range to be prescribed, or (c) support Marketing Approval or Reimbursement Approval of such product or label expansion of such product.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.42 "CMO" means contract manufacturing organization.

1.43 "Code" has the meaning set forth in Section 8.5.

1.44 "Combination Product" has the meaning set forth in Section 1.132.3.

1.45 "Combination Target" has the meaning set forth in Section 2.1.1.

1.46 "Commercial License" has the meaning set forth in Section 4.3.1.

1.47 "Commercial License Fee" has the meaning set forth in Section 8.2.

1.48 "Commercial Option" has the meaning set forth in Section 4.1.1.

1.49 [***]

1.50 "Commercial Option Exercise Notice" has the meaning set forth in Section 4.1.2.

1.51 "Commercial Option Exercise Period" has the meaning set forth in Section 4.1.1.

1.52 "Commercialization" means all activities related to the commercial exploitation of products for the treatment of human diseases and conditions, including manufacturing, importation, exportation, marketing, Promotion, distribution, pre-launch, launch, sale, and offering for sale of such products. When used as a verb, "Commercialize" or "Commercializing" means to engage in Commercialization.

1.53 "Commercialization Enabling Technology" has the meaning set forth in Section 9.3.2.

1.54 "Commercially Reasonable Efforts" means:

1.54.1 with respect to the obligations of a Party under this Agreement relating to Development activities, the level of efforts and expenditure of resources required to carry out such obligation in a sustained manner consistent with the efforts and resources such Party typically devotes to a product of similar market potential, resulting from its own research efforts or development and commercialization collaborations for which it is responsible, at a similar stage in its development or product life, taking into account Relevant Factors; or

1.54.2 with respect to the level of obligations of a Party under this Agreement relating to Commercialization activities,

(a) as it relates to Baxalta, the level of efforts and expenditure of resources required to carry out such obligation in a sustained manner consistent with the efforts and resources Baxalta typically devotes to a product of similar market potential, resulting from its own research efforts or development and commercialization collaborations for which it is responsible, at a similar stage in its development or product life, taking into account Relevant Factors;

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(b) as it relates to Precision, the level of efforts and expenditure of resources required to carry out such obligation in a sustained manner consistent with the efforts and resources of a typical Third Party biopharmaceutical company of similar size and with similar resources as Precision typically devotes to a product of similar market potential, at a similar stage in its development or product life, taking into account Relevant Factors; or

1.54.3 with respect to the obligations of a Party under this Agreement relating to any other objective, reasonable, good-faith efforts, taking into account industry practices.

Provided that, [***].

1.55 "Competitive Program" means [***].

1.56 "Competitor" means any Person, other than the Parties and their Affiliates, that is conducting any Competitive Program, for so long as such conduct continues.

1.57 "Confidential Information" means Baxalta Confidential Information and Precision Confidential Information.

1.58 "Confidentiality Agreement" means that certain Mutual Confidential Disclosure Agreement between Baxter Healthcare Corporation and Precision dated October 6, 2014, which was assigned in its entirety by Baxter Healthcare Corporation to Baxalta effective as of July 1, 2015.

1.59 "Control" or "Controlled" means, with respect to any Know-How, Patent Rights or other intellectual property rights, that a Party has the legal authority or right (whether by ownership, license or otherwise) to grant a license, sublicense, access or right to use (as applicable) under such Know-How, Patent Rights, or other intellectual property rights, including to the other Party on the terms and conditions set forth herein, as applicable, in each case without breaching the terms of any agreement with a Third Party.

1.60 "Cover" or "Covering" means, with respect to Patent Rights and a particular Licensed Product, that such Patent Rights include one or more Valid Claims that would, but for the licenses granted under this Agreement be infringed by Development, manufacture, use or Commercialization of the applicable Licensed Product or the Licensed Product Candidate comprising such Licensed Product in the applicable country in which any such activity occurred.

1.61 "CPR" has the meaning set forth in Section 15.1.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.62 "CPR Panels" has the meaning set forth in Section 15.1.

1.63 "Damages" has the meaning set forth in Section 13.1.

1.64 "Debtor Party" has the meaning set forth in Section 14.2.3.

1.65 "Defense Election Notice" has the meaning set forth in Section 13.3.1.

1.66 "Development" means all activities related to the development of products for the treatment of human diseases and conditions and obtaining Marketing Approval for such products, including all activities related to research, development, preclinical testing, preclinical toxicology, stability testing, toxicology, formulation, Clinical Trials, regulatory affairs, statistical analysis, report writing, manufacturing process scale up (including without limitation, registration batches/process validation, engineering studies qualification and validation, process validation, characterization and stability, scale and technology transfer to CMOs), qualification and validation activities, quality assurance/quality control development, Regulatory Filing creation and submission related to obtaining Marketing Approval for a product, and all other activities directed to obtaining Marketing Approval and/or Reimbursement Approval. When used as a verb, "Develop" means to engage in Development.

1.67 "Development Achievement Notice" has the meaning set forth in Section 2.2.5.

1.68 "Development Milestone" has the meaning set forth in Section 8.3.1.

1.69 "Development Plan" means each plan setting forth the specific activities to be undertaken by each of the Parties, as applicable, in connection with the Development of each Licensed Product Candidate and Licensed Product, as may be amended as set forth in this Agreement.

1.70 "Directed to" means, when used to describe the relationship between an engineered human T cell and a Target, that the T cell (a) is designed or being developed to bind to the Target (or a portion thereof), (b) is designed or being developed to exert its biological effect in whole or in part through binding to such Target (or such portion thereof), and (c) is not designed or developed to bind to or exert its effect on any other Target (or a portion thereof). Notwithstanding the foregoing, when used to describe the relationship between an engineered human T cell and a Combination Target, "Directed to" means that the T cell (i) is designed or being developed to bind to both of the Targets (or portions thereof) that comprise the Combination Target, (ii) is designed or being developed to exert its biological effect in whole or in part through binding to both such Targets (or such portions thereof), and (iii) is not designed or developed to bind to or exert its effect on any other Target (or a portion thereof).

1.71 "Divest" means, as it relates to a Competitive Program: (i) the sale of all right, title and interest in such Competitive Program, including all technology, intellectual property and other assets relating solely thereto, to a Third Party, without the retention or reservation of any rights, license or interest (other than an economic interest such as a right to receive payments) by the selling entity or its Affiliates; or (ii) the complete termination and/or shut-down of such Competitive Program such that no technology, intellectual property or other asset solely relating thereto is used by the terminating entity or its Affiliates for the conduct of such Competitive Program.

1.72 "DOJ" has the meaning set forth in Section 17.17.1.

1.73 "Duke Agreement" means the License Agreement entered into by Precision and Duke University ("Duke") on April 17, 2006, as amended from time to time.

1.74 "Duke IP" means all Patent Rights and Know-How licensed to Precision under the Duke Agreement that constitute Precision Platform Patents or Precision Platform Technology. The patent numbers and patent application numbers of the Patent Rights that are included within the Duke IP as of the Effective Date are set forth in Exhibit A.

1.75 "Effective Date" has the meaning set forth in the preamble.

1.76 "Election Time Period" has the meaning set forth in Section 13.3.1.

1.77 "EMA" means the European Medicines Agency or any successor agency or agencies thereto.

1.78 "Enforcing Party" has the meaning set forth in Section 9.5.3.

1.79 "Escrow Agent" has the meaning set forth in Section 2.1.3(b).

1.80 "European Union" or "EU" means all countries of the European Union, as may be included from time to time.

1.81 "Executive Officers" has the meaning set forth in Section 3.1.6(b).

1.82 "FCPA" means the Foreign Corrupt Practices Act, as amended (15 U.S.C. §§ 78dd-1, et. seq.).

1.83 "FDA" means the U.S. Food and Drug Administration or any successor agency or agencies thereto.

1.84 "FDCA" means the United States Food, Drug and Cosmetic Act, as amended (21 U.S.C. §§ 301, et. seq.).

1.85 "Field" means all uses in humans.

1.86 "Final Candidate Proposal Date" has the meaning set forth in Section 2.1.5(b).

1.87 "Final Determination" means, in connection with any disputed event or occurrence, the resolution of the dispute (i) pursuant to the dispute resolution provisions set forth in Article XV or (ii) by mutual agreement of the Parties.

1.88 [***]

1.89 [***]

1.90 [***]

1.91 "First Commercial Sale" means, with respect to a particular Licensed Product in a particular country or other jurisdiction, the first arms'-length sale of such Licensed Product by Baxalta or any of its Affiliates or Sublicensees, in each case to a Third Party for use in the Field in such country or other jurisdiction after such Licensed Product has been granted (a) Marketing Approval and Reimbursement Approval if such sale is in any country in the EU or (b) Marketing Approval only if such sale is not in a country in the EU. For avoidance of doubt, no sale or other disposition of a Licensed Product shall be deemed the "First Commercial Sale" if such sale or other disposition would not be included in the calculation of Net Sales.

1.92 [***]

1.93 [***]

1.94 [***]

1.95 "Force Majeure" has the meaning set forth in Section 17.15.1.

1.96 "FTC" has the meaning set forth in Section 17.17.1.

1.97 "Global Dossier" means, with respect to a particular Licensed Product, a set of documents that follows the principles of the International Conference on Harmonization and that contains all of the technical data (including quality, non-clinical and clinical data) and administrative information of a product intended for the treatment of human disease and conditions necessary for such product to be approved or registered for Commercialization in the countries and regions in the Territory. The Global Dossier must include data proving that the Licensed Products have quality, efficacy and safety properties suitable for the applicable intended uses, as well as additional administrative documents that follow applicable local and regional guidance.

1.98 "Governmental Authority" means any nation or government, any state, local or other political subdivision thereof, and any entity, department, commission, bureau, agency, authority, board, court, official or officer, domestic or foreign, exercising executive, judicial, regulatory or administrative governmental functions.

1.99 "Hourly Rate" has the meaning set forth in Section 6.1.3.

1.100 "HSR Act" means the Hart-Scott-Rodino Antitrust Improvements Act of 1976, as amended.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.101 "Inactive Target" has the meaning set forth in Section 2.4.1.

1.102 "Inactive Target Evaluation Data" has the meaning set forth in Section 2.4.3(a).

1.103 "Inactive Target Freeze Period" has the meaning set forth in Section 2.4.3(d).

1.104 "Inactive Target Non-Disclosure Period" has the meaning set forth in Section 2.4.3(b).

1.105 "Included Target" means a Target that has been Nominated by Baxalta and has become an Included Target pursuant to Section 2.1.2 or Section 2.1.4 of this Agreement.

1.106 "Included Target-Specific Information" means with respect to an Included Target [***].

1.107 "IND" means any investigational new drug application, clinical trial application, clinical trial exemption or similar or equivalent application or submission (including investigator-initiated applications) for approval to conduct human Clinical Trials filed with or submitted to a Regulatory Authority in conformance with the requirements of such Regulatory Authority.

1.108 [***]

1.109 "Indemnification Claim Notice" has the meaning set forth in Section 13.3.1.

1.110 "Indemnified Party" has the meaning set forth in Section 13.3.1.

1.111 "Indemnifying Party" has the meaning set forth in Section 13.3.1.

1.112 "Indemnitee" means, as the context requires, the Precision Indemnitees and/or the Baxalta Indemnitees.

1.113 "Independently Active Therapeutic Ingredient" means, with respect to a Combination Product, an active therapeutic ingredient having a different Target or mode of action, or which is otherwise treated or designated by the applicable Regulatory Authority as a separate active ingredient, than the applicable Licensed Product.

1.114 "Initial CD19 Licensed Product Candidates" means [***] Directed to CD19 [***].

1.115 "Initiate" or "Initiation" means, with respect to a Clinical Trial of a Licensed Product Candidate or Licensed Product, the first dosing of the first patient for such Clinical Trial.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.116 "Invention" means any and all discoveries, developments, improvements, modifications, formulations, compositions of matter, processes and other inventions (whether patentable or not patentable) that are invented (as determined in accordance with U.S. patent laws) in the course of activities performed under this Agreement by or on behalf of either Party or both Parties, including all rights, title and interest in and to the intellectual property rights therein.

1.117 "Isolex Platform Patents" means the Patent Rights Controlled by Baxalta as of the Effective Date, or that come to be Controlled by Baxalta at any time during the Term, that claim the Isolex Platform Technology.

1.118 "Isolex Platform Technology" means the technology Controlled by Baxalta as of the Effective Date, or that come to be Controlled by Baxalta at any time during the Term, relating to the Isolex cell separator machine, disposables, reagents and methods of use thereof.

1.119 "Joint Inventions" has the meaning set forth in Section 9.1.2.

1.120 "Joint Patents" has the meaning set forth in Section 9.1.2.

1.121 "JSC" has the meaning set forth in Section 3.1.1.

1.122 "Know-How" means techniques, data, inventions, practices, methods, trade secrets, knowledge, sources of supply, patent positioning, know-how, skill, experience, test data (including manufacturing, pharmacological, toxicological, preclinical and clinical test data) and analytical and quality control data or descriptions, including all proprietary information submitted to relevant Regulatory Authorities to support an application for Marketing Approval or an application for Reimbursement Approval, and in each case in written, oral, electronic or other form.

1.123 "Launch Milestone" has the meaning set forth in Section 8.3.2.

1.124 "Law" means all laws, statutes, rules, regulations, ordinances, orders, judgments and other pronouncements having the effect of law of any federal, national, multinational, state, provincial, county, city or other political subdivision, domestic or foreign, including all such laws, statutes, rules, regulations, ordinances, orders, judgments and other pronouncements pertaining to the pharmaceutical industry or the healthcare industry and all anti-bribery or anti-corruption laws, including the FDCA and the FCPA and their implementing regulations and all foreign equivalents thereof.

1.125 "Licensed Product" means a Licensed Product Candidate for which the Commercial Option Exercise Date has occurred, including in any preparation, formulation, dosage, packaging or method of administration.

1.126 "Licensed Product Candidate" means each Variant Directed to an Included Target that is the subject of a Development Plan.

1.127 "Licensed Product Marks" has the meaning set forth in Section 9.11.

1.128 "Litigation Conditions" has the meaning set forth in Section 13.3.1.

1.129 "Major EU Countries" means [***].

1.130 "Manufacturing and Supply Role" has the meaning set forth in Section 6.1.

1.131 "Marketing Approval" means, with respect to a particular product for the treatment of human disease and conditions in a particular country or regulatory jurisdiction, the registrations, authorizations and approvals of the applicable Regulatory Authority or other Governmental Authority in such country or regulatory jurisdiction (including, but not limited to, the FDA and EMA) that are necessary to market, sell or otherwise Commercialize such product in such country or regulatory jurisdiction.

1.132 Net Sales Definition.

1.132.1 "Net Sales" means, with respect to a particular Licensed Product in a country in the Territory, the gross revenues invoiced for sales of such Licensed Product by Baxalta or any of its Affiliates or Sublicensees in connection with the sale, lease or other transfer for value to a Third Party in such country in a *bona fide* arm's length transaction, less the following deductions from such gross revenues, in each case to the extent attributable to such Licensed Product and to the extent actually incurred or reasonably accrued and to the extent not already deducted in the amount invoiced:

(a) trade and quantity and/or cash discounts actually allowed or taken;

(b) governmental customs, duties, sales, withholding and similar taxes (including, for the avoidance of doubt value added or import/export taxes, sales taxes and excise taxes but excluding taxes based on income), if any, imposed on the Licensed Product, to the extent directly related to such sale; as well as any amount of branded prescription pharmaceutical fee allocable to the sale of Licensed Products and paid by Baxalta, its Affiliates or Sublicensees under section 9008 of the Affordable Care Act (P.L. 111-148), as amended;

(c) amounts actually allowed or credited by reason of rejections, return of goods (including as a result of recalls), any retroactive price reductions or allowances specifically identifiable as relating to the Licensed Product (including those resulting from inventory management or similar agreements with wholesalers);

(d) amounts incurred resulting from government-mandated rebate programs, including programs mandated by any agency thereof;

(e) rebates actually given to a Third Party specifically for the Licensed Product;

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

(f) freight, postage, shipping and applicable insurance charges, to the extent same are separately itemized in the invoice price and charged to the buyer;

(g) patient discount programs and chargebacks or similar price concessions related to the sale of the Licensed Product; and

(h) to the extent agreed by the Parties in writing, such agreement not to be unreasonably withheld, any other specifically identifiable appropriate allowances or deductions that were actually credited as may be similar to those deductions listed above;

provided, however, that any rebate to Baxalta, gift, excess payment on other compounds or similar compensation received by Baxalta from a Third Party whether in the applicable country or any other and whether intended to be applicable to the Licensed Product or not shall be added to Net Sales.

1.132.2 The Parties agree that the following shall not be considered Net Sales for purposes of Section 1.132.1: (a) the transfer of Licensed Product (i) between Baxalta or its Affiliates, on one hand, and Baxalta's Sublicensees, on the other hand, for resale (which resale will give rise to Net Sales), or (ii) between or among Baxalta and its Affiliates or between Baxalta's Affiliates, in each case unless such Affiliate is the end user of such Licensed Product; (b) use of Licensed Product in a preclinical trial or a Clinical Trial; (c) use of Licensed Product as free marketing samples; or (d) the transfer of Licensed Product by Baxalta or its Affiliates or Sublicensees to a Third Party as a sale or donation for charitable or compassionate use purposes.

1.132.3 In the event a Licensed Product is co-packaged, co-formulated or otherwise sold in a manner that includes one or more Independently Active Therapeutic Ingredients in addition to a Licensed Product (such Licensed Product, a "Combination Product"), then Net Sales, for purposes of determining royalty payments under Section 8.4 on such Combination Product, will be calculated by [***].

1.132.4 All calculations set forth in this Section 1.132 shall be determined in accordance with U.S. GAAP on a basis consistent with Baxalta's annual audited financial statements.

1.133 "Nominate" or "Nomination" means delivery by Baxalta of a written notice to Precision indicating that Baxalta desires to designate a Target as an Included Target.

1.134 "Nomination Period" means the period commencing on the Effective Date and ending on the [***] of the Effective Date or such later date to which such period has been extended pursuant to Section 2.1.6, if applicable; provided, however, that the Nomination Period shall terminate immediately on the first date upon which there are six (6) Included Targets.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.135 "Non-Debtor Party" has the meaning set forth in Section 14.2.3.

1.136 "Other Enabling Technology" has the meaning set forth in Section 9.3.3.

1.137 "Party" and "Parties" has the meaning set forth in the preamble.

1.138 "Patent" means (a) unexpired and currently in force letters patent (or other equivalent legal instrument), including utility and design patents, and including any extension, substitution, registration, confirmation, reissue, re-examination or renewal thereof, (b) applications for letters patent, a reissue application, a continuation application, a continuation-in-part application, a divisional application or any equivalent of the foregoing applications, that are pending before a government patent authority and (c) all foreign or international equivalents of any of the foregoing in any country.

1.139 "Patent Challenge" has the meaning set forth in Section 14.2.2.

1.140 "Patent Rights" means all rights in, to and under Patents.

1.141 "Patent Term Extensions" has the meaning set forth in Section 9.8.

1.142 "Paying Party" has the meaning set forth in Section 8.5.

1.143 "Person" means any individual, firm, corporation, partnership, limited liability company, trust, business trust, joint venture, Governmental Authority, association or other entity.

1.144 "Phase I Clinical Trial" means a Clinical Trial in which a product is administered to human subjects with the primary purpose of determining (as appropriate) safety and pharmacokinetic and pharmacodynamic properties of the product, and which is consistent with 21 C.F.R. § 312.21(a) or equivalent regulation in countries other than the US.

1.145 "Phase I Notice" has the meaning set forth in Section 2.2.4.

1.146 [***]

1.147 "Phase II Clinical Trial" means a Clinical Trial that would satisfy the requirements of 21 C.F.R. § 312.21(b) or equivalent regulation in countries other than the US.

1.148 "Phase II Ready Batch" means the first batch of Phase II Clinical Trial material for the applicable Licensed Product Candidate [***].

1.149 "Phase II Ready Batch Success" means, with respect to any Licensed Product Candidate, that Precision has delivered to Baxalta a Phase II Ready Batch.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.150 "Phase II Ready Status" means, with respect to a particular Licensed Product Candidate, [***].

1.151 [***].

1.152 "Phase III Clinical Trial" means a controlled or uncontrolled human Clinical Trial of a Licensed Product that would satisfy the requirements of 21 C.F.R. § 312.21(c) or equivalent regulation in countries other than the US.

1.153 [***].

1.154 "Platform Enabling Technology" has the meaning set forth in Section 9.3.1.

1.155 "Precision" has the meaning set forth in the preamble.

1.156 "Precision Confidential Information" has the meaning set forth in Section 12.1.1(a).

1.157 "Precision Indemnitees" has the meaning set forth in Section 13.2.

1.158 "Precision Invention" has the meaning set forth in Section 9.1.3(a).

1.159 "Precision Know-How" means the Know-How (a) Controlled by Precision as of the Effective Date, or that comes to be Controlled by Precision at any time during the Research Phase, or (b) that comes to be Controlled by Precision at any time thereafter during the Term and that Precision elects to provide to Baxalta, in each case that is reasonably necessary or useful to clinically Develop, manufacture and Commercialize Licensed Product Candidate(s) or Licensed Product(s) in the Field; in each case of (a) and (b), excluding Know-How Controlled by Precision specifically related to the Precision Platform Technology. Precision Know-How shall include Precision's interest in any Joint Inventions. For clarity, Precision Know-How does not include Patent Rights claiming Precision Know-How.

1.160 "Precision Patents" means the Patent Rights (a) Controlled by Precision as of the Effective Date, (b) that come to be Controlled by Precision at any time during the Term, or (c) that are jointly owned by Baxalta and Precision pursuant to this Agreement; in each case of (a), (b) and (c), that claim (x) any Licensed Product Candidate or Licensed Product or a method of manufacture or use thereof, or (y) any constructs that are used to create any Licensed Product Candidate or Licensed Product, any gene products (*i.e.*, RNA and protein resulting from expression, which may include ARCUS™ nucleases) of such constructs, the replication of such constructs, or the use of such constructs or such nucleases to Develop, manufacture, use or Commercialize any Licensed Product Candidate or Licensed Product. Precision Patents shall include Precision's interest in any Joint Patents. Precision Patents do not include Precision Platform Patents.

1.161 "Precision Platform Patents" means the Patent Rights Controlled by Precision as of the Effective Date, or that come to be Controlled by Precision at any time during the Term, that claim Precision Platform Technology.

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1.162 "Precision Platform Technology" means the technology Controlled by Precision as of the Effective Date, or that comes to be Controlled by Precision at any time during the Research Phase, relating to (a) the Development, manufacture or use of any genome engineering tools (excluding use of ARCUS™ nucleases that are used to create any Licensed Product Candidate or Licensed Product) or (b) the Development or manufacture of any precursor, intermediate or construct (including any such CAR-T construct), which tools, precursors, intermediates or constructs, as applicable, are used in the creation of any Licensed Product Candidate or Licensed Product.

1.163 "Precision Restrictive Covenants" has the meaning set forth in Section 11.2.1(b).

1.164 "Precision Target" has the meaning set forth in Section 2.4.4.

1.165 "Product Infringement" has the meaning set forth in Section 9.5.1.

1.166 "Product-Related Patents" has the meaning set forth in Section 9.2.2.

1.167 "Promote" means those activities normally undertaken by a pharmaceutical company's sales force in accordance with applicable Laws to implement marketing plans and strategies aimed at encouraging the appropriate use of a particular product for the treatment of human diseases and conditions. When used as a verb, "Promote" shall mean to engage in such activities. The word "Promotion" has correlative meaning.

1.168 "Prosecuting Party" has the meaning set forth in Section 9.2.3.

1.169 "Quality" has the meaning set forth in Section 6.3.

1.170 "Quality Agreement" has the meaning set forth in Section 6.3.

1.171 "Quarantined Information" means [***] in each case that are in Precision's possession [***].

1.172 "Recipient Party" has the meaning set forth in Section 8.5.

1.173 "Redacted Form of Agreement" has the meaning set forth in Section 12.4.2.

1.174 "Regulatory Authority" means any national, supra national, regional, state or local regulatory authority, department, bureau, commission, council or other Governmental Authority (including the FDA and EMA) that is responsible for overseeing the Development, use, manufacture, transport, storage or Commercialization of a Licensed Product Candidate or a Licensed Product.

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1.175 "Regulatory Exclusivity" means the right or protection, granted by a Regulatory Authority or other Governmental Authority, as applicable, in a jurisdiction, providing with respect to a Licensed Product in such jurisdiction: (a) marketing exclusivity that prevents the Regulatory Authority or other Governmental Authority from accepting an application for Marketing Approval from, or from granting Marketing Approval to, a Third Party (other than any Sublicensee or authorized designee of Baxalta or any of its Affiliates or Sublicensees) for a pharmaceutical or biologic product (including a generic, biosimilar, similar medicinal product or generic or competing version of a pharmaceutical product) that is the same or a bioequivalent of the Licensed Product, such as through new molecular entity or biological product or orphan drug or pediatric exclusivity designation by the applicable Regulatory Authority or Governmental Authority, or an exclusive right to sell pursuant to data exclusivity provisions such as those under EC Directives 2004/27/EC and 2001/83/EC and Regulation 726/2004/EC or, in each of the foregoing cases, any foreign equivalent; or (b) data protection for regulatory data relating to the Licensed Product against unfair commercial use or public release, such as that provided for in Article 39.3 of Annex 1C. Part II. Section 7 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), or any foreign equivalent.

1.176 "Regulatory Filings" means any application for Marketing Approval, any application for Reimbursement Approval, and any notification or other submission made to or with a Regulatory Authority that is necessary or reasonably desirable to Develop (including to conduct Clinical Trials), use, manufacture, transport, store or Commercialize a particular product for the treatment of human diseases and conditions in a particular country or regulatory jurisdiction, whether made before or after receipt of Marketing Approval in the country or regulatory jurisdiction. The term "Regulatory Filings" shall include all amendments and supplements to any of the foregoing and all proposed labels, labeling, package inserts, monographs and packaging for a Licensed Product in a particular country.

1.177 "Regulatory Role" has the meaning set forth in Section 5.1.

1.178 "Reimbursement Approval" means with respect to a particular Licensed Product and a particular country or regulatory jurisdiction, [***].

1.179 "Relevant Factors" means all factors that are relevant to the Development, manufacture or Commercialization of a product, including its safety and efficacy, product profile, cost to develop, cost and availability of supply, the time required to complete Development, the competitiveness of the marketplace (including the proprietary position and anticipated market share of the product), the patent position with respect to such product (including the ability to obtain or enforce, or have obtained or enforced, such patent rights), the third-party patent landscape relevant to the product, the regulatory structure involved, the likelihood of regulatory approval, the anticipated or actual profitability of the applicable product and other technical, commercial, legal, scientific, regulatory and medical considerations.

1.180 "Remedial Action" has the meaning set forth in Section 5.6.

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1.181 "Research Phase" means for each Licensed Product Candidate the period starting with the establishment of a Development Plan and ending upon Phase II Ready Status for such Licensed Product Candidate.

1.182 "Restrictive Covenants" has the meaning set forth in Section 11.2.2(a).

1.183 "Reversion IP" means any Baxalta Patents, Baxalta Know-How and Joint Patents that (a) come to be Controlled by Baxalta or any of its Affiliates at any time during the Term as a result of activities in connection with this Agreement, (b) are in existence as of the date of termination of this Agreement (in whole or in part) by Precision pursuant to Section 14.2.1, Section 14.2.2 or Section 14.2.3, by Baxalta in accordance with Section 14.2.1 (for any reason other than for the events described in Section 14.3.2(a)), or by Baxalta pursuant to Section 14.2.5 and (c) are reasonably necessary or useful in connection with the Development, manufacture, use or Commercialization of Reversion Products in the Territory.

1.184 "Reversion Patents" has the meaning set forth in Section 14.3.1(a)(i).

1.185 "Reversion Products" means, in the event of termination of this Agreement by Precision in accordance with Section 14.2.1, Section 14.2.2 or Section 14.2.3, by Baxalta in accordance with Section 14.2.1 (for any reason other than for the events described in Section 14.3.2(a)), or by Baxalta in accordance with Section 14.2.5, in each case in its entirety or with respect to one or more Included Targets, (a) any product that (i) was a Licensed Product Candidate or Licensed Product immediately prior to such termination and (ii) is no longer a Licensed Product Candidate or Licensed Product as a result of such termination, and (b) any other engineered human T cells with Chimeric Antigen Receptors Directed to any Target that was an Included Target immediately prior to such termination and is no longer an Included Target as a result of such termination.

1.186 "Royalty Term" has the meaning set forth in Section 8.4.3.

1.187 "Safety Agreement" has the meaning set forth in Section 5.4.

1.188 "Sales Milestone" has the meaning set forth in Section 8.3.3.

1.189 "Sales Report" means, with respect to each Calendar Quarter, a report detailing for such Calendar Quarter, on a on a Licensed Product-by-Licensed Product and country-by-country basis: (a) the amount of Net Sales of the Licensed Products in the Territory, (b) a calculation of the royalty payment due on such Net Sales, and (c) the exchange rates and dates used to convert any amounts to USD, as applicable.

1.190 [***].

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1.191 "Sublicensee" means, with respect to Baxalta, any Third Party to which Baxalta sublicenses all or any portion of the rights granted to it under Section 4.3.

1.192 "Supply Agreement" means a Manufacturing and Supply Agreement between Precision and Baxalta pursuant to which Precision will, by itself or through one or more Third Party CMOs, supply to Baxalta its requirements of clinical trial materials for Phase II Clinical Trials for each of the Licensed Products.

1.193 "Target" means a single unique molecular species that (a) is chemically distinct from other molecules, (b) is an antigenic protein or antigenic glycolipid protein complex that is expressed on or in a human cell (including all epitopes of such antigenic protein or antigenic glycolipid protein complex), and (c) wherein a binding entity derives recognized therapeutic value from binding such molecular species.

1.194 "Target Information Package" has the meaning set forth in Section 2.1.4.

1.195 "Target Proposal Date" has the meaning set forth in Section 2.1.4.

1.196 "Technology Transfer Plan" means, with respect to a given Licensed Product, the mutually-agreed technology transfer plan, timeline, budget and assignment of project managers from both Baxalta and Precision, which shall be developed and agreed upon in good faith by the Parties.

1.197 "Term" has the meaning set forth in Section 14.1.

1.198 "Territory" means worldwide.

1.199 "Third Party" means any Person other than Precision and Baxalta and their respective Affiliates.

1.200 "Third Party License Agreement" means any agreement (including any settlement agreement) entered into after the Effective Date with a Third Party, whereby royalties are to be paid to such Third Party based on the grant of rights under valid Patent Rights Controlled by such Third Party in a country or countries, which Patent Rights are Necessary to Commercialize the Licensed Product free from infringement of such Patent Rights. For purposes of this definition, "Necessary to Commercialize" means, with respect to a particular Licensed Product and Third Party Patent Rights in a particular country or countries, [***]. For clarity, an agreement under which rights are obtained with respect to any Independently Active Therapeutic Ingredient is not a Third Party License Agreement.

1.201 "Threshold Decrease" has the meaning set forth in Section 8.4.4.

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1.202 "Unavailable Target" means a Target that becomes the subject of an agreement entered into by Precision or any of its Affiliates and a Third Party after the Effective Date relating to any Development and/or Commercialization of any products with respect to such Target, for so long as such Target remains the subject of such an agreement.

1.203 "Unavailable Target Information" has the meaning set forth in Section 2.1.3(b).

1.204 "Upfront Fee" has the meaning set forth in Section 8.1.

1.205 "Unselected Candidate" means any Variant that is proposed by Precision to Baxalta in accordance with Section 2.1.4 or Section 2.1.5 and that does not become the subject of a Development Plan upon the completion of the Variant selection processes that are set forth in such Sections.

1.206 "U.S." or "US" means the United States of America, its territories and possessions.

1.207 "U.S. GAAP" means U.S. Generally Accepted Accounting Principles.

1.208 "USD" means U.S. Dollars.

1.209 "Valid Claim" means (a) a claim of an issued and unexpired patent (as may be extended through supplementary protection certificate or patent term extension or the like) that has not been revoked, held invalid or unenforceable by a patent office, court or other governmental agency of competent jurisdiction in a final and non-appealable judgment (or judgment from which no appeal was taken within the allowable time period) and which claim has not been disclaimed, denied or admitted to be invalid or unenforceable through reissue, re-examination or disclaimer or otherwise; or (b) a pending claim of an unissued patent application that is supported by the specification and that has been pending for no longer than [***] from the earliest claimable priority date.

1.210 "Variant" means a CAR-T Directed to a particular Target, which contains [***].

1.211 "Withholding Taxes" has the meaning set forth in Section 8.5.

ARTICLE II.

DISCOVERY AND DEVELOPMENT

2.1 Selection of Included Targets.

2.1.1 Maximum Number of Included Targets. Baxalta shall have the right to designate up to six (6) Included Targets during the Nomination Period in accordance with this Section 2.1, including the Target (CD19) that is designated as of the Effective Date pursuant to Section 2.1.2. [***]. Any Target is eligible to become an Included Target unless it is an Unavailable Target or a Precision Target. Such designation right includes the right, during the Nomination

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Period, for Baxalta to designate combinations of [***] Included Targets to be a single Included Target (each such combination, a "Combination Target"); provided, however, that (a) a combination of Targets may not be designated as a Combination Target unless (i) [***] the Targets within such combination are also Included Targets on an individual basis, and (ii) each of such Included Targets is not itself a Combination Target, and (b) a Combination Target shall constitute a separate Included Target for all purposes under this Agreement, except that a Combination Target shall not constitute a separate Included Target for purposes of Baxalta's limit of designating up to six (6) Included Targets.

2.1.2 Initial Included Target. The Parties agree that B-lymphocyte antigen CD19 ("CD19") is hereby designated, as of the Effective Date, as the initial Included Target. A summary draft Development Plan for CD19 is attached hereto as Exhibit G. No later than [***] days after the Effective Date, Precision shall deliver to Baxalta a full Development Plan for CD19, [***]. As promptly as practicable thereafter (but in no event later than [***] after delivery of such proposed Development Plan), the JSC shall meet to review and approve such Development Plan. The Parties will work together in good faith to ensure that the Development Plan for CD19 has been approved by the JSC by no later than [***] after Precision's delivery of the full Development Plan for CD19.

2.1.3 Unavailable Targets.

(a) Precision represents and warrants that as of the Effective Date, there are no Unavailable Targets. Except as expressly set forth in this Section 2.1.3, Baxalta shall have no rights with respect to any Unavailable Targets, and Precision and its Affiliates may freely undertake and engage in, including in collaboration with Third Parties, any research, Development, Commercialization or any other activities of any kind in any field with respect to all Unavailable Targets without any obligation to Baxalta. For clarity, without limiting the obligations set forth in Section 2.4, nothing in this Agreement shall be construed to preclude, limit, restrict or otherwise affect any right or ability of Precision or any of its Affiliates to enter into any agreement that would cause any Target that is not an Included Target to become an Unavailable Target at any time.

(b) If any Target becomes an Unavailable Target after the Effective Date, Precision shall submit a complete and accurate list of Unavailable Targets along with a copy of the applicable agreement related to each of such Unavailable Targets, which copies may be submitted in redacted form except to the extent necessary to confirm that such agreement relates to any Development and/or Commercialization of products with respect to such Unavailable Target (the "Unavailable Target Information"), to an independent escrow agent mutually agreed to by the Parties (the "Escrow Agent"), and shall provide the Escrow Agent with updated Unavailable Target Information promptly upon any Target becoming an Unavailable Target or losing its status as an Unavailable Target. The Unavailable Target Information shall be held by the Escrow Agent in confidence. If Precision notifies Baxalta that any Target is an Unavailable Target, the Escrow Agent shall provide confirmation to Baxalta that such Target is an Unavailable Target. The Escrow Agent shall not provide to Baxalta the identity of any other Target that appears on the list of Unavailable Targets or any details regarding any agreement related to any Unavailable Target. Precision represents and warrants that the Unavailable Target Information maintained with the Escrow Agent shall be promptly updated by Precision in order to remain accurate, complete and up-to-date at all times during the Nomination Period.

2.1.4 Nomination of Additional Targets. At any time during the Nomination Period, Baxalta may designate up to (i) [***] additional Targets that are not Unavailable Targets or Precision Targets, or (ii) subject to Section 2.1.1, any number of Combination Targets, as Included Targets in accordance with this Section 2.1.4. Baxalta may Nominate a Target for potential designation as an Included Target by providing Precision with written notice identifying the Target and providing such other information (if any) that it determines may be reasonably

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necessary or useful to Precision for preparing the associated Development Plans (the "Target Information Package"). If Baxalta Nominates pursuant to any provision of this Agreement any Target that is an Unavailable Target as of the date of Nomination by Baxalta, Precision shall promptly, but in no event more than [***] following Nomination, provide Baxalta with written notice that such Target is an Unavailable Target, and shall request confirmation by the Escrow Agent in accordance with Section 2.1.3(b), and such Nomination by Baxalta shall have no further effect. If Baxalta Nominates pursuant to any provision of this Agreement any Target that is a Precision Target as of the date of Nomination by Baxalta, such Nomination by Baxalta shall have no effect. If the Nominated Target is not an Unavailable Target or a Precision Target as of the date of Nomination by Baxalta, Baxalta and Precision will meet to discuss the Target Information Package through a meeting of the JSC, including any technical or other concerns Precision may have with respect to any such Target. Provided that Baxalta desires to move forward with Nomination after such meeting, Precision shall prepare and deliver to the JSC within [***] after the date of such meeting (i) a proposed Development Plan for such Target for review and approval by the JSC, and (ii) a list of Variants that Precision believes in good faith are capable of being generated by Precision via Precision Platform Technology for such Target (the date such proposal and Variant list are delivered, the "Target Proposal Date"). A Target will be deemed an Included Target if (and only if) (x) Baxalta has selected at least one (1) Variant to be the subject of a Development Plan and (y) the Development Plan for such Variant(s) and Target has been approved in writing by the JSC; in each case within [***] after the Target Proposal Date (or any extended period as mutually agreed by the Parties). If Baxalta does not move forward with Nomination or select one or more Variants, or if the JSC does not approve the proposed Development Plan for at least one of the Variants proposed by Precision and selected by Baxalta, the Parties shall discuss same at the following JSC meeting. For the avoidance of doubt, if any Target Nominated by Baxalta, other than any Unavailable Target or Precision Target, fails to become an Included Target through the foregoing process, Baxalta may later re-Nominate such Target, but such Target will not be an Included Target unless the process described in this Section 2.1.4 has been repeated resulting in such Target becoming an Included Target.

2.1.5 Additional Variants for Included Targets.

(a) Proposal of Additional Variants. From time to time during the Term, Precision may notify Baxalta in writing of one or more additional Variants (which may include Unselected Candidates) that Precision believes in good faith are capable of being generated by Precision via Precision Platform Technology for an Included Target (the date such notice is provided, the "Candidate Proposal Date"). If, within [***] after such notification, Baxalta indicates in writing that it is interested in reviewing a proposed Development Plan for such Variant(s), then Precision will prepare a proposed Development Plan that includes such Variant(s) for review and approval by the JSC within [***] after receipt of such indication of interest from Baxalta. Each proposed Variant will be deemed a Licensed Product Candidate for such Included Target if (and only if) a Development Plan that includes such Variant has been approved in writing by the JSC,

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which approval shall be provided within [***] after the Candidate Proposal Date (or any extended period as mutually agreed by the Parties). If (a) Baxalta does not indicate that it is interested in reviewing a proposed Development Plan for any one or more of such Variants within the applicable time period above or (b) the JSC does not approve a Development Plan for any one or more of such Variants within the applicable time period above, such Variants shall thereafter be (or continue to be, as applicable) deemed Unselected Candidates.

(b) Final Proposal of Additional Variants. During any period in which (i) Baxalta does not hold a Commercial License for any one or more Licensed Products Directed to a particular Included Target, and (ii) there is no Licensed Product Candidate Directed to such Included Target that is currently the subject of Development activities under a Development Plan pursuant to Section 2.2, this Section 2.1.5(b) shall apply with respect to proposals of additional Variants for such Included Target in lieu of Section 2.1.5(a). During any such period with respect to a particular Included Target, Precision may notify Baxalta of one or more additional Variants (which may include Unselected Candidates) that Precision believes in good faith are capable of being generated by Precision via Precision Platform Technology for such Included Target and if Baxalta indicates in writing that it is interested in reviewing a proposed Development Plan for such Variant(s), which it must do within [***] after the date of Precision's notice, Precision shall promptly deliver a proposed Development Plan that includes such Variant(s) for review and approval by the JSC (the later of the expiration of such [***] period or the date such Development Plan(s) are provided, the "Final Candidate Proposal Date"). Each proposed Variant will be deemed a Licensed Product Candidate for such Included Target if (and only if) a Development Plan that includes such Variant has been approved in writing by the JSC, which approval shall be provided within [***] after the Final Candidate Proposal Date (or any extended period as mutually agreed by the Parties). If the JSC does not approve a Development Plan for any one or more of such Variants within such time period above, or if Baxalta does not express interest in any such Variants within the [***] period set forth above, then notwithstanding anything to the contrary in this Agreement, Baxalta shall be deemed to have terminated this Agreement with respect to such Included Target (including all Licensed Product Candidates, Unselected Candidates, and Variants Directed to such Included Target) pursuant to Section 14.2.5.

2.1.6 Extension of the Nomination Period. Baxalta may (in its sole discretion) request to extend the Nomination Period for a single additional term of [***] by providing written notice of such request to Precision; provided, however, that such extension shall only become effective upon mutual written agreement of the Parties (in the Parties' sole discretion) regarding funding commitments and other terms related to such extension. For clarity, while the Parties will be obligated to discuss the proposed extension in good faith, neither Party shall be obligated to agree to extend the Nomination Period.

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2.2 Development Plans; Development Obligations.

2.2.1 Precision shall, subject to the oversight of the JSC, use Commercially Reasonable Efforts to direct, coordinate, perform and manage the Development of Licensed Product Candidates for each of the Included Targets, in each case in accordance with this Agreement and the applicable Development Plan.

2.2.2 Through the JSC, each Party shall have the right to propose changes to the Development Plans on an ongoing basis as necessary. The JSC shall have the authority to review and approve such changes, provided that each Development Plan shall at all times contain terms that are consistent with this Article II. If the terms of any Development Plan contradict, or create inconsistencies or ambiguities with, the terms of this Agreement, then the terms of this Agreement shall govern.

2.2.3 Precision shall be solely responsible for, shall use Commercially Reasonable Efforts to carry out, and shall pay all costs and expenses incurred by Precision in carrying out, Development activities for each Licensed Product Candidate in accordance with the applicable Development Plan (including any fees and associated costs and expenses for Regulatory Filings to be made by Precision pursuant to the Development Plans). Precision may not subcontract any of Precision's Development obligations (other than to a CMO approved pursuant to Section 6.2) without the JSC's consent to the subcontracting of such obligations (but which shall not require the JSC's consent to any particular subcontractors that are not contract research organizations that will conduct Clinical Trials under this Agreement or CMOs), and, if the JSC provides such consent, Precision agrees that any subcontractor (including any contract research organization or CMO) shall be bound by written obligations consistent with those required under Section 11.1.1(a) and written obligations of confidentiality and non-use consistent with this Agreement, and such other provisions to permit Precision to comply with all the terms and conditions of this Agreement. Precision shall remain responsible for compliance with this Agreement and shall be fully responsible for any breach of this Agreement by any of its subcontractors.

2.2.4 Promptly, but in no event more than [***], following receipt of trial phase data for the first Phase I Clinical Trial dose escalation study with respect to any Licensed Product Candidate, Precision shall deliver written notice to the JSC, together with a copy of the relevant data regarding the results of such study (the "Phase I Notice"). The JSC shall promptly (but in any event within [***] after the Phase I Notice) convene a meeting to review and discuss such data with respect to such Licensed Product Candidate and determine (a) whether activities related to the manufacture of Phase II Clinical Trial material for such Licensed Product Candidate should be initiated under the applicable Development Plan, and (b) the amount of such material that will be sufficient to conduct the initial Phase II Clinical Trial with respect to such Licensed Product Candidate. If the JSC does not determine to initiate such activities, then the JSC shall meet to consider whether it is commercially reasonable to continue to seek to achieve Phase II

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Ready Status for such Licensed Product Candidate and, upon a positive determination, develop a plan for such achievement. If the JSC determines that it is not commercially reasonable to continue to seek to achieve Phase II Ready Status for such Licensed Product Candidate, or fails to approve a plan for such achievement within [***] after such meeting of the JSC, then neither Party shall be required nor permitted to conduct any further Development or Commercialization activities under this Agreement with respect to such Licensed Product Candidate.

2.2.5 Promptly, but in no event more than [***] following the achievement of Phase II Ready Status (which may or may not include, for purposes of Precision's notice as set forth in this sentence, the JSC having identified a pivotal Phase II Clinical Trial dose for the applicable Licensed Product Candidate) with respect to any Licensed Product Candidate, Precision shall deliver written notice to the JSC (the "Development Achievement Notice"), together with a copy of the data package regarding the results of Precision's research and development program for such Licensed Product Candidate. The JSC shall promptly, but in no event more than [***] following receipt of such notice, convene a meeting to review and discuss such notice and data package with respect to such Licensed Product Candidate and, if not yet identified by the JSC, to identify a pivotal Phase II Clinical Trial dose for such Licensed Product Candidate. Additionally, for [***] following the end of such meeting, Baxalta may request, and Precision shall thereafter provide as promptly as practicable, any additional information that could reasonably be expected to assist Baxalta in determining whether it desires to exercise the Commercial Option for the applicable Licensed Product Candidate in accordance with Section 4.1. If the JSC determines that the Development Achievement Notice was not properly provided, or that it cannot identify a pivotal Phase II Clinical Trial dose for the applicable Licensed Product Candidate based on the available Phase I Clinical Trial data, then the Development Achievement Notice shall be deemed not to have been delivered by Precision. In the event that the JSC determines that it cannot identify a pivotal Phase II Clinical Trial dose for the applicable Licensed Product Candidate based on the available Phase I Clinical Trial data, (a) the JSC shall meet to consider whether it is commercially reasonable to continue to seek to achieve Phase II Ready Status for such Licensed Product Candidate and, upon a positive determination, develop a plan for such achievement and (b) if the JSC determines that it is not commercially reasonable to continue to seek to achieve Phase II Ready Status for such Licensed Product Candidate, or fails to approve a plan for such achievement within [***] after such meeting of the JSC, then neither Party shall be required nor permitted to conduct any further Development or Commercialization activities under this Agreement with respect to such Licensed Product Candidate.

2.2.6 Following the Commercial Option Exercise Date for each Licensed Product Candidate, Baxalta shall be solely responsible for and shall have sole control of, and shall use Commercially Reasonable Efforts to carry out, all further Development activities for such Licensed Product in the Territory, at Baxalta's sole cost and expense (including any fees and associated costs and expenses for Regulatory Filings made following such exercise). With respect to determinations by Baxalta to discontinue Development activities for a particular Licensed Product in all countries throughout the Territory, Baxalta shall give Precision written notice of such determination within a reasonable period of time, but in any event within [***] after any such determination is made, and upon provision of such notice Baxalta shall be deemed to have terminated this Agreement pursuant to Section 14.2.5 with respect to such Licensed Product.

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2.2.7 Neither Party makes any representation, warranty or guarantee that the Development activities conducted under the Development Plan will be successful or that any particular results will be achieved.

2.3 Development of Unselected Candidates.

2.3.1 Precision and its Affiliates shall be free to Develop Unselected Candidates (but not any other Variant for an Included Target that is not a Licensed Product Candidate) at their own expense, provided that (a) Precision complies with its obligations under the Development Plans, (b) no Unselected Candidate may be the subject of any Clinical Trial unless approved in advance by the JSC, and (c) no Unselected Candidate may be the subject of Development efforts conducted in collaboration with or on behalf of any Third Party without prior approval of the JSC. Precision will deliver written updates to Baxalta no less frequently than quarterly regarding the status of Precision's Development of any Unselected Candidates, including all reasonably necessary data to allow Baxalta to assess Precision's progress towards achieving a functional CAR-T Directed to the applicable Included Target with any Unselected Candidate, including details regarding the first in-vivo proof of concept and pre-IND information relating to each such Unselected Candidate. If any Unselected Candidate is approved by the JSC for Clinical Trials, Precision shall provide no less than [***] advance written notice prior to any planned IND filing with respect to such Unselected Candidate. If safety concerns related to the Unselected Candidates arise from such Development activities, Precision must inform Baxalta immediately. Any publication or presentation with respect to Unselected Candidates shall be subject to Section 12.3.

2.3.2 Baxalta may elect to designate any Unselected Candidate as a Licensed Product Candidate for a particular Included Target at any time until the [***] anniversary of the date upon which such Included Target became an Included Target, by notifying Precision in writing that it is interested in reviewing a proposed Development Plan for such Unselected Candidate. In such event, Precision will prepare a proposed Development Plan for such Unselected Candidate for review and approval by the JSC within [***] after receipt of such indication of interest from Baxalta. The Unselected Candidate will be deemed a Licensed Product Candidate for such Included Target if (and only if) a Development Plan for such Unselected Candidate has been approved in writing by the JSC, which approval shall be provided within [***] after such written indication of interest from Baxalta (or any extended period as mutually agreed by the Parties). If such Unselected Candidate becomes a Licensed Product Candidate, and if such Unselected Candidate has previously achieved any Development Milestone(s) [***] prior to

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becoming a Licensed Product Candidate, Precision may immediately invoice Baxalta for such achieved Development Milestone(s), and Baxalta shall make the applicable payment within [***] following receipt of such invoice. If the JSC does not approve a Development Plan for such Unselected Candidate within the applicable time period above, such Unselected Candidate shall remain an Unselected Candidate.

2.3.3 For the avoidance of doubt, the rights set forth in this Section 2.3 shall be subject to Precision's obligations under the Precision Restrictive Covenants.

2.4 Inactive Targets; Precision Targets.

2.4.1 Inactive Targets. From the Effective Date until the end of the Nomination Period, Precision shall notify Baxalta in writing prior to Precision initiating Development of any CAR-T Directed to any Target that is clinically relevant to oncology and not an Included Target, Unavailable Target or Precision Target (each, an "Inactive Target"); provided that, the JSC must determine that a Target (other than an Unavailable Target or Precision Target) is not clinically relevant to oncology prior to Precision being relieved of any obligations with respect to such Target pursuant to this Section 2.4. For clarity, Precision and its Affiliates may freely undertake and engage in, including in collaboration with Third Parties, any research, Development, Commercialization or any other activities of any kind in any field with respect to Inactive Targets at their own expense without any obligation to Baxalta except as expressly set forth in this Section 2.4.

2.4.2 Nomination of Inactive Targets. At any time during the Nomination Period, Baxalta may Nominate any Inactive Target. In such event, the process set forth in Section 2.1.4 shall commence with respect to the Nomination of such Inactive Target. If an Inactive Target becomes an Included Target as a result of such process, such Inactive Target shall thereafter cease to be an Inactive Target and shall be deemed to be an Included Target, and if any Variant for such Inactive Target has previously achieved any Development Milestone(s) [***] prior to becoming a Licensed Product Candidate, Precision may immediately invoice Baxalta for such achieved Development Milestone(s), and Baxalta shall make the applicable payment within [***] following receipt of such invoice. If such Inactive Target fails to become an Included Target as a result of such process, then such Inactive Target shall continue to be an Inactive Target, subject to the terms of this Agreement.

2.4.3 Updates; Inactive Target Non-Disclosure Period.

(a) During the Nomination Period, Precision will deliver written updates to Baxalta no less frequently than Calendar Quarterly regarding the status of Precision's Development of any Inactive Targets that are clinically relevant to oncology, including all reasonably necessary data to allow Baxalta to assess Precision's progress towards achieving a functional CAR-T Directed to the applicable Inactive Target, including details regarding the first in-vivo proof of concept and pre-IND information relating to Variants Directed to each Inactive Target (the "Inactive Target Evaluation Data").

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(b) Precision will not provide any Inactive Target Evaluation Data to any Third Party in connection with any discussions with or inquiries of a Third Party that, at the time such data would be provided, relate to a transaction that would result in such Inactive Target becoming an Unavailable Target during the Nomination Period, unless Precision has first provided notice to Baxalta of its desire to share such information with such a Third Party, together with a proposed Development Plan and list of Variants that Precision believes in good faith are capable of being generated by Precision via Precision Platform Technology for such Inactive Target, and Baxalta has had at least [***] after such notice and delivery of a proposed Development Plan and list of Variants (the "Inactive Target Non-Disclosure Period") to determine whether Baxalta desires to Nominate such Inactive Target as an Included Target in accordance with this Agreement.

(c) If Baxalta provides notice Nominating an Inactive Target within the applicable Inactive Target Non-Disclosure Period (which it may do only if it has a bona fide interest in such Inactive Target becoming an Included Target), then the following shall apply with respect to such Nomination in lieu of Section 2.4.2. Such Inactive Target shall be deemed an Included Target if (and only if) (i) Baxalta has selected at least one such Variant to be the subject of the Development Plan for such Inactive Target and (ii) an initial Development Plan including such Variant as a Licensed Product Candidate for such Inactive Target has been approved in writing by the JSC; in each case within the Inactive Target Non-Disclosure Period (or any extended period as mutually agreed by the Parties). If such Inactive Target becomes an Included Target as a result of such process, such Inactive Target shall thereafter cease to be an Inactive Target and shall be deemed to be an Included Target, and if any Variant for such Inactive Target has previously achieved any Development Milestone(s) [***] prior to becoming a Licensed Product Candidate, Precision may immediately invoice Baxalta for such achieved Development Milestone(s), and Baxalta shall make the applicable payment within [***] following receipt of such invoice.

(d) If, prior to the expiration of the applicable Inactive Target Non-Disclosure Period for an Inactive Target, Baxalta does not Nominate such Inactive Target as set forth in Section 2.4.3(c), or if Baxalta Nominates such Inactive Target during the applicable Inactive Target Non-Disclosure Period and such Inactive Target fails to become an Included Target as the result of the process described above, then Precision and its Affiliates shall thereafter be free to share the applicable Inactive Target Evaluation Data for such Inactive Target with any Third Party for a period of [***] directly following the conclusion of the Inactive Target Non-Disclosure Period for such Inactive Target (such [***] period, the "Inactive Target Freeze Period"). During the Inactive Target Freeze Period, (i) Precision's obligation to share the applicable Inactive Target Evaluation Data with Baxalta under Section 2.4.3(a) with respect to such Inactive Target shall not apply, and (ii) Baxalta shall have no right to Nominate such Inactive Target. Following the conclusion of the Inactive Target Freeze Period, unless such Inactive Target has become an Unavailable Target during such period, Precision's obligations with respect to such Inactive Target under Section 2.4.3(a) shall resume (including with respect to Inactive Target Evaluation Data generated during the Inactive Target Freeze Period), and Baxalta's ability to Nominate such Inactive Target shall resume, but Precision's obligations with respect to such

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Inactive Target under Section 2.4.3(b) shall cease to apply with respect to any Third Party to which the Inactive Target Evaluation Data was disclosed during the applicable Inactive Target Freeze Period or any of such Third Party's Affiliates.

(e) Precision may, but shall not be required to, commence additional Inactive Target Freeze Periods (including during any current Inactive Target Freeze Period) by providing the notice and opportunity to Nominate the Inactive Target as set forth in Section 2.4.3(b); provided, however, if Precision provides any such notice during the pendency of any Inactive Target Freeze Period for any Inactive Target, Baxalta shall, notwithstanding Section 2.4.3(d), be permitted to Nominate the Target within the [***] Inactive Target Non-Disclosure Period in accordance with Section 2.4.3(c).

(f) Notwithstanding anything to the contrary in this Agreement, if Baxalta Nominates an Inactive Target during the applicable Inactive Target Non-Disclosure Period for such Inactive Target, then regardless of whether or not such Inactive Target becomes an Included Target as a result of the process described above, the number of available Included Targets that may be designated by Baxalta in accordance with this Agreement, as set forth in Section 2.1, shall be reduced by one.

2.4.4 Precision Targets. Precision shall provide no less than [***] advance written notice prior to any planned IND filing by Precision with respect to any Variant Directed to an Inactive Target. If Baxalta does not Nominate such Inactive Target in accordance with Section 2.4.2 within [***] after the date of such notice, or thereafter such Inactive Target fails to become an Included Target as a result of the process initiated by such Nomination, such Inactive Target shall thereafter cease to be an Inactive Target and shall be deemed to be a "Precision Target". Precision and its Affiliates may freely undertake and engage in, including in collaboration with Third Parties, any research, Development, Commercialization or any other activities of any kind in any field with respect to all Precision Targets with no further obligation to Baxalta.

2.5 Development Licenses.

2.5.1 Subject to the terms and conditions of this Agreement, Precision hereby grants to Baxalta a non-exclusive, royalty-free, non-transferable (except in accordance with Section 17.1), non-sublicensable license under the Precision Patents and Precision Know-How, solely to conduct Baxalta's activities set forth in the applicable Development Plans or as contemplated pursuant to Section 16.2 or 16.3 (if applicable) with respect to the Licensed Product Candidates and to otherwise conduct internal research and Development relating to Licensed Product Candidates.

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2.5.2 Subject to the terms and conditions of this Agreement, Baxalta hereby grants to Precision a non-exclusive, royalty-free, non-transferable (except in accordance with Section 17.1), non-sublicensable license under the Baxalta Patents and Baxalta Know-How, solely to conduct Precision's activities set forth in the applicable Development Plans or the Supply Agreement with respect to the Licensed Product Candidates and Licensed Products, to otherwise conduct internal research and Development relating to Licensed Product Candidates as expressly permitted pursuant to this Agreement, and to comply with all other obligations of Precision under this Agreement.

2.5.3 Each Party is permitted to exercise its rights and perform its obligations under the licenses set forth in this Section 2.5, by itself or through the engagement of any of its Affiliates without the prior written consent of the other Party.

2.6 Isolex Co-Development.

2.6.1 If the JSC determines that it is desirable to use the Isolex Platform Technology for clinical and/or commercial-scale manufacturing of one or more Licensed Product Candidates or Licensed Products, then:

(a) Baxalta agrees to grant and hereby grants to Precision a non-exclusive, royalty-free, non-transferable (except in accordance with Section 17.1), non-sublicensable license under the Isolex Platform Patents and related Know-How Controlled by Baxalta that is necessary or useful to practice and further develop the Isolex Platform Technology for CAR-T manufacturing, solely to conduct Precision's activities set forth in the applicable Development Plans or the Supply Agreement with respect to the Licensed Product Candidates and Licensed Products, to otherwise conduct internal research and Development relating to Licensed Product Candidates as expressly permitted pursuant to this Agreement, and to comply with all other obligations of Precision under this Agreement; and

(b) The Parties shall use Commercially Reasonable Efforts to enter into an agreement pursuant to which the Parties will use Commercially Reasonable Efforts to co-develop the Isolex Platform Technology for commercial-scale manufacturing, which agreement shall include the right for Precision to use the Isolex Platform Technology for its own products and services on commercially reasonable terms and shall otherwise be mutually agreed between the Parties within [***] after such determination by the JSC.

(c) [***]

2.7 Know-How Database. The Parties will establish and maintain a Know-How database to identify the Precision Know-How provided to Baxalta in connection with this Agreement as well as any Baxalta Know-How provided to Precision by Baxalta in connection with this Agreement.

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ARTICLE III.
GOVERNANCE

3.1 Joint Steering Committee.

3.1.1 Establishment; Responsibility and Authority. Within [***] after the Effective Date, the Parties will establish a joint steering committee to oversee the planning and execution of the activities under the Development Plans (the "JSC"). The JSC's responsibilities shall include the following:

(a) reviewing and approving the Development Plan, and overseeing and evaluating implementation of the Development Plan, with respect to each Included Target, including monitoring progress of preclinical and clinical studies of the Licensed Product Candidates and Licensed Products and otherwise monitoring compliance with the Development Plan;

(b) proposing, reviewing and approving amendments to, including implementing all agreed upon extensions or delays, the Development Plan;

(c) reviewing, commenting on and approving all Regulatory Filings and other regulatory submissions and all material correspondence with Regulatory Authorities occurring prior to the Commercial Option Exercise Date;

(d) overseeing development of the Isolex Platform Technology in relation to Licensed Product Candidates and Licensed Products (as applicable);

(e) determining in accordance with Section 2.2.4 whether any activities related to the manufacture of Phase II Clinical Trial material for any Licensed Product Candidate should be initiated under the applicable Development Plan and establishing the amount of such material that will be sufficient to conduct the initial Phase II Clinical Trial with respect to any such Licensed Product Candidate;

(f) reviewing and discussing the Development Achievement Notices provided by Precision pursuant to Section 2.2.5 and identifying a pivotal Phase II Clinical Trial dose for each Licensed Product Candidate;

(g) overseeing manufacture and supply of pre-clinical and clinical trial materials necessary for Development of Licensed Product Candidates through Phase II Ready Batch Success by Precision or its CMO(s) and reviewing and approving all Changes to the manufacturing process for clinical trial materials manufactured by Precision or its CMO(s);

(h) reviewing and approving the protocols of all preclinical and Clinical Trials for the Licensed Product Candidates planned prior to the Commercial Option Exercise Date;

(i) reviewing, commenting on and approving all publication strategy (in accordance with Section 12.3) with respect to each Licensed Product and Licensed Product Candidate prior to the Commercial Option Exercise Date;

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(j) evaluating and establishing the patent prosecution and maintenance strategy together with appropriate legal counsel for each Party in accordance with Article IX;

(k) overseeing any technology transfers required pursuant to this Agreement, and addressing any intellectual property or technology related issues, including issues under Article IX;

(l) attempting to resolve disputes arising under this Agreement among the Parties, the Alliance Managers or any project teams of the Parties (provided, that for clarity, the JSC shall not have authority to amend this Agreement or to resolve any disputes between the Parties regarding whether a Party has fulfilled or breached this Agreement, and such disputes shall instead be resolved pursuant to Article XV); and

(m) performing such other tasks and undertaking such other responsibilities as designated to it under this Agreement or the Development Plans.

3.1.2 Composition; Voting. Within [***] after the Effective Date, each Party shall appoint three (3) employees or consultants to serve on the JSC, each of which shall have such expertise as is appropriate to the activities of the JSC. Each Party may replace its JSC representatives by written notice to the other Party. Each Party shall have one (1) vote on all matters and decisions that are within the responsibility of the JSC, regardless of the number of such Party's representatives on the JSC, and any decision or other action by the JSC may only be made by unanimous consensus of the Parties. The members of the JSC will use good faith efforts to reach unanimous consensus on all decisions and other actions that are within the responsibility of the JSC.

3.1.3 Co-Chairpersons. Each Party shall designate one of its JSC representatives to serve as co-chairperson. The co-chairpersons shall be jointly responsible for calling meetings and shall be jointly responsible for setting the agenda (which shall include a list of all participants expected at a meeting). The co-chairpersons shall alternate responsibility for circulating such agenda at least [***] prior to each meeting and distributing minutes of the meetings pursuant to Section 3.1.5 within [***] following such meeting, but will not otherwise have any greater power (including voting power) or authority than any other member of the JSC.

3.1.4 Meetings. The JSC shall, after appointment of its initial members, meet at least once every Calendar Quarter at times mutually agreed upon by the Parties, and at least two (2) of such meetings each year shall be held in person. The location of the meetings of the JSC to be held in person shall be agreed upon by the Parties (with the intent that it should alternate between the Parties' respective headquarters locations or be held at the time and sites of major medical conferences attended by both Parties). Additionally, either Party may call a special meeting of the JSC upon written notice to the other (and which meeting shall be scheduled promptly at mutually agreeable times) (a) to make any determination under this Agreement that cannot reasonably be postponed until the next scheduled JSC meeting, (b) for the purpose of

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resolving disputes in connection with, or for the purpose of reviewing or making a decision pertaining to, any material matter within the purview of the JSC, the examination or resolution of which cannot reasonably be postponed until the next scheduled JSC meeting or (c) as reasonably necessary to review other matters occurring between JSC meetings. Each such special meeting of the JSC shall be convened at such time as may be mutually agreed upon by the Parties, but in any event shall be held within [***] after delivery of the written notice described in the immediately preceding sentence. Each Party shall use reasonable efforts to cause its representatives to attend the meetings of the JSC. If a representative of a Party is unable to attend a meeting, such Party may designate an alternate to attend such meeting in place of the absent representative. Each Party shall bear all the expenses of its representatives on the JSC. Either Party may invite personnel or consultants of the Parties (other than the members of the JSC) having applicable expertise to participate in discussions of the JSC from time to time as appropriate to assist in the activities of the JSC; provided, that neither Party's legal counsel may attend a JSC meeting without prior notice to the other Party reasonably sufficient to allow the other Party's legal counsel to attend or to expressly waive attendance, and any such non-member shall be (x) bound by confidentiality and non-use obligations equivalent in scope to those set forth in ARTICLE XII of this Agreement and (y) under a written obligation to assign to the Party inviting such non-member any inventions of such non-member in the course of or as a result of attending any such meeting.

3.1.5 Minutes. The minutes of each JSC meeting shall be distributed to the members within [***] after the completion of the relevant meeting and shall provide a description in reasonable detail of the discussions held at the meeting and a list of any actions, decisions or determinations approved by the JSC. Minutes of each JSC meeting shall be approved or disapproved, and revised as necessary, within [***] after the applicable JSC meeting and shall be considered Confidential Information of both Parties.

3.1.6 Matter Resolution; Escalation.

(a) The Alliance Managers shall use good faith efforts to mediate potential disagreements between the Parties regarding the Development Plans with the goal of resolving such disagreements without requiring escalation. If the Alliance Managers are unable to reach resolution on an issue for which the JSC has responsibility hereunder, the issue will be escalated to the JSC for review.

(b) If the JSC is unable to reach unanimous consensus on a particular issue for which the JSC has responsibility hereunder within [***] after such issue is first presented to the JSC, such issue shall be referred to an executive officer of each Party or their designees selected for such purpose and authorized to resolve the issue and notified to other Party (the "Executive Officers") for resolution. Each Party shall use good faith efforts to resolve issues as promptly as practicable and at the lowest level possible within the governance structure established by this Article III and, notwithstanding the escalation procedures set forth herein, to limit any such escalations.

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(c) If the Executive Officers are unable to resolve a particular issue referred to them pursuant to Section 3.1.6(b) within [***] after such issue is referred to them, then such issue shall be finally resolved pursuant to the dispute resolution provisions set forth in Article XV.

(d) For the avoidance of doubt, other than amendments of the Development Plan in accordance with Section 2.2.2, the JSC shall not have the power to amend or waive compliance with this Agreement, determine any such issue in a manner that would conflict with the express terms and conditions of this Agreement, require any Party to perform any act that is inconsistent with applicable Law or, without the consent of the affected Party, to materially increase or reduce the obligations of the Parties under this Agreement.

3.1.7 Limitations on JSC Responsibility after the Commercial Option Exercise Date; Annual Reports.

(a) With respect to each Licensed Product for which Precision has not exercised the CDCP Option, from and after the Commercial Option Exercise Date with respect to such Licensed Product Candidate, the JSC's responsibility with respect to the corresponding Licensed Product shall be limited as follows: (i) the JSC will not have any decision making or oversight rights with respect to such Licensed Product; and (ii) the JSC's role shall be limited to reviewing and discussing reports provided by Baxalta as set forth in the following sentence. On an annual basis, Baxalta will be obligated to (x) deliver to Precision a report describing the status of the Development and Commercialization efforts with respect to such Licensed Product, for informational purposes only (but sufficient to establish Baxalta's compliance with its Development and Commercialization obligations under this Agreement and for Precision to comply with its disclosure obligations (if any) under any Law applicable to the public sale of securities or status as a public or listed company, provided that Precision has provided Baxalta a written request describing the type of information it needs in order to fulfill such disclosure obligations), and (y) upon Precision's request, meet with Precision through the JSC to discuss such report. In addition, within [***] after Baxalta's completion of any Phase II Clinical Trial with respect to a particular Licensed Product, Baxalta shall notify Precision of Baxalta's determination of whether such Licensed Product has an acceptable safety profile to proceed to Phase III Clinical Trials.

(b) With respect to each Licensed Product for which Precision has exercised the CDCP Option, a separate joint co-development and co-promotion committee will be established for each such Licensed Product to oversee clinical Development, manufacturing, registration, Commercialization and marketing in the U.S. pursuant to the CDCP Agreement, and the JSC under this Agreement will have no role with respect to any such Licensed Product.

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3.2 Alliance Managers. Promptly after the Effective Date, each Party shall appoint an individual to act as alliance manager for such Party, which may be one of the representatives of such Party on the JSC (each, an "Alliance Manager"). The Alliance Managers shall be the primary point of contact for the Parties regarding the activities contemplated by this Agreement and shall facilitate all such activities hereunder and shall be responsible for progressing the alliance activities, otherwise facilitating communication and being the first line of dispute resolution. The Alliance Managers shall attend all meetings of the JSC and shall be responsible for assisting the JSC in performing its oversight responsibilities. The name and contact information for each Party's Alliance Manager, as well as any replacement(s) chosen by such Party, in its sole discretion, from time to time, shall be promptly provided to the other Party in accordance with Section 17.5. Each Party shall provide its Alliance Manager with sufficient resources for the Alliance Manager to perform his or her role under this Agreement.

ARTICLE IV.
COMMERCIAL OPTIONS; LICENSES

4.1 Commercial Option.

4.1.1 Commercial Option Exercise Period. With respect to each Licensed Product Candidate Directed to a particular Included Target, subject to the terms and conditions of this Agreement, Precision hereby grants to Baxalta an exclusive option to obtain a Commercial License for such Licensed Product Candidate (the "Commercial Option"). Baxalta will be allowed to (but will not be obligated to) provide notice that it desires to exercise its Commercial Option, on a Licensed Product Candidate-by-Licensed Product Candidate basis, for each Licensed Product Candidate Directed to a particular Included Target at any time during the period beginning on the date on which Precision provides the Development Achievement Notice for such Licensed Product Candidate and ending [***] (such period, the "Commercial Option Exercise Period").

4.1.2 Commercial Option Exercise. Baxalta may begin the process for exercising the Commercial Option by providing written notice to Precision during the Commercial Option Exercise Period indicating its intent to exercise its Commercial Option with respect to the applicable Licensed Product Candidate (the "Commercial Option Exercise Notice"). Upon provision of the Commercial Option Exercise Notice with respect to a particular Licensed Product Candidate, (a) Precision will promptly initiate or continue, as applicable (at Precision's sole cost and expense) manufacturing and quality testing of a Phase II Ready Batch of such Licensed Product Candidate and (b) if Antitrust Clearance is required, the Parties will comply with their obligations under Section 17.17. The Commercial Option with respect to a Licensed Product Candidate shall be deemed exercised on the Commercial Option Exercise Date, and such Licensed Product Candidate shall thereafter be a Licensed Product. Notwithstanding anything to the contrary set forth in this Agreement, if Antitrust Clearance is required for the exercise of any Commercial Option and is not obtained within [***] following delivery of the Commercial Option Exercise Notice, the Commercial Option Exercise Period for the applicable Licensed Product Candidate will be deemed to have occurred without issuance of a Commercial Option Exercise Notice, and shall be treated in accordance with Section 4.1.4.

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4.1.3 Batch Failure. If Precision is unable to achieve Phase II Ready Batch Success within [***] after the date of the Commercial Option Exercise Notice with respect to a Licensed Product Candidate, then the JSC shall meet to consider (a) whether Phase II Ready Batch Success can be achieved, (b) whether it is commercially reasonable to continue to seek to achieve Phase II Ready Batch Success and, (c) upon positive determination of (a) and (b), to develop a plan for such achievement (the "Batch Success Achievement Plan"). Following receipt of the Batch Success Achievement Plan from the JSC, Precision will use Commercially Reasonable Efforts to perform the activities set forth in such plan as promptly as practicable. If, subsequent to the performance of the activities set forth in the Batch Success Achievement Plan, Phase II Ready Batch Success has not been achieved, the JSC shall meet to discuss the considerations set forth in clauses (a) through (c) above, and any further obligations of Precision in relation to manufacturing and quality testing of the Phase II Ready Batch shall be subject to the JSC's approval of an additional Batch Success Achievement Plan.

4.1.4 Effect of Failure to Deliver Commercial Option Exercise Notice. If Precision provides a Development Achievement Notice for a Licensed Product Candidate Directed to a particular Included Target and Baxalta does not provide a Commercial Option Exercise Notice with respect to such Licensed Product Candidate during the applicable Commercial Option Exercise Period, then:

(a) during any period in which (i) Baxalta holds a Commercial License for any one or more Licensed Products Directed to such Included Target, or (ii) a different Licensed Product Candidate Directed to such Included Target is currently the subject of Development activities under a Development Plan pursuant to Section 2.2, then, subject to Section 4.1.4(b), upon the first date following the expiration of such Commercial Option Exercise Period, neither Party shall be required nor permitted to conduct any further Development or Commercialization activities under this Agreement with respect to the Licensed Product Candidate for which Precision provided the Development Achievement Notice; and

(b) during any period in which (i) Baxalta does not hold a Commercial License for any one or more Licensed Products Directed to such Included Target, and (ii) there is no Licensed Product Candidate Directed to such Included Target that is currently the subject of Development activities under a Development Plan pursuant to Section 2.2, then Precision shall notify Baxalta of remaining Variants (which may include Unselected Candidates), if any, that Precision believes in good faith are capable of being generated by Precision via Precision Platform Technology for such Included Target in accordance with Section 2.1.5(b). If (x) (i) the JSC determines that no such Variants exist, or (ii) the JSC does not approve a Development Plan for any one or more of such Variants for which Baxalta has expressed interest in accordance with the process set forth in Section 2.1.5(b) within [***] after the Final Candidate Proposal Date, and (y) Baxalta does not provide a Commercial Option Exercise Notice with respect to any other Licensed Product Candidate Directed to such Included Target (which may include a Licensed Product Candidate for which Baxalta has previously declined to timely provide a Commercial Option

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Exercise Notice) within [***] after the Final Candidate Proposal Date, then notwithstanding anything to the contrary in this Agreement, Baxalta shall be deemed to have terminated this Agreement with respect to such Included Target (including all Licensed Product Candidates, Unselected Candidates, and Variants Directed to such Included Target) pursuant to Section 14.2.5.

4.2 Development Transfer. With respect to a particular Licensed Product, as promptly as practicable following the Commercial Option Exercise Date for such Licensed Product, Precision shall deliver to Baxalta a copy of all Precision Know-How then existing that relates to such Licensed Product, and a description of the status of the Development efforts to date for such Licensed Product.

4.3 Licenses to Baxalta. Effective immediately upon the Commercial Option Exercise Date for a particular Licensed Product Candidate in accordance with Section 4.1 (or if applicable, Section 14.3.2(b), Section 14.3.2(c), Section 16.2.4, or Section 16.3.4) subject to the terms and conditions of this Agreement, Precision hereby grants to Baxalta the following licenses:

4.3.1 Precision hereby grants to Baxalta an exclusive (even as to Precision except as set forth in Section 4.3.3), royalty-bearing (in accordance with Section 8.4), transferable (in accordance with Section 17.1), sub-licensable (in accordance with Section 4.4) right and license under the Precision Patents and Precision Know-How, in each case to make, have made, use, sell, offer for sale, import and otherwise Develop and Commercialize such Licensed Product with respect to the applicable Included Target in the Field in the Territory, in each case alone or in combination with other products or therapies (with respect to each such Licensed Product and Included Target, for so long as such license remains in effect during the Term, a "Commercial License"). For clarity, the foregoing license does not include any rights under the Precision Platform Patents or Precision Platform Technology or any rights with respect to other products or therapies with which a Licensed Product may be combined.

4.3.2 Precision hereby grants to Baxalta a non-exclusive, royalty-bearing (in accordance with Section 8.4), transferable (in accordance with Section 17.1), sub-licensable (in accordance with Section 4.4) right and license under the Precision Platform Patents solely to the extent necessary to permit Baxalta's conduct of the activities licensed to Baxalta under the Precision Patents and Precision Know-How under Section 4.3.1 with respect to such Licensed Product.

4.3.3 Notwithstanding the exclusive licenses set forth in Section 4.3.1, and subject to the terms and conditions of this Agreement (including the Precision Restrictive Covenants), Precision and its Affiliates shall retain the right under the Precision Patents and Precision Know-How to: (a) practice the Precision Patents and Precision Know-How to exercise its rights and perform its obligations under this Agreement; (b) conduct research related to the Precision Platform Technology; and (c) practice and license Precision Patents and Precision Know-How outside the scope of the licenses granted to Baxalta under Section 4.3.1.

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4.4 Sublicenses.

4.4.1 Baxalta may exercise its rights and perform its obligations under this Agreement by itself or through the engagement of any of its Affiliates without Precision's prior written consent.

4.4.2 Baxalta may grant sublicenses of the rights granted to it under Section 4.3 to one or more Third Parties without Precision's prior written consent [***]. Notwithstanding the foregoing, Baxalta may not grant a sublicense to any potential Sublicensee if such potential Sublicensee, its Affiliates or its or their respective Agents (a) has ever been debarred or is subject to debarment or, to Baxalta's knowledge after reasonable inquiry, convicted of a crime for which a Person could be debarred before a Regulatory Authority under applicable Laws, or (b) to such Baxalta's knowledge after reasonable inquiry, has ever been under indictment for a crime for which a Person could be debarred under such Laws.

4.4.3 Baxalta shall remain responsible for all of its obligations under this Agreement that have been delegated, subcontracted or sublicensed to any of its Affiliates, Sublicensees or subcontractors. All such delegation, subcontracting and sublicensing shall be established by written agreements consistent with the terms and conditions of this Agreement in all material respects (including without limitation written obligations consistent with those required under Section 11.1.1(a) and written obligations of confidentiality and non-use consistent with this Agreement), and Baxalta shall be fully responsible for any breach of this Agreement by any of its Affiliates, Sublicensees or subcontractors. In addition, each sublicense granted under any one or more of the Precision Patents and/or Precision Platform Patents must grant the same scope of rights under each such Patent that is included in such sublicense grant.

4.5 No Other Licenses. Neither Party grants to the other Party any rights, licenses or covenants in or to any intellectual property, whether by implication, estoppel, or otherwise, other than the license rights that are expressly granted under this Agreement. Without limiting the foregoing, and except for the limited rights set forth in Section 16.2.2 or Section 16.3.2, if applicable, nothing in this Agreement shall be deemed to grant Baxalta any right to access or receive any Precision Platform Technology or to design, Develop or manufacture any genome engineering tools, or any precursor, intermediate or construct, within the Precision Platform Technology. Baxalta acknowledges and agrees that rights under certain Precision Patents and Precision Platform Patents are licensed to Precision by Cellectis S.A. (the "Cellectis Patents") under that certain Patent Cross-License Agreement between Cellectis S.A. and Precision dated January 23, 2014 (the "Cellectis Agreement"), and, notwithstanding any exclusive license granted to Baxalta under this Agreement, (a) Cellectis S.A. retains rights under the Cellectis Patents and is not restricted from granting rights to Third Parties under the Cellectis Patents, (b) any licenses and rights granted by Precision to Baxalta under the Cellectis Patents are granted only within the permissible scope of sublicenses granted under the Cellectis Agreement, and (c) pursuant to the Cellectis Agreement, Cellectis S.A. retains non-exclusive rights under certain Precision Patents and Precision Platform Patents identified in the Cellectis Agreement, which may be further sublicensed by Cellectis S.A. without Precision control or consent. Baxalta acknowledges and

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agrees that any exercise of any right by Cellectis S.A, or by any Third Party through Cellectis S.A, under the Cellectis Agreement shall not constitute a breach of this Agreement by Precision. Each Party shall not, and shall not permit any of its Affiliates or sublicensees to, practice any Patent Rights or Know-How licensed to it by the other Party outside the scope of the license granted to it under this Agreement.

ARTICLE V.
REGULATORY MATTERS

5.1 Regulatory Roles. The Parties shall have responsibility for the following activities with respect to Regulatory Filings for each Licensed Product Candidate or Licensed Product, as applicable (each Party's activities, its "Regulatory Role"):

5.1.1 With respect to each Licensed Product Candidate, Precision shall (subject to the oversight of the JSC, as provided in Section 3.1.1) prepare and file all Regulatory Filings (including an IND) for such Licensed Product Candidate that are to be filed at or prior to Phase II Ready Status for such Licensed Product Candidate pursuant to the applicable Development Plan, in each case in the name of Precision, and shall prepare and file all amendments to such Regulatory Filings that are required by applicable Regulatory Authorities or that are otherwise necessary to comply with applicable Laws. Without limiting the foregoing, Precision shall be responsible for attendance at all meetings (whether occurring in person or by telephone or other remote means) with applicable Regulatory Authorities with respect to each such Licensed Product Candidate; provided that Precision, where permitted by applicable Law, shall permit or may require Baxalta to designate up to two (2) Baxalta employees to attend such meetings. As promptly as practicable following and, in any event, unless prohibited by applicable regulations, within [***] following, the Commercial Option Exercise Date for a particular Licensed Product Candidate, Precision shall transfer and, if applicable, assign to Baxalta all clinical trial exemptions, all Regulatory Filings (including the IND file and supporting master files) and worldwide sponsorship for such Licensed Product Candidate, and will provide a copy of all related regulatory documents and regulatory information (including clinical, safety/pharmacovigilance and other data) in Precision's Control, including all communications with Regulatory Authorities, source documentation, analysis files, source program files, validation reports, study reports, Clinical Trial raw data sets (including all collected raw data, including, for example CRF data and lab data) in electronic form (or, if not available electronically, in paper form), study submission data sets in submission-ready electronic form, study documentation and all other documents and data reasonably necessary for Regulatory Filings, in each case regarding such Licensed Product Candidate; provided, that all such data, documents and other information, including the design history file (DHF) established to support such Licensed Product Candidate as required for any Regulatory Filings, shall be transferred to Baxalta using a mutually acceptable secure and validated transfer method; provided, further, that Precision shall be entitled to retain copies of any or all of the foregoing.

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5.1.2 Following the Commercial Option Exercise Date for each Licensed Product Candidate, Baxalta shall, at Baxalta's sole cost and expense, be solely responsible for and, without limiting Baxalta's obligations under Section 2.2.6, have sole control of all clinical, nonclinical and quality studies, creation of the Global Dossier and all regulatory matters (including ownership of all Regulatory Filings and all correspondence with Regulatory Authorities) for such Licensed Product, and shall use Commercially Reasonable Efforts to prepare and file all Regulatory Filings necessary to obtain Marketing Approvals and Reimbursement Approvals, and thereafter maintain such Marketing Approvals and Reimbursement Approvals, throughout the Territory in the name of Baxalta with respect to such Licensed Product. Baxalta shall own and be the license holder for all Marketing Approvals and Reimbursement Approvals for the Licensed Products and shall be responsible for complying with all requirements of Regulatory Authorities in the Territory after the Commercial Option Exercise Date.

5.1.3 Each Party shall bear its own costs and expenses for effecting its respective Regulatory Role.

5.2 Cooperation; Effort. Each Party will, at its sole cost and expense, cooperate with the other Party in providing technical regulatory expertise for assistance in developing the submission strategy for Regulatory Filings and defining technical content and will provide reasonable support to the other Party to ensure timely Regulatory Filings and other regulatory submissions reasonably necessary to obtain Marketing Approvals and Reimbursement Approvals, and any post-Marketing Approval or post-Reimbursement Approval Regulatory Filings or other regulatory submissions, in each case for each Licensed Product Candidate or Licensed Product, as applicable. Additionally, Precision shall provide to Baxalta, as promptly as practicable following Baxalta's request and at Baxalta's sole cost and expense, such assistance, cooperation and input (including documents and data) reasonably necessary for Baxalta to obtain Marketing Approvals and Reimbursement Approvals, together with any post-Marketing Approval or post-Reimbursement Approval Regulatory Filings or other regulatory submissions, in each case with respect to each Licensed Product, including information, data and documents reasonably necessary for Baxalta's creation of the Global Dossier. Baxalta shall designate a global regulatory affairs representative and Precision shall invite such representative to attend any substantive in-person or other meetings (including telephonic meetings) with Regulatory Authorities associated with Precision's Regulatory Role. Through the JSC, Baxalta shall have the right to review the content of all Regulatory Filings for each Licensed Product Candidate that are prepared or filed by Precision, and Precision agrees to consider in good faith Baxalta's comments with respect to each such Regulatory Filing; provided, that Precision shall provide such proposed Regulatory Filings to the members of the JSC at least [***] prior to filing such Regulatory Filings, together with the proposed filing date.

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5.3 Right of Reference. Each Party hereby grants to the other Party a "Right of Reference", as that term is defined in 21 C.F.R. § 314.3(b), to any data Controlled by such Party or its Affiliates (a) that relates to the Licensed Product Candidates or Licensed Products and (b) that each Party reasonably believes may be necessary or useful to the Development, manufacture or Commercialization of any Licensed Product Candidate or Licensed Product pursuant to this Agreement, and each Party will provide a signed statement to the foregoing effect, if so requested by the other Party in accordance with 21 C.F.R. § 314.50(g)(3).

5.4 Adverse Event Reporting. Promptly after the transfer by Precision to Baxalta of the Regulatory Filings with respect to a Licensed Product, Baxalta and Precision shall discuss in good faith whether their respective activities would require them to enter into a pharmacovigilance and adverse event reporting agreement setting forth the worldwide pharmacovigilance procedures for Baxalta and Precision with respect to the Licensed Product, such as safety data sharing, adverse event reporting and prescription events monitoring (the "Safety Agreement"). If Baxalta and Precision agree that a Safety Agreement is necessary or otherwise advisable, the Parties will work together in good faith to execute a Safety Agreement for such Licensed Product no later than [***] after transfer by Precision to Baxalta of the Regulatory Filings with respect to the applicable Licensed Product, provided that the procedures set forth in such agreement shall be in accordance with, and enable the Parties to fulfill, local and national regulatory reporting obligations under applicable Laws. In any event, Baxalta shall maintain the global adverse event database for each Licensed Product in the Territory at its cost and shall be responsible for adverse event reporting in accordance with applicable Laws related to the Licensed Product to the applicable Regulatory Authorities in the Territory, as well as responding to safety issues and to all requests of Regulatory Authorities related to the Licensed Products in the Territory. Each Party hereby agrees to comply with its respective obligations under each Safety Agreement and to cause its Affiliates and sublicensees to comply with such obligations.

5.5 Notification of Threatened Action. Each Party shall promptly notify the other Party of any information it receives regarding any threatened or pending action, inspection or communication by any Regulatory Authority, which such Party believes is reasonably likely to have a material adverse effect on any rights or licenses granted in this Agreement, including as may affect the claims of any Licensed Product Candidate or Licensed Product or the continued marketing of any Licensed Product. Upon receipt of such information, Baxalta and Precision shall consult with each other in an effort to arrive at a mutually acceptable procedure for taking appropriate action; however, Baxalta shall have final decision making authority with respect to any such action related to Licensed Product Candidates or Licensed Products. Baxalta shall have the right to determine whether or not to continue the marketing of any Licensed Product in the Field in any jurisdiction based on communications by Regulatory Authorities.

5.6 Remedial Actions. Each Party shall notify the other Party promptly, and promptly confirm such notice in writing, if it obtains information indicating that any Licensed Product Candidate or Licensed Product may be subject to any recall, corrective action or other regulatory action with respect to such Licensed Product Candidate or Licensed Product in the Field taken by virtue of applicable Laws (a "Remedial Action"). The Parties shall assist each other in gathering and evaluating such information as is necessary to determine the necessity of conducting a Remedial Action. Each Party shall, and shall ensure that its Affiliates and sublicensees will,

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maintain adequate records to permit the Parties to trace the manufacture of each Licensed Product Candidate and Licensed Product and the distribution and use of each Licensed Product Candidate and Licensed Product. Precision shall have sole discretion with respect to any matters relating to any Remedial Action directed towards any Licensed Product Candidate, including the decision to commence such Remedial Action and the control over such Remedial Action, at its sole cost and expense. Baxalta shall have sole discretion with respect to any matters relating to any Remedial Action directed towards any Licensed Product, including the decision to commence such Remedial Action and the control over such Remedial Action, at its sole cost and expense.

ARTICLE VI.
MANUFACTURING AND SUPPLY

6.1 Manufacturing and Supply Roles. The Parties shall have responsibility for the following activities with respect to manufacture and supply of each Licensed Product Candidate or Licensed Product, as applicable (each Party's activities, its "Manufacturing and Supply Role"):

6.1.1 With respect to each Licensed Product Candidate, Precision shall be solely responsible (subject to the oversight of the JSC), by itself or through one or more CMOs approved as set forth in Section 6.2, to use Commercially Reasonable Efforts to manufacture and supply pre-clinical and clinical trial materials necessary for Development of such Licensed Product Candidate through Phase II Ready Batch Success, including, as applicable, the Phase II Ready Batch.

6.1.2 With respect to each Licensed Product, Baxalta shall be solely responsible, by itself or through one or more CMOs, to use Commercially Reasonable Efforts to (a) manufacture and supply such Licensed Product for Development use after the Phase II Ready Batch and (b) manufacture and supply such Licensed Product for Commercialization, in each case for use in the Field in the Territory.

6.1.3 Following the Commercial Option Exercise Date for a Licensed Product Candidate, at such time as Baxalta notifies Precision in writing that Baxalta will initiate the manufacture of clinical or commercial supply of any Licensed Product itself or will engage a CMO to conduct such manufacture and supply pursuant to Baxalta's obligations under Section 6.1.2, Precision shall, at Baxalta's cost and expense, use Commercially Reasonable Efforts to perform a technology transfer of Precision's (or its CMOs') manufacturing process for the corresponding Licensed Product to Baxalta (or its designated Affiliate or CMO) pursuant to the applicable Technology Transfer Plan for such Licensed Product. Promptly following such written notice from Baxalta, the Parties shall establish the Technology Transfer Plan for the applicable Licensed Product, for the purpose of enabling technology transfer of Precision Know-How sufficient to allow Baxalta (or its Affiliates or CMOs) to manufacture and supply the Licensed Product for further Development and Commercialization of such Licensed Product. Baxalta shall pay Precision (or its Affiliates or CMOs) the Hourly Rate with respect to technical support provided for each hour of activities undertaken pursuant to the applicable Technology Transfer Plan. For

purposes of this Section 6.1.3, the "Hourly Rate" means [***]. Such technology transfer shall be subject to reasonable and appropriate restrictions on use and disclosure of Precision Know-How, including appropriate confidentiality agreements between Precision and any Third Party that is involved. Any representatives of Baxalta or its Affiliate or CMO, while present at Precision's facilities, shall comply with all terms and conditions of this Agreement and such rules, regulation, policies and procedures as are from time to time applicable to Precision's employees and such other reasonable requests as Precision may make from time to time. Without limiting the foregoing, Precision may isolate or require such representatives to abide by firewalls or other protective procedures designed to protect the confidential and proprietary information of Precision and Third Parties to which Baxalta does not have access rights under this Agreement. Baxalta shall be responsible for all activities of such representatives under this Agreement. In no event shall Precision be required to disclose or make available any Precision Platform Technology. The Parties acknowledge and agree that Baxalta or its CMO(s) shall hold all manufacturing licenses with applicable Regulatory Authorities for the Licensed Products and shall be solely responsible through itself or one or more CMOs for such manufacture.

6.1.4 Except to the extent otherwise expressly provided in Section 6.1.3, each Party shall bear its own costs and expenses for effecting its respective Manufacturing and Supply Role. For clarity, Precision has no obligation to perform any manufacture or supply of Licensed Products for Commercialization.

6.2 Supply Agreement. On or before a date to be established by the JSC but in no event later than [***] prior to initiation of manufacture of any Licensed Product Candidate that will be used by Baxalta in Clinical Trials, the Parties shall enter into a Supply Agreement pursuant to which Precision or its CMO, approved by the JSC as set forth below, will manufacture and supply clinical trial materials for Phase II Clinical Trials, including Phase II Ready Batches, to Baxalta. The terms of such Supply Agreement shall be negotiated in good faith by the Parties and will contain the terms attached hereto as Exhibit B and other customary terms and conditions that are consistent with this Agreement. All CMOs manufacturing and supplying clinical trial materials of Licensed Products for Clinical Trials must be approved by the JSC, except that Precision and [***] are deemed to be approved suppliers as of the Effective Date. The Supply Agreement will provide that Precision, and any contract service provider used by Precision, must maintain supplier compliance/cGMP status and ensure the production of any clinical product meets cGMP requirements.

6.2.1 Based on risk, the JSC will determine if other contract service providers in the Licensed Product supply chain will be required to be approved by the JSC.

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6.3 Quality Agreement. In connection with the negotiation and execution of a Supply Agreement, the Parties shall also enter into a separate agreement governing the quality control, quality assurance and validation (the "Quality") of any clinical trial materials for Phase II Clinical Trials delivered by Precision (or its CMO) to Baxalta under the Supply Agreement, including the requirement that Baxalta and Precision will implement a joint quality team to facilitate communication and consensus on issues related to quality of such clinical trial materials (the "Quality Agreement"). The Quality Agreement shall be negotiated in good faith by the Parties and will contain the terms attached hereto as Exhibit C and other customary terms and conditions that are consistent with this Agreement. The Quality Agreement will provide that Precision will have final functional Quality decision-making authority with respect to the clinical trial materials for Phase II Clinical Trials delivered to Baxalta and that Precision will have responsibility for Quality oversight of all Third Party manufacturers of such clinical trial materials that are engaged by Precision; provided, that no clinical trial materials may be used in humans without approval by the JSC.

ARTICLE VII.
COMMERCIALIZATION OF LICENSED PRODUCTS

7.1 Commercialization Responsibility. Subject to Section 7.2 and Section 7.3, Baxalta shall be solely responsible for and have sole control of all Commercialization activities for Licensed Products in the Field in the Territory, at Baxalta's sole cost and expense.

7.2 Diligence. After receiving Marketing Approval and, in countries of the EU, Reimbursement Approval, of a particular Licensed Product, for a country in the Territory, Baxalta shall use Commercially Reasonable Efforts to Commercialize such Licensed Product in such country in accordance with the terms of this Agreement and in compliance with all applicable Laws. With respect to determinations by Baxalta to discontinue Commercialization activities for a particular Licensed Product in all countries throughout the Territory, Baxalta shall give Precision written notice of such determination within a reasonable period of time, but in any event within [***] after any such determination is made, and upon provision of such notice Baxalta shall be deemed to have terminated this Agreement pursuant to Section 14.2.5 with respect to such Licensed Product.

7.3 Co-Development and Co-Promote Option.

7.3.1 On a Licensed Product-by-Licensed Product basis, Baxalta hereby grants to Precision an exclusive option to co-Develop and co-Promote such Licensed Product with Baxalta in the United States, and to share profits from the sales of any such co-Developed and co-Promoted Licensed Product in the United States with Baxalta, pursuant to the terms and conditions of Section 7.3.2 and a CDCP Agreement (each, a "CDCP Option").

7.3.2 Upon Precision's written request delivered to Baxalta within [***] after the Commercial Option Exercise Date for a particular Licensed Product, Baxalta shall prepare in good faith a summary Development plan for such Licensed Product for the United States and an estimated budget for the Development activities set forth in such plan. Baxalta shall provide a

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copy of such plan and budget to Precision within [***] of such request by Precision. Precision may exercise the CDCP Option for such Licensed Product by providing Baxalta with written notice within [***] after Precision's receipt of such plan and budget for such Licensed Product. The CDCP Option shall be exercisable by the delivery by Precision of written notice to Baxalta. Upon exercise of the CDCP Option for a Licensed Product, the following shall apply:

(a) Subject to Section 7.3.4, Baxalta and Precision shall promptly enter into good faith negotiations of and execute a co-Development, co-Promotion and profit share agreement consistent with the key terms set forth in Exhibit D as described in Section 7.3.3 (and in any event, no later than [***] after the date of exercise of the CDCP Option), pursuant to which the Parties will, notwithstanding anything to the contrary in this Agreement, equally share all remaining Development, manufacturing and Commercialization costs, and all profits and losses, with respect to the applicable Licensed Product in the United States (each, a "CDCP Agreement"), and

(b) On or prior to [***] after the execution of a CDCP Agreement with respect to the first Licensed Product Directed to a particular Included Target for which the CDCP Option is exercised, following Precision's receipt of Baxalta's invoice therefor, Precision shall pay [***] (the "CDCP Option Fee") to Baxalta.

For the avoidance of doubt, after payment of the CDCP Option Fee with respect to a Licensed Product Directed to a particular Included Target, Precision may elect to exercise the CDCP Option for any subsequent Licensed Product Directed to the same Included Target without payment of an additional CDCP Option Fee.

7.3.3 The key terms of the CDCP Agreement are set forth in Exhibit D. The Parties will negotiate in good faith a form of CDCP Agreement consistent with such terms and other terms and conditions that are typical for such agreements with respect to similarly situated products between similarly situated parties in the pharmaceutical industry promptly after the Effective Date (and in any event, no later than [***] after the Effective Date), and such form of CDCP Agreement shall be attached to this Agreement as Exhibit D-1 upon mutual agreement between the Parties.

7.3.4 In the event the Parties are unable to agree upon the terms of any CDCP Agreement, including the form of CDCP Agreement described in Section 7.3.3, the Parties will resolve the disagreement in accordance with the dispute resolution process set forth in ARTICLE XV.

7.3.5 During any period in which a CDCP Agreement is in effect with respect to a particular Licensed Product, notwithstanding anything to the contrary in ARTICLE VIII: (a) the obligation for Baxalta to pay [***] shall cease to apply; (b) the Calendar Year global Net Sales of such Licensed Product for purposes of calculating the Sales Milestones shall exclude [***]; and (c) the cumulative Calendar Year global Net Sales of such Licensed Product, for purposes of determining royalty rates payable under Section 8.4.1, shall [***].

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ARTICLE VIII.
PAYMENTS

8.1 Upfront Fee. In consideration of the Commercial Options, licenses, technology access and other rights granted to Baxalta under this Agreement, in addition to the payments specified in Section 8.2, Section 8.3 and Section 8.4, Baxalta shall pay to Precision, on or prior to the date that is fifteen (15) days after the Effective Date or, if such date is not a Business Day, on the next Business Day, a one time, non-refundable, non-creditable fee equal to one hundred five million USD ($105,000,000) (the "Upfront Fee"). Precision may invoice Baxalta for the Upfront Fee on the Effective Date.

8.2 Commercial Option Exercise Fee. In consideration for exercising its Commercial Option with respect to a particular Included Target, Baxalta shall pay to Precision a one-time, non-creditable, non-refundable exercise fee with respect to such Included Target, [***] (the "Commercial License Fee"). Precision may invoice Baxalta for the Commercial License Fee upon the Commercial Option Exercise Date for the first Licensed Product Candidate Directed to each Included Target. Baxalta shall pay such invoice within [***] after receipt of such invoice.

Achievement of Phase II Ready Batch Success	**Commercial License Fee**
On or prior to the date that is [***]	[***]
After the date that is [***] but on or prior to the date that is [***].	[***]
After the date that is [***]	[***]

[***]

8.3 Milestones. In addition to the payments specified in Section 8.1, Section 8.2 and Section 8.4, Baxalta shall, conditioned upon achievement of the applicable milestone, for each Licensed Product Candidate and Licensed Product, make the following payments to Precision in consideration of the licenses, technology access and other rights granted to Baxalta under this Agreement:

8.3.1 Development Milestones.

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(a) Baxalta shall pay to Precision the following non-creditable, non-refundable amounts for the first achievement of the following milestone events for each Licensed Product Candidate (as applicable) (each, a "Development Milestone"):

Development Milestone	Milestone Payment (USD)
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

(b) In addition, with respect to each Licensed Product, Baxalta shall pay to Precision the following non-creditable, non-refundable amounts for the first achievement of the following milestone events for such Licensed Product by Baxalta or any of its Affiliates or Sublicensees (each, also a "Development Milestone"):

Development Milestone	Milestone Payment (USD)
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

(c) As to the Licensed Product Candidate or Licensed Product, as applicable, each applicable milestone payment set forth in this Section 8.3.1 shall be payable by Baxalta upon the first achievement of the applicable Development Milestone [***]. In each case, Precision shall provide Baxalta with a corresponding invoice and Baxalta shall pay to Precision the applicable milestone payment described above within [***] after receipt of such invoice.

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8.3.2 Launch Milestones. As to each Licensed Product, Baxalta shall pay to Precision the following non-creditable, non-refundable amounts for the first achievement of the following milestone events for such Licensed Product by Baxalta of any of its Affiliates or Sublicensees (each, a "Launch Milestone"):

Launch Milestone	**Milestone Payment (USD)**
First Commercial Sale of the Licensed Product in [***]	[***]
First Commercial Sale of the Licensed Product in [***]	[***]
First Commercial Sale of the Licensed Product in [***]	[***]
First Commercial Sale of the Licensed Product in [***]	[***]
First Commercial Sale of the Licensed Product in [***]	[***]
First Commercial Sale of the Licensed Product in [***]	[***]

[***]

Each milestone payment set forth in this Section 8.3.2 shall be payable by Baxalta upon the first achievement of the applicable Launch Milestone, and Baxalta shall provide notice to Precision of such achievement within [***] following such achievement. Following Precision's receipt of a notice described in the immediately preceding sentence, Precision shall provide Baxalta with a corresponding invoice and Baxalta shall pay to Precision the applicable milestone payment described above within [***] after receipt of such invoice.

8.3.3 Sales Milestones. As to each Licensed Product, Baxalta shall pay to Precision the following non-creditable, non-refundable amounts for the first achievement of the following milestone events for such Licensed Product (each, a "Sales Milestone"):

Sales Milestone	**Milestone Payment (USD)**
First achievement of [***]	[***]
First achievement of [***]	[***]
First achievement of [***]	[***]

For the avoidance of doubt, (a) each of the milestone payments set forth above in this Section 8.3.3 shall be payable no more than one time for any particular Licensed Product, (b) Net Sales of the applicable Licensed Product shall be aggregated globally without regard to the identity of the selling entity in any particular country of the Territory (e.g., Baxalta or any of its Affiliates or Sublicensees) for purposes of determining whether the above Net Sales thresholds have been achieved, and (c) Net Sales of different Licensed Products shall not be aggregated for purposes of determining whether the above Net Sales thresholds have been achieved.

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Each milestone payment set forth in this Section 8.3.3 shall be payable by Baxalta upon the first achievement of the applicable Sales Milestone, and Baxalta shall provide notice to Precision of such achievement within [***] following such achievement. Following Precision's receipt of a notice described in the immediately preceding sentence, Precision shall provide Baxalta with a corresponding invoice and Baxalta shall pay to Precision the applicable milestone payment described above within [***] after receipt of such invoice.

8.4 Royalty Payment; Audits.

8.4.1 Royalty Payments. In addition to the payments specified in Section 8.1, Section 8.2 and Section 8.3, in consideration of the licenses, technology access and other rights granted to Baxalta under this Agreement, on a Licensed Product-by-Licensed Product basis, Baxalta shall pay to Precision non-creditable, non-refundable royalty payments at the following royalty rates on the applicable portion of cumulative Calendar Year global Net Sales of the applicable Licensed Product:

Cumulative Calendar Year Global Net Sales of the Applicable Licensed Product	**Royalty Rate**
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]

[***]

[***]

8.4.2 Royalty Stacking. Subject to the terms herein, if Baxalta, its Affiliate or Sublicensee enters into one or more Third Party License Agreement(s) with respect to a particular Licensed Product in a particular country or countries, then Baxalta's obligation to pay royalties to Precision with respect to sales of such Licensed Product in such country or countries in a particular Calendar Quarter shall be reduced by [***] provided that no royalty payment to Precision for a Licensed Product hereunder shall be reduced, pursuant to this Section 8.4.2, to less than [***] of the royalty payment that would otherwise be due to Precision in the absence of a reduction pursuant to this Section 8.4.2.

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8.4.3 Royalty Term. Baxalta's obligation to pay royalties pursuant to this Section 8.4 shall expire, on a country-by-country and Licensed Product-by-Licensed Product basis, upon the last to occur of: (a) the expiration of the last to expire Valid Claim of all Precision Patents Covering such Licensed Product, (b) expiration of all Regulatory Exclusivity with respect to such Licensed Product in the applicable country of sale, and (c) [***] after the First Commercial Sale of such Licensed Product in such country (with respect to a particular Licensed Product in a particular country, the "Royalty Term"). [***]

8.4.4 Royalty Reductions. Notwithstanding Section 8.4.3, if, during any portion of the Royalty Term, there is no [***], the royalty payments due pursuant to Section 8.4.1 during such portion of the Royalty Term for sales of such Licensed Product in such country shall be reduced to [***].

8.4.5 [***].

8.4.6 Royalty Payment Timing; Royalty Reports. Within [***] following the end of each Calendar Quarter during which royalties accrue, Baxalta shall provide Precision with a Sales Report and any other information reasonably required by Precision for the purpose of calculating royalties and Sales Milestone payments due under this Agreement. Any royalty payments due to Precision will be paid on the date of delivery of such Sales Report. In the event that either Party determines that the calculation of Net Sales for a Calendar Quarter deviates from the amounts previously reported to Precision for any reason (such as, on account of additional amounts collected or Licensed Product returns), Baxalta and Precision shall reasonably cooperate to reconcile any such deviations to the extent necessary under applicable legal or financial reporting requirements.

8.4.7 Audit. Until the expiration of all royalty payment obligations hereunder and for a period of [***] thereafter, Baxalta shall keep complete and accurate records pertaining to the sale or other disposition of Licensed Products by Baxalta, its Affiliates and Sublicensees in sufficient detail to permit Precision to confirm the accuracy of the royalties and Sales Milestone payments due hereunder. Precision shall have the right to cause an independent internationally recognized accounting firm reasonably acceptable to Baxalta to audit such records for the sole purpose of confirming Net Sales and royalties for a period covering not more than the preceding [***]. Baxalta may require such accounting firm to execute a reasonable confidentiality agreement with Baxalta prior to commencing the audit. Such audits may be conducted during normal business hours upon reasonable prior written notice to Baxalta, but no more frequently than [***]. No accounting period of Baxalta shall be subject to audit more than one time by Precision, unless after an accounting period has been audited by Precision, Baxalta restates its financial results for such accounting period, in which event Precision may conduct a second audit of such accounting period

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in accordance with this Section 8.4.7. Adjustments (including remittances of underpayments or overpayments disclosed by such audit) shall be made by the Parties to reflect the results of such audit, which adjustments shall be paid (plus interest as set forth in Section 8.6) promptly following receipt of an invoice therefor. Precision shall bear the full cost and expense of such audit unless such audit discloses an underpayment by Baxalta of [***] or more of the amount of royalties due under this Agreement for the audited period, in which case Baxalta shall bear and reimburse Precision for the full cost and expense of such audit.

8.5 Taxes. All payments under this Agreement shall be made without any deduction or withholding for or on account of any tax, except as set forth in this Section 8.5. The Parties agree to cooperate with one another and use reasonable efforts to minimize under applicable Law obligations for any and all income or other taxes required by applicable Law to be withheld or deducted from any of the royalty and other payments made by or on behalf of a Party hereunder ("Withholding Taxes"). The applicable paying Party under this Agreement (the "Paying Party") shall, if required by applicable Law, deduct from any amounts that it is required to pay to the recipient Party hereunder (the "Recipient Party") an amount equal to such Withholding Taxes; provided that the Paying Party shall give the Recipient Party reasonable notice prior to paying any such Withholding Taxes. Such Withholding Taxes shall be paid to the proper taxing authority for the Recipient Party's account and, if available, evidence of such payment shall be secured and sent to Recipient Party within [***] after such payment. The Paying Party shall, at the Recipient Party's sole cost and expense, as mutually agreed by the Parties, do all such lawful acts and things and sign all such lawful deeds and documents as the Recipient Party may reasonably request to enable the Parties to avail themselves of any applicable legal provision or any double taxation treaties with the goal of paying the sums due to the Recipient Party hereunder without deducting any Withholding Taxes. For US federal income tax purposes, Baxalta will report the payments made under this Agreement in the manner required by the US Internal Revenue Code (the "Code"). The Parties agree that this Agreement does not constitute a financial option for US federal income tax purposes as described in section 1234 of the Code.

8.6 Late Payments. If Precision does not receive payment of any sum due to it under this Agreement on or before the due date, interest shall thereafter accrue on the sum due to Precision from the due date until the date of payment, such interest to be calculated at a rate equal to [***].

8.7 Reporting. All financial reporting hereunder shall be, if applicable, on the basis of U.S. GAAP, consistently applied.

8.8 Currency; Exchange Rate. All payments to be made under this Agreement shall be made in USD by bank wire transfer in immediately available funds to a bank account designated by written notice from Precision. With respect to sales not denominated in USD, Baxalta shall convert each applicable quarterly sales in foreign currency into USD by using the then current and reasonable standard exchange rate methodology applied by Baxalta in its worldwide accounting practices, consistent with U.S. GAAP, consistently applied. Based on the resulting sales in USD, the then applicable royalties shall be calculated. The initial wire transfer instructions for Precision are set forth on Exhibit H.

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ARTICLE IX.
INVENTIONS; ACCESS TO IMPROVEMENTS; PATENTS; TRADEMARKS

9.1 Ownership.

9.1.1 With respect to all Patents, Know-How and other intellectual property Controlled by a Party prior to the Effective Date or first invented (as determined in accordance with U.S. patent laws) outside of the course of activities performed under this Agreement ("Background IP"), as between the Parties, such Background IP shall be deemed owned by the Controlling Party. Without limiting the foregoing, Precision Platform Technology and Precision Platform Patents shall be deemed Precision's Background IP, and Isolex Platform Technology and Isolex Platform Patents shall be deemed Baxalta's Background IP.

9.1.2 Subject to Section 9.1.3, (a) any Invention invented (as determined in accordance with U.S. patent laws) solely by Agents of a Party or its Affiliates in the course of performing activities under this Agreement, together with all intellectual property rights therein, shall be owned by such Party and (b) any Invention invented (as determined in accordance with U.S. patent laws) jointly by at least one (1) Agent of each Party or such Party's Affiliate, together with all intellectual property rights therein ("Joint Inventions", and all Patents claiming such Joint Inventions, hereinafter, "Joint Patents"), shall be owned jointly by the Parties in accordance with joint ownership interests of co-inventors under U.S. patent laws, with each joint Party having, unless otherwise set forth in this Agreement, an equal, undivided interest therein, with the unrestricted right to practice, exploit, license and grant its rights to sublicense any such Joint Invention without a duty of accounting or an obligation to seek consent from the other Party, subject to the exclusive licenses granted to the other Party, the payment obligations under this Agreement and the Restrictive Covenants set forth in Section 11.2. Each Party shall promptly disclose to the other Party in writing any Inventions and any written Invention disclosures, or other similar documents, submitted to it by its Agents describing each and every Invention that constitutes an Invention owned by the other Party or a Joint Invention, and all Know-How relating to such Invention that is in the disclosing Party's possession.

9.1.3 Notwithstanding Section 9.1.2:

(a) Subject to Section 9.1.3(c), to the extent any Invention comprises an improvement or modification of Precision Platform Technology (a "Precision Invention"), such Precision Invention will be solely owned by Precision (as Precision Platform Technology or Precision Platform Patents, as applicable) irrespective of inventorship, and Baxalta agrees to assign and hereby assigns all of its right, title and interest in and to the Precision Inventions (and any intellectual property rights thereto) to Precision and agrees to execute such documents and perform such other acts as Precision may reasonably request to obtain, perfect and enforce its rights to such Precision Inventions and the assignment thereof.

(b) Subject to Section 9.1.3(c), to the extent any Invention comprises an improvement or modification of Isolex Platform Technology (a "Baxalta Invention"), such Baxalta Invention will be solely owned by Baxalta (as Isolex Platform Technology or Isolex Platform Patents, as applicable) irrespective of inventorship, and Precision agrees to assign and hereby assigns all of its right, title and interest in and to the Baxalta Inventions (and any intellectual property rights thereto) to Baxalta and agrees to execute such documents and perform such other acts as Baxalta may reasonably request to obtain, perfect and enforce its rights to such Baxalta Inventions and the assignment thereof.

(c) If any Invention comprises only an improvement or modification of both the Precision Platform Technology and the Isolex Platform Technology, such Invention shall be jointly owned by the Parties (as Joint Inventions or Joint Patents, as applicable) irrespective of inventorship, and to the extent ownership is not already vested jointly by inventorship, each Party agrees to assign and hereby assigns such joint right, title and interest in and to such Joint Inventions (and any intellectual property rights thereto) to the other Party as is necessary for each of the Parties to own an equal, undivided interest therein, and agrees to execute such documents and perform such other acts as the other Party may reasonably request to obtain, perfect and enforce its rights to such Joint Inventions and the assignment thereof. Such Joint Inventions and Joint Patents shall be subject to all terms of this Agreement applicable to Joint Inventions and Joint Patents.

9.2 Prosecution of Patents.

9.2.1 Non-Product-Related Precision Patents. Precision shall have sole discretion and authority, at its sole cost and expense, with respect to filing, prosecuting and maintaining (a) all Precision Patents that do not include claims directed to CAR-Ts, human T cell engineering, one or more Licensed Product Candidates or Licensed Products, or manufacture or components of one or more Licensed Product Candidates or Licensed Products, and (b) all Precision Platform Patents. Baxalta acknowledges and agrees that Precision has no rights or responsibility for filing, prosecuting or maintaining the Cellectis Patents.

9.2.2 Product-Related Precision Patents. Precision shall have the first right and authority to file, prosecute, and maintain the Precision Patents, other than those described in Section 9.2.1 and other than Joint Patents (collectively, "Product-Related Patents"), on a worldwide basis in its sole discretion, subject to this Section 9.2.2. Precision shall be solely responsible for all costs and expenses incurred in connection with such filing, prosecution and maintenance in the Territory. Precision shall provide Baxalta with the opportunity to review and comment on any and all prosecution efforts, but in no case less than [***] prior to any filing deadlines, regarding the Product-Related Patents within the Territory; provided, that Precision shall have final control over such prosecution efforts after reasonably considering Baxalta's comments, if any (and if Baxalta does not provide comments within [***] after such opportunity, Baxalta shall be deemed to have no comment on such prosecution efforts). Precision shall provide Baxalta with a copy of material communications from Patent authorities in the Territory regarding

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the Product-Related Patents, and shall provide drafts of any material filings or responses to be made to such Patent authorities with respect to such Product-Related Patents in a timely manner. Notwithstanding the foregoing, if Precision determines in its sole discretion to abandon or not maintain in the Territory any Product-Related Patents (other than allowing the lapse of any provisional patent application, or abandonment of any patent application in favor of a continuation), Precision shall provide Baxalta with at least [***] prior written notice of such determination and shall assign to Baxalta an equal, undivided interest in such Product-Related Patent and permit Baxalta, at its discretion and expense, to continue filing, prosecution and maintenance of such Product-Related Patent. Such Product-Related Patent shall thereafter be deemed to be a Joint Patent. Baxalta's filing, prosecution or maintenance of such Product-Related Patent shall not change the Parties' respective rights and obligations under this Agreement with respect to such Product-Related Patent other than those expressly set forth in this Section 9.2.2. Baxalta will have the right to deduct any costs or expenses it incurs in the performance of filing, prosecution or maintenance of such Product-Related Patents from any amounts payable by Baxalta to Precision under this Agreement.

9.2.3 Joint Patents. With respect to any potentially patentable Joint Inventions, the Parties shall meet and agree in good faith upon which Party shall file, prosecute and maintain Patent applications claiming such Joint Invention in particular countries and jurisdictions throughout the Territory. The Parties will designate one or the other Party to file, prosecute and maintain each such Patent application and coordinate their efforts as appropriate to make such prosecution activities as efficient, convenient, and harmonious as possible. All costs and expenses of filing, prosecuting and maintaining a Joint Patent shall be shared equally by the Parties. The Party that prosecutes a particular Joint Patent (the "Prosecuting Party") shall provide the other Party the opportunity to review and comment on any and all such prosecution efforts, but in no case less than [***] prior to any filing deadlines, regarding the applicable Joint Patent in the particular countries and jurisdictions in the Territory, and such other Party shall provide the Prosecuting Party reasonable assistance in such efforts; provided, that the Prosecuting Party shall have final control over such prosecution efforts after reasonably considering the other Party's comments, if any (and if the other Party does not provide comments within [***] after such opportunity, such Party shall be deemed to have no comment on such prosecution efforts). The Prosecuting Party shall provide the other Party with a copy of all material communications from Patent Authorities in the Territory regarding the Joint Patent being prosecuted by such Party, and shall provide drafts of any material filings or responses to be made to such Patent authorities with respect to such Joint Patent in a timely manner. In particular, each Party agrees to provide the other Party with all information necessary or desirable to enable the other Party to comply with any duty of candor or duty of disclosure requirements of any Patent authority. Notwithstanding the foregoing, if the Prosecuting Party determines in its sole discretion to abandon or not maintain in any country or jurisdiction of the Territory any Joint Patent (other than allowing the lapse of any provisional patent application, or abandonment of any patent application in favor of a continuation), the Prosecuting Party shall provide the other Party with at least [***] prior written notice of such determination and the other Party shall thereafter have the right, but not the obligation, at its sole discretion and expense, to continue filing, prosecution and maintenance of such Joint Patent.

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9.2.4 Baxalta Patents. Baxalta shall have sole discretion and authority, at its sole cost and expense, with respect to filing, prosecuting and maintaining (a) all Baxalta Patents, and (b) all Isolex Platform Patents.

9.2.5 Cooperation in Prosecution. Each Party shall, at its sole cost and expense, provide the other Party all reasonable assistance and cooperation in the Patent prosecution efforts described above in this Article IX, including providing any necessary powers of attorney and executing any other required documents or instruments for such prosecution. Such cooperation may further include coordinating filing or prosecution of applications to avoid potential issues during prosecution (including novelty, enablement, estoppel, double-patenting and execution of amendments), and the assistance of each Party's relevant personnel. Each Party will use reasonable efforts via consultation with the JSC to avoid creating potential issues in prosecution of the applications for Precision Patents, Precision Platform Patents, Baxalta Patents, Isolex Platform Patents and Joint Patents.

9.3 Licenses to Enabling Technologies.

9.3.1 If Precision, in its good faith discretion, identifies any enabling technologies that are reasonably necessary for the use of Precision Platform Technology to engineer CAR-Ts to create Licensed Product Candidates in accordance with the Development Plans under this Agreement (such technology, "Platform Enabling Technology"), (a) Precision shall promptly inform the JSC of such Platform Enabling Technology, and (b) if approved by the JSC for use under the Development Plans in accordance with this Agreement [***].

9.3.2 If Baxalta, in its good faith discretion, identifies any enabling technologies that are reasonably necessary for the commercial-scale manufacturing, Development after Phase II Ready Status or Commercialization of Licensed Products in accordance with this Agreement (such technology, "Commercialization Enabling Technology"), (a) Baxalta shall promptly inform the JSC of such Commercialization Enabling Technology, and (b) [***].

9.3.3 If either Party, in its good faith discretion, identifies any other enabling technologies that are not clearly within the scope of Platform Enabling Technology or Commercialization Enabling Technology (such technology, "Other Enabling Technology"), (a) such Party shall promptly inform the JSC of such Other Enabling Technology, and (b) if approved by the JSC for use in the Development or Commercialization of the Licensed Product in accordance with this Agreement, [***].

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9.3.4 With respect to any Platform Enabling Technology, Commercialization Enabling Technology, Other Enabling Technology or any other technology Controlled by either Party and used in connection with this Agreement, each Party acknowledges that such technology may be subject to certain restrictions or other terms and conditions set forth in the agreement or agreements under which such Party obtained access to such technology. Prior to either Party delivering any such technology to the other Party, the use of which would be subject to any such restrictions or other terms or conditions not imposed by any other provision of this Agreement, such Party shall notify the JSC in writing of such applicable restrictions or other terms or conditions, and as a condition of using such technology, such other Party shall comply with such restrictions, terms and conditions.

9.4 Duke IP. Baxalta acknowledges and agrees that any licenses and rights granted by Precision to Baxalta under the Duke IP are granted subject to the terms and conditions of the Duke Agreement, including Duke's right to practice under the Duke IP for its own internal, non-commercial, educational, research and clinical purposes, and subject to the rights of the United States Government and applicable limitations under 37 C.F.R. § 401, Public Law 96-517 and Public Law 98-620 resulting from the United States Government's funding of research leading to creation of the Duke IP. Without limiting the foregoing, Baxalta agrees to comply with any obligations resulting from such government rights with respect to its practice of the Duke IP (if any) under this Agreement.

9.5 Infringement of Patents by Third Parties.

9.5.1 Notification. Each Party shall promptly notify the other Party in writing of any existing or threatened infringement by a Third Party of the Precision Patents, Precision Platform Patents, Baxalta Patents, Isolex Platform Patents or the Joint Patents of which it becomes aware in the Territory, and shall provide to the other Party any and all evidence and information available to such Party regarding such alleged infringement. Any such infringement that results from making, using, importing, offering for sale, or selling any Licensed Product Directed to an Included Target in the Field during any period in which Baxalta holds a Commercial License to such Licensed Product with respect to such Included Target, including any "patent certification" filed in the United States under 21 U.S.C. § 355(b)(2) or 21 U.S.C. § 355(j)(2) or similar provisions in other jurisdictions is referred to as "Product Infringement" for purposes of this Section 9.5.

9.5.2 Product Infringement in the Territory.

(a) Baxalta shall have the first right, but not the obligation, to bring an appropriate suit or other action against any Third Party engaged in Product Infringement in the Territory based on Precision Patents or Joint Patents, subject to Section 9.5.2(d). Baxalta shall have a period of [***] after such notification to or by Precision, to elect to so enforce such Precision Patent or Joint Patent, as applicable, in the Territory. If Baxalta does not so elect, Baxalta shall so notify Precision in writing during such [***] period, or [***] prior to any deadline relating to loss of any rights with respect to the Product Infringement, whichever is earlier, and Precision shall have the right, but not the obligation, to commence a suit or take action to enforce any such Precision Patent or Joint Patent against such Third Party allegedly perpetrating such Product

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Infringement. Each Party shall provide to the Party enforcing any such rights under this Section 9.5.2(a) (the "Enforcing Party") reasonable assistance in such enforcement, including joining an action as a party plaintiff if so required by applicable Laws to pursue such action, at the Enforcing Party's sole expense. The Enforcing Party shall keep the other Party regularly informed of the status and progress of such enforcement efforts, and shall reasonably consider the other Party's comments on any such efforts. The Enforcing Party shall bear and be responsible for all costs incurred in connection with each Party's activities under this Section 9.5.2(a).

(b) Baxalta shall have the sole and exclusive right, but not the obligation, in its sole discretion to bring an appropriate suit or other action against any Third Party engaged in Product Infringement in the Territory based on the Baxalta Patents or Isolex Platform Patents.

(c) Precision shall have the sole and exclusive right, but not the obligation, in its sole discretion to bring an appropriate suit or other action against any Third Party engaged in Product Infringement in the Territory based on the Precision Platform Patents.

(d) The Party not bringing an action with respect to Product Infringement under this Section 9.5.2 shall be entitled to separate representation in such matter by counsel of its own choice and at its own expense, but such Party shall at all times cooperate fully with the Party bringing such action. Additionally, the Party not bringing an action under this Section 9.5.2 may have an opportunity to participate in such action, at its sole cost and expense, to the extent that the Parties may mutually agree at the time the Enforcing Party elects to bring such action hereunder.

9.5.3 Non-Product Infringement in the Territory.

(a) For infringement of the Joint Patents in the Territory that is not Product Infringement, the Parties shall confer to determine which Party shall have the first right to bring an appropriate suit or other action against the Third Party engaged in such infringement, and the manner in which the Parties shall bear costs of and share related damage recoveries from such suit or action. The Party that brings such suit or actions (also the "Enforcing Party") shall keep the other Party regularly informed of the status and progress of such enforcement efforts, and shall reasonably consider the other Party's comments on any such efforts. The other Party shall cooperate with the Enforcing Party in enforcing Joint Patents against such infringement, including joining an action as a party plaintiff if so required by applicable Laws to pursue such action. If the Parties are unable to reach agreement upon which a Party shall bring an appropriate suit or other action against any Third Party engaged in such infringement of such Joint Patent within [***] prior to any deadline relating to loss of any rights with respect to such infringement, whichever is earlier, then Baxalta shall have the first right, but not the obligation, to bring such suit or other actions against such infringement in the Territory at its sole expense. The Party that does not bring such suit or action shall have the right to participate in such actions at its expense upon written notice to the other Party. The Enforcing Party shall bear and be responsible for all costs incurred in connection with each Party's activities under this Section 9.5.3(a).

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(b) Baxalta shall have the sole and exclusive right, but not the obligation, in its sole discretion to bring an appropriate suit or other action against any Third Party engaged in infringement that does not constitute Product Infringement in the Territory, based on the Baxalta Patents or Isolex Platform Patents.

(c) Precision shall have the sole and exclusive right, but not the obligation, in its sole discretion to bring an appropriate suit or other action against any Third Party engaged in infringement that does not constitute Product Infringement in the Territory, based on the Precision Patents or Precision Platform Patents.

9.5.4 Settlement. No Party shall settle any claim, suit or action that it brings under this Section 9.5 involving Precision Patents or Joint Patents in any manner that would, in the other Party's reasonable judgment, materially and adversely impact the other Party or that would have the effect of diminishing any rights or licenses granted hereunder, including settlements involving the ownership, validity or enforceability of any of the Precision Patents or Joint Patents, or that do not include a full and unconditional release from all liability of the other Party, without the prior written consent of the other Party, which shall not be unreasonably withheld, conditioned or delayed.

9.5.5 Allocation of Proceeds. Except as otherwise provided in this Section 9.5, if either Party recovers monetary damages from any Third Party in a suit or action described in this Section 9.5, such recovery shall be allocated first to the repayment of costs and expenses of the Party(ies) with respect to the action (on a pro rata basis), and any remaining damages [***].

9.5.6 Certain Limitations. Baxalta acknowledges and agrees that (a) Precision has no rights or responsibility for enforcing the Cellectis Patents, and therefore all references to Precision Patents or Precision Platform Patents in this Section 9.5 shall be deemed to exclude the Cellectis Patents for all purposes, (b) prior to initiating enforcement actions against a Third Party with respect to certain Precision Patents or Precision Platform Patents which were subject to the non-exclusive license granted by Precision to Cellectis S.A. pursuant to the Cellectis Agreement, Precision is required by the Cellectis Agreement to confirm that Cellectis S.A has not granted a license to such Third Party under such Precision Patents or Precision Platform Patents, and Baxalta will cooperate with Precision in taking such actions as required by the Cellectis Agreement, and (c) Duke retains discretion as to whether to become a party plaintiff and has certain rights with respect to enforcement of Patent Rights contained within the Duke IP in the event Precision does not enforce such Patent Rights.

9.6 Infringement of Third Party Rights in the Territory.

9.6.1 Notice. If the Development, use, manufacture or Commercialization of any Licensed Product in the Field and in the Territory results in a claim for Patent infringement by a Third Party, the Party first having notice of such claim shall promptly notify the other Party in writing of such a claim. Following such notice, the Parties agree to enter into either a joint defense or common interest agreement, under which agreement the Parties can share the known facts of such infringement in reasonable detail, if they are advised to do so by counsel.

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9.6.2 Third Party Claims. Baxalta shall assume control of the defense of any claims brought by Third Parties alleging infringement of Third Party intellectual property rights in connection with Baxalta's Development, manufacture, use or Commercialization of any Licensed Product in the Field in the Territory, represented by its own counsel. If requested by Baxalta, Precision agrees to join in any such litigation, and in any event shall reasonably cooperate with Baxalta, at Baxalta's sole cost and expense. Baxalta shall have the exclusive right to settle any such claim without the consent of Precision, unless such settlement shall materially and adversely affect Precision's rights under the Precision Patents, Precision Platform Patents, or Joint Patents, including on the ownership, validity or enforceability thereof. Any costs and expenses incurred in defending any such claims shall be solely the responsibility of Baxalta (without limiting Baxalta's rights under Section 8.4.2), provided that if Precision elects to retain separate representation in the defense of any such claims brought by Third Parties using counsel of its own choice, it shall do so solely at its cost and expense.

9.6.3 Potential Third Party Claims. In the event that either Party becomes aware of a Third Party intellectual property right that might reasonably be expected to give rise to a claim of infringement under this Section 9.6, that Party shall promptly notify the other Party of such intellectual property right and all relevant facts and circumstances known to the discovering Party. Following such notice, the Parties agree to enter into either a joint defense or common interest agreement, under which agreement the Parties can share the known facts of such infringement in reasonable detail, if they are advised to do so by counsel, and to consult thereafter regarding any corrective or preventive action to be taken to address such potential claim.

9.7 Patent Oppositions and Other Proceedings.

9.7.1 By the Parties. If either Party desires to bring an opposition, action for declaratory judgment, nullity action, interference, declaration for non-infringement, reexamination, inter partes review or other attack upon the validity, title, or enforceability of a Patent owned or controlled by a Third Party that claims, in the Territory, any Licensed Product Candidate or Licensed Product, or the manufacture, use or Commercialization of any Licensed Product Candidate or Licensed Product (except insofar as such action is a counterclaim to or defense of, or accompanies a defense of, a Third Party's claim or assertion of infringement under Section 9.6, in which case the provisions of Section 9.6 shall govern), such Party shall so notify the other Party, and the Parties shall promptly confer to determine whether to bring such action or the manner in which to settle such action. Baxalta shall have the first right, but not the obligation, to bring in its sole control and at its sole cost and expense such action in the Territory. If Baxalta does not bring such action within [***] after notification thereof pursuant to this Section 9.7 (or earlier, if required by the nature of the proceeding), then Precision shall have the right, but not the obligation, to bring, in Precision's sole control and at its sole cost and expense, such action. The

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Party not bringing an action under this Section 9.7 shall join the action as a joint party plaintiff if required to enable the other Party to bring such action, at the other Party's sole cost and expense. Additionally, if appropriate, the Party not bringing the applicable action under this Section 9.7 shall be entitled to separate representation, at its sole cost and expense, in such proceeding by counsel of its own choice, and shall reasonably cooperate with the Party bringing such action. Any awards or amounts received in bringing any such action shall be first allocated to reimburse the Parties' expenses in such action, and any remaining amounts shall be retained by the Party bringing such action.

9.7.2 By Third Parties.

(a) Precision Patents. If a Precision Patent becomes the subject of any proceeding commenced by a Third Party in the Territory in connection with an opposition, reexamination request, action for declaratory judgment, nullity action, interference, inter partes review or other attack upon the validity, title or enforceability thereof, then Precision shall have the first right, but not the obligation, to control such defense at its sole cost and expense. Precision shall permit Baxalta to participate in the proceeding to the extent permissible under applicable Laws, and to be represented by its own counsel in such proceeding, at Baxalta's sole cost and expense. If Precision decides that it does not wish to defend against such action, then Baxalta shall have a right to assume defense of such Third Party action.

(b) Joint Patents. If a Joint Patent becomes the subject of any proceeding commenced by a Third Party in the Territory in connection with an opposition, reexamination request, action for declaratory judgment, nullity action, interference, inter partes review or other attack upon the validity, title or enforceability thereof (except insofar as such action is a counterclaim to or defense of, or accompanies a defense of, an action for infringement against a Third Party under Section 9.5, in which case the provisions of Section 9.5 shall govern), then Baxalta shall have the first right, but not the obligation, to control such defense at its sole cost and expense. Baxalta shall permit Precision to participate in the proceeding to the extent permissible under applicable Laws, and to be represented by its own counsel in such proceeding, at Precision's sole cost and expense. If Baxalta decides that it does not wish to defend against such action, then Precision shall have a right to assume defense of such Third Party action.

(c) Allocation of Costs and Proceeds. Except as set forth above, all expenses incurred by the Parties in an action under this Section 9.7 shall be borne by the Party controlling the defense of the Third Party action. Any awards or amounts received in defending any such Third Party action, if any, shall be allocated between the Parties as provided in Section 9.5.5 as if the Party controlling the defense of the Third Party action were the Party that brought an action against an alleged infringer.

9.8 Patent Term Extensions in the Territory. The patent counsel of each Party shall discuss and recommend for which, if any, of the Precision Patents and Joint Patents in the Territory the Parties should seek any term extensions, supplementary protection certificates, and equivalents thereof offering Patent protection beyond the initial term with respect to any issued Patents ("Patent Term Extensions") licensed to Baxalta hereunder in the Territory. If Precision consents to applying for any such Patent Term Extension (such consent not to be unreasonably withheld,

conditioned or delayed), Baxalta shall thereafter have (i) the final decision making authority with respect to applying for any such Patent Term Extensions in the Territory; provided that Baxalta shall not unreasonably fail or refuse to do so, and (ii) the sole right to apply for any such Patent Term Extensions Baxalta decides to seek, at its expense; provided, however, that to the extent any such application for Patent Term Extension must be filed in the name of Precision, Precision hereby grants (effective as of the date of its consent) Baxalta the power to file such application on behalf of or as agent for Precision. Precision shall cooperate fully with Baxalta, at Baxalta's expense, in making such filings or taking any related actions, for example and without limitation, making available all required regulatory data and information and executing any required authorizations to apply for such Patent Term Extension.

9.9 Registration of License. Precision agrees that Baxalta may, if applicable, register its license under the Precision Patents or Joint Patents with the Patent authorities in the Territory. Baxalta shall, at its expense, prepare and deliver to Precision such instruments and other documents reasonably necessary and in proper form for such registration. The Parties shall mutually agree on the form of documents to be used for such purpose, and shall cooperate to preserve confidentiality of this Agreement to the extent permitted under applicable Laws in the relevant country. Precision shall execute and return to Baxalta such instruments and documents within [***] from the receipt thereof.

9.10 [***]

9.10.1 [***]

9.10.2 [***]

9.10.3 [***]

9.11 Trademarks. Baxalta shall have the sole right to brand the Licensed Products using Baxalta related trademarks, service marks, names, logos, design or trade dress it determines appropriate for the Licensed Products, which may vary by country or within a country ("Licensed Product Marks"). Baxalta shall own all rights in the Licensed Product Marks in the Territory and shall register and maintain the Licensed Product Marks in the countries and regions in the Territory that it determines reasonably necessary, at Baxalta's cost and expense. Under a separate trademark agreement, Baxalta and Precision may mutually agree to the use of certain Precision trademarks for the benefit of branding, including co-branding.

9.12 Patent Marking. Baxalta shall use Commercially Reasonable Efforts to mark all Licensed Products in accordance with the applicable patent marking Law, and shall require all of its Affiliates and Sublicensees to do the same to the extent required by Law.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

ARTICLE X.
REPRESENTATIONS AND WARRANTIES

10.1 The Parties' Representations and Warranties. Each Party hereby represents and warrants to the other Party, as of the Effective Date, as set forth below.

10.1.1 Such Party (a) is a corporation or other entity duly organized and subsisting under the applicable Laws of its jurisdiction of incorporation or organization, and (b) has full power and authority and the legal right to own and operate its property and assets and to carry on its business as it is now being conducted and as it is contemplated to be conducted by this Agreement.

10.1.2 Such Party has the power, authority and legal right, and is free to, enter into and perform its obligations under this Agreement and, in so doing, will not violate or conflict with (a) any other agreement to which such Party is a party as of the Effective Date or (b) any instrument or binding understanding, oral or written, to which such Party is a party or by which it is otherwise bound.

10.1.3 This Agreement has been duly executed and delivered on behalf of such Party and constitutes a legal, valid, and binding obligation of such Party and is enforceable against it in accordance with its terms.

10.1.4 Such Party has taken all corporate action necessary to authorize the execution and delivery of this Agreement.

10.1.5 Except with respect to required approvals for the exercise of the Commercial Option pursuant to applicable Antitrust Laws and Marketing Approvals and Reimbursement Approvals for Licensed Products or as otherwise described in this Agreement, such Party has obtained all necessary consents, approvals, and authorizations of all Regulatory Authorities and other Third Parties required to be obtained by such Party in connection with the execution and delivery of this Agreement and the performance of its obligations hereunder.

10.1.6 The execution and delivery of this Agreement and the performance of such Party's obligations hereunder (a) do not conflict with or violate any requirement of applicable Laws or any provision of the articles of incorporation, bylaws, limited partnership agreement, or any similar instrument of such Party, as applicable, in any material way, and (b) do not conflict with, violate, or breach or constitute a default or require any consent under, any applicable Laws or any contractual obligation or court or administrative order by which such Party is bound.

10.1.7 Such Party is neither a party to nor bound by any corporate integrity agreement or similar compliance agreement to which any Governmental Authority or Third Party payor is a counterparty.

10.2 Precision's Representations and Warranties. Precision hereby represents and warrants to Baxalta, as of the Effective Date, as set forth below.

10.2.1 Exhibit E sets forth a complete and correct list of patent numbers and patent application numbers of all Precision Patents and Precision Platform Patents as of the Effective Date, other than the Cellectis Patents. Precision is the owner of, or otherwise has Control of, each Precision Patent and Precision Platform Patent set forth in Exhibit E and, subject to the terms of the Cellectis Agreement, the Cellectis Patents. Except as would not have a material adverse effect on the rights granted to Baxalta herein, each Precision Patent and Precision Platform Patent owned by Precision has been filed in good faith, has been prosecuted in accordance with any applicable duty of candor and has been maintained in a manner consistent with Precision's standard practice, in each case in each applicable jurisdiction in which such Precision Patent or and Precision Platform Patent rights have been filed, and applicable fees (to the extent such fees have come due) have been paid on or before the due date for payment.

10.2.2 Precision and its Affiliates have sufficient legal or beneficial rights or title under their respective intellectual property rights necessary to grant all of the licenses contained in this Agreement with respect to such intellectual property rights.

10.2.3 Neither Precision nor any of its Affiliates has granted any right or license, or agreed to grant any right or license, to any Third Party relating to any of the intellectual property rights that are licensed by Precision or any of its Affiliates to Baxalta pursuant to this Agreement that conflict with, or limit the scope of, any of the rights or licenses granted to Baxalta pursuant to this Agreement.

10.2.4 All of Precision's and its Affiliates' Agents that are involved in research and Development work have executed agreements requiring assignment or licensing to Precision or its Affiliate, as applicable, of all Inventions made during the course of and as a result of their association with Precision or its Affiliate, except to the extent that any such assignment would not be permitted pursuant to applicable Law, as applicable, and obligating the individual to maintain as confidential the Confidential Information of Precision or its Affiliate, as applicable (except where the failure to have entered into such an agreement would not have a material adverse effect on the rights granted to Baxalta herein); provided, however, that for employees of Precision or its Affiliates based in Germany, Austria, or any other jurisdiction where a prior obligation to assign is not permitted, the obligation under this paragraph will be deemed satisfied if (a) each such employee is obligated to notify his employer of such Inventions and (b) the employer has an established program for receiving such notifications and timely claiming ownership of or exclusive rights to such Inventions after notification.

10.2.5 None of Precision, its Affiliates or their respective officers or employees (a) has ever been debarred or is subject to debarment or, to Precision's knowledge, convicted of a crime for which a Person could be debarred before a Regulatory Authority under applicable Laws, or (b) to Precision's knowledge, has ever been under indictment for a crime for which a Person could be debarred under such Laws. To Precision's knowledge, none of the independent contractors, consultants or agents of Precision, or its Affiliates (a) has ever been debarred or is subject to debarment or convicted of a crime for which a Person could be debarred before a Regulatory Authority under applicable Laws, or (b) has ever been under indictment for a crime for which a Person could be debarred under such Laws.

10.2.6 [***].

10.2.7 Other than as disclosed to Baxalta prior to the Effective Date, neither Precision nor any of its Affiliates has received any written communications alleging that it has infringed, misappropriated or otherwise violated, or that it would infringe, misappropriate or otherwise violate, through the use of the Precision Platform Technology, Precision Patents and/or Precision Know-How, to manufacture, use, import, export, sale, or offer for sale of any of the products in the Field and in the Territory, any intellectual property rights Controlled by any Third Party.

10.2.8 The Duke Agreement is a legal and valid obligation binding upon Precision and, to Precision's knowledge, Duke, and authorizes Precision to grant the rights under the Duke IP granted to Baxalta under this Agreement. As of the Effective Date, Precision is not in breach of the Duke Agreement. Precision shall comply in all material respects with the Duke Agreement and shall not modify or amend the Duke Agreement in a manner that would reduce Baxalta's access or rights to the Duke IP without the prior written consent of Baxalta.

10.2.9 To Precision's knowledge, no invention claimed by any Precision Patent owned by Precision was made or reduced to practice using any funding of the U.S. Government.

10.2.10 To Precision's knowledge, Precision is not in possession of any in-licensed Third Party Know-How or Patent Rights that are necessary to Develop, use, manufacture or Commercialize any Licensed Product Candidate or Licensed Product but are not Controlled by Precision. As of the Effective Date, the only Third Party Patents that are included within the Precision Patents and the Precision Platform Patents are the Cellectis Patents and Patents contained within the Duke IP.

ARTICLE XI.
CERTAIN COVENANTS

11.1 Covenants.

11.1.1 Mutual Covenants. Each Party hereby covenants throughout the Term as set forth below:

(a) All of such Party's and its Affiliates' Agents working under this Agreement will be under the obligation to assign to such Party or such Party's Affiliate, as applicable, in each case as the sole owner, all right, title and interest in and to their inventions and discoveries arising in the performance of such work, whether or not patentable, either immediately upon invention or, if applicable Law so provides, upon disclosure to and demand made by such Party or such Party's Affiliates; provided, however, that for employees based in Germany, Austria, or any other jurisdiction where a prior obligation to assign is not permitted, the obligation under this paragraph will be deemed satisfied if (i) each such employee is obligated to notify his employer of such inventions and (ii) the employer has an established program for receiving such notifications and timely claiming ownership of or exclusive rights to such inventions after notification.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

(b) Such Party will not, and will cause its Affiliates not to, employ or use any Agent that employs any individual or entity (i) that has been debarred by a Regulatory Authority under applicable Laws or convicted of a crime for which such Person could be so debarred, or (ii) that is the subject of a debarment investigation or proceeding of a Regulatory Authority under applicable Laws, in each case of clauses (i) and (ii), in the conduct of such Party's or its Affiliates' activities under this Agreement. If during the Term, a Party has reason to believe that actions or omissions have occurred that will cause such Party to breach the covenant in the immediately preceding sentence, then such Party promptly shall notify the other Party of same in writing.

(c) Such Party shall not, and shall cause its Affiliates not to, enter into any agreement or other arrangement with a Third Party that conflicts with the rights granted to the other Party under this Agreement.

11.1.2 Precision Covenants. Precision covenants that it will update Exhibit E on a regular basis during the Term of this Agreement, at least once per year upon each anniversary of the Effective Date (provided updates are required at such time). In addition, Precision covenants that it will not amend the Cellectis Agreement in any manner that would have the effect of diminishing the rights granted by Precision to Baxalta hereunder without Baxalta's prior written consent, not to be unreasonably withheld.

11.2 Restrictive Covenants.

11.2.1 Precision Restrictive Covenants.

(a) In consideration for the payments and rights granted to it under this Agreement, Precision agrees that for so long as [***], Precision will not [***].

(b) If [***] (this Section 11.2.1(b), together with Section 11.2.1(a), the "Precision Restrictive Covenants").

(c) Notwithstanding anything to the contrary in this Agreement, but without limiting the obligations of Precision as it relates to its Affiliates (including an Acquirer) as set forth in Section 11.2.1(a), Section 11.2.1(b), Section 16.1.2(a) or Section 16.1.2(b), [***].

(d) Notwithstanding Section [***] shall not be a breach of the Precision Restrictive Covenants, provided that (i) Precision notifies Baxalta of such [***] period following such [***], (ii) within such [***] and (iii) during any such [***].

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

11.2.2 Baxalta Restrictive Covenants.

(a) In consideration for the payments, rights and licenses granted to it under this Agreement, Baxalta agrees that for so long as [***], Baxalta will not, and will cause its Affiliates not to, [***] (the "Baxalta Restrictive Covenants" and, together with the Precision Restrictive Covenants, the "Restrictive Covenants").

(b) Notwithstanding Section 11.2.2(a) [***] shall not be a breach of the Baxalta Restrictive Covenants, provided that Baxalta notifies Precision of such [***] and either: (i) Baxalta provides written notice, within [***], that Baxalta is terminating this Agreement with respect to [***] in accordance with Section 14.2.5 (Termination for Convenience), with an effective date of such termination not later than [***] days after the lapse of such [***] period, or (ii) Baxalta notifies Precision of [***] within the [***] period following such [***], and within such [***] period, Baxalta or its Affiliate, as applicable, [***].

11.2.3 Injunctive Relief. Each Party acknowledges and agrees that the other Party may be irreparably damaged if the Restrictive Covenants are not performed by a Party in accordance with their specific terms, and that any such breach by a Party may not be adequately compensated by monetary damages alone. Each Party shall be entitled to enforce any Restrictive Covenant by a decree of specific performance and to temporary, preliminary and permanent injunctive relief to prevent breaches or threatened breaches of the Restrictive Covenants, without posting any bond or other undertaking.

11.2.4 Attorneys' Fees. If any arbitration or other legal proceeding is brought by a Party for the enforcement of the Restrictive Covenants, or to recover damages or other applicable remedy based on an alleged dispute, breach or default in connection with Restrictive Covenants, the prevailing Party shall be entitled to recover reasonable attorneys' fees and other reasonable costs and expenses incurred in enforcing the Restrictive Covenants, and such Party shall be entitled to (i) cause the other Party to reimburse such reasonable fees, costs and expenses, or (ii) offset such reasonable fees, costs and expenses against any amounts payable to the other Party under this Agreement.

11.2.5 Offset of Damages. Each Party shall be entitled to cause the other Party to pay or to offset, against amounts payable to the other Party under this Agreement, any amounts of damages determined in an arbitration or other legal proceeding, to be owed to such Party by the other Party based on the other Party's breach of the Restrictive Covenants.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

ARTICLE XII.
CONFIDENTIALITY

12.1 Confidentiality Obligations of Baxalta.

12.1.1 Subject to Section 12.3, during the Term and for a period of [***] Baxalta:

(a) shall hold in strict confidence any and all information disclosed to it by Precision, including Precision Know-How and including all information disclosed to it by Precision prior to the Effective Date under the Confidentiality Agreement (together "Precision Confidential Information"), and shall not use, nor disclose or supply to any Third Party, nor permit any Third Party, to have access to the Precision Confidential Information, without first obtaining the written consent of Precision, except in connection with the performance of its obligations and exercise of its rights under this Agreement;

(b) shall take all reasonable precautions necessary or prudent to prevent material in its possession or control that contains or refers to Precision Confidential Information from being destroyed or lost, or discovered, received, used, intercepted or copied by any Third Party; and

(c) may disclose the Precision Confidential Information only to its Agents, Affiliates, actual and potential Sublicensees, actual and potential collaborators, and actual and potential investors or acquirers, in each case solely to the extent reasonably necessary for the purposes of, and for those matters undertaken pursuant to, the performance of Baxalta's obligations and exercise of Baxalta's rights under this Agreement, and may disclose Precision Confidential Information contained in reports provided by Precision pursuant to this Agreement to Baxalta's actual and potential investors or acquirers; provided in each case that such Agents, Affiliates, actual and potential Sublicensees, actual and potential collaborators and actual and potential investors or acquirers are bound by terms and conditions of confidentiality no less protective than the terms and conditions that bind Baxalta hereunder; provided, however, that the duration of such terms and conditions of confidentiality for such recipients shall be no less than five (5) years.

For the avoidance of doubt, it is understood that Baxalta shall be liable for any breach of the confidentiality obligation under this Section 12.1 by any Person to whom the Precision Confidential Information is disclosed by Baxalta.

12.1.2 Baxalta's obligations of confidentiality and non-use under this Section 12.1 shall not apply to, and Baxalta shall have no further obligations under this Section 12.1 with respect to, any of the Precision Confidential Information, to the extent that such Precision Confidential Information:

(a) is or becomes part of the public domain without breach by Baxalta of this Agreement;

(b) was rightfully in Baxalta's possession before disclosure by Precision to Baxalta and was not acquired directly or indirectly from Precision, as documented by Baxalta's written records;

(c) is obtained from a Third Party with no applicable obligation of confidentiality to Precision, who has a right to disclose it to Baxalta;

(d) is developed independently by Baxalta without use of or reference to the Precision Confidential Information, as evidenced by Baxalta's written records; or

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(e) is required to be revealed in response to a court decision or administrative order, or to otherwise comply with applicable Law, applicable rules of any recognized stock exchange or quotation system or applicable rules or requirements of the Securities and Exchange Commission or other Governmental Authority or Regulatory Authority, provided, that in each such case Baxalta shall inform Precision immediately by written notice and cooperate with Precision using its Commercially Reasonable Efforts either to seek protective measures for such Precision Confidential Information, or to seek confidential treatment of such Precision Confidential Information, and in any case Baxalta shall disclose only such portion of the Precision Confidential Information which is so required to be disclosed.

Any combination of features or disclosures shall not be deemed to fall within the foregoing exclusions merely because individual features are published or available to the general public or in the rightful possession of Baxalta unless the combination itself and principle of operation are published or available to the general public or in the rightful possession of Baxalta.

12.1.3 Nothing herein shall prevent Baxalta from disclosing any Precision Confidential Information to the extent that such Precision Confidential Information is required to be used or disclosed for the purposes of seeking or obtaining approvals of Licensed Product Candidates or Licensed Products from Regulatory Authorities, including Marketing Approvals and Reimbursement Approvals, or seeking or maintaining patent protection for Inventions it owns or has responsibility for prosecuting under Article IX.

12.2 Confidentiality Obligations of Precision.

12.2.1 Subject to Section 12.3, during the Term and for a period of [***] Precision:

(a) shall hold in strict confidence any and all information disclosed to it by Baxalta, including Baxalta Know-How and including all information disclosed to it by Baxalta prior to the Effective Date under the Confidentiality Agreement, as well as the fact that any Target is an Included Target under this Agreement (together "Baxalta Confidential Information"), and shall not use, nor disclose or supply to any Third Party nor permit any Third Party to have access to the Baxalta Confidential Information, without first obtaining the written consent of Baxalta, except in connection with the performance of its obligations and exercise of its rights under this Agreement;

(b) shall take all reasonable precautions necessary or prudent to prevent material in its possession or control that contains or refers to Baxalta Confidential Information from being destroyed or lost, or discovered, received, used, intercepted or copied by any Third Party;

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(c) may disclose the Baxalta Confidential Information to its Agents, Affiliates, actual and potential collaborators and actual and potential investors or acquirers, in each case solely to the extent reasonably necessary for the purposes of, and for those matters undertaken pursuant to, the performance of Precision's obligations and exercise of Precision's rights under this Agreement, and may disclose Baxalta Confidential Information contained in reports provided by Baxalta pursuant to this Agreement to Precision's actual and potential investors or acquirers; provided in each case that such Agents, Affiliates, actual and potential collaborators and actual and potential investors or acquirers are bound by terms and conditions of confidentiality no less protective than the terms and conditions that bind Precision hereunder; provided, however, that the duration of such terms and conditions of confidentiality for such recipients shall be no less than five (5) years; and

(d) [***] For the avoidance of doubt, it is understood Precision shall be liable for any breach of the confidentiality obligation under this Section 12.2 by any Person to whom the Baxalta Confidential Information is disclosed by Precision.

12.2.2 Precision's obligations of confidentiality and non-use under this Section 12.2 shall not apply to, and Precision shall have no further obligations under this Section 12.2 with respect to, any of the Baxalta Confidential Information to the extent that such Baxalta Confidential Information:

(a) is or becomes part of the public domain without breach by Precision of this Agreement;

(b) was rightfully in Precision's possession before disclosure by Baxalta to Precision and was not acquired directly or indirectly from Baxalta, as documented by Precision's written records;

(c) is obtained from a Third Party with no applicable obligation of confidentiality to Baxalta, who has a right to disclose it to Precision;

(d) is developed by Precision without use of or reference to the Baxalta Confidential Information, as evidenced by Precision's written records; or

(e) is required to be revealed in response to a court decision or administrative order, or to otherwise comply with applicable Law, applicable rules of any recognized stock exchange or quotation system or applicable rules or requirements of the Securities and Exchange Commission or other Governmental Authority or Regulatory Authority, provided, that in each such case Precision shall inform Baxalta immediately by written notice and cooperate with Baxalta using its Commercially Reasonable Efforts either to seek protective measures for such Baxalta Confidential Information, or to seek confidential treatment of such Baxalta Confidential Information, and in any case Precision shall disclose only such portion of the Baxalta Confidential Information which is so required to be disclosed.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Any combination of features or disclosures shall not be deemed to fall within the foregoing exclusions merely because individual features are published or available to the general public or in the rightful possession of Precision unless the combination itself and principle of operation are published or available to the general public or in the rightful possession of Precision.

12.2.3 Nothing herein shall prevent Precision from disclosing any Baxalta Confidential Information to the extent that such Baxalta Confidential Information is required to be used or disclosed for the purposes of seeking or obtaining approvals of Licensed Product Candidates [***] from Regulatory Authorities, including Marketing Approvals and Reimbursement Approvals, or seeking or maintaining patent protection for Inventions it owns or has responsibility for prosecuting under Article IX.

12.2.4 In addition, Precision shall be permitted to disclose Baxalta Confidential Information and the terms and conditions of this Agreement to Duke solely as and to the extent necessary to fulfill Precision's reporting obligations under the Duke Agreement, provided that such information is disclosed subject to the confidentiality provisions of the Duke Agreement.

12.3 Scientific Publication. Each Party recognizes that the publication of papers regarding results of and other information regarding Licensed Products, Licensed Product Candidates, and Unselected Candidates, including oral presentations and abstracts, may be beneficial to both Parties, provided that publications are subject to reasonable controls to protect Confidential Information and the Parties' mutual interest in obtaining Patent Rights and protecting trade secret information. Accordingly, the Party proposing publication shall deliver to the JSC for review and approval a copy of any proposed publication or presentation that pertains to any Licensed Product, Licensed Product Candidate or Unselected Candidate at least [***] prior to submitting the material to a publisher or initiating any other publication or presentation. The other Party shall have the right (a) to require modifications of the publication or presentation (i) to protect each Party's respective Confidential Information, or (ii) for trade secret reasons or business reasons; (b) to delay such submission for an additional [***] as may be reasonably necessary to seek patent protection for the information disclosed in such proposed submission; and/or (c) to prevent such presentation or publication based on a good faith determination that such publication or presentation will have an adverse effect on the non-publishing Party's ability to procure a patent or, with regard to Baxalta, to Commercialize Licensed Products. Notwithstanding the foregoing, after the Commercial Option Exercise Date, Baxalta shall not be required to share proposed presentations and publications with Precision that relate to any Licensed Product provided that any such presentations and publications (x) do not include any of Precision's Confidential Information and (y) do not contain any information that has a reasonable likelihood of adversely affecting Precision's ability to obtain a Patent on any invention owned by Precision relating to Precision Platform Technology or the Licensed Product.

12.4 Press Releases; Publicity.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

12.4.1 Press Release. Except with respect to the press release attached hereto as Exhibit F which will be jointly issued by the Parties upon execution of this Agreement, and except as otherwise permitted under this Agreement, no disclosure shall be made by either Party concerning the execution of this Agreement or the terms and conditions hereof without the prior written consent of the other Party, which shall not be unreasonably withheld, conditioned or delayed.

12.4.2 Disclosure of Agreement to Third Parties. Notwithstanding the foregoing in Section 12.4.1, each Party may disclose a copy of this Agreement without the prior written consent of the other Party pursuant to Section 12.1.2(e) or Section 12.2.2(e), as applicable. In addition, the Parties will use good faith efforts to agree in writing upon a redacted form of this Agreement within [***] after the Effective Date that redacts information that each Party considers (in good faith) to be of a competitively sensitive nature (the "Redacted Form of Agreement"), and each Party may disclose a copy of the Redacted Form of Agreement without the prior written consent of the other Party in connection with a due diligence process associated with the negotiation or exploration of a possible financing transaction by such Party or the negotiation or exploration of a possible acquisition transaction involving such Party (e.g., transfer or sale of all or any portion of such Party's assets, equity or business, or a merger or consolidation or similar business combination transaction or otherwise); provided that (a) such disclosure is made in the course of such diligence, negotiation or exploration pursuant to confidentiality and nonuse obligations consistent with those set forth in this Agreement and (b) that the duration of such terms and conditions of confidentiality for such recipients shall be no less than five (5) years. Notwithstanding the foregoing, either Party may provide an unredacted copy to the Third Party after such Party and the Third Party have executed a non-binding term sheet or letter of intent or have otherwise entered into a period of exclusive negotiation with respect to a possible financing transaction or acquisition transaction involving such Party.

12.4.3 General. Except as otherwise permitted under this Agreement, (a) Precision may not issue a press release or public announcement concerning the Development of any particular Licensed Product Candidates or Licensed Products without Baxalta's prior written consent, and (b) prior to the Commercial Option Exercise Date for any Licensed Product Candidate, Baxalta may not issue a press release or public announcement concerning the Development of any particular Licensed Product Candidates without Precision's prior written consent.

12.4.4 Disclosures Required by Law. Each Party agrees that it shall cooperate fully and in a timely manner with the other Party with respect to all disclosures required by the Securities and Exchange Commission and any other Governmental Authority or Regulatory Authority, including requests for confidential treatment of Confidential Information of either Party included in any such disclosure. Notwithstanding any other provision of this Agreement, either Party may issue any public announcement or other disclosure that it is advised by legal counsel is required under applicable Laws or the applicable rules of any recognized stock exchange or

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quotation system, provided that the Parties shall coordinate with each other with respect to the timing, form and content of such required disclosure to the extent practicable under the circumstances, and the Party seeking such disclosure shall use Commercially Reasonable Efforts to provide the other Party with reasonable advance notice thereof (including a copy of the proposed disclosure) and, in any event, at least [***] advance notice. Any request for revision to the content of said disclosure by the non-disclosing Party shall be furnished to the disclosing Party as promptly as necessary for the disclosing Party to comply with such requirements in a timely manner. Without limiting the foregoing, each Party shall consult in good faith with the other Party on the provisions of this Agreement (for the avoidance of doubt, including the schedules and exhibits hereto) to be redacted in any filings made by either Party with the Securities and Exchange Commission or as otherwise required by applicable Law.

12.4.5 Right to Further Disclose. Once a public disclosure that is required pursuant to applicable Law, pursuant to applicable rules of any recognized stock exchange or quotation system or by the Securities and Exchange Commission or other Governmental Authority or Regulatory Authority, is made, in each case in accordance with this Section 12.4, the content of such disclosure (or any portion thereof) may be repeated in one or more subsequent disclosures without any obligation of the disclosing Party to give any notices or obtain any consents for such disclosure that would otherwise be required under this Section 12.4.

ARTICLE XIII.
INDEMNIFICATION

13.1 Precision Indemnity. Precision shall defend, indemnify and hold harmless Baxalta and its Affiliates, successors and permitted assignees and each of its and their respective Agents (collectively, the "Baxalta Indemnitees") from and against any and all liabilities, losses, costs, damages and expenses, including reasonable attorneys' fees (collectively, "Damages"), to the extent arising out of or resulting from any claim, suit, action, demand or other proceeding made or brought against one or more Baxalta Indemnitees by a Third Party in connection with (a) the gross negligence, recklessness, or intentional wrongful acts or omissions of Precision or its Affiliates or their respective employees, directors, representatives, consultants, independent contractors or agents (collectively, "Agents"), in connection with the performance by or on behalf of Precision of Precision's obligations or exercise of Precision's rights under this Agreement, (b) any material breach by Precision or its Affiliates or their respective Agents of any representation, warranty, covenant or obligation of Precision set forth in this Agreement, and (c) [***]; except, in any such case, to the extent such Damages are reasonably primarily attributable to any gross negligence, recklessness, willful misconduct or breach of this Agreement by Baxalta or a Baxalta Indemnitee (other than any breach by Baxalta or a Baxalta Indemnitee that primarily resulted from Precision's or its Affiliates' or their respective Agents' breach of this Agreement).

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

13.2 Baxalta Indemnity. Baxalta shall defend, indemnify and hold harmless Precision and its Affiliates, successors and permitted assignees and each of its and their respective Agents (collectively, the "Precision Indemnitees") from and against any and all Damages, to the extent arising out of or resulting from any claim, suit, action, demand or other proceeding made or brought against one or more Precision Indemnitees by a Third Party in connection with (a) the gross negligence, recklessness, or intentional wrongful acts or omissions of Baxalta or its Affiliates or their respective Agents, in connection with the performance by or on behalf of Baxalta of Baxalta's obligations or exercise of Baxalta's rights under this Agreement, (b) any material breach by Baxalta or its Affiliates or their respective Agents of any representation, warranty, covenant or obligation of Baxalta set forth in this Agreement, and (c) [***]; except, in any such case, to the extent such Damages are reasonably primarily attributable to any gross negligence, recklessness, willful misconduct or breach of this Agreement by Precision or a Precision Indemnitee (other than any breach by Precision or a Precision Indemnitee that primarily resulted from Baxalta's or its Affiliates' or their respective Agents' breach of this Agreement).

13.3 Indemnification Procedure.

13.3.1 Each Party shall notify the other in the event it becomes aware of a claim for which indemnification may be sought pursuant to this Article XIII. In case any claim, suit, action, demand or other proceeding (including any governmental investigation) shall be instituted involving any Party or its Indemnitees in respect of which indemnity may be sought pursuant to this Article XIII, such Party (the "Indemnified Party") shall promptly notify the other Party (the "Indemnifying Party") in writing (an "Indemnification Claim Notice"); provided, that the failure to promptly provide an Indemnification Claim Notice shall not relieve the Indemnifying Party of its indemnification obligations except, and only to the extent, that the Indemnifying Party is actually incrementally damaged as a result of such failure. The Indemnifying Party and Indemnified Party shall promptly meet to discuss how to respond to any claims that are the subject matter of such proceeding. At its option, the Indemnifying Party may assume the defense of a Third Party claim subject to indemnification as provided for in this Section 13.3 with competent counsel free of any conflict of interest with the Indemnified Party by giving written notice (a "Defense Election Notice") to the Indemnified Party within [***] after its receipt of the applicable Indemnification Claim Notice (the "Election Time Period"), solely for claims (a) that solely seek monetary damages and (b) as to which the Indemnifying Party expressly agrees in writing that, as between the Indemnifying Party and the Indemnified Party, the Indemnifying Party shall be solely obligated to satisfy and discharge the claim in full (the matters described in (a) and (b), the "Litigation Conditions"). If the Indemnifying Party does not deliver a Defense Election Notice to the Indemnified Party during the applicable Election Time Period, or if any Litigation Condition is not satisfied, the Indemnified Party will assume responsibility for and control such defense and, without limiting the Indemnifying Party's indemnification obligations, the Indemnifying Party will reimburse the Indemnified Party for all costs and expenses, including reasonable attorneys' fees, incurred by the Indemnified Party in defending itself.

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13.3.2 Upon assuming the defense of a Third Party claim in accordance with this Section 13.3, the Indemnifying Party shall be entitled to appoint competent counsel free of any conflict of interest with the Indemnified Party in the defense of the Third Party claim. Should the Indemnifying Party assume and continue the defense of a Third Party claim, except as otherwise set forth in this Section 13.3, the Indemnifying Party will not be liable to the Indemnified Party for any legal expenses subsequently incurred by such Indemnified Party after the date of assumption of defense in connection with the analysis, defense, countersuit or settlement of the Third Party claim. Without limiting this Section 13.3, any Indemnified Party will be entitled to participate in, but not control, the defense of a Third Party claim for which it has sought indemnification hereunder and to engage counsel of its choice for such purpose; provided, however, that such engagement will be at the Indemnified Party's own cost and expense unless (a) the engagement thereof has been specifically requested by the Indemnifying Party in writing, or (b) the Indemnifying Party has failed to assume and actively further the defense and engage counsel in accordance with this Section 13.3 (in which case the Indemnified Party will control the defense), or (c) the Indemnifying Party no longer satisfies the Litigation Conditions.

13.3.3 Subject to the Litigation Conditions continuing to be satisfied, the Indemnifying Party will have the sole right to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Damages, on such terms as the Indemnifying Party, in its reasonable discretion, will deem appropriate (provided, however, that such terms (a) shall include a complete and unconditional release of the Indemnified Party from all liability with respect thereto and (b) shall not include any admission of fault by, or impose any liability or obligation on, the Indemnified Party), and will transfer to the Indemnified Party all amounts which said Indemnified Party will be liable to pay pursuant to such settlement or disposal of such claim prior to the time such payments become due by the Indemnified Party. With respect to all other entries of judgment, entries into settlements or other dispositions of Damages in connection with a Third Party claim for which the Indemnifying Party has assumed the defense in accordance with this Section 13.3, the Indemnifying Party will only have authority to consent to the entry of such judgment, entry into such settlement or such other disposition of Damages if it has obtained the Indemnified Party's prior written consent, not to be unreasonably withheld, conditioned or delayed.

13.3.4 The Indemnifying Party that has assumed the defense of the Third Party claim in accordance with this Section 13.3 (and continues to maintain control of such defense pursuant to this Section 13.3) will not be liable for any settlement or other disposition of any Damages by an Indemnified Party that is reached without the prior written consent of such Indemnifying Party. The Indemnified Party will not admit any liability with respect to, or settle, compromise or discharge, any Third Party claim without first offering to the Indemnifying Party the opportunity to assume the defense of the Third Party claim in accordance with this Section 13.3. If the Indemnifying Party chooses to defend or prosecute any Third Party claim, the Indemnified Party will cooperate in the defense or prosecution thereof and will furnish such records, information and testimony, provide such witnesses including to the extent possible, former employees and attend such conferences, discovery proceedings, hearings, trials and appeals as may be reasonably requested in connection with such Third Party claim. Such cooperation will include access during normal business hours afforded to the Indemnifying Party to, and reasonable retention by the Indemnified Party of, records and information that are reasonably relevant to such

Third Party claim, and making Agents available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder. The Indemnifying Party will reimburse the Indemnified Party for all its reasonable out of pocket expenses incurred in connection with such cooperation.

13.3.5 Each Party shall maintain, at its cost, a program of insurance or self-insurance against liability and other risks associated with its activities and obligations under this Agreement, including its Clinical Trials, its Development, use, manufacture and Commercialization of any Licensed Product Candidates or Licensed Products and its indemnification obligations hereunder, in such amounts, subject to such deductibles and on such terms as are customary for the activities to be conducted by it under this Agreement. All insurance required by this Section 13.3.5 shall be maintained during the Term and each Party shall, from time to time, provide copies of certificates of such insurance to the other Party upon request. Further, each Party shall list the other Party as an additional insured on all insurance policies. All insurance required by this Section 13.3.5 shall be maintained for at least [***] following expiration or termination of this Agreement.

13.4 Limitation of Liability; Exclusion of Damages; Disclaimer.

13.4.1 EXCEPT TO THE EXTENT A PARTY IS REQUIRED TO PROVIDE INDEMNIFICATION UNDER SECTION 13.1 OR SECTION 13.2, AND EXCEPT IN THE CASE OF A BREACH OF ARTICLE XII, AND WITHOUT LIMITING THE LIABILITY OF A PARTY FOR INFRINGEMENT OR MISAPPROPRIATION OF THE INTELLECTUAL PROPERTY RIGHTS OF THE OTHER PARTY OR ANY OF ITS AFFILIATES OR FOR FRAUD OR WILLFUL MISCONDUCT, NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES RESULTING FROM LOSS OF USE, LOSS OF PROFITS, INTERRUPTION OR LOSS OF BUSINESS, DIMINUTION OF VALUE, OR OTHER ECONOMIC LOSS) ARISING OUT OF THIS AGREEMENT OR WITH RESPECT TO A PARTY'S PERFORMANCE OR NON PERFORMANCE HEREUNDER.

13.4.2 EXCEPT AS EXPRESSLY PROVIDED IN THIS AGREEMENT, NEITHER PARTY PROVIDES ANY REPRESENTATIONS OR WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESS OR IMPLIED, REGARDING ANY SUBJECT MATTER OF THIS AGREEMENT AND EACH PARTY HEREBY DISCLAIMS ALL OTHER REPRESENTATIONS AND WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESS AND IMPLIED, INCLUDING REGARDING TITLE, VALIDITY, PATENTABILITY, ENFORCEABILITY OF PATENT RIGHTS, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND FREEDOM FROM INFRINGEMENT OF THIRD PARTY RIGHTS, AND ANY WARRANTIES ARISING FROM A COURSE OF DEALING, USAGE OR TRADE PRACTICES.

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ARTICLE XIV.
TERM; TERMINATION

14.1 Term. This Agreement shall become effective as of the Effective Date and shall remain in effect until the first to occur of (a) the instance that, at any time from and after the expiration of the Nomination Period, there are no Included Targets, (b) expiration of all Commercial Option Exercise Periods for all Licensed Product Candidates if no Commercial Option Exercise Dates have occurred, or (c) the expiration of the last to expire Royalty Term in the Territory and satisfaction of all of Baxalta's payment obligations under this Agreement; in each case of (a), (b) and (c), unless this Agreement is earlier terminated in its entirety pursuant to Section 14.2 (the "Term"). In the event of expiration of this Agreement pursuant to clause (c) of this Section 14.1, (x) the Commercial Licenses previously granted to Baxalta upon exercise of Commercial Options shall continue in full force and effect, shall not be revocable and shall be considered to be fully paid up and (y) subject to the confidentiality obligations contained in Article XII, Baxalta shall have the right to freely use all Know-How disclosed to it by Precision hereunder solely in connection with the Development, manufacture and Commercialization of Licensed Products and Licensed Product Candidates Directed to Included Targets in the Field.

14.2 Early Termination.

14.2.1 By Either Party for Material Breach. Without prejudice and in addition to any other contractual remedy the non-breaching Party may have with respect to this Agreement, either Party may, upon a material breach of this Agreement (as it relates to this Agreement in its entirety or to any particular Licensed Product Candidate or Licensed Product) by the other Party, terminate this Agreement (at the non-breaching Party's option, either (a) in its entirety or (b) for any material breach of the Agreement relating only to certain of the Licensed Product Candidate(s) or Licensed Product(s), (i) with respect the affected Licensed Product Candidate(s) or Licensed Product(s), or (ii) with respect to the affected Included Target, including all Licensed Product Candidates and Licensed Products Directed to such Included Target) by providing [***] prior written notice [***] to the breaching Party, specifying in such notice the breaching Party's material breach and demanding its cure, with such termination being effective upon the end of such [***] cure period or, if applicable, the end of the extended cure period set forth in the immediately following sentence, in each case if the applicable material breach has not then been cured. [***]. Neither Party may terminate this Agreement pursuant to this Section 14.2.1 if the other Party's material breach of this Agreement was primarily the result of the terminating Party's material breach of this Agreement.

14.2.2 By Precision for Patent Challenge. Precision shall have the right to terminate this Agreement in its entirety immediately upon written notice to Baxalta if Baxalta, itself or through an Affiliate (other than any Person within the Baxalta Parent Group), or any of its Sublicensees, directly or through assistance granted to a Third Party commences or participates in any administrative, judicial or similar proceeding challenging the validity, enforceability and/or

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patentability of any Precision Patent or Precision Platform Patent (except where such action is ordered by a court, patent office or other tribunal or is required by Law),(such action, a "Patent Challenge"), however, Patent Challenge shall exclude (a) any *bona fide* patent infringement defense against a claim of infringement of such Patent Rights brought by Precision, a Precision Affiliate or a Third Party and (b) in response to a claim by Precision that a royalty payment is due, assertion by Baxalta that the Royalty Term has expired because there is no longer a Valid Claim of a Precision Patent Covering a Licensed Product in the applicable country.

14.2.3 By Either Party for Insolvency. Either Party (the "Non-Debtor Party") may terminate this Agreement in its entirety effective immediately upon delivery of written notice to the other Party (the "Debtor Party") if the Debtor Party is dissolved or liquidated, files or has filed against it a petition as a debtor under Title 11 of the U.S. Bankruptcy Code (excluding a reorganization proceeding under Chapter 11 of the U.S. Bankruptcy Code if the Debtor Party is continuing to perform all of its obligations under this Agreement) that is not dismissed within [***], makes an assignment of all or substantially all of its property for the benefit of its creditors or has a receiver or trustee appointed for all or substantially all of its property.

14.2.4 For Force Majeure. This Agreement may be terminated in its entirety as set forth in Section 17.15.2.

14.2.5 By Baxalta for Convenience. Baxalta may terminate this Agreement (a) in its entirety or (b) with respect to one or more Included Targets (including all Licensed Product Candidates and Licensed Products Directed to such Included Targets), or with respect to one or more Licensed Product Candidates or Licensed Products, in each case effective at any time after [***], by providing [***] prior written notice to Precision [***]. The Parties shall continue to perform their respective obligations hereunder with respect to the Included Targets, Licensed Product(s) and Licensed Product Candidate(s) to which the termination applies until the effective date of the termination as described in the immediately preceding sentence. For clarity, if Baxalta has terminated this Agreement with respect to all Licensed Product Candidates and Licensed Products Directed to a particular Included Target, then Baxalta shall be deemed to have terminated this Agreement with respect to such Included Target pursuant to this Section 14.2.5.

14.3 Effects of Termination.

14.3.1 Effect of Termination by Precision for [***] or Termination by Baxalta for [***].

(a) In the event of termination by Precision [***], in each case without prejudice and in addition to any contractual remedy either Party may have with respect to this Agreement, the following shall apply:

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(i) Baxalta agrees to grant and hereby grants to Precision and its Affiliates, effective upon such termination, a royalty-bearing, worldwide, transferrable (solely in connection with a transfer of the rights related to the applicable Reversion Product), irrevocable license (with the right to grant sublicenses through multiple tiers) under the Reversion IP to make, have made, use, sell, offer for sale, import and otherwise Develop and Commercialize Reversion Products in the Field in the Territory. Such license will be exclusive (even as to Baxalta and its Affiliates) or non-exclusive, on a Patent-by-Patent basis, based on Precision's election made in a written notice to Baxalta with respect to each of the Patents included in the Reversion IP ("Reversion Patents"). Precision may also decline to accept the foregoing license on a Patent-by-Patent basis by providing written notice thereof to Baxalta. With respect to any Reversion Patents licensed to Precision on an exclusive basis, Precision shall have all of the rights granted to Baxalta in (A) Sections 9.5, 9.7, 9.8 and 9.9 determined *mutatis mutandis* as if such Reversion Patents were Precision Patents under such Sections, and (B) Section 9.2 determined *mutatis mutandis* as if such Reversion Patents were Product-Related Patents under such Section. During the period in which a Valid Claim of any Reversion Patent licensed to Precision would, but for the license granted in this Section 14.3.1(a)(i) be infringed by Development, manufacture, use or Commercialization of a particular Reversion Product in the country of sale, on a Reversion Product-by-Reversion Product, country-by-country basis, Precision shall pay to Baxalta annual (once per Calendar Year) non-refundable, non-creditable royalty payments equal to [***]. Such royalty payment shall be subject to Sections 8.4.2, 8.4.6, 8.4.7, 8.5, 8.6, 8.7 and 8.8, each determined *mutatis mutandis* with respect to sales by Precision, its Affiliates and sublicensees and Reversion Patents (and without Section 9.3 limiting Precision's rights under Section 8.4.2, if applicable).

(ii) Upon Precision's request and, except in connection with termination by Precision in accordance with Section 14.2.1 or Section 14.2.2, at Precision's expense (including payment at the then-prevailing FTE rate for work provided by Baxalta employees), as to any or all of the following, Baxalta shall:

(1) to the extent permitted by Law or the terms of any applicable Third Party agreements, assign to Precision its and its Affiliates' entire right, title and interest in and to all materials, licenses, Third Party agreements, preclinical and clinical data, safety data and all other supporting data that is in Baxalta's or its Affiliates' Control, and deliver to Precision a copy of all relevant Know-How, in each case that relates to, and to the extent reasonably necessary for, Precision to continue the Development, use, manufacture and Commercialization of the Reversion Products; provided, that Baxalta shall not be obligated to translate or reformat any data or to convert or adapt any database or software (it being understood that such data and databases shall be transferred on an as-is basis);

(2) furnish Precision with reasonable cooperation to transition to Precision the management and continued performance of any clinical or other studies in progress then being conducted by Baxalta or its Affiliates related to the Reversion Products which Precision determines to continue in compliance with applicable Laws and ethical guidelines applicable to the transfer or termination of any such studies; provided, that in the event that Precision informs Baxalta that it does not intend to continue specific Development activities then in progress, Baxalta shall bear its own costs and expenses incurred in closing out such activities;

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(3) transfer to Precision any and all Regulatory Filings, Global Dossiers and related regulatory data and Know-How, Marketing Approvals and Reimbursement Approvals and all other filings and submissions with and to Regulatory Authorities with respect to the Reversion Products; and, to this end, Baxalta shall use Commercially Reasonable Efforts to file for transfer with the relevant Regulatory Authorities and to give all other notifications and approvals necessary under applicable Law for the transfer of Regulatory Filings, Global Dossiers and related regulatory data and Know-How, Marketing Approvals and Reimbursement Approvals and such other filings and submissions;

(4) use Commercially Reasonable Efforts to transfer to Precision the manufacturing processes, documents, materials and other Know-How reasonably necessary for the manufacture, testing and supply of the Reversion Products, in each case to the extent (A) Controlled by Baxalta, (B) Baxalta is legally or contractually, as applicable, permitted to so transfer, and (C) such processes, documents, materials and other Know-How are actually used (at the time of the applicable termination) by or on behalf of Baxalta or its Affiliates in the manufacture of the Reversion Products (in all cases, provided that Baxalta shall not be obligated to incur any costs or expenses from the use of such transferred processes, documents, materials or other Know-How by or on behalf of Precision);

(5) provide reasonable technical assistance relating to the manufacture, testing and supply of the Reversion Products as necessary for Precision to be qualified or to qualify a Third Party for the manufacturing of such Reversion Products, such assistance being limited to assistance that a manufacturer familiar with, and having experience with equipment for, manufacturing of CAR-T, and in any case not to exceed a total of [***];

(6) after fulfillment of Baxalta's existing commitments to its customers (including its distributors), sell to Precision Baxalta's then-existing inventory of Reversion Products, at [***]; provided that Precision shall not be obligated to purchase such inventory and such sale shall only occur if Precision shall notify Baxalta within thirty (30) days after the effective date of termination that Precision elects to exercise such right;

(7) to the extent permitted by Law, transfer to Precision ongoing Clinical Trials of Reversion Products being conducted by or under authority of Baxalta as of the date of the applicable termination notice, continue to conduct such Clinical Trials up to such transfer or, if requested by Precision, terminate such Clinical Trials in a manner conforming to applicable Laws; provided, that Baxalta shall not be obligated to translate or reformat documents or databases or to convert or adapt any database or software (it being understood that such documents and databases shall be transferred on an as-is basis);

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(8) Baxalta shall not withdraw or cancel any Reversion Product Marketing Approval or Reimbursement Approval or application for either, unless expressly instructed so by Precision in writing; provided that Precision shall be responsible for all costs and expenses for the maintenance of all Marketing Approvals and Reimbursement Approvals following receipt of notice of termination;

(9) Baxalta shall negotiate in good faith with Precision a royalty-free, fully paid up license for use of the Licensed Product Marks that have been used in commerce solely with Reversion Products (excluding any corporate name or logo of Baxalta or any of its Affiliates and any trademarks that are used by Baxalta or any of its Affiliates on products that are not Reversion Products), together with all goodwill relevant thereto, throughout the Territory;

(10) Baxalta shall thereafter refrain from making any statement, public or otherwise, regarding any Reversion Products unless Baxalta is required to make such statement pursuant to applicable Law, such statement is limited to the fact that Baxalta is no longer Developing or Commercializing the Reversion Products or Precision shall have approved any such statement in writing; and

(11) following written request by Precision, Baxalta shall take such other actions and execute such other instruments, assignments and documents that are reasonably necessary to effect the transfers and grants of rights under this Section 14.3.1 to Precision.

Following the foregoing assignments and transfer, all information and Know-How so assigned or transferred that was previously Confidential Information of Baxalta shall thereafter be deemed the Confidential Information of both Parties under Article XII. In addition, following the foregoing assignments and transfer and without limiting Precision's other rights and remedies under this Agreement for such breach, Baxalta shall be deemed to no longer be in continuing breach of this Agreement.

(iii) For the avoidance of doubt, in the event that this Agreement is terminated in its entirety or with respect to one or more Included Targets, the terminated Included Target(s) shall not be subject to any further Nomination right of Baxalta under this Agreement, and the Reversion Products shall not be subject to the Precision Restrictive Covenants.

(b) With respect only to termination by Baxalta [***] upon Precision's request, Baxalta will [***].

14.3.2 Effect of Termination by Baxalta for Precision's Uncured Material Breach of the Precision Restrictive Covenants or Enablement of an Acquirer to Conduct a Competitive Program; [***].

(a) The provisions set forth in subsections (b) and (c) of this Section 14.3.2 shall apply if Baxalta terminates this Agreement with respect to an Included Target pursuant to Section 14.2.1 based on a Final Determination that one of the following has occurred with respect to such Included Target:

(i) Precision has materially breached the Precision Restrictive Covenants and fails to cure such breach (if capable of cure) within ninety (90) days after receipt of Baxalta's written notice of such breach (or, in the case of a good faith dispute as to whether a breach occurred, within ninety (90) days after a Final Determination that such breach occurred), provided, that, without limiting the foregoing in this clause (i), any such breach of the Precision Restrictive Covenants shall be deemed material and incapable of cure if such breach resulted in Commercialization of any product comprising engineered human T cells with Chimeric Antigen Receptors in the Field (whether Allogeneic, autologous or otherwise) that is Directed to the applicable Included Target; or

(ii) Precision does any of the following (each of which shall be deemed a material breach of this Agreement) during the term the Firewall is required to be in effect and ending on the Commercial Option Exercise Date for the Included Target that is the subject of the Firewall: (x) affirmatively performs a technology transfer to the Acquirer of the Precision Know-How or Precision Platform Technology in a manner that enables the Acquirer to conduct a Competitive Program Directed to such Included Target based on the Precision Know-How or Precision Platform Technology, (y) grants the Acquirer a license or a covenant not to assert under the Precision Know-How, Precision Platform Technology, Precision Platform Patents or Precision Patents in a manner that enables the Acquirer to conduct such a Competitive Program, or (z) transfers ownership of the Precision Know-How, Precision Platform Technology, Precision Platform Patents or Precision Patents to the Acquirer in the absence of restrictions requiring that such Precision Know-How, Precision Platform Technology, Precision Platform Patents or Precision Patents not be used to conduct such a Competitive Program; and fails to cure such breach (if capable of cure) within ninety (90) days after receipt of Baxalta's written notice of such breach (or, in the case of a good faith dispute as to whether a breach occurred, within ninety (90) days after a Final Determination that such breach occurred).

(b) The licenses granted to Baxalta under Section 2.5.1 and Section 4.3 of this Agreement with respect to the Licensed Product Candidates and Licensed Products Directed to the Included Target that was the subject of such breach will become royalty-free, fully paid up, perpetual and irrevocable, with Baxalta being deemed to have previously exercised the Commercial Option for any then-existing Licensed Product Candidates Directed to such Included Target (but shall have no obligation to pay the Commercial Option Exercise Fee).

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(c) [***]

14.3.3 Effect of Termination for Any Reason. In the event of termination of this Agreement (in whole or in part) for any reason (including the reasons set forth in Section 14.3.1 and Section 14.3.2), in each case without prejudice and in addition to any contractual remedy either Party may have with respect to this Agreement, in addition to the rights and obligations set forth in Section 14.3.1 and Section 14.3.2 (as and if applicable), the following shall apply:

(a) If such termination is with respect to one or more, but not all, Licensed Product Candidates or Licensed Products, or one or more, but not all, Included Targets, the effects of termination set forth in Section 14.3.1 or Section 14.3.2, as applicable, and Section 14.3.3(b) shall apply solely as to such Licensed Product Candidates or Licensed Products, or in the case of such termination with respect to an Included Target apply solely as to such Included Target and all Licensed Product Candidates and Licensed Products Directed to such Included Target. Except as otherwise expressly set forth in this Section 14.3.3 or in Section 14.3.1, Section 14.3.2 or Section 14.3.4, all rights and obligations of the Parties under this Agreement with respect to any terminated Licensed Product Candidates, terminated Licensed Products and terminated Included Targets shall cease.

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(b) Except as expressly set forth in Section 14.3.1(a)(i), Section 14.3.2(b) or Section 14.3.2(d) (as and if applicable), all licenses granted to either Party under this Agreement, including all sublicenses thereunder, shall immediately terminate. Notwithstanding the foregoing, if this Agreement is terminated by Precision pursuant to Section 14.2.3 (Termination for Insolvency), any sublicenses granted by Baxalta prior to the effective date of such termination shall continue provided that (i) the Sublicensee consents to the assignment of its sublicense agreement to Precision and agrees in writing with Precision to render all performance required under its sublicense agreement directly to Precision, (ii) the Sublicensee cures any uncured material breach of Baxalta existing at such time within [***] of such termination, and (iii) the Sublicensee agrees in writing with Precision that Precision will not be obligated to perform under such sublicense to the extent such sublicense requires obligations of Precision that exceed the obligations of Precision under this Agreement.

(c) Within [***] following the expiration of this Agreement or termination of this Agreement in its entirety, each Party shall, at the request of the other Party, (i) deliver to the other Party, or certify the destruction of any and all tangible Confidential Information of the other Party in such Party's possession, (ii) to the extent practicable, remove Confidential Information of the other Party from all databases and systems and in those instances where removal is not practicable, segregate or otherwise indicate that such Confidential Information is restricted, and/or (iii) treat all Confidential Information of the other Party contained in lab notebooks in accordance with such Party's then current procedure for the status of the project and properly note that such Confidential Information contained in such lab notebooks is restricted. Notwithstanding the foregoing, Precision may retain such Confidential Information of Baxalta as is necessary or useful for the practice of the rights granted to it under Section 14.3.1.

(d) With respect to termination of this Agreement in part, this Agreement shall continue in full force and effect with respect to the Development, manufacture and Commercialization of any remaining Licensed Product Candidates and Licensed Products until the effective date of expiration or termination with respect thereto, without any modification to this Agreement unless otherwise mutually agreed between the Parties.

14.3.4 Survival. The following Articles and Sections of this Agreement, as well as remedies for breach of this Agreement, shall survive expiration or termination of this Agreement for any reason: ARTICLE I (solely to the extent required to enforce any other surviving rights or obligations of the Parties), Section 2.6.1(c), Section 4.5, ARTICLE VIII (solely to the extent any right to payment has accrued prior to the effective date of termination), Section 9.1, Section 12.1, Section 12.2, Section 12.4, ARTICLE XIII, Section 14.3, ARTICLE XV and ARTICLE XVII.

14.3.5 Other Remedies. Termination or expiration of this Agreement for any reason shall not release any Party from any liability or obligation that has accrued prior to such termination or expiration, nor affect the survival of any provision hereof to the extent it is expressly stated to survive termination or expiration. Termination or expiration of this Agreement for any reason shall not constitute a waiver or release of, or otherwise be deemed to prejudice or adversely affect, any rights, remedies, or claims, whether for damages or otherwise, that a Party may have hereunder with respect to the period prior to such termination or expiration or that may arise out of or in connection with such termination or expiration.

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ARTICLE XV.
DISPUTE RESOLUTION

15.1 Resolution by Executive Officers; Mediation. The Parties shall attempt to resolve any and all disputes, claims or controversies arising out of or relating to this Agreement promptly by negotiation between Executive Officers of the respective Parties, in each case who have authority to settle the dispute, claim or controversy. If a Party provides written notice to the other Party regarding any such dispute, claim or controversy and such dispute, claim or controversy is not resolved through such negotiation procedures within [***] after receipt of such written notice by the other Party (or immediately if the Executive Officers have been unable to resolve such dispute, claim or controversy pursuant to Section 3.1.6(c)), then the Parties shall endeavor in good faith to settle the dispute, claim or controversy by confidential mediation by the International Institute for Conflict Prevention & Resolution ("CPR") pursuant to the CPR Mediation Procedure for a period not to exceed [***]. The Parties will select a mediator from the CPR Panels of Distinguished Neutrals ("CPR Panels"). If such dispute, claim or controversy is not resolved by the Executive Officers or by mediation, then it shall be submitted for final and binding arbitration pursuant to Section 15.2.

15.2 Arbitration. To the extent not resolved pursuant to Section 15.1, any dispute, claim or controversy arising out of or relating to this Agreement (for the avoidance of doubt, including the Development Plans) or the alleged breach, termination, enforcement, interpretation or validity hereof, including the determination of the scope or applicability of this agreement to arbitrate, shall be determined solely by arbitration in New York, New York, in the language in which this Agreement is written. Notwithstanding anything to the contrary in this Agreement, (a) any disputes, claims or controversies arising out of, or for which resolution depends in whole or in part on a determination of the interpretation, validity, enforceability or infringement of, Patent Rights or the misappropriation of trade secrets, shall not be subject to arbitration under this Agreement and (b) each Party may apply to any court of law or equity of competent jurisdiction for temporary injunctive or other interim relief, pending completion of arbitration, to enforce or prevent any violation of this Agreement.

15.2.1 Arbitration Format. Any arbitration hereunder shall be administered by the CPR pursuant to its Rules for Administered Arbitration. References herein to any arbitration or mediation rules or procedures mean such rules or procedures as amended from time to time, including any successor rules or procedures, and references herein to the CPR include any successor thereto. The arbitration shall be before three (3) arbitrators, selected within [***] after the date such dispute, claim or controversy is referred for arbitration. Each Party shall designate one (1) arbitrator from the CPR Panels in accordance with the "screened" appointment procedure

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provided in Rule 5.4 of the CPR Rules. The two Party-appointed arbitrators will select the third arbitrator from the CPR Panels and such third arbitrator will serve as the arbitration panel's chair or president. All three (3) arbitrators shall have at least ten (10) years' experience in biotechnology licensing, discovery, development or commercialization matters; provided that, in the event of a dispute, claim or controversy relating to the ownership of Patent Rights and Know-How developed under this Agreement, the arbitrators also shall be patent attorneys with at least ten (10) years' experience in the relevant subject matter area. This Section 15.2, and the arbitration itself, shall be governed by the laws of the State of New York and the Federal Arbitration Act, 9 U.S.C. §§ 1-16.

15.2.2 Arbitration Procedures. Consistent with the expedited nature of arbitration, each Party will, upon the written request of the other Party, promptly provide the other Party with copies of documents on which the producing Party may rely in support of or in opposition to any claim or defense and will identify all individuals the Party may call to testify in support of that Party's claim or defense. Each Party may obtain production of documents from the other Party in response to document requests not to exceed [***] in number, answers to interrogatories by the other Party not to exceed [***] in number, and the examination by deposition of witnesses as set forth in this Section 15.2.2. The arbitrators may permit each Party up to [***] additional document requests and [***] additional interrogatories upon a showing that such additional document requests and interrogatories are relevant and appropriate. Unless the Parties otherwise agree, depositions will occur and documents will be produced in New York, New York. Neither Party shall object to the production of documents on the grounds that documents are located outside the United States or are in the possession, custody or control of an Affiliate of the producing Party. Depositions of fact witnesses shall be limited to a maximum of [***]. Additional depositions may be taken only with the permission of the arbitrators, and for good cause shown. In addition to depositions of fact witnesses as provided above, each Party shall have the right to depose all testifying experts designated by the other Party. Each deposition shall be limited to a maximum of eight (8) hours of testimony conducted during [***] duration, except that any deposition involving an interpreter shall be limited to a maximum of [***] of testimony. If agreed by the Parties, any deposition or testimony may be conducted by videoconference. All objections are reserved for the arbitration hearing except for objections based on privilege, the form of questions, and proprietary or confidential information. Any dispute regarding discovery, or the relevance or scope thereof, shall be determined by the arbitrators. All discovery shall be completed within [***] following the appointment of the arbitrators unless the Party initiating such arbitration elects by written notice to the other Party to expand such period to a period of up to [***]. Each Party may present at the hearing a total of [***] of direct testimony. Testimony by sworn affidavit filed by a Party will be permitted provided the witness is made available by that Party at the hearing for cross-examination by the other Party. In the arbitrators' discretion, costs or fees relating to the retrieval, review and production of electronic discovery may be assessed in whole or in part against the Party requesting such discovery. All briefing, hearings, post-hearing briefing, and the arbitral award shall be completed within [***] following the completion of discovery. A record that includes all hearings and all evidence (including exhibits, deposition transcripts, and affidavits admitted into evidence) shall be maintained in any arbitration in which [***].

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

15.2.3 Arbitral Awards. The panel of arbitrators shall have no power to award non-monetary or equitable relief of any sort, other than injunctions and specific performance. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing Party's actual damages, except as may be required by applicable statute. The arbitrators shall have no power or authority, under the CPR Rules or otherwise, to relieve the Parties from their agreement hereunder to arbitrate or otherwise to amend or disregard any provision of this Agreement or to award any damages or other relief that conflicts with the express terms of this Agreement. In any arbitration in which [***], the arbitrators shall render a written decision setting forth the factual and legal bases of the award. The arbitrators also shall render a written decision setting forth the factual and legal bases of any award that [***]. In any case, the award of the arbitrators shall be final and binding on the Parties, except as such award may be modified pursuant to appeal as set forth in Section 15.2.4. Either Party may seek to confirm and enforce any final award entered in arbitration in any court of competent jurisdiction as provided in Section 17.13. The cost of the arbitration, including the fees of the arbitrators (excluding each Party's attorneys' fees), shall be borne by the Party the arbitrators determine has not prevailed in the arbitration; provided, if a Party does not prevail on all issues, the arbitrators shall award costs in reasonable proportion to the issues on which such Party prevails.

15.2.4 Arbitral Appeals. The arbitral award may be appealed to a tribunal of appellate arbitrators pursuant to the CPR Arbitration Appeal Procedure if [***]. Otherwise, the award shall not be appealable and shall be subject only to such challenges as are permitted under the Federal Arbitration Act, 9 U.S.C. §§ 1-16. In any appeal, the arbitration tribunal and the appeal tribunal may take such interim measures as it deems necessary. The Parties agree to use commercially reasonable efforts to conclude the appeal within [***] after its commencement. Any appeal will be conducted in New York, New York in the language in which this Agreement is written. The cost of the appeal, including the fees of the tribunal of appellate arbitrators (excluding each Party's attorneys' fees), shall be borne by the Party the appellate arbitrators determine has not prevailed in the arbitration; provided, if a Party does not prevail on all issues, the appellate arbitrators shall award costs in reasonable proportion to the issues on which such Party prevails.

15.2.5 Confidentiality. Except as may be required to confirm or enforce a final award, or as may be required by applicable Law, neither a Party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both Parties.

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ARTICLE XVI.
CERTAIN ADDITIONAL MATTERS

16.1 Change of Control of Precision.

16.1.1 Notice Regarding Potential or Completed Change of Control of Precision.

(a) During the Nomination Period, Precision will provide prompt written notice to Baxalta in the event that (i) Precision executes or intends to execute a non-binding term sheet or letter of intent relating to the terms of a potential Change of Control of Precision, (ii) Precision has entered into or intends to enter into a period of exclusive negotiation with respect to a potential Change of Control of Precision, (iii) Precision receives an unsolicited offer proposing a potential Change of Control of Precision that Precision intends to accept or with respect to which Precision intends to initiate discussions with the Third Party making such a proposal, or (iv) Precision initiates an external process seeking offers from Third Parties with respect to a potential Change of Control of Precision, in each case subject to confidentiality obligations to Third Parties, the fiduciary obligations of Precision's executive officers and board of directors and applicable Laws, and it being understood and agreed that Precision shall not be required to disclose any further information (including the identity of any potential Acquirer) other than the fact that one of the foregoing events has occurred. Precision represents and warrants that, as of the Effective Date, none of the events described in subsections (i)—(iv) above has occurred and is currently in effect or ongoing.

(b) Precision will provide Baxalta with prompt written notice prior to, contemporaneous with or promptly after the closing of any Change of Control of Precision.

16.1.2 [***]. Following the closing of a Change of Control of Precision, the following provisions shall apply with respect to each Included Target:

(a) [***].

(i) [***]

(ii) [***]

(iii) [***]

(b) Additional Limitation for Included Targets [***]. Without limiting the obligations of Precision set forth in Section 16.1.2(a), from and after the designation by Baxalta of a Target as an Included Target in accordance with this Agreement, and regardless of whether [***], Precision covenants that it will not [***].

(c) Cessation of Certain Obligations. The notification and update obligations set forth in Section 2.4.1 and Section 2.4.3 shall continue solely with respect to any Inactive Targets for which Precision has initiated Development prior to the date of closing of the Change of Control of Precision. For clarity, the rights and restrictions in connection with the Inactive Target Non-Disclosure Period shall not apply with respect to any sharing of any Inactive Target Evaluation Data with the Acquirer.

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(d) Effect on CDCP Option and Existing CDCP Agreements. Precision shall not have the right to exercise the CDCP Option pursuant to Section 7.3.2 with respect to any Licensed Product Directed to an Included Target for which [***]. If a CDCP Agreement has previously been executed with respect to any Licensed Product Directed to an Included Target for which [***], Baxalta may (at its option) terminate such CDCP Agreement within [***] and the Parties will agree upon terms for the orderly transition of Precision's activities under such CDCP Agreement to Baxalta (which may include, without limitation, acquisition by Baxalta of any sales force dedicated to the applicable Licensed Product). [***].

16.2 Effect of Final Determination of [***]. If a Final Determination is made that [***] then upon Baxalta's written request, [***]

16.2.1 [***]

16.2.2 [***]

16.2.3 [***]

16.2.4 [***]

16.2.5 [***]

16.2.6 [***]

16.2.7 [***]

16.2.8 [***]

16.2.9 [***]

16.3 Effect of Final Determination of [***]. If a Final Determination is made that [***]

16.3.1 [***]

16.3.2 [***]

16.3.3 [***]

16.3.4 [***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

16.3.5 [***]

16.3.6 [***]

16.3.7 [***]

16.3.8 [***]

16.3.9 [***]

16.4 Other Remedies. Nothing in this Article XVI shall limit any other rights or remedies that a Party would otherwise have at law or in equity.

ARTICLE XVII.
GENERAL PROVISIONS

17.1 Assignment. This Agreement is binding upon and will inure to the benefit of the Parties and their respective permitted assignees or successors in interest, including those that may succeed by assignment, transfer or otherwise to the ownership of the assets necessary to the conduct of the business to which this Agreement relates. This Agreement may not be assigned or otherwise transferred by either Party without the prior written consent of the other Party; provided, however, that either Party may, without such consent, assign or otherwise transfer this Agreement, together with all of its rights and obligations hereunder, to any of its Affiliates, or to a successor in interest in connection with the transfer or sale of all or substantially all of its business to which this Agreement relates (including by transfer or sale of all or any portion of such Party's assets, equity or business), or in the event of its merger or consolidation or similar business combination transaction. Notwithstanding the foregoing, Precision shall not be required to obtain Baxalta's consent to sell, assign, pledge as security, contribute, or otherwise transfer, in whole or in part, to any Third Party its rights to receive any payment under this Agreement, and, as it relates to any such transfer, Precision may provide to such Third Party (i) a copy of reports received from Baxalta pursuant to Section 8.4.6 and (ii) the result of any audit conducted in pursuant to Section 8.4.7, in each case of (i) and (ii), provided that any such Third Party is bound by confidentiality and non-use obligations equivalent in scope to those set forth in ARTICLE XII of this Agreement. Any purported assignment in violation of the preceding sentences in this Section shall be void. Any permitted assignee or successor shall assume and be bound by all obligations of its assignor or predecessor under this Agreement. Notwithstanding anything to the contrary in this Agreement, the Patent Rights and Know-How Controlled by an entity that is a permitted assignee, transferee or successor of a Party under this Agreement, or an entity who becomes an Affiliate of a Party during the Term (or any Affiliate of any such entity), whether such Patent Rights and Know-How were developed prior to or after the transaction that was the basis for such assignment, transfer or succession or resulted in such entity becoming an Affiliate, shall be automatically excluded from

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the rights licensed to the other Party under this Agreement; provided, however, that following such a transaction involving Precision, if at Precision's sole option (a) Precision uses or commences to use any of such excluded Know-How, or (b) Precision comes to Control and uses or commences to use any such excluded Patent Right, in each case for purposes of performing Precision's Development and manufacturing responsibilities with respect to a Licensed Product Candidate or Licensed Product, such intellectual property will be included within the Patent Rights or Know-How licensed to Baxalta pursuant to this Agreement with respect to such Licensed Product Candidate or Licensed Product, as Precision Patents, Precision Know-How, Precision Platform Patents or Precision Platform Technology, as applicable.

17.2 Allocation of Costs. Without limiting Baxalta's payment obligations under ARTICLE VIII of this Agreement, each of Baxalta and Precision shall be solely responsible for all costs and expenses it incurs in connection with their activities under this Agreement except as otherwise expressly set forth in this Agreement.

17.3 Headings; Rules of Construction. Headings are inserted for convenience and shall not affect the meaning or interpretation of this Agreement. Each Party agrees that this Agreement shall be interpreted without regard to any presumption or rule requiring construction against the Party causing this Agreement to be drafted. Except as otherwise explicitly specified to the contrary in this Agreement, (a) the words "hereof," "herein," "hereby," "hereunder" and words of similar import shall refer to this Agreement as a whole and not to any particular section or subsection of this Agreement and reference to a particular section of this Agreement shall include all subsections thereof, (b) references to a section, exhibit or schedule means a section of, or exhibit or schedule to, this Agreement, (c) definitions shall be equally applicable to both the singular and plural forms of the terms defined, and references to the masculine, feminine or neuter gender shall include each other gender, (d) the words "include," "includes" and "including" shall be deemed to be followed by the words "without limitation," (e) references to a rule, statute or regulation (including CPR rules and procedures) include all rules and regulations thereunder and any successor statute, rule or regulation, in each case as amended or otherwise modified from time to time, (f) references to a particular Governmental Authority include any successor agency or body to such Governmental Authority and (g) references to "days" means calendar days, unless specified as Business Days.

17.4 No Implied Waiver. No waiver of any default hereunder by either Party or any failure to enforce, or delay in enforcing, any rights hereunder shall be deemed to constitute a waiver of any subsequent default with respect to the same or any other provision hereof.

17.5 Notices. Any notice or other communication given by one Party to the other Party under this Agreement must be in writing and shall be sufficient if (a) delivered personally or (b) sent by registered or certified mail, return receipt requested, reputable overnight business courier, email or fax, in each case properly addressed to the receiving Party as set forth below. The effective date of any notice or other communication given hereunder shall be the actual date of receipt by the receiving Party.

If to Precision:

Precision BioSciences, Inc.
302 East Pettigrew Street, Suite A-100
Durham, NC 27701
Facsimile: (480) 393-5553
Attention: Michael Dombeck, Vice President, Business Development

with a copy (which copy shall not constitute legal notice to Precision) to:

Smith, Anderson, Blount, Dorsett, Mitchell & Jernigan, LLP
150 Fayetteville Street, Suite 2300
Raleigh, NC 27601
Facsimile: (919) 821-6800
Attention: John R. Therien, Esq.

If to Baxalta:

Baxalta Incorporated
1200 Lakeside Drive
Bannockburn, IL 60015
Facsimile: (224) 940-8294
Email: legal.operations@baxalta.com
Attention: Legal Department

and

Baxalta GmbH
Thurgauerstrasse 130
8152 Glattpark (Opfikon)
Switzerland
Attention: Legal Department

with a copy (which copy shall not constitute legal notice to Baxalta) to counsel:

Baxalta Incorporated
1200 Lakeside Drive
Bannockburn, IL 60015
Email: general.counsel@baxalta.com
Attention: General Counsel

Any Party may change its notification address by giving notice to the other Party in the manner herein provided.

17.6 Severability. Whenever possible, each term and provision of this Agreement shall be interpreted in such manner as to be valid and effective under applicable Laws, but, if any term or provision of this Agreement is held to be invalid or unenforceable under applicable Laws, such term or provision shall be invalid and ineffective only to the extent of such invalidity or unenforceability, without invalidating or making unenforceable the remainder of this Agreement. In the event of such invalidity or unenforceability, the Parties shall use reasonable efforts to seek and agree on an alternative valid and enforceable provision that preserves the original purpose and intent of the Agreement.

17.7 Entire Agreement. This Agreement constitutes the entire agreement between the Parties and shall cancel and supersede any and all prior and contemporaneous negotiations, correspondence, understandings and agreements, whether oral or written, between the Parties respecting the subject matter hereof, including the Confidentiality Agreement and that certain non-binding term sheet exchanged by the Parties prior to the Effective Date.

17.8 Amendment; Waiver. Any amendment or modification to this Agreement shall only be made in writing and shall only be valid when signed by an authorized representative of each Party. No term or provision of this Agreement, including the Parties' respective obligations, may be waived except by a writing signed by the Party against which such waiver is sought to be enforced.

17.9 Counterparts. This Agreement may be executed in more than one counterpart (including by electronic transmission), each of which shall be deemed an original, but all of such counterparts taken together shall constitute one and the same agreement.

17.10 Agency. Neither Party is, nor shall be deemed to be, an employee, agent, co-venturer, or legal representative of the other Party for any purpose. Neither Party shall be entitled to enter into any contracts in the name of, or on behalf of the other Party, nor shall either Party be entitled to pledge the credit of the other Party in any way or hold itself out as having the authority to do so.

17.11 Further Actions. Each Party agrees to execute, acknowledge, and deliver such further instruments, and to do all such other acts, as may be necessary or appropriate in order to carry out the purpose and intent of this Agreement.

17.12 Compliance with Laws. Each Party will comply with all applicable Laws in performing its obligations and exercising its rights hereunder, including all applicable Laws relating to the export, re-export or other transfer of any Know-How transferred pursuant to this Agreement.

17.13 Governing Law; Jurisdiction. Any dispute, claim or controversy arising under or related to this Agreement, including the construction, validity and performance of this Agreement, shall be governed in all respects by the substantive laws of the state of New York, excluding its provisions regarding conflicts of law; provided, however, that any issue relating to the interpretation, construction, validity, enforceability or infringement of Patent Rights shall be determined according to the patent laws of the country (or countries) in which the relevant Patent (or Patents) issued. Subject to Section 15.2, this Agreement will be subject to the exclusive jurisdiction of the United States District Court for the Southern District of New York or, if such court is not of competent jurisdiction, a court of competent jurisdiction located in New York, New York. Each Party hereby consents to the personal jurisdiction of such courts for the purposes of any action brought consistent with this Agreement.

17.14 Rights in Bankruptcy.

17.14.1 Effect on Licenses. All rights and licenses granted under or pursuant to this Agreement by Precision or Baxalta are, and shall otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code and of any similar provisions of applicable Laws under any other jurisdiction (collectively, the "Bankruptcy Laws"), licenses of rights to "intellectual property" as defined under the Bankruptcy Laws. Each Party agrees that the other Party, as licensee of such rights under this Agreement shall retain and may fully exercise all of its rights and elections under the Bankruptcy Laws. Each Party agrees during the Term, to create and maintain current copies or, if not amenable to copying, detailed descriptions or other appropriate embodiments, to the extent feasible, of all such intellectual property. If a case is commenced by or against the Debtor Party under the Bankruptcy Laws (excluding a reorganization proceeding under Chapter 11 of the U.S. Bankruptcy Code if the Debtor Party is continuing to perform all of its obligations under this Agreement), the Debtor Party (in any capacity, including debtor-in-possession) and its successors and assigns (including a trustee under the Bankruptcy Laws) shall, as the Non-Debtor Party may elect in a written request, immediately upon such request:

(a) perform all of the obligations provided in this Agreement to be performed by the Debtor Party including, where applicable, providing to the Non-Debtor Party portions of such intellectual property (including embodiments thereof) held by the Debtor Party and such successors and assigns or otherwise available to them and to which the Non-Debtor Party is entitled to have access under this Agreement; or

(b) provide to the Non-Debtor Party all such intellectual property (including embodiments thereof) held by the Debtor Party and such successors and assigns or otherwise available to them and to which the Non-Debtor Party is entitled to have access under this Agreement; and

(c) not interfere with the rights of the Non-Debtor Party under this Agreement, or any agreement supplemental hereto, to such intellectual property (including such embodiments), including any right to obtain such intellectual property (or such embodiments) from another entity, to the extent provided in the Bankruptcy Laws.

17.14.2 Rights to Intellectual Property. If (a) a case under the Bankruptcy Laws is commenced against the Debtor Party, (b) this Agreement is rejected by the trustee pursuant to the Bankruptcy Laws, and (c) the Non-Debtor Party elects to retain its rights hereunder as provided in the Bankruptcy Laws, then the Debtor Party (in any capacity, including debtor-in-possession) and its successors and assigns (including a trustee under the Bankruptcy Laws) shall provide to the Non-Debtor Party all such intellectual property (including embodiments thereof) held by the Debtor Party and such successors and assigns, or otherwise available to them, and to which the Non-Debtor Party is entitled to have access under this Agreement, immediately upon the Non-Debtor Party's written request. Whenever the Debtor Party or any of its successors or assigns provides to the Non-Debtor Party any of the intellectual property licensed hereunder (or any embodiment thereof) pursuant to this Section 17.14.2, the Non-Debtor Party shall have the right to perform the obligations of the Debtor Party hereunder with respect to such intellectual property, but neither such provision nor such performance by the Non-Debtor Party shall release the Debtor Party from any such obligation or liability for failing to perform it.

17.14.3 Additional Rights. All rights, powers and remedies of the Non-Debtor Party provided herein are in addition to and not in substitution for any and all other rights, powers and remedies now or hereafter existing at law or in equity (including under the Bankruptcy Laws) in the event of the commencement of a case under the Bankruptcy Laws by or against the Debtor Party. The Non-Debtor Party, in addition to the rights, power and remedies expressly provided herein, shall be entitled to exercise all other such rights and powers and resort to all other such remedies as may now or hereafter exist at law or in equity (including under the Bankruptcy Laws) in such event. The Parties agree that they intend the foregoing rights to extend to the maximum extent permitted by applicable Laws, including for purposes of the Bankruptcy Laws:

(a) The right of access to any intellectual property (including embodiments thereof) of the Debtor Party to which the Non-Debtor Party is entitled to have access under this Agreement, or any Third Party with whom the Debtor Party contracts to perform an obligation of the Debtor Party under this Agreement, and, in the case of the Third Party, which is necessary for the Development, manufacture or Commercialization of Licensed Products; and

(b) The right to contract directly with any Third Party described in Section 17.14.3(a) to complete the contracted work.

17.15 Force Majeure.

17.15.1 No failure or delay by either Party in the performance of any obligation hereunder (other than any obligation to make a payment to the other Party) shall be deemed a breach of this Agreement nor create any liability for any damages, increased cost or losses which the other Party may sustain by reason of such failure or delay of performance, if the same shall arise from any cause or causes beyond the control of that Party, such as earthquake, storm, flood, fire, other acts of nature, epidemic, war, riot, hostility, public disturbance, cessation of transport, act of public enemies, prohibition or act by a Governmental Authority or public agency, strike or other labor dispute or work stoppage (collectively "Force Majeure"); provided, however, that the failing or delaying Party shall (a) without undue delay, notify the other Party in writing of the applicable failure or delay and (b) continue to take all commercially reasonable actions within its power to comply with its obligations hereunder as fully as possible and to mitigate possible damages.

17.15.2 Should an event of Force Majeure continue for more than [***], the Parties shall promptly discuss their further performance under this Agreement and whether to modify or terminate this Agreement in view of the effect of the event of Force Majeure. Any such modification or termination of this Agreement shall be effective only upon mutual written agreement of the Parties.

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17.16 Consideration. The Parties acknowledge that each of the licenses and rights granted by Precision in this Agreement and each of the provisions of this Agreement for efforts or assistance by Precision and access to Precision Patents, Precision Know-How and Precision Platform Patents, individually and collectively, constitute good, valuable and sufficient consideration for each and all of the fees and payments called for hereunder and for each and all of the other obligations of Baxalta, its Affiliates and Sublicensees; and the Parties further acknowledge that the individual and collective rights under and access to Precision Patents, Precision Know-How and Precision Platform Patents renders the way in which those fees and payments hereunder are determined, and their duration, appropriate and desirable as a matter of convenience.

17.17 Antitrust.

17.17.1 To the extent required by the HSR Act, each Party will (a) file or cause to be filed, as promptly as practicable after Baxalta's provision of a Commercial Option Exercise Notice (but not later than [***], except in the case of provision of the Commercial Option Exercise Notice in accordance with Section 16.2.4 or Section 16.3.4 which shall be not later than [***]), with the United States Federal Trade Commission ("FTC") and the United States Department of Justice ("DOJ"), all reports and other documents required to be filed by such Party under the HSR Act concerning the exercise of the applicable Commercial Option and (b) promptly comply with or cause to be complied with any requests by the FTC or DOJ for additional information concerning the exercise of the applicable Commercial Option, in each case so that the waiting period applicable to the applicable Commercial Option under the HSR Act will expire as soon as practicable after the date hereof. Each Party agrees to request, and to cooperate with the other Party in requesting, early termination of any applicable waiting period under the HSR Act. The Parties acknowledge that compliance with the timelines set forth in this paragraph will require the Parties to begin to prepare such filings sufficiently in advance of provision of the Commercial Option Exercise Notice, and if it is reasonably expected that the Commercial Option Exercise Notice will be provided then each Party agrees to commence any required actions as soon as possible in advance of provision of the Commercial Option Exercise Notice.

17.17.2 From the date of each Commercial Option Exercise Notice through receipt of Antitrust Clearance (but for no longer than [***] after the date of the Commercial Option Exercise Notice unless otherwise agreed between the Parties), Baxalta and Precision agree (and shall cause each of their respective Affiliates) to use their respective commercially reasonable efforts, (a) to cooperate to obtain any authorizations, clearances, orders or approvals required for the exercise of the Commercial Option under the HSR Act and any other federal, state or foreign Law, regulation or decree designed to prohibit, restrict or regulate actions intended to or having the effect of reducing competition or monopolizing or restraining trade (collectively, "Antitrust Laws"); (b) to promptly respond to any request by any Governmental Authority for information under any Antitrust Law; (c) to contest and resist any action, including any legislative, administrative or judicial action, and to have vacated, lifted, reversed or overturned any decree,

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judgment, injunction or other order (whether temporary, preliminary or permanent) that restricts, prevents or prohibits the exercise of any Commercial Option under any Antitrust Law; (d) to promptly inform the other Party upon receipt of any material communication from the FTC, the DOJ or any other Governmental Authority regarding the exercise of any Commercial Option; (e) subject to applicable legal limitations and the instructions of any Governmental Authority, keep the other Party apprised of the status of matters relating to the exercise of any Commercial Option, including promptly furnishing the other Party with copies of material notices or other material communications received by such Party or any of their respective Affiliates, as the case may be, from any Third Party and/or any Governmental Authority with respect to the exercise of any Commercial Option, and (f) refrain from taking any action the purpose or effect of which could reasonably be expected delay, impair or impede the termination of any waiting period or the receipt of any required consents, permits, authorizations or approvals of any Governmental Authority. The Parties shall each permit legal counsel for the other Party a reasonable opportunity to review in advance, and consider in good faith the views of the other Party in connection with, any proposed material written communication to any Governmental Authority. Each of the Parties agrees, subject to applicable legal limitations and the instructions of any Governmental Authority, not to participate in any substantive meeting or discussion, either in person or by telephone, with any Governmental Authority in connection with the exercise of any Commercial Option unless it consults with the other Party in advance and gives the other Party the opportunity to attend and participate. Notwithstanding the foregoing, Baxalta shall, on behalf of the Parties, control and lead all communications and strategy relating to Antitrust Laws and litigation matters relating to the Antitrust Laws (provided that Precision is not prohibited from complying with applicable Law), subject to good faith consultations with Precision and the inclusion of Precision at meetings with Governmental Authorities with respect to any discussion related to the exercise of any Commercial Options under the Antitrust Laws.

17.17.3 Baxalta shall be responsible for all costs, expenses (other than Precision's legal expenses), and filing fees in connection with this Section 17.17.

17.17.4 Notwithstanding the foregoing, nothing in this Section 17.17 or otherwise in this Agreement shall require Baxalta to propose, negotiate, effect or agree to, the sale, divestiture, license or other disposition of any assets or businesses or otherwise take any action that limits the freedom of action with respect to, or its ability to retain any of the businesses, product lines or assets.

[Signature Pages Follow]

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

PRECISION BIOSCIENCES, INC.

By: /s/ Matthew Kane
Name: Matthew Kane
Title: CEO

[signatures continue on following page]

BAXALTA INCORPORATED

By: /s/ Robert J. Hombach
Name: Robert J. Hombach
Title: Executive Vice President, Chief Financial Officer and Chief Operations Officer

BAXALTA US INC.

By: /s/ Robert J. Hombach
Name: Robert J. Hombach
Title: Executive Vice President, Chief Financial Officer and Chief Operations Officer

[signatures continue on following page]

BAXALTA GMBH

By: /s/ René Büchel
Name: Dr. René Büchel
Title: Dir. Plasma Procurement

By: /s/ Yvo Aebli
Name: Yvo Aebli
Title: Controller Switzerland & ECG

[***]

EXHIBIT A
DUKE IP

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EXHIBIT B

SUPPLY AGREEMENT TERM SHEET

OVERVIEW

PARTIES	Baxalta and Precision
SUBJECT MATTER	This "Supply Agreement Term Sheet" sets forth the key terms that will be included in the supply agreement that the Parties will negotiate as contemplated by Section 6.2 of the Agreement (the "Supply Agreement"). Pursuant to the Supply Agreement, Precision or its CMO will manufacture and Precision will supply clinical trial materials for use in Phase II Clinical Trials, including Phase II Ready Batches, to Baxalta. Baxalta will retain the right to engage or appoint additional suppliers and/or CMOs from time to time in its sole discretion to produce Product for Phase II Clinical Trials or for any further Development and Commercialization.
TERRITORY	As defined in the Agreement.
DEFINITIONS	All capitalized terms used but not otherwise defined in this Supply Agreement Term Sheet shall have the meaning set forth in the Development and Commercial License Agreement between Precision and Baxalta of which this Exhibit is a part (referred to as the "Agreement" for purposes of this Supply Agreement Term Sheet).

MANUFACTURING OBLIGATIONS

MANUFACTURING OF PRODUCT	Precision shall supply to Baxalta formulated Licensed Product Candidates or Licensed Product (as applicable, the "Product") for use by Baxalta in Phase II Clinical Trials. Prior to manufacture by Precision of any Product for use in Phase I or Phase II Clinical Trials, the Parties will establish (and the JSC shall approve) a written specification for each Product, setting forth Product attributes and the corresponding test methods and quality systems adequate to ensure quality and consistency of the Product (the "Specification"). Precision shall manufacture all Product for Clinical Trial use in accordance with cGMP, the Specification and the Quality Agreement. Precision may not make any material changes to the manufacturing process for Product without JSC approval. Precision shall label Product in accordance with the JSC's instructions in a manner appropriate for clinical use. Precision shall ensure that all Product supplied to Baxalta has the minimum shelf life specified in the Specification for the applicable Product. All manufacturers and suppliers of materials to manufacture Product shall be Baxalta certified and approved prior to the initiation of manufacture.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

FORECASTS AND ORDERS	The quantity of the Phase II Ready Batch shall be established for each Product by the JSC in accordance with the Agreement. Baxalta shall deliver a binding order for the Phase II Ready Batch not less than [***] before its requested delivery date. If Baxalta determines that it requires additional quantities of Product for use in Phase II Clinical Trials after supply of the Phase II Ready Batch, Baxalta shall provide Precision with a non-binding forecast of its requirements as soon as practicable after making such determination and shall adjust its forecast from time to time as its expected requirements of such additional Product change. Baxalta shall issue a binding order of its requirements of Product not less than [***] before its requested delivery date. The Supply Agreement will acknowledge that the process for manufacture of the Products has variable yields and will provide appropriate accommodation parameters regarding ordered and delivered quantities of Products.
CERTIFICATE OF ANALYSIS	In conjunction with each delivery of Product, Precision shall provide a signed Certificate of Analysis certifying that the Product in such shipment meets all requirements of the final Specification.
DELIVERY	EXW (ICC Incoterms 2010) Precision's manufacturing facility.

FINANCIAL TERMS

SUPPLY PRICE AND PAYMENT	Baxalta shall purchase Product (other than Phase II Ready Batches) from Precision at a supply price equal to [***]. Precision may invoice Baxalta upon delivery, and Baxalta will pay all correctly issued invoices within [***] days after receipt. Precision will not charge [***] Baxalta for the Phase II Ready Batches.

MISCELLANEOUS

TERM AND TERMINATION	The term of the Supply Agreement will commence upon execution of the Supply Agreement and shall continue until six (6) months after completion of manufacture of the Phase II Ready Batch of the last Licensed Product Candidate Baxalta may pursue under the Agreement. The Parties can mutually agree to extend the Supply Agreement. The Supply Agreement will be in place prior to Precision's manufacture of any Licensed Product Candidate for use in Clinical Trials. The Supply Agreement will automatically terminate if the Agreement terminates. In addition, either Party may terminate the Supply Agreement in its entirety immediately upon written notice to the other Party if the other Party materially breaches its obligations under the Supply Agreement (which termination shall be substantially similar to Section 14.2.1 of the Agreement)

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

REPRESENTATIONS, WARRANTIES / INDEMNIFICATION / LIMITATIONS OF LIABILITY	The Supply Agreement shall contain customary representations and warranties relating to the manufacture and supply of products in the pharmaceutical industry, including representations and warranties that (i) Products are manufactured in compliance with the Specification, cGMP and the Quality Agreement, (ii) Products are not adulterated or misbranded within the meaning of the Federal Food, Drug and Cosmetic Act (21 USC §321, as amended), (iii) Precision will comply with all applicable Laws in connection with its manufacturing activities, and (iv) that Precision will not use any personnel that to its knowledge have been debarred or disqualified or committed any act subject to debarment or disqualification. In addition, the Supply Agreement shall include appropriate indemnification provisions (including for breach of warranty) and limitations of liability, in each case as are reasonable and customary for agreements for supply of clinical study material.
CONFIDENTIALITY	Article XII of the Agreement shall govern the Parties' obligations with respect to confidentiality.
ASSIGNMENT AND CHANGE OF CONTROL	These matters will be subject to the same terms as agreed by the Parties with respect to such matters in the Agreement.
GOVERNING LAW	New York
DISPUTE RESOLUTION	Article XV of the Agreement shall govern resolution of disputes arising under the Supply Agreement.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

EXHIBIT C

QUALITY AGREEMENT TERM SHEET

OVERVIEW

PARTIES	Baxalta and Precision
SUBJECT MATTER	This "Quality Agreement Term Sheet" sets forth the key terms that will be included in the quality agreement that the Parties will negotiate as contemplated by Section 6.3 of the Agreement (the "Quality Agreement").
TERRITORY	As defined in the Agreement.
DEFINITIONS	All capitalized terms used but not otherwise defined in this Quality Agreement Term Sheet shall have the meaning set forth in the Development and Commercial License Agreement between Precision and Baxalta of which this Exhibit is a part (referred to as the "Agreement" for purposes of this Quality Agreement Term Sheet).

QUALITY AGREEMENT SCOPE

GENERAL SCOPE AND RESPONSIBILITIES	The Quality Agreement will define the responsibilities and interactions of Baxalta and Precision for the clinical production of Product by Precision pursuant to the Supply Agreement, specifically relating to quality control, quality assurance and validation of clinical supply of Product to ensure that Product complies with the Specification (as defined in the Supply Agreement Term Sheet), licenses, and marketing authorizations. The Quality Agreement is intended to comply with the guidance and directives set forth in current Good Manufacturing Practice (cGMP) requirements for the United States and the European Union. The Parties will be responsible for ensuring compliance to cGMPs for the roles outlined in the Quality Agreement.
TERM	The Quality Agreement will be coterminous with the Supply Agreement, except for those provisions that may survive termination or expiration, which include, without limitation, the provisions regarding complaints, recalls, regulatory inquires and inspections, completion of defined testing, product-specific document storage, and reserve samples.
JOINT QUALITY TEAM	Baxalta and Precision will implement a joint quality team (the "JQT") to facilitate communication and consensus on issues related to Product quality. Meetings will be held at a frequency that is adequate to assist the JQT responsible for final functional quality decision-making authority with respect to the clinical trial materials. Minimally, the following metrics will be reviewed each meeting: • Significant changes (change controls) • Out of Specifications (OOS) Additional subjects include but are not limited to review of major nonconformities to the Specification, cGMP or the Quality Agreement, and logistics related to Product Candidate testing and release.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

ADDITIONAL TERMS The Quality Agreement will contain provisions relating to the following, which are reasonable and customary consistent with Baxalta's practices:

- Manufacturing cGMP compliance
- Primary packaging
- Qualification/validation/calibration
- Quality control
- Quality assurance
- Change management
- Third Party subcontracting
- Vendor management
- Regulatory responsibilities
- Traceability
- Regulatory compliance
- Analytical method transfer
- Technology transfer

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

EXHIBIT D

FORM CDCP AGREEMENT TERM SHEET

OVERVIEW

PARTIES	Baxalta and Precision.
SUBJECT MATTER	This "CDCPA Term Sheet" sets forth the key terms that will be included in the form CDCP Agreement that the Parties will negotiate as contemplated by Section 7.3.3 of the Agreement.
TERRITORY	United States, including its territories and possessions
DEFINITIONS	All capitalized terms used but not otherwise defined in this CDCPA Term Sheet shall have the meaning set forth in the Development and Commercial License Agreement between Precision and Baxalta of which this Exhibit is a part (referred to as the "Agreement" for purposes of this CDCPA Term Sheet). "Regional Product" means [***].

GOVERNANCE AND ALLOCATION OF RESPONSIBILITY FOR CDCP PRODUCT

GOVERNANCE	The Parties will establish a joint co-development and co-promotion committee (for purposes of this CDCPA Term Sheet, the "Committee") which shall oversee the clinical Development, manufacturing, and Commercialization of each Licensed Product for which Precision has exercised the CDCP Option (each, a "CDCP Product") for the Territory. The Committee shall be put in place immediately upon execution of the CDCP Agreement. The Committee will operate in substantially the same manner as the JSC under Section 3.1 of the Agreement, except that the matters over which the Committee will have oversight shall be limited to issues relating to Development, manufacturing, and Commercialization of the CDCP Product(s). Any disagreement or inability to reach unanimous consensus on the Committee shall be subject to resolution through procedures substantially the same as those set forth in Section 3.1.6 of the Agreement; provided, however, that if after the process set forth in Section 3.1.6(b) of the Agreement the Executive Officers are unable to resolve a particular issue, Section 3.1.6(c) and Article XV of the Agreement shall not apply and instead Baxalta shall have final decision-making authority on all decisions required to be made by the Committee. Baxalta will covenant not to use bad faith in exercising its final decision making authority.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

DEVELOPMENT

The Parties will equally share all costs and expenses in connection with all aspects of further Development of the CDCP Product for the Territory after the effective date of the CDCP Agreement.

Promptly after execution of the CDCP Agreement, the Committee will set the required form and contents of a comprehensive Development plan for the CDCP Product for the Territory, which plan will allocate responsibility to the Parties for any further Development of the CDCP Product (the "Joint Development Plan"). The Joint Development Plan shall be appropriately coordinated with Baxalta's global plan for Development, manufacturing and Commercialization for the CDCP Product, with Baxalta being the sponsor of any Clinical Trials, including those that are conducted on a global basis ("Global Studies"). The Joint Development Plan will contain an estimate of the budget for the period covered by the Joint Development Plan. For clarity, the Joint Development Plan shall not require any activity directed to Development of the CDCP Product for Commercialization outside the Territory.

Baxalta will prepare an initial Joint Development Plan in good faith in consultation with Precision and subject to the Committee's review and approval. Baxalta will review and, as necessary, update the Joint Development Plan at least annually, in each case in good faith in consultation with Precision and subject to the Committee's review and approval. Each Party may request at any time that the Committee approve other updates to the Joint Development Plan. All Development activities for the CDCP Product related to the Territory shall be performed in accordance with the Joint Development Plan. To the extent Third Parties are engaged under contract by either Party to perform Development activities consistent with the Joint Development Plan, such contracts shall provide for appropriate indemnification rights that are equally protective of each Party, and to the extent Precision engages under contract any such Third Party, all such contracts will be subject to Baxalta's approval.

Promptly after executing the CDCP Agreement and concurrently with preparing the Joint Development Plan, Baxalta will prepare the initial budget for the first year of the activities set forth in the Joint Development Plan (the "Initial Joint Development Budget") in good faith in consultation with Precision and subject to the Committee's review and approval. Thereafter, Baxalta will prepare a budget for the activities under the Joint Development Plan on an annual basis prior to the beginning of the next year (each, including the Initial Joint Development Budget, an "Annual Joint Development Budget"), in each case in good faith in consultation with Precision and subject to the Committee's review and approval. Together with each Annual Joint Development Budget, for

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informational purposes only, so as to facilitate Precision's planning, Baxalta will provide a non-binding estimate of the budget for activities remaining under the Joint Development Plan in subsequent years. In the event that Baxalta proposes an update to the Joint Development Plan that would have the effect of deviating from the then-current Annual Joint Development Budget in an amount greater than [***]. For a CDCP Product that is not being Developed as a Regional Product, in the event that any Global Studies are conducted, [***] of the aggregate cost of the Global Studies will be reflected in each Annual Joint Development Budget.

In the event that either Party reasonably expects any deviation from an Annual Joint Development Budget in excess of the percent overage threshold set forth above is necessary to complete its Development activities, the Committee shall meet and consider any necessary adjustments to the Annual Joint Development Budget. Further, the Parties will review and reconcile on a Calendar Quarterly basis costs and expenses of each of the Parties in connection with the Joint Development Plan.

Upon execution of the CDCP Agreement, Precision must either: (a) have cash or cash equivalents on hand, or (b) be able to reasonably demonstrate (i) anticipated cash flows, or (ii) access to cash via credit facility or otherwise, in each case sufficient to cover its share of Development costs (in accordance with the reasonably anticipated Initial Joint Development Budget) for at least [***].

COMMERCIALIZATION The Parties will equally share all costs and expenses in connection with all aspects of Commercialization of the CDCP Product in the Territory. At such time as the Committee deems appropriate (with sufficient time to complete the Joint Commercialization Plan as set forth below), the Committee will set the required form and contents of a comprehensive Commercialization plan for the CDCP Product in the Territory, which plan will allocate responsibility to the Parties for Commercialization of the CDCP Product (the "Joint Commercialization Plan"). The Joint Commercialization Plan will contain an estimate of the budget for the period covered by the Joint Commercialization Plan. Without limiting the foregoing, Precision's required Commercialization activities will be limited to establishing and maintaining a sales force, but Precision may participate in other Commercialization activities subject to Baxalta approval. The Joint Commercialization Plan will be finalized at least [***] prior to launch of Commercialization of the CDCP Product. The Joint Commercialization Plan shall be appropriately coordinated with Development, manufacturing and Commercialization activities undertaken with respect to the CDCP Product outside the Territory, and shall not require any activity directed to Commercialization of the CDCP Product with respect to countries outside the Territory.

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Baxalta will prepare an initial Joint Commercialization Plan in good faith in consultation with Precision and subject to the Committee's review and approval. Baxalta will review and, as necessary, update the Joint Commercialization Plan at least annually, in each case in good faith in consultation with Precision and subject to the Committee's review and approval. Each Party may request at any time that the Committee approve other updates to the Joint Commercialization Plan. All Commercialization activities for the CDCP Product in the Territory shall be performed in accordance with the Joint Commercialization Plan. To the extent Third Parties are engaged under contract by either Party to perform Commercialization activities consistent with the Joint Commercialization Plan, such contracts shall provide for appropriate indemnification rights that are equally protective of each Party, and to the extent Precision engages under contract any such Third Party, all such contracts will be subject to Baxalta's approval.

Concurrently with preparing the Joint Commercialization Plan, Baxalta will prepare the initial budget for the first year of the activities set forth in the Joint Commercialization Plan (the "Initial Joint Commercialization Budget") in good faith in consultation with Precision and subject to the Committee's review and approval. Thereafter, Baxalta will prepare a budget for the activities under the Joint Commercialization Plan on an annual basis prior to the beginning of the next year (each, including the Initial Joint Commercialization Budget, an "Annual Joint Commercialization Budget"), in each case in good faith in consultation with Precision and subject to the Committee's review and approval. Together with each Annual Joint Commercialization Budget, for informational purposes only, so as to facilitate Precision's planning, Baxalta will provide a non-binding estimate of the budget for activities remaining under the Joint Commercialization Plan in subsequent years. In the event that Baxalta proposes an update to the Joint Commercialization Plan that would have the effect of deviating from the then-current Annual Joint Commercialization Budget in an amount greater than [***].

In the event that either Party reasonably expects any deviation from any Annual Joint Commercialization Budget in excess of the percent overage threshold set forth above is necessary to complete its Commercialization activities, the Committee shall meet and consider any necessary adjustments to the Annual Joint Commercialization Budget. Further, the Parties will review and reconcile on a Calendar Quarterly basis costs and expenses of each of the Parties in connection with the Joint Commercialization Plan.

All personnel (including sales and marketing personnel) performing Commercialization activities will conform to Baxalta's qualifications and requirements, as will be set forth in the form CDCP Agreement.

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SALES FORCE AND PROMOTIONAL MATERIALS

Baxalta will direct the training of both Parties' sales representatives contemplated by the Joint Commercialization Plan and will prepare and implement, in consultation with Precision, a training program and provide training materials for such sales representatives. Baxalta will specify the conduct and content of the CDCP Product training and marketing materials.

Unless otherwise set forth in the Joint Commercialization Plan, each Party is solely responsible for recruiting, hiring and maintaining its sales force for promotion of the CDCP Product in accordance with applicable Law and industry standards, its standard procedures, the Joint Commercialization Plan and the CDCP Agreement. Each Party's sales representatives will utilize only promotional material approved by Baxalta and all dealings shall be consistent with the approved promotional materials.

Baxalta will have sole authority (i) to execute medical and scientific affairs and programs based upon protocols approved by the Committee, (ii) over all medical affairs activities related to the CDCP Product, (iii) to respond to questions and requests for information about the CDCP Product that go beyond the understanding of the sales representatives or are beyond the scope of the CDCP Product labels and inserts. Further, Baxalta will have sole control over all other customer-facing aspects of Commercialization of the CDCP Product, including but not limited to all aspect of the development & execution of the commercial and promotional strategy, brand name, packaging, pricing, reimbursement, contracting, promotional materials, commercial booth structure & promotional content for display at scientific forums and at other approved venues; provided, however, for a Regional Product, development & execution of the foregoing activities shall be handled by the Committee.

Notwithstanding the foregoing, Precision may, by written notice to Baxalta received at least [***], elect not to field a sales force and instead to share the costs of the Baxalta sales force for promotion of the CDCP Product in accordance with the Profit & Loss Share below.

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REGULATORY	The Parties will assume through the Committee joint responsibility for all regulatory matters regarding seeking Regulatory Approval in the Territory, which shall be part of the Joint Development Plan. Baxalta will take the lead and have final authority with respect to regulatory activities for seeking Regulatory Approval for the CDCP Product, provided that Precision will have the right (i) to review and provide comments on all Regulatory Materials in the Territory other than administrative communications with Regulatory Authorities, and (ii) have a limited number of representatives participate in all meetings with any Regulatory Authorities in the Territory regarding such activities to the extent permitted by the applicable Regulatory Authorities and provided that, for any meetings with limited number of attendees, Baxalta shall have the first right to appoint designees to attend meetings in accordance with the goal of the meeting, but in all events at least one Precision representative shall be permitted to attend at Precision's request. All Regulatory Materials for the CDCP Product will be owned by Baxalta. Baxalta will maintain the global adverse event database for the CDCP Product in accordance with the Agreement.
REPORTS	Each Party will prepare and provide to the other Party reports regarding its activities under the CDCP Agreement as the Committee may reasonably require or as the other Party may reasonably request. Each Party will prepare and maintain reasonably complete and accurate records regarding its Development and Commercialization activities under the CDCP Agreement. Each Party will provide to the other Party a reasonably detailed report regarding such efforts at least once every [***] (or more frequently if required by the Committee), with sufficient detail to enable a Party to assess the other Party's compliance with its obligations under the CDCP Agreement.
PRECISION'S RIGHT TO NEGOTIATE LEAD ROLE	With respect to the fourth, fifth and sixth Included Targets designated by Baxalta under the Agreement, if applicable, for up to two (2) CDCP Products that are anticipated to be Developed as Regional Products, Precision may elect by written notice to Baxalta to negotiate in good faith additional terms of the applicable CDCP Agreement relating to a lead or increased role for Precision with respect to the following: (a) [***] (b) [***] (c) [***] (d) [***]

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Notwithstanding anything to the contrary, Baxalta shall be required only to discuss with Precision in good faith the terms under which it may agree to a lead or increased role by Precision, but shall not be required to agree to Precision taking a lead or increased role.

FINANCIAL TERMS

PROFIT & LOSS SHARE

The Parties will share equally all operating profits and all operating losses arising from the CDCP Product for and in the Territory, which shall be calculated in accordance with an exhibit to be attached to the CDCP Agreement (the "Profit and Loss").

The Profit and Loss calculation will include the following: [***].
Each Party shall prepare quarterly reports of their Profits and Losses for the immediately prior Calendar Quarter and submit it to the representatives from each Party selected by the Committee. The representatives shall prepare a reconciliation statement comparing the Parties' actual Profits and Losses. If the agreed reconciliation statement reflects that a Party has incurred more than its share of Losses (or if the other Party received more than its share of Profits) in the applicable calendar quarter, it may submit an invoice to the other Party for the difference, and the other Party shall pay the amount owed within [***] after receipt of the invoice.

The Parties will agree upon a commercially reasonable FTE rate for Development and Commercialization activities that will be included in the form CDCP Agreement.

MISCELLANEOUS

TERMINATION

The CDCP Agreement will automatically terminate if the Agreement terminates with respect to any CDCP Product in the Territory, and may be terminated in accordance with any provision of the Agreement that provides for termination of the CDCP Agreement. In addition, either Party may terminate the CDCP Agreement in its entirety immediately upon written notice to the other Party if the other Party materially breaches its obligations under the CDCP Agreement (which termination shall be substantially similar to Section 14.2.1 of the Agreement).

Precision may terminate the CDCP Agreement by delivering written notice to Baxalta [***]. Upon receipt of notice of the Opt-Out, the Committee will promptly meet and agree upon revisions to the Joint Development

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	Plan and Joint Commercialization Plan as necessary for an orderly wind-down of Precision's activities prior to the effective date of the Opt-Out, with any additional cost directly related to wind-down of such activities allocated to Precision to be borne by Precision. The effective date of the Opt-Out will be [***] of the Calendar Year after Baxalta's receipt of the Opt-Out notice. After the effective date of the Opt-Out, Precision will have no further responsibilities for conducting Development or Commercialization activities for the CDCP Product except as set forth in the Agreement, and will no longer share in the Profit and Loss with respect to such CDCP Product. Upon exercising the Opt-Out, the adjusted financials set forth in Section 7.3.5 of the Agreement will no longer apply, and the CDCP Product will again be considered a Licensed Product subject to milestone payments and royalties under the Agreement. [***]. At any time during the term of the CDCP Agreement, if Precision believes that it may not have access to cash sufficient to cover its share of Development or Commercialization costs (in accordance with the Annual Joint Development Budget or Annual Joint Commercialization Budget, as applicable) for the then-following [***], Precision shall promptly notify Baxalta, and the Parties shall promptly meet and discuss in good faith to resolve the issue. If the Parties agree that Precision will not have sufficient cash for such [***] period, then the Parties shall promptly meet and agree upon revisions to the Joint Development Plan and Joint Commercialization Plan as necessary for an orderly wind-down of Precision's activities within the [***] following such meeting, with any additional cost directly related to wind-down of such activities allocated to Precision to be borne by Precision. Such cessation of activities shall be deemed an Opt-Out, effective on the date of the last day of the mutually-agreed wind-down activities.
INTELLECTUAL PROPERTY	The intellectual property rights and responsibilities described in the Agreement shall govern the CDCP Agreement.
TRADEMARKS	Baxalta will select trademarks and trade dress for CDCP Products. Precision shall have the right to include its logo on Baxalta-approved marketing materials that are used by Precision's salesforce in a manner approved by the Committee.
PRESS RELEASE	The Parties may, upon mutual agreement, jointly issue a press release to reflect the co-development and co-promotion of the CDCP Product.

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INDEMNIFICATION	The CDCP Agreement would contain commercially reasonable indemnification provisions customary for an agreement of this type, consistent with the Agreement.
ASSIGNMENT AND CHANGE OF CONTROL	These matters will be subject to the same terms as agreed by the Parties with respect to such matters in the Agreement.
GOVERNING LAW	New York
DISPUTE RESOLUTION	Executive escalation, followed by binding arbitration with a neutral arbitrator pursuant to the arbitration process set forth in Article XV of the Agreement.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

EXHIBIT E
PRECISION PATENTS AND PRECISION PLATFORM PATENTS

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EXHIBIT F

PRESS RELEASE

[Follows on next page.]

Baxalta and Precision BioSciences form Global Genome Editing Collaboration in Immuno-Oncology

- Baxalta and Precision BioSciences to utilize proprietary ARCUS genome editing technology to develop an allogeneic CAR T cell therapeutic pipeline
- Precision BioSciences to receive $105 million upfront, in addition to potential future milestone payments and royalties

BANNOCKBURN, Ill. and DURHAM, N.C., Feb [__], 2016 – Baxalta Incorporated (NYSE: BXLT), a global biopharmaceutical leader dedicated to delivering transformative therapies to patients with orphan diseases and underserved conditions, and Precision BioSciences, the genome editing company, today announced a global collaboration to develop a broad series of allogeneic chimeric antigen receptor (CAR) T cell therapies directed towards areas of major unmet need in multiple cancers.

CAR T is widely recognized as a breakthrough technology with the potential to become a curative option for certain malignancies. Most CAR T cell therapy technologies isolate cells from cancer patients' blood and re-engineer them to specifically target receptors on tumor cells. The reprogrammed cells are multiplied in a laboratory and then returned to the patient to target the tumor. This approach has had initial success in clinical trials for certain tumor types, but persistent scaling challenges remain based on the highly personalized nature of the therapy. Precision BioSciences' proprietary ARCUS genome editing technology enables the production of CAR T cells derived from healthy donors rather than relying on the patient. This approach aims to overcome the manufacturing-related limitations with existing CAR T therapies and enable a broader range of malignancies to be targeted.

"Collaborating with Precision BioSciences enables Baxalta to accelerate innovation in immuno-oncology with a next-generation, donor-derived CAR T strategy using a proprietary combination of genome editing expertise and technology," said David Meek, executive vice president and president, Oncology, Baxalta. "Combining Precision BioSciences' ARCUS technology with Baxalta's global infrastructure, expertise and growing immuno-oncology portfolio is a synergistic approach that we believe has the potential to make disruptive approaches available to people with a range of underserved cancers."

“Baxalta is an ideal partner in CAR T for Precision and our ARCUS genome editing platform because of their global reach, collaborative business model, and long-term commitment to succeeding in immuno-oncology,” said Matthew Kane, CEO of Precision BioSciences. “We look forward to working closely with the team at Baxalta to develop novel CAR T therapeutics that could transform the treatment of cancer.”

Under the terms of the agreement, Baxalta and Precision BioSciences will develop CAR T therapies for up to six unique targets, with the first program expected to enter clinical studies in late 2017. Precision BioSciences will be responsible for performing early-stage research activities up to Phase 2, following which Baxalta has the exclusive right to opt in for late-stage development and commercialization. Precision BioSciences will receive an upfront payment of $105 million from Baxalta, with additional option fees, developmental, clinical, regulatory, and sales milestones, potentially totaling up to $1.6 billion, in addition to royalties on worldwide sales. Precision also has the right to participate in the development and commercialization of any licensed products resulting from the collaboration through a 50/50 co-development and co-promotion option in the United States. Additional terms and initial targets were not disclosed.

The agreement follows another recently established Baxalta collaboration to advance novel therapeutics against checkpoint targets, advancing the company’s strategic commitment to investing in immuno-oncology and building an innovative portfolio of cancer immunotherapies.

About Baxalta

Baxalta Incorporated (NYSE: BXLT) is a $6 billion global biopharmaceutical leader developing, manufacturing and commercializing therapies for orphan diseases and underserved conditions in hematology, oncology and immunology. Driven by passion to make a meaningful impact on patients’ lives, Baxalta’s broad and diverse pipeline includes biologics with novel mechanisms and advanced technology platforms such as gene therapy. The Baxalta Global Innovation and R&D Center is located in Cambridge, Massachusetts. Launched in 2015 following separation from Baxter International Inc, Baxalta’s heritage in biopharmaceuticals spans decades. Baxalta’s therapies are available in more than 100 countries and it has advanced biological manufacturing operations across 12 facilities, including state-of-the-art recombinant production and plasma fractionation. Headquartered in Northern Illinois, Baxalta employs 16,000 employees worldwide.

About Precision BioSciences

Precision BioSciences, the genome editing company, is dedicated to improving life. Our team seeks to solve significant problems in oncology, genetic disease, agriculture, and beyond via its ARCUS genome editing platform. ARCUS is Precision's proprietary, nuclease-based genome editing platform which now encompasses an industry leading combination of site specificity, ease of delivery, and breadth of editing capabilities. For additional information, please visit www.precisionbiosciences.com.

Forward-Looking Statements

This release includes forward-looking statements concerning a collaboration between Baxalta Incorporated and Precision BioSciences, including expectations with regard to potential impact of the CAR T technology to patients, future clinical studies and commercial launches, as well as the potential financial impact of the arrangements. Such statements are made of the date that they were first issued and are based on current expectations, beliefs and assumptions of management. Forward-looking statements are subject to a number of risks and uncertainties, many of which involve factors or circumstances that are beyond Baxalta's control and which could cause actual results to differ materially from those in the forward-looking statements, including the following: clinical trial results; satisfaction of regulatory and other requirements; actions of regulatory bodies and other governmental authorities; changes in laws and regulations; product quality, manufacturing or supply issues; patient safety issues; and other risks identified in Baxalta's filings with the Securities and Exchange Commission, all of which are available on Baxalta's website. Baxalta expressly disclaims any intent or obligation to update these forward-looking statements except as required by law.

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Baxalta Investor Relations
Mary Kay Ladone, +1-224-940-3371, mary.kay.ladone@baxalta.com
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Precision BioSciences Media Relations
Chelsea Lynam, +1-919-314-5512, chelsea.lynam@precisionbiosciences.com

Precision BioSciences Inquiries
partner@precisionbiosciences.com

[***]
[***]
[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

EXHIBIT H
PRECISION WIRE INSTRUCTIONS

NAME:	Precision BioSciences, Inc.
BANK:	Square 1 Bank 406 Blackwell Street, Suite 240 Durham, NC 27701
Account No.:	[***]
Routing No.:	[***]
Swift-BIC:	[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

AMENDMENT NO. 1 TO DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT

This AMENDMENT NO. 1 TO DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT (this "Amendment"), effective as of February 24, 2017, amends that certain Development and Commercial License Agreement, effective February 24, 2016 (the "DCLA"), by and among BAXALTA INCORPORATED, a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BI"), BAXALTA US INC., a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BUSI"), BAXALTA GMBH, a company organized under the laws of Switzerland with its principal place of business at Postfach 8010, Zurich, Switzerland ("BGMBH" and, together jointly and severally with BI and BUSI, collectively, "Baxalta"), and PRECISION BIOSCIENCES, INC., a Delaware corporation with its principal place of business at 302 E Pettigrew St A-100, Durham, NC 27701 ("Precision"). Baxalta and Precision may each be referred to herein individually as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, the Parties desire to amend the DCLA as set forth below in accordance with Section 17.8 of the DCLA.

AGREEMENT

NOW THEREFORE, in consideration of the mutual promises and covenants set forth below and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. Amendment of the DCLA. Section 7.3.3 of the DCLA is hereby amended and restated in its entirety as follows:

7.3.3 The key terms of the CDCP Agreement are set forth in Exhibit D. The Parties will negotiate in good faith a form of CDCP Agreement consistent with such terms and other terms and conditions that are typical for such agreements with respect to similarly situated products between similarly situated parties in the pharmaceutical industry promptly after the Effective Date (and in any event, no later than [***] after the Effective Date), and such form of CDCP Agreement shall be attached to this Agreement as Exhibit D-1 upon mutual agreement between the Parties.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

2. No Other Changes. Except as expressly modified by this Amendment, the DCLA shall remain unchanged and in full force and effect. This Amendment shall become a part of the DCLA as if set forth in full therein, and references to the DCLA shall be to the DCLA as amended. To the extent of any conflict or inconsistency between the terms of this Amendment and the DCLA, the terms of this Amendment shall prevail.

3. Dispute Resolution; Governing Law; Jurisdiction. The Parties acknowledge and agree that Article XV and Section 17.13 of the DCLA shall apply to this Amendment as if fully set forth herein.

4. Counterparts. This Amendment may be executed in more than one counterpart (including by electronic transmission), each of which shall be deemed an original, but all of such counterparts taken together shall constitute one and the same agreement.

[Signature Pages Follow]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 1 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

PRECISION BIOSCIENCES, INC.

By: /s/ Matt Kane
Name: Matt Kane
Title: CEO

[signatures continue on following pages]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 1 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

BAXALTA INCORPORATED

By: /s/ Jeffrey E Prowda
Name: Jeffrey E Prowda
Title: Assistant Secretary

BAXALTA US INC.

By: /s/ Jeffrey E Prowda
Name: Jeffrey E Prowda
Title: Assistant Secretary

[signatures continue on following page]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 1 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

BAXALTA GMBH

By: _____
Name: _____
Title: _____

By: /s/ Yvo Aebli
Name: Yvo Aebli
Title: EU & EEMEA Controller

AMENDMENT NO. 2 TO DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT

This AMENDMENT NO. 2 TO DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT (this "Amendment"), effective as of August 21, 2017, amends that certain Development and Commercial License Agreement, effective February 24, 2016 (as previously amended by that certain Amendment No. 1 to Development and Commercial License Agreement, effective as of February 24, 2017, the "DCLA"), by and among BAXALTA INCORPORATED, a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BI"), BAXALTA US INC., a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BUSI"), BAXALTA GMBH, a company organized under the laws of Switzerland with its principal place of business at Postfach 8010, Zurich, Switzerland ("BGMBH" and, together jointly and severally with BI and BUSI, collectively, "Baxalta"), and PRECISION BIOSCIENCES, INC., a Delaware corporation with its principal place of business at 302 E Pettigrew St A-100, Durham, NC 27701 ("Precision"). Baxalta and Precision may each be referred to herein individually as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, the Parties desire to amend the DCLA as set forth below in accordance with Section 17.8 of the DCLA.

AGREEMENT

NOW THEREFORE, in consideration of the mutual promises and covenants set forth below and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. Amendment of the DCLA. Section 7.3.3 of the DCLA is hereby amended and restated in its entirety as follows:

> 7.3.3 The key terms of the CDCP Agreement are set forth in Exhibit D. The Parties will negotiate in good faith a form of CDCP Agreement consistent with such terms and other terms and conditions that are typical for such agreements with respect to similarly situated products between similarly situated parties in the pharmaceutical industry promptly after the Effective Date (and in any event, no later than [***] after the Effective Date), and such form of CDCP Agreement shall be attached to this Agreement as Exhibit D-1 upon mutual agreement between the Parties.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

2. No Other Changes. Except as expressly modified by this Amendment, the DCLA shall remain unchanged and in full force and effect. This Amendment shall become a part of the DCLA as if set forth in full therein, and references to the DCLA shall be to the DCLA as amended. To the extent of any conflict or inconsistency between the terms of this Amendment and the DCLA, the terms of this Amendment shall prevail.

3. Dispute Resolution; Governing Law; Jurisdiction. The Parties acknowledge and agree that Article XV and Section 17.13 of the DCLA shall apply to this Amendment as if fully set forth herein.

4. Counterparts. This Amendment may be executed in more than one counterpart (including by electronic transmission), each of which shall be deemed an original, but all of such counterparts taken together shall constitute one and the same agreement.

[Signature Pages Follow]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 2 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

PRECISION BIOSCIENCES, INC.

By: /s/ Matt Kane
Name: Matt Kane
Title: CEO

[signatures continue on following pages]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 2 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

BAXALTA INCORPORATED

By: /s/ Denise M. Serewicz
Name: Denise M. Serewicz
Title: Assistant Secretary

BAXALTA US INC.

By: /s/ Denise M. Serewicz
Name: Denise M. Serewicz
Title: Assistant Secretary

[signatures continue on following page]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 2 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

BAXALTA GMBH

By: /s/ Remco Lemarcq
Name: Remco Lemarcq
Title: Proxy Holder

AMENDMENT NO. 3 TO DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT

This AMENDMENT NO. 3 TO DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT (this "Amendment"), effective as of February 5, 2018, amends that certain Development and Commercial License Agreement, effective February 24, 2016 (as previously amended by that certain Amendment No. 1 to Development and Commercial License Agreement, effective as of February 24, 2017, and that certain Amendment No. 2 to Development and Commercial License Agreement, effective as of August 21, 2017, the "DCLA"), by and among BAXALTA INCORPORATED, a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BI"), BAXALTA US INC., a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BUSI"), BAXALTA GMBH, a company organized under the laws of Switzerland with its principal place of business at Postfach 8010, Zurich, Switzerland ("BGMBH" and, together jointly and severally with BI and BUSI, collectively, "Baxalta"), and PRECISION BIOSCIENCES, INC., a Delaware corporation with its principal place of business at 302 E Pettigrew St A-100, Durham, NC 27701 ("Precision"). Baxalta and Precision may each be referred to herein individually as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, the Parties desire to amend the DCLA as set forth below in accordance with Section 17.8 of the DCLA.

AGREEMENT

NOW THEREFORE, in consideration of the mutual promises and covenants set forth below and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. Amendment of the DCLA. Section 7.3.3 of the DCLA is hereby amended and restated in its entirety as follows:

7.3.3 The key terms of the CDCP Agreement are set forth in Exhibit D. The Parties will negotiate in good faith a form of CDCP Agreement consistent with such terms and other terms and conditions that are typical for such agreements with respect to similarly situated products between similarly situated parties in the pharmaceutical industry promptly after the Effective Date (and in any event, no later [***]), and such form of CDCP Agreement shall be attached to this Agreement as Exhibit D-1 upon mutual agreement between the Parties.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

2. No Other Changes. Except as expressly modified by this Amendment, the DCLA shall remain unchanged and in full force and effect. This Amendment shall become a part of the DCLA as if set forth in full therein, and references to the DCLA shall be to the DCLA as amended. To the extent of any conflict or inconsistency between the terms of this Amendment and the DCLA, the terms of this Amendment shall prevail.

3. Dispute Resolution; Governing Law; Jurisdiction. The Parties acknowledge and agree that Article XV and Section 17.13 of the DCLA shall apply to this Amendment as if fully set forth herein.

4. Counterparts. This Amendment may be executed in more than one counterpart (including by electronic transmission), each of which shall be deemed an original, but all of such counterparts taken together shall constitute one and the same agreement.

[Signature Pages Follow]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 3 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

PRECISION BIOSCIENCES, INC.

By: /s/ Matt Kane
Name: Matt Kane
Title: CEO

[signatures continue on following pages]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 3 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

BAXALTA INCORPORATED

By: /s/ David Bailey
Name: David Bailey
Title: Assistant Treasurer

BAXALTA US INC.

By: /s/ David Bailey
Name: David Bailey
Title: Assistant Treasurer

[signatures continue on following page]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 3 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

BAXALTA GMBH

By: /s/ Barbara Lenzlinger
Name: Barbara Lenzlinger
Title: International Controller

AMENDMENT NO. 4 TO DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT

This AMENDMENT NO. 4 TO DEVELOPMENT AND COMMERCIAL LICENSE AGREEMENT (this "Amendment"), effective as of May 23, 2018, amends that certain Development and Commercial License Agreement, effective February 24, 2016 (as previously amended by that certain Amendment No. 1 to Development and Commercial License Agreement, effective as of February 24, 2017, that certain Amendment No. 2 to Development and Commercial License Agreement, effective as of August 21, 2017, and that certain Amendment No. 3 to Development and Commercial License Agreement, effective as of February 5, 2018, the "DCLA"), by and among BAXALTA INCORPORATED, a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BI"), BAXALTA US INC., a Delaware corporation with its principal place of business at 1200 Lakeside Drive, Bannockburn, IL 60015 ("BUSI"), BAXALTA GMBH, a company organized under the laws of Switzerland with its principal place of business at Zahlerweg 4, 6300Zug, Switzerland ("BGMBH" and, together jointly and severally with BI and BUSI, collectively, "Baxalta"), and PRECISION BIOSCIENCES, INC., a Delaware corporation with its principal place of business at 302 E Pettigrew St A-100, Durham, NC 27701 ("Precision"). Baxalta and Precision may each be referred to herein individually as a "Party" and collectively as the "Parties." All capitalized terms not otherwise defined in this Amendment shall have the meaning set forth in the DCLA.

RECITALS

WHEREAS, the Parties have determined to extend the date for negotiation and execution of the CDCP Agreement;

WHEREAS, the Parties have determined that the Isolex Platform Technology will not be used by the Parties with respect to Licensed Product Candidates or Licensed Products, and therefore the Parties wish to remove from the DCLA all references to rights and obligations in connection with such use (but for clarity, retain references to and protection of Isolex Platform Technology and Isolex Platform Patents as Baxalta's Background IP); and

WHEREAS, the Parties desire to amend the DCLA as set forth below in accordance with Section 17.8 of the DCLA.

AGREEMENT

NOW THEREFORE, in consideration of the mutual promises and covenants set forth below and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. Amendment of Section 7.3.3 of the DCLA. Section 7.3.3 of the DCLA is hereby amended and restated in its entirety as follows:

7.3.3 The key terms of the CDCP Agreement are set forth in Exhibit D. The Parties will negotiate in good faith a form of CDCP Agreement consistent with such terms and other terms and conditions that are typical for such agreements with respect to similarly situated products between similarly situated parties in the pharmaceutical industry promptly after the Effective Date (and in any event, no later than [***]), and such form of CDCP Agreement shall be attached to this Agreement as Exhibit D-1 upon mutual agreement between the Parties.

2. Amendment of Section 2.6, Section 14.3.4, and the Table of Contents of the DCLA.

a. Section 2.6 of the DCLA is hereby amended and restated in its entirety as follows:

2.6 [Intentionally Omitted]

b. Section 14.3.4 of the DCLA is hereby amended and restated in its entirety as follows:

14.3.4 Survival. The following Articles and Sections of this Agreement, as well as remedies for breach of this Agreement, shall survive expiration or termination of this Agreement for any reason: ARTICLE I (solely to the extent required to enforce any other surviving rights or obligations of the Parties), Section 4.5, ARTICLE VIII (solely to the extent any right to payment has accrued prior to the effective date of termination), Section 9.1, Section 12.1, Section 12.2, Section 12.4, ARTICLE XIII, Section 14.3, ARTICLE XV and ARTICLE XVII.

c. The Table of Contents of the DCLA is hereby amended to replace “2.6 Isolex Co-Development” with “2.6 [Intentionally Omitted]”.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

3. No Other Changes. Except as expressly modified by this Amendment, the DCLA shall remain unchanged and in full force and effect. This Amendment shall become a part of the DCLA as if set forth in full therein, and references to the DCLA shall be to the DCLA as amended. To the extent of any conflict or inconsistency between the terms of this Amendment and the DCLA, the terms of this Amendment shall prevail.

4. Dispute Resolution; Governing Law; Jurisdiction. The Parties acknowledge and agree that Article XV and Section 17.13 of the DCLA shall apply to this Amendment as if fully set forth herein.

5. Counterparts. This Amendment may be executed in more than one counterpart (including by electronic transmission), each of which shall be deemed an original, but all of such counterparts taken together shall constitute one and the same agreement.

[Signature Pages Follow]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 4 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

PRECISION BIOSCIENCES, INC.

By: /s/ Matt Kane
Name: Matt Kane
Title: CEO

[signatures continue on following pages]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 4 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

BAXALTA INCORPORATED

By: /s/ Jeffrey E Prowda
Name: Jeffrey E Prowda
Title: Vice President and Assistant Secretary

BAXALTA US INC.

By: /s/ Jeffrey E Prowda
Name: Jeffrey E. Prowda
Title: Vice President and Assistant Secretary

[signatures continue on following page]

IN WITNESS WHEREOF, the Parties hereto have caused this Amendment No. 4 to Development and Commercial License Agreement to be executed as of the date first set forth above by their respective duly authorized officers or representatives.

BAXALTA GMBH

By: /s/ Elisabeth Leimbacher
Name: Elisabeth Leimbacher
Title: Proxy Holder

LICENSE AGREEMENT

THIS AGREEMENT made and entered into this 17th day of April ("EFFECTIVE DATE"), by and between DUKE UNIVERSITY, a nonprofit educational and research institution organized under the laws of North Carolina ("DUKE"), having its principal office at Durham, North Carolina 27710, and Precision BioSciences, Inc., a Delaware corporation ("PRECISION") with offices at 2211 Hillsborough Road, #4087, Durham, NC 27705.

WHEREAS, DUKE owns certain PATENT RIGHTS (as hereinafter defined) relating to Duke Office of Science and Technology File [***], entitled "[***]" ("INVENTION"), and has the right to grant licenses under said PATENT RIGHTS; and

WHEREAS, DUKE desires to have the PATENT RIGHTS developed and commercialized to benefit the public and is willing to grant a license hereunder; and

WHEREAS, LICENSEE desires to obtain licenses under PATENT RIGHTS and upon the terms and conditions hereinafter set forth; and

WHEREAS, the INVENTION was made with US government support and, notwithstanding anything to the contrary in this AGREEMENT, the US government has certain rights in the INVENTION under the 37 C.F.R. § 401.

NOW THEREFORE, in consideration of the premises and the mutual covenants contained herein, the parties hereto agree as follows:

ARTICLE 1 - DEFINITIONS

For the purposes of this AGREEMENT, and solely for that purpose, the terms and phrases set forth below and elsewhere in this AGREEMENT in capital letters shall be defined as follows:

1.01 "AFFILIATE" shall mean any corporation or non-corporate entity which controls, is controlled by or is under the common control with a party hereto. A corporation or a non-corporate entity, as applicable, shall be regarded as in control of another corporation if it owns or directly or indirectly controls at least fifty percent (50%) of the voting stock of the other corporation, or in the absence of ownership of at least fifty percent (50%) of the voting stock of a corporation, or in the case of a non-corporate entity, if it possesses directly or indirectly, the power to direct or cause the direction of the management and policies of such corporation or non-cooperate entity, as applicable.

1.02 "FIELD OF USE" shall mean all applications of the PATENT RIGHTS in all fields of use.

1.03 "INVENTOR" means any individual who is identified as an inventor on one or more of the PATENT RIGHTS (in accordance with applicable patent law) and whose contribution as an inventor to such PATENT RIGHTS was made as result of his/her association with DUKE such that the individual is obligated to assign his/her rights in such PATENT RIGHTS to DUKE.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.04 “PATENT RIGHTS” shall mean the patents, patent applications listed in APPENDIX A (such patent applications hereinafter collectively referred to as “PATENT APPLICATION”) and any patent hereafter issuing on any such PATENT APPLICATIONS, together with all divisions, continuations, continuations-in-part (but only to the extent that the subject matter claimed in each such continuation-in-part application is described in and enabled by the disclosure of said PATENT APPLICATIONS), re-examinations, reissues, substitutions, or extensions thereof and patents issuing therefrom in the United States and non-U.S. jurisdictions. Notwithstanding the foregoing or anything else to the contrary in this AGREEMENT, PATENT RIGHTS shall not include those patents and/or patent applications which, during the term of this AGREEMENT, cease to be PATENT RIGHTS pursuant to Section 6.01. It is understood and agreed that subject matter that is PATENTABLY DISTINCT (defined below) from the subject matter described within the PATENT APPLICATIONS is not within the scope of the PATENT RIGHTS even though that PATENTABLY DISTINCT subject matter may fall within the scope of one or more claims of said PATENT APPLICATIONS. PATENTABLY DISTINCT improvements relating to the subject matter of PATENT APPLICATIONS shall not be considered PATENT RIGHTS. As used herein, “PATENTABLY DISTINCT” subject matter is subject matter that is novel and unobvious over subject matter described within said PATENT APPLICATIONS.

1.05 “PATENT RIGHTS EXPENSES” shall mean all patent-related expenses (including, but not limited to, filing fees, maintenance fees, and reasonable fees and expenses of patent counsel) incurred in connection with the PATENT RIGHTS, including but not limited to all reasonable expenses incurred in connection with the assembly and copying of files for transfer to and from as the case may be LICENSEE’s legal counsel in connection with LICENSEE’s assuming responsibility for PATENT RIGHTS or transferring some of all of that responsibility back to DUKE (as the case may be) pursuant to Section 6.

1.06 “VALID CLAIM” shall mean (i) an issued and unexpired claim within the PATENT RIGHTS, that has not been permanently revoked or held invalid or unenforceable by a decision of a court or other governmental agency of competent jurisdiction and that has not been dedicated to the public or admitted to be invalid or unenforceable through reissue, disclaimer or otherwise, or (ii) a claim of a pending patent application that was filed in good faith, has not been pending for more than [***] (including in parent applications), and which has not been abandoned or finally disallowed without the possibility of appeal or refilling of such application contained in the PATENT RIGHTS in the country in which any such product or part thereof is made, used or sold.

1.07 “LICENSED PRODUCT” shall mean any product or part thereof which:

(a) is covered in whole or in part by any VALID CLAIM contained in the PATENT RIGHTS in the country in which any such product or part thereof is made, used or sold; and/or

(b) is manufactured by using a process which is covered in whole or in part by a VALID CLAIM contained in the PATENT RIGHTS in the country in which such product or part thereof is used or sold; or

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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

(c) in its use, practices a VALID CLAIM contained in the PATENT RIGHTS in the country in which any such product or part thereof is made, used, or sold.

1.08 “LICENSED PROCESS” shall mean any process which is covered in whole or in part by any VALID CLAIM contained in the PATENT RIGHTS.

1.09 “LICENSED PRODUCTS” shall mean the following terms, collectively: LICENSED PRODUCTS, LICENSED PROCESSES, and LICENSED SERVICES, and a LICENSED PROCESS and LICENSED SERVICE shall be included within such term notwithstanding such process or service is not literally a “product”.

1.10 “LICENSED SERVICE” shall mean any service provided by LICENSEE (and/or SUBLICENSEES, as the case may be) to a THIRD PARTY that is covered in whole or in part by any VALID CLAIM contained in the PATENT RIGHTS.

1.11 “MATERIALS” shall mean samples of the materials covered under Patent Rights.

1.12 “NET SALES” shall mean:

(a) in the case of LICENSED PRODUCTS, LICENSEE’S (and/or those of its AFFILIATES, as the case may be) revenues received from sale and/or lease of LICENSED PRODUCTS; and

(b) in the case of LICENSED PROCESSES, LICENSEE’S (and/or those of its AFFILIATES, as the case may be) revenues received from sale and/or lease of LICENSED PROCESSES; and

[***]:

[***]
[***]
[***]
[***]

[***]

1.13 “SUBLICENSE” and “SUBLICENSE AGREEMENT” shall mean, and include without limitation, any relationship/agreement in which a THIRD PARTY gains any rights—temporary or otherwise—to any of the rights granted by DUKE to LICENSEE under this AGREEMENT (including, but not limited to, LICENSEE’s licensee(s) and/or sublicensee(s), hereinafter, such THIRD PARTIES referred as “SUBLICENSEES”, but not including LICENSEE’s AFFILIATES), including, but not limited to those granted via options, rights of first refusal, material transfer agreements, sublicenses (implied or expressed), and the like.

1.14 “SUBLICENSE REVENUES” shall mean any and all upfront fees, license fees, royalties, option fees, milestone payments, and other amounts payable to LICENSEE (and/or its AFFILIATES, as the case may be) under a SUBLICENSE to any of the licenses granted by DUKE to LICENSEE under this AGREEMENT, [***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.15 “TERRITORY” shall mean the world.

1.16 “THIRD PARTY” means any individual or other entity other than DUKE and/or LICENSEE or its AFFILIATES.

1.17 Where appropriate, words denoting a singular number only shall include the plural and vice versa.

1.18 Certain other defined terms shall have the meanings given them elsewhere in this AGREEMENT.

ARTICLE 2 - LICENSE

2.01 DUKE hereby grants to LICENSEE and its AFFILIATES and LICENSEE and its AFFILIATES hereby accept from DUKE, subject to the terms and conditions of this AGREEMENT, the exclusive right and sublicenseable license for the FIELD OF USE in the TERRITORY to practice under the PATENT RIGHTS (a) to develop, make, have made, import, use, lease, offer for sale, sell, and distribute LICENSED PRODUCTS for the FIELD OF USE in the TERRITORY, (b) to develop, make, have made, import, use, practice, lease, offer for sale, sell, and distribute LICENSED PROCESSES in/for the FIELD OF USE in the TERRITORY, until the end of the term for which the PATENT RIGHTS are granted unless this AGREEMENT shall be sooner terminated according to the terms hereinafter provided.

2.02 Notwithstanding anything to the contrary in this AGREEMENT, it is understood and agreed that DUKE encourages LICENSEE (and/or its AFFILLIATES and/or SUBLICENSEE(S), as the case may be) to secure rights under any THIRD PARTY intellectual property rights required to practice the PATENT RIGHTS and/or to exercise any and all of the rights practiced or exercised by LICENSEE or such AFFILIATES and/or SUBLICENSEE(S) (as the case may be) and that DUKE shall have no responsibility in securing any such rights. Further, if LICENSEE (and/or any of its AFFILIATES) secures any such rights to THIRD PARTY intellectual property rights in order to practice the technology and/or to exercise any or all the rights granted herein, then LICENSEE (and/or such AFFILIATES and/or SUBLICENSEE, as the case may be) shall use its commercially reasonable efforts to secure from any such THIRD PARTY a covenant not to sue DUKE, or any of its faculty, students, employees or agents, for any research and development efforts conducted at DUKE that resulted in the creation of any of its inventions and/or any licensing thereof, and any intellectual property or other rights arising therefrom, including, but not limited to, PATENT RIGHTS.

2.03 All SUBLICENSES shall be subject to the terms and conditions of this AGREEMENT, shall be no less favorable to or protective of DUKE than this AGREEMENT except as expressly stated in this AGREEMENT, and shall not be further sublicenseable without the express written approval of DUKE, such approval not to be unreasonably withheld. DUKE shall be a third party beneficiary of each SUBLICENSE. In the event of any termination of this Agreement, all SUBLICENSES shall survive such termination provided that the SUBLICENSEES are in compliance with the terms and conditions of the SUBLICENSE and the SUBLICENSEES comply with all terms of this Agreement related to such SUBLICENSE including the payment of all amounts that would be due DUKE under this Agreement if it had not terminated. In such case,

DUKE shall not be obligated to perform any of the obligations of LICENSEE under such SUBLICENSE. However, DUKE shall have all of the rights afforded LICENSEE under any such SUBLICENSE including but not limited to enforcement of the SUBLICENSE, collection of payments, receipt of reports indemnification by SUBLICENSEE, termination for breach by SUBLICENSEE etc. LICENSEE will ensure that said rights to DUKE are included in any executed SUBLICENSE. LICENSEE shall use commercially reasonable efforts to enforce the terms of the SUBLICENSE agreements. LICENSEE further agrees to provide DUKE with a copy of all SUBLICENSES [***] prior to execution of each subject SUBLICENSE with the ability to review and comment, such comments to be reasonably considered by LICENSEE. LICENSEE will provide DUKE with an executed copy of SUBLICENSE within [***] of the effective date of such SUBLICENSE.

2.04 In the event that LICENSEE shall receive non-cash consideration for any SUBLICENSE, DUKE shall nonetheless be entitled to its applicable portion of sublicense fees in cash with respect to such non-cash consideration. In the event that DUKE and LICENSEE cannot agree on the value of such on-cash consideration, such value shall be determined by an independent THIRD PARTY selected in good faith by LICENSEE and DUKE. If LICENSEE and DUKE cannot mutually agree upon an independent THIRD PARTY within thirty (30) business days, then DUKE and LICENSEE shall each select an independent THIRD PARTY within thirty (30) business days, and those two independent third parties shall in good faith select a mutually agreeable THIRD PARTY within thirty (30) days thereafter. The expense of such independent THIRD PARTY being borne equally by DUKE and LICENSEE. In the event on a dispute concerning the valuation of the THIRD PARTY consideration, no payment of the fees with respect thereto shall be made until the dispute is resolved.

[***]

2.06 Notwithstanding anything to the contrary in this AGREEMENT, DUKE shall have the right to practice under the PATENT RIGHTS for its own internal, non-commercial, educational, research and clinical purposes without restriction and without payment of royalties and other fees.

2.07 The licenses granted under this AGREEMENT will not be construed to confer any rights upon LICENSEE by implication, estoppel or otherwise as to any data, technology, patents, patent applications or other property rights held by DUKE (solely or jointly) not specifically set forth herein, regardless of whether such property rights are dominant or subordinate to any of the PATENT RIGHTS DUKE represents that it is the sole owner of the Patent Rights, that it has the authority to grant the licenses granted hereunder, and that it has not knowingly taken any actions that would adversely affect the validity of the PATENT RIGHTS. DUKE does not warrant the validity or enforcement of the PATENT RIGHTS licensed hereunder and makes no representations whatsoever with regard to the scope of the PATENT RIGHTS or that the practice of the PATENT RIGHTS does not infringe the rights of any third party. Notwithstanding anything to the contrary in this Section 2, LICENSEE shall have the right to continue to use the lab notebooks and technical data related to the PATENT RIGHTS developed by employees or agents of LICENSEE while working at DUKE, provided however, that DUKE employees and students shall not be considered agents of LICENSEE.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

2.08 DUKE hereby discloses to LICENSEE and LICENSEE acknowledges that the research leading to the PATENT RIGHTS was funded in part by the U.S. Government, and the parties agree that, notwithstanding any use of descriptive terms such as “exclusive” herein this AGREEMENT, the U.S. Government has certain rights in the PATENT RIGHTS as set forth in 37 CFR 401. LICENSEE agrees to comply with all obligations resulting from such government rights, including, but not limited to, the requirement that any products sold in the United States based upon such technology be substantially manufactured in the United States.

2.09 The license granted hereunder shall be subject to Public Law 96-517 and Public Law 98-260. Any right granted in this AGREEMENT which is greater than that permitted under Public Law 96-517 and Public Law 98-260 shall be modified as may be required to conform to the provisions of those laws.

ARTICLE 3 - LICENSE FEE, ROYALTIES AND OTHER FEES

3.01 In consideration of the rights granted to LICENSEE pursuant to this AGREEMENT and subject to the terms and conditions of this AGREEMENT, LICENSEE agrees to pay or otherwise compensate DUKE as follows:

(a) [***]

(b) LICENSEE shall pay to DUKE [***], which shall be due and payable within [***] of the EFFECTIVE DATE.

(c) Royalty on NET SALES. At the times and in the manner set forth hereinafter, LICENSEE and it AFFILIATES shall pay to DUKE a [***] royalty on NET SALES of LICENSED PRODUCTS or LICENSED PROCESSES, by LICENSEE, and/or its AFFILIATES. Such royalty shall be at the rate of:

(i) [***] of NET SALES for LICENSED PRODUCTS; and

(ii) [***] of NET SALES for LICENSED PROCESSES; and

provided that where in order to manufacture, sell, use, practice or otherwise dispose of LICENSED PRODUCTS or LICENSED PROCESSES it is [***] for LICENSEE to obtain a license under any patent rights from a THIRD PARTY (including in settlement of a claim contemplated by Article 7.01) and by reason of an agreement with such THIRD PARTY a royalty on LICENSEE NET SALES (or similarly defined amount) is payable to such THIRD PARTY the royalties shall be reduced as follows. The royalty payable pursuant to this Article 3.01(c) shall be reduced by [***] of the amounts paid to third parties provided that under no circumstances will the royalty payable to DUKE on NET SALES of LICENSED PRODUCTS or LICENSED PROCESSES reduce to less than [***].

(d) MINIMUM ROYALTY. [***]

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(i) [***]

(ii) [***]

[***]

(e) SUBLICENSE FEE. LICENSEE shall pay to DUKE a sublicense fee ("SUBLICENSE FEE") which is equal to:

(i) [***] of all SUBLICENSE REVENUES from royalties; plus,

(ii) [***] of all SUBLICENSE REVENUES from non-royalty sublicense revenue.

SUBLICENSE FEES shall be creditable against the MINIMUM ROYALTIES on NET SALES in Section 3.01(d).

(f) MILESTONE PAYMENTS. LICENSEE shall pay to DUKE, MILESTONE PAYMENTS as set forth in APPENDIX C.

3.02 Notwithstanding reports, correspondence or other communications from LICENSEE, it is understood that DUKE shall, in accordance with its policies and procedures, apply any amounts received from LICENSEE under the terms of this AGREEMENT as follows:

(a) [***]

(b) [***]

Application of amounts received under (a) above shall in no respect alter the aggregate amount due to DUKE.

3.03 Notwithstanding anything to the contrary in this AGREEMENT, all payments due hereunder shall be paid in full, without deduction of taxes or other fees which may be imposed by any government and which shall be paid by LICENSEE on behalf of LICENSEE, as the case may be.

3.04 LICENSEE agrees to achieve the milestones set forth in APPENDIX B. If these milestones are not met, DUKE may, in its sole discretion after providing LICENSEE a thirty (30) day notification during which period LICENSEE fails to achieve the applicable milestone(s), terminate the exclusive licenses granted hereunder. In the event of any such termination, all SUBLICENSES shall survive such termination provided that the SUBLICENSEES are in compliance with the terms and conditions of the SUBLICENSE and the SUBLICENSEES comply with all terms of this Agreement related to such SUBLICENSE including the payment of all amounts that would be due DUKE under this Agreement if it had not terminated. In such case, DUKE shall not be obligated to perform any of the obligations of LICENSEE under such SUBLICENSE subject to the same terms and conditions as described in section 2.03. For any rights that LICENSEE may be permitted to retain, LICENSEE will still be responsible to DUKE for any royalty payments and payments with respect to non-royalty income.

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3.05 All payments due from LICENSEE pursuant to this AGREEMENT shall be due and payable in accordance with the terms and conditions of this AGREEMENT, and if a payment due pursuant to this AGREEMENT is not paid within [***] of the payment due date, then a late payment fee equal to [***] shall be added to the payment due; [***]. The payment of such [***] late fees shall not foreclose DUKE from exercising any other rights it may have as a consequence of the lateness of any payment.

3.06 No multiple royalties on NET SALES shall be payable to DUKE on a single LICENSED PRODUCT or LICENSED PROCESS, because its manufacture, use, lease, sale or practice are or shall be covered by more than one of the PATENT RIGHTS.

3.07 All payments due to DUKE under this AGREEMENT shall be paid in United States Dollars in Durham, North Carolina, or at such place as DUKE may reasonably designate consistent with the laws and regulations controlling in any foreign country. If any currency conversion shall be required in connection with such payments due hereunder, such conversion shall be made by using the exchange rate prevailing at Wachovia Bank (N.A.) (or its successor, as the case may be) on the last business day of the reporting period to which such payments relate. If payments are made by wire, electronic or other transfer form for which a fee is charged ("PAYMENT TRANSFER FEES"), LICENSEE shall be responsible for the full amount of such fees and shall promptly reimburse DUKE for DUKE's payment of such reasonable PAYMENT TRANSFER FEES within thirty (30) days of invoice of the same from DUKE.

3.08 All payments due to DUKE under this AGREEMENT shall cite "[***]", and shall be made payable to "Duke University." Such payments, as well as reports due to DUKE shall be sent to DUKE at the following address:

For delivery via the U.S. Postal Service:

Duke University Office of Science and Technology
Attention: Financial Administrator
Box 90083 Duke University
Durham, NC 27708 USA

For delivery via nationally/internationally recognized courier:

Duke University Office of Science and Technology
Attention: Financial Administrator
2020 West Main Street, Suite 10
Durham, NC 27705 USA

For payment via wire transfer:

BANK:	[***]
	[***]
ABA#	[***]
SWIFT CODE:	[***]
BENEFICIARY:	[***]
ACCOUNT NO.:	[***]
ATTENTION:	[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

ARTICLE 4 - DUE DILIGENCE REQUIREMENTS

4.01 LICENSEE shall use commercially reasonable efforts to bring LICENSED PRODUCTS and/or LICENSED PROCESSES to market through a thorough, vigorous and diligent program for exploitation of the PATENT RIGHTS, and to continue active, diligent marketing efforts for LICENSED PRODUCTS and/or LICENSED PROCESSES throughout the term of this AGREEMENT. The development and commercialization schedule set forth on attached APPENDIX B (hereinafter "COMMERCIALIZATION SCHEDULE") is hereby agreed upon as a reasonable one to be followed. Variations from the schedule set forth in the COMMERCIALIZATION SCHEDULE must be expressly approved by DUKE in writing, such approval not to be unreasonably withheld. If any of the targets set forth in the COMMERCIALIZATION SCHEDULE are not reached within the stated time periods set out in APPENDIX B, or within those amended periods of time approved in writing by Duke, then it will be considered a material breach by the LICENSEE, and will be handled according to Section 10 herein.

4.02 During the term of this AGREEMENT, LICENSEE will submit [***] progress reports to DUKE as set forth in Section 5. DUKE shall have the right to request [***] to discuss such information with representatives of LICENSEE at mutually acceptable times and places. It is agreed that should any of DUKE's personnel be required by LICENSEE to consult with LICENSEE outside of Durham, North Carolina, LICENSEE will reimburse reasonable travel and living expenses incident thereto.

ARTICLE 5 - REPORTS AND RECORDS

5.01 LICENSEE shall keep full, true and accurate books of accounts and other records containing all particulars which may be necessary to properly ascertain and verify the amounts payable to DUKE hereunder and shall require its AFFILIATES and/or SUBLICENSEES, as the case may be, to do the same. Said books of account shall be kept at LICENSEE's (and/or AFFILIATE's and/or SUBLICENSEES') principal place of business or the principal place of business of the appropriate division of LICENSEE (and/or AFFILIATE's and/or SUBLICENSEE) to which this AGREEMENT relates. Said books of LICENSEE and its AFFILIATES and the supporting data shall be open at all reasonable times for [***] following the end of the calendar year to which they pertain, to the inspection of an independent certified public accountant engaged by DUKE for the purpose of verifying the LICENSEE's and/or AFFILIATE'S royalty statement or compliance in other respects with this AGREEMENT. [***]

5.02 LICENSEE shall report the status of development of each LICENSED PRODUCT and LICENSED PROCESS [***] to DUKE by [***]. Such report shall provide information at least sufficient to meet DUKE's government reporting requirements and additionally shall include descriptions of LICENSEE's (and/or AFFILIATE's and/or SUBLICENSEES's plans and commercially reasonable estimated timeframes for testing, development, governmental approvals and marketing/sale of each LICENSED PRODUCT or LICENSED PROCESS.

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5.03 After the first commercial sale of a LICENSED PRODUCT or LICENSED PROCESS and in addition to the reports required, LICENSEE shall render to DUKE prior to [***] a written account of the NET SALES of LICENSED PRODUCTS and LICENSED PROCESSES, subject to royalty under this AGREEMENT and made during the prior [***] period ending [***], and shall simultaneously pay to DUKE the royalties due on such NET SALES in United States dollars. Reports tendered shall include the calculation of royalties by product by country in substantially the format provided in APPENDIX D hereto. Further, LICENSEE shall render to DUKE prior to [***] a written account of the portion of SUBLICENSE REVENUES due to DUKE for the prior [***] period [***] and shall simultaneously pay to DUKE such amounts due in United States dollars. MINIMUM ROYALTIES which are due DUKE for any calendar year, shall be paid by LICENSEE along with the written report due on [***].

ARTICLE 6 - PATENTS

6.01 Patent Prosecution

(a) LICENSEE shall, apply for, prosecute, and maintain the PATENT RIGHTS during the term of this AGREEMENT. LICENSEE will keep DUKE advised as to all developments with respect to any PATENT APPLICATIONS, and/or applicable continuation, continuation-in-part and reissue application(s) promptly. DUKE will have (i) the right to review LICENSEE's pending PATENT APPLICATIONS that are within the PATENT RIGHTS, and to make recommendations regarding the prosecution of such PATENT APPLICATIONS, (ii) the right to receive such applications and other documentations at such time as to allow a reasonable period for review thereof prior to any applicable deadline for filing or responding, and (iii) the right to request amendments of any such patent application to include claims or arguments as may be appropriate for obtaining a patent claiming commercially relevant inventions. Upon request by DUKE and/or its agents, LICENSEE shall promptly inform DUKE in writing which non-US countries, if any, in which LICENSEE will seek patent protection. DUKE may elect to seek patent protection in countries not so designated by LICENSEE, in which case DUKE shall notify LICENSEE in writing of such election, and from the date of such filing of such PATENT APPLICATIONS by DUKE shall not be considered PATENT RIGHTS (and/or PATENT APPLICATIONS) and LICENSEE shall be deemed to have forfeited all rights under this AGREEMENT to such PATENT APPLICATIONS and resulting patents. (APPENDIX A shall be deemed to be so amended.) It is understood and agreed that all final decisions with respect to prosecution of PATENT RIGHTS are reserved to DUKE except as expressly stated in this AGREEMENT.

6.02 Patent Costs.

(a) [***]

(b) If LICENSEE decides to discontinue the prosecution or maintenance of a subject PATENT APPLICATION or patent falling within the scope of PATENT RIGHTS, LICENSEE will give DUKE timely written notice at least [***] in advance of the effective date of LICENSEE's decision and DUKE will be free to continue prosecution or maintain any such application/patent, and to maintain any protection issuing thereon in the U.S. and in any foreign country at DUKE's sole expense. In such instances, from the date of DUKE's receipt of such

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written notice from LICENSEE, such patent and/or PATENT APPLICATION shall no longer be considered to fall within the definition of PATENT RIGHTS (APPENDIX A shall be deemed to be so amended) and LICENSEE shall forfeit all rights under this AGREEMENT to the subject issued patent(s) and/or subject PATENT APPLICATION and patent(s) arising from such PATENT APPLICATION. Accordingly, DUKE shall be free, at its sole discretion to license said patent(s) and patent application(s) to any THIRD PARTY or otherwise dispose of such patent(s) and patent applications(s) as it deems appropriate.

6.03 It is understood that ownership of such PATENT RIGHTS shall not be affected by LICENSEE's assuming such responsibility for prosecution and maintenance of such PATENT RIGHTS.

6.04 LICENSEE agrees to mark the LICENSED PRODUCTS and LICENSED PROCESS, and/or their containers, labels, and/or other packaging, in such a manner as to conform to the patent laws and practices of the country of manufacture or sale, as appropriate.

ARTICLE 7 - INFRINGEMENT OF THIRD-PARTY RIGHTS

7.01 In the event that DUKE or LICENSEE is charged with infringement of a patent by a THIRD PARTY or is made a party in a civil action as a result of the activity of LICENSEE and/or its AFFILIATE and/or a SUBLICENSEE (and not from the activity of DUKE or its AFFILIATES other than the granting of this license to LICENSEE) as a result (directly or indirectly) under the licenses granted hereunder to LICENSEE, LICENSEE:

(a) [***];

(b) [***];

(c) [***].

7.02 DUKE will give LICENSEE reasonable assistance, [***] in the defense of any such infringement charge or lawsuit, as may be reasonably required. [***].

ARTICLE 8 - INFRINGEMENT OF PATENT RIGHTS BY THIRD PARTIES

8.01 Each party to this AGREEMENT is obligated to inform the other promptly in writing of any alleged infringement of which it becomes aware and of any available evidence of infringement by a THIRD PARTY of any patents within the PATENT RIGHTS.

8.02 If during the term of this AGREEMENT, LICENSEE becomes aware of any alleged infringement by a THIRD PARTY, LICENSEE shall have the right, but not the obligation, to either:

(a) settle the infringement suit by sublicensing the alleged infringer or by other means; or

(b) prosecute at its own expense any infringement of the PATENT RIGHTS. In the event LICENSEE prosecutes such infringement of PATENT RIGHTS, LICENSEE may, for such purposes, request to use the name of DUKE as party plaintiff. DUKE, at its sole discretion, may agree to become a party plaintiff, and all costs associated therewith shall be borne by LICENSEE.

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8.03 In the event that LICENSEE undertakes the enforcement and/or defense of the PATENT RIGHTS by litigation, including any declaratory judgment action, [***]. Any recovery of damages by LICENSEE as a result of such action shall be applied [***].

8.04 In the event LICENSEE does not undertake action to prevent the infringing activity within [***] of having been made aware and notified thereof, DUKE shall have the right, but not the obligation, to prosecute at its own expense any such infringements of the PATENT RIGHTS and, in furtherance of such right, DUKE may use the name of LICENSEE as a party plaintiff in any such suit without expense to LICENSEE. [***]. Any recovery of damages by DUKE for any infringement shall be applied [***].

8.05 In any infringement suit instituted by either party to enforce the PATENT RIGHTS pursuant to this AGREEMENT, the other party hereto shall, at the request and expense of the party initiating such suit, reasonably cooperate in all respects and, to the extent reasonably possible, have its employees testify when requested and make available relevant records, papers, information, samples, specimens, and the like.

8.06 LICENSEE has the sole right in accordance with the terms and conditions herein to sublicense any LICENSED PRODUCT or LICENSED PROCESS to an alleged infringer under the PATENT RIGHTS in the TERRITORY in order to avoid infringement in the future.

8.07 Any of the foregoing notwithstanding, if at any time during the term of this AGREEMENT any of the PATENT RIGHTS are held invalid or unenforceable in a decision which is not appealable or is not appealed within the time allowed, LICENSEE shall have no further obligations to DUKE with respect to its future use or sale of any LICENSED PRODUCT and LICENSED PROCESS covered solely by such PATENT RIGHTS, including the obligation of paying royalties. For avoidance of doubt it is understood and agreed that in such event, LICENSEE shall not have any damage claim or any claim for refund or reimbursement against DUKE for any amounts previously paid to DUKE under this AGREEMENT.

ARTICLE 9 - GOVERNMENT CLEARANCE, PUBLICATION, EXPORT

9.01 Insofar as such clearance is required, LICENSEE agrees to use its commercially reasonable efforts to have the LICENSED PRODUCTS and/or LICENSED PROCESSES cleared for marketing in those countries in which LICENSEE intends to sell LICENSED PRODUCTS and/or LICENSED PROCESSES, by the responsible government agencies requiring such clearance. To accomplish said clearances at the earliest possible date, LICENSEE agrees to file or have filed, according to the usual practice of LICENSEE, any necessary data with said government agencies as quickly as commercially reasonable.

9.02 It is understood and agreed that the right of publication/presentation of the inventions described in the PATENT RIGHTS shall reside in the INVENTORS, faculty, staff, and students of DUKE. LICENSEE shall also have the right to publish and/or co-author any publication/presentation on the inventions described in PATENT RIGHTS in accordance with academic custom.

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9.03 This AGREEMENT is subject to all of the United States laws and regulations controlling the export of technical data, computer software, laboratory prototypes and other commodities and technology. It is understood that DUKE is subject to United States laws and regulations controlling the export of technical data, computer software, laboratory prototypes and other commodities (including the Arms Export Control Act, as amended and the Export Administration Act of 1979), and that its obligations hereunder are contingent on compliance with applicable United States export laws and regulations. The transfer of certain technical data and commodities may require a license from the cognizant agency of the United States Government and/or written assurances by LICENSEE that LICENSEE shall not export data or commodities to certain foreign countries without prior approval of such agency. DUKE neither represents that a license shall not be required nor that, if required, it shall be issued.

ARTICLE 10 - DURATION AND TERMINATION

10.01 This AGREEMENT shall become effective upon the EFFECTIVE DATE, and unless sooner terminated in accordance with any of the provisions herein, shall remain in full force and effect for the life of the last-to-expire of the patents included in the PATENT RIGHTS.

10.02 Subject to the provisions of this AGREEMENT, LICENSEE will have caused a material breach in accordance with this Section 10 if LICENSEE fails to meet any of the development/commercialization milestones set forth in APPENDIX B unless DUKE expressly approves such variations in writing.

10.03 LICENSEE may terminate this AGREEMENT by giving DUKE written notice at least [***] prior to the effective date of such termination. It is understood that LICENSEE shall remain responsible for the timely payment of all amounts due DUKE under this AGREEMENT through the effective date of the termination.

10.04 Either party may immediately terminate this AGREEMENT for fraud, willful misconduct, or illegal conduct of the other party, in all such cases with respect to the subject matter of this AGREEMENT, upon written notice of same to that other party.

10.05 If either party fails to fulfill any of its material obligations under this AGREEMENT including, but not limited to, lack of payment or failure to meet the provisions of ARTICLE 3, the non-breaching party may terminate this AGREEMENT, upon written notice to the breaching party, as provided below. Such notice must contain a full description of the event or occurrence constituting a breach of the AGREEMENT. The party receiving notice of the breach will have the opportunity to cure that breach within [***] of receipt of notice. If the breach is not cured within that time, the termination will be effective as of [***].

10.06 If during the term of this AGREEMENT, LICENSEE shall become insolvent whether by the voluntary act of LICENSEE or otherwise, or if LICENSEE shall cease to exist as an active business, this AGREEMENT shall immediately terminate. In the event the LICENSEE shall become bankrupt or if the business of LICENSEE shall be placed in the hands of a receiver or trustee, this LICENSE shall terminate unless otherwise prohibited by law or judicial action.

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10.07 Notwithstanding anything to the contrary in this AGREEMENT, neither expiration nor any termination of this AGREEMENT shall remove any financial obligations to DUKE which LICENSEE incurred under this AGREEMENT prior to and as of the effective date of any expiration or termination.

10.08 On or before the effective date of any early termination of this AGREEMENT pursuant to Sections 10.02 – 10.06, LICENSEE shall cease the manufacture, use, practice, lease, and sale, offering, distribution, and other commercialization of LICENSED PRODUCTS and LICENSED PROCESSES.

10.09 Within [***] of any early termination of this AGREEMENT, LICENSEE shall destroy all LICENSED PRODUCTS for which a royalty has not been paid to DUKE in a safe and legal manner. LICENSEE shall also provide DUKE with a written statement signed by an authorized representative of LICENSEE certifying the destruction of all such LICENSED PRODUCTS for which a royalty has not been paid to DUKE in a safe and legal manner. Further, LICENSEE shall certify that they have destroyed all confidential information provided by DUKE under Article 11 or return all copies of such information to DUKE.

ARTICLE 11 - CONFIDENTIALITY

11.01 DUKE and LICENSEE each agree to treat any confidential information disclosed to it by the other party under this AGREEMENT with reasonable care and to avoid disclosure of such information to any other person, firm or corporation, except AFFILIATES bound by the obligations of confidentiality and restricted use set forth in this Article 11, and either party shall be liable for unauthorized disclosure or failure to exercise such reasonable care. Further, the receiving party will not use the disclosing party's confidential information other than for the benefit of the parties hereto and relating to this AGREEMENT. These obligations of non-disclosure and restricted use shall remain in effect for each subject disclosure of confidential information for a period of time of [***] from such disclosure, however, neither party shall have an obligation, with respect to confidential information disclosed to it, or any part thereof, which:

(a) is already known to the receiving party at the time of the disclosure;

(b) becomes publicly known without the wrongful act or breach of this AGREEMENT by the receiving party;

(c) is rightfully received by the receiving party from a THIRD PARTY on a non-confidential basis;

(d) is subsequently and independently developed by employees of the receiving party who had no knowledge of the information, as verified by written records;

(e) is approved for release by prior written authorization of the party disclosing the information; or

(f) is disclosed pursuant to any judicial or government request, requirement or order, provided that the party so disclosing takes reasonable steps to provide the other party sufficient prior notice in order to contest such request, requirement or order and provided that such disclosed confidential information otherwise remains subject to the obligations of confidentiality set forth in this Article 11.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

11.02 DUKE and LICENSEE agree that any information to be treated as confidential information under this Article 11 must be disclosed in writing or other tangible medium and must be clearly marked “CONFIDENTIAL”. Confidential information disclosed orally must be summarized and reduced to writing or other tangible medium and communicated to the other party within [***] of such disclosure, and the other party agrees that such disclosed information shall be deemed confidential.

11.03 Notwithstanding the foregoing, LICENSEE shall have the right to use and disclose any confidential information related to the PATENT RIGHTS (a) to the extent necessary to obtain regulatory approval for, or to sell, a LICENSED PRODUCT or LICENSED PROCESS and (b) to investors, prospective investors, employees, consultants and agents with a need to know, collaborators, prospective collaborators and other THIRD PARTIES in the chain of manufacturing and distribution provided that LICENSEE obtains from such parties written confidentiality agreements, the provisions of which are at least as restrictive and protective of DUKE’s confidential information as those provided in this Article 11.

11.04 Notwithstanding anything to the contrary in this AGREEMENT, all information relating to filing, prosecution, maintenance, defense, infringement, and the like regarding the PATENT RIGHTS (no matter how disclosed) shall be considered the confidential information of DUKE until published by the applicable patent office and subject to the obligations of restricted use and non-disclosure set forth in this Article 11.

ARTICLE 12 - NOTICES

12.01 It shall be a sufficient giving of any notice, request, report, statement, disclosure or other communication hereunder if the party giving the same shall

(a) hand deliver such communication; or

(b) mail such a communication, postage prepaid, first class, certified mail; or

(c) send such communication, shipping prepaid by national/international courier service

to the party to receive such communication at the address given below or as otherwise given as provided in this ARTICLE 12, in the case of payments and/or reports due in accordance with this AGREEMENT or such other address as may hereafter be designated by notice in writing by the appertaining party.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

DUKE	LICENSEE
For delivery via the U.S. Postal Service	
Office of Science and Technology Duke University Attn: Agreement Coordinator Box 90083 Durham, NC 27708 USA	Precision BioSciences, Inc. Attn: Matthew Kane 2211 Hillsborough Rd #4087 Durham, NC 27705 USA
For delivery via nationally/internationally recognized courier	
Office of Science and Technology Duke University Attn: Agreement Coordinator 2020 West Main Street, Suite 10 Durham, NC 27705 USA	(same as above)
cc: *(if of a legal nature)* Office of University Counsel Duke University 2400 Pratt Street, Suite 4000 Durham, North Carolina 27710	WilmerHale Attn: Michael J. Bevilacqua 60 State Street Boston, MA 02109 USA

12.02 The date of giving any such notice, request, report, statement, disclosure or other communications, and the date of making any payment hereunder required (provided such payment is received), shall be the actual date of receipt.

ARTICLE 13 - ASSIGNMENT

13.01 This AGREEMENT shall be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. However, LICENSEE may not assign its rights in this AGREEMENT without approval by DUKE, such approval not to be unreasonably withheld. Notwithstanding the foregoing, a change of control transaction, merger, consolidation or sale of substantially all of the business of LICENSEE related to this Agreement shall not be deemed an assignment for purposes of this clause and no consent of DUKE shall be required for such transactions.

ARTICLE 14 - INDEMNITY, INSURANCE, REPRESENTATIONS, STATUS

14.01 DUKE, and its trustees, officers, employees, faculty members, students, and agents (collectively, “DUKE Indemnitees”) will be indemnified, defended by counsel reasonably acceptable to DUKE, and held harmless by LICENSEE and AFFILIATES and SUBLICENSEES, as the case may be, from and against any claim, liability, cost, expense, damage, deficiency, loss or obligation, of any kind or nature (including, without limitation, reasonable attorneys’ fees and other costs and expenses of defense) (collectively, “CLAIMS”) based upon, arising out of, or otherwise relating to this AGREEMENT including, but not limited to, (i) any action relating to product liability, and (ii) any CLAIM that a LICENSED PRODUCT and/or LICENSED PROCESS and/or practice of any of the PATENT RIGHTS infringes the intellectual property of a THIRD PARTY. However, the foregoing indemnity shall not apply to CLAIMS to the extent that they are (x) caused by the gross negligence of DUKE, DUKE employees, DUKE faculty members,

students, and/or agents acting solely within the performance of their respective responsibilities at DUKE, (y) caused by a material breach of this AGREEMENT by DUKE, and/or (z) pertain solely to claims that the activities of DUKE employees, faculty members, students, and/or agents in their performance of their respective responsibilities at DUKE (excluding any research or other responsibilities such individuals may have as a result of an association each may have with LICENSEE and/or AFFILIATES and/or SUBLICENSEES) infringe the intellectual property of a THIRD PARTY.

14.02 DUKE MAKES NO REPRESENTATIONS NOR EXTENDS ANY WARRANTIES OF ANY KIND. IN PARTICULAR, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR THAT THE USE OF THE PATENT RIGHTS DOES NOT INFRINGE ANY PATENT, COPYRIGHT, TRADEMARK OR OTHER RIGHTS. IN ADDITION, NOTHING IN THIS AGREEMENT SHALL BE DEEMED TO BE A REPRESENTATION OR WARRANTY BY DUKE OF THE VALIDITY OF ANY OF THE PATENT RIGHTS OR THE ACCURACY, SAFETY, EFFICACY, OR USEFULNESS, FOR ANY PURPOSE, OF THE PATENT RIGHTS DUKE SHALL HAVE NO OBLIGATION, EXPRESS OR IMPLIED, TO SUPERVISE, MONITOR, REVIEW OR OTHERWISE ASSUME RESPONSIBILITY FOR THE PRODUCTION, MANUFACTURE, TESTING, MARKETING OR SALE OF ANY LICENSED PRODUCT OR LICENSED PROCESS. (FOR AVOIDANCE OF DOUBT, IT IS UNDERSTOOD AND AGREED THAT ANY SUCH ACTIVITY DESCRIBED IN THE PRECEDING SENTENCE BY ONE OR MORE OF THE INVENTORS OR ANY OTHER DUKE TRUSTEE, FACULTY MEMBER, EMPLOYEE, STUDENT, AND/OR AGENT SHALL BE DEEMED TO BE OUTSIDE THEIR RESPECTIVE CAPACITY AS A DUKE TRUSTEE, FACULTY MEMBER, EMPLOYEE, STUDENT, AND/OR AGENT, AS THE CASE MAY BE.) FURTHER, DUKE SHALL HAVE NO LIABILITY WHATSOEVER TO LICENSEE, ITS AFFILIATES, SUBLICENSEES, OR ANY THIRD PARTIES FOR OR ON ACCOUNT OF ANY INJURY, LOSS, OR DAMAGE, OF ANY KIND OR NATURE, SUSTAINED BY, OR ANY DAMAGE ASSESSED OR ASSERTED AGAINST, OR ANY OTHER LIABILITY INCURRED BY OR IMPOSED UPON LICENSEE OR ANY OTHER PERSON OR ENTITY, ARISING OUT OF OR IN CONNECTION WITH OR RESULTING FROM:

(a) the production, use, practice, offering, lease, or sale of any LICENSED PRODUCT or LICENSED PROCESS;

(b) the use of the PATENT RIGHTS; or

(c) any advertising or other promotional activities with respect to any of the foregoing.

14.03 Neither party hereto is an agent of the other party for any purpose whatsoever.

ARTICLE 15 - USE OF A PARTY'S NAME

15.01 Neither party will, without the prior written consent of the other party:

(a) use in any publication, advertising, publicity, press release, promotional activity or otherwise, any trade-name, personal name, trademark, trade device, service mark, symbol, image, icon, or any abbreviation, contraction or simulation thereof owned by the other party;

(b) use the name or image of any employee, faculty member, student, or agent of the other party in any publication, publicity, advertising, press release, promotional activity or otherwise; or

(c) represent, either directly or indirectly, that any product or service of the other party is a product or service of the representing party or that it is made in accordance with or utilizes the information or documents of the other party.

ARTICLE 16 - SEVERANCE AND WAIVER

16.01 Each clause of this AGREEMENT is a distinct and severable clause and if any clause is deemed illegal, void or unenforceable, the validity, legality or enforceability of any other clause or portion of this AGREEMENT will not be affected thereby.

16.02 The failure of a party in any instance to insist upon the strict performance of the terms of this AGREEMENT will not be construed to be a waiver or relinquishment of any of the terms of this AGREEMENT, either at the time of the party's failure to insist upon strict performance or at any time in the future, and such terms will continue in full force and effect.

ARTICLE 17 - TITLES

17.01 All titles and article headings contained in this AGREEMENT are inserted only as a matter of convenience and reference. They do not define, limit, extend or describe the scope of this AGREEMENT or the intent of any of its provisions.

ARTICLE 18 - SURVIVAL OF TERMS

18.01 The provisions of ARTICLES 2.04, 2.09, 3 (as regards financial obligations described therein incurred during the term of this Agreement), 5 (as regards obligations for reports and payments due to Duke for activities occurring during the term of this Agreement), 6, 7, 8, (to the extent, but only to the extent, that such infringement occurs during the term of this Agreement and excluding Section 8.06 which shall only apply during the term of this Agreement), .11, 12, 13, 14, 15, 16, 18, 19 shall survive the expiration or termination of this AGREEMENT.

ARTICLE 19 - GOVERNING LAW

19.01 This AGREEMENT shall be construed as having been entered into in the State of North Carolina and shall be interpreted in accordance with and its performance governed by the laws of the State of North Carolina. Notwithstanding the foregoing, questions affecting the construction and effect of any patent in PATENT RIGHTS shall be determined by the law of the country in which the patent was granted.

ARTICLE 20 - ENTIRE UNDERSTANDING

20.01 This AGREEMENT represents the entire understanding between the parties, and supersedes all other agreements, express or implied, between the parties concerning the subject matter hereof, and shall not be subject to any change or modification except by the execution of a written instrument subscribed to by the parties hereto.

[Signature page follows]

IN WITNESS WHEREOF, the parties hereto have executed this AGREEMENT on the dates set forth below.

DUKE UNIVERSITY

By: /s/ Rose Ritts
Rose Ritts, Ph.D.
Executive Director
Office of Licensing and Ventures

Date: 4/17/2006

Precision BioSciences, Inc.

By: /s/ Matthew Kane
Matthew Kane
CEO

Date: 4/17/2006

Read and Understood by the INVENTORS

By: /s/ Homme Hellinga
Homme Hellinga, Ph.D.

Date: 4/24/2006

By: /s/ Jeff Smith
Jeff Smith, Ph.D.

Date: 4/17/2006

By: /s/ Derek Jantz
Derek Jantz, Ph.D.

Date: 4/17/2006

APPENDIX A

[***]

APPENDIX B

Milestones

COMMERCIALIZATION SCHEDULE
(year one starts the day the license is executed by DUKE)

[***]
[***]
[***]
[***]
[***]
[***]
[***]
[***]
[***]
[***]

APPENDIX C

Milestone payments

Milestone	Amount due DUKE
1) Closing of Series A Financing in excess of $1 million	[***]
2) First signed partnership with guaranteed payments in excess of $1 million	[***]
3) First commercial seed trait brought to market by PBI or partner	[***]
4) First human therapeutic brought to market by PRI or partner	[***]

APPENDIX D

As per the attached XL file titled “standard royrpt format”

APPENDIX E
[***]

APPENDIX F
[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

AMENDMENT TO LICENSE AGREEMENT

THIS AMENDMENT to License Agreement (the "Amendment"), dated as of May 31, 2007, is entered into by and between Duke University, a nonprofit educational and research institution organized under the laws of North Carolina ("Duke") and Precision BioSciences, Inc., a Delaware corporation ("Precision", and collectively with Duke, the "Parties"). All capitalized terms used herein and not otherwise defined shall have the meaning given to them in the License Agreement (as defined below).

WHEREAS, the Parties entered into that certain License Agreement, dated April 17, 2006 (the "License Agreement"), whereby Precision licensed certain PATENT RIGHTS from Duke; and

WHEREAS, the Parties wish to amend the License Agreement to [***] the royalty payments and sublicense fees payable to Duke under certain circumstances.

NOW THEREFORE, in consideration of the mutual covenants and agreements contained herein, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

1. Section 3.01(c) shall be deleted in its entirety and replaced with the following:

(c) (i) Royalty on NET SALES. At the times and in the manner set forth hereinafter, LICENSEE and it AFFILIATES shall pay to DUKE a [***] royalty on NET SALES of LICENSED PRODUCTS or LICENSED PROCESSES, by LICENSEE, and/or its AFFILIATES. Such royalty shall be at the rate of:

(A) [***] of NET SALES for LICENSED PRODUCTS;

(B) [***] of NET SALES for LICENSED PROCESSES.

(ii) Where in order to manufacture, sell, use, practice or otherwise dispose of LICENSED PRODUCTS or LICENSED PROCESSES it is [***] for LICENSEE to obtain a license under any patent rights from a THIRD PARTY (including in settlement of a claim contemplated by Article 7.01) and by reason of an agreement with such THIRD PARTY a royalty on LICENSEE NET SALES (or similarly defined amount) is payable to such THIRD PARTY, the royalty payable pursuant to this Article 3.01(c) shall be reduced by [***] of the amounts paid to third parties provided that under no circumstances will the royalty payable to DUKE on NET SALES of LICENSED PRODUCTS or LICENSED PROCESSES reduce to less than [***].

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

(iii) Where the development, manufacture, importation, use, lease, sale or distribution of LICENSED PRODUCTS or LICENSED PROCESSES utilizes or incorporates technology owned by LICENSEE (the "LICENSEE TECHNOLOGY"), the royalty payable pursuant to this Article 3.01(c) shall be reduced by [***].

Notwithstanding anything to the contrary in this Article 3.01 (c), the royalties payable to DUKE on NET SALES of LICENSED PRODUCTS or LICENSED PROCESSES shall not be lower than [***].

2. The following language shall be added to the end of Section 3.01(e):

Where the development, manufacture, importation, use, lease, sale or distribution of LICENSED PRODUCTS or LICENSED PROCESSES utilizes or incorporates LICENSEE TECHNOLOGY, the SUBLICENSE FEE payable pursuant to Article 3.01(e)(i) shall be reduced to [***] or the SUBLICENSE FEE payable pursuant to Article 3.01(e)(ii) shall be reduced to [***].

IN WITNESS WHEREOF, the Parties have each caused this Amendment to be executed by its duly authorized representative.

DUKE UNIVERSITY		**PRECISION BIOSCIENCES, INC.**	
By:	/s/ Rose Ritts	By:	/s/ Matthew Kane
Name:	Rose Ritts, Ph.D. Executive Director	Name:	Matthew Kane
Title:	Office of Licensing & Ventures Duke University & DUMC	Title:	CEO

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

PRECISION BIOSCIENCES, INC.
104 T.W. Alexander Drive, Bldg #7
P.O. Box 12292
Research Triangle Park, NC 27709

December 10, 2007

Office of Science and Technology
Duke University
Attn: Agreement Coordinator
Box 90083
Durham, NC 27708

To Whom This May Concern:

Reference is made to the License Agreement, dated as of April 17, 2006, by and between Duke University and Precision BioSciences, Inc. ("PB") (as amended, the "License Agreement").

This is a clarification of the definition of the term "Patent Rights," which is set forth in paragraph 1.04 of the License Agreement. Specifically, the term "Patentably Distinct," as used therein, is not intended by the parties to the License Agreement to apply to any of the patents and/or patent application(s) listed in Appendix A of the License Agreement, including any and all divisionals, continuations, and/or continuations-in-part (only to the extent set forth in paragraph 1.04 of the License Agreement) which constitute any of the Patent Rights licensed to PB thereunder and which may be sublicensed by PB to a third party pursuant to the terms of the License Agreement.

Please sign both copies this letter where indicated below and return one copy to PB at the address set forth above. Thank you for your assistance with this matter.

Sincerely,

/s/ Matthew Kane

Matthew Kane
President and Chief Executive Officer

Acknowledge and Agreed:

DUKE UNIVERSITY

By: /s/ Rose Ritts

Name: Rose Ritts, Ph.D.

Title: Executive Director, Duke Office of Licensing & Ventures

PRECISION BIOSCIENCES, INC.
104 T.W. Alexander Drive, Bldg #7
P.O. Box 12292
Research Triangle Park, NC 27709

February13, 2009

Office of Science and Technology
Duke University
Attn: Agreement Coordinator
Box 90083
Durham, NC 27708

To Whom This May Concern:

Reference is made to the License Agreement, dated as of April 17, 2006, by and between Duke University ("Duke") and Precision BioSciences, Inc. ("Precision") as amended on May 31, 2007, and as clarified by letter agreement on December 10, 2007, (collectively, the "Duke License Agreement"). Precision proposes to enter into an agreement (the "[***] License Agreement") with [***] ("[***]") pursuant to which Precision would grant to [***] among other things a sublicense under the rights and licenses granted to Precision under the Duke License Agreement. In connection with Precision's proposal to enter into the [***] License Agreement, Duke and Precision wish to clarify certain terms and conditions of the Duke License Agreement, as follows. Terms not defined herein have the meaning ascribed to them in the Duke License Agreement,

I. Section 2.03 of the Duke License Agreement states that "All SUBLICENSES shall be subject to the terms and conditions of this AGREEMENT, shall be no less favorable to or protective of DUKE than this AGREEMENT except as expressly stated in this AGREEMENT, and shall not be further sublicenseable without the express written approval of DUKE, such approval not to be unreasonably withheld." The parties hereby agree that the express written approval requirement shall not apply to the following types of sublicenses entered into by a sublicensee of Precision (a "Precision Sublicensee"):

   (a) Sublicenses of a Licensed Product or Licensed Products by a Precision Sublicensee to a third party, under which such third party may make, use, sell, offer for sale, import, distribute or otherwise exploit such Licensed Product or Licensed Products;

   (b) Sublicenses by a Precision Sublicensee to a third party for such third party to practice the Patent Rights in order to perform work on the Precision Sublicensee's behalf; or

   (c) Further sublicenses of any sublicense entered into in accordance with either of sub-sections (a) or (b) above.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

II. Section 2.03 of the Duke License Agreement further states that "In the event of any termination of this Agreement, all SUBLICENSES shall survive such termination provided that the SUBLICENSEES are in compliance with the terms and conditions of the SUBLICENSE and the SUBLICENSEES comply with all terms of this Agreement related to such SUBLICENSE including the payment of all amounts that would be due DUKE under this Agreement if it had not terminated." The parties hereby agree that in the event of any termination of the Duke License Agreement (including without limitation termination under Section 3.04 of the Duke License Agreement), the requirement that a Precision Sublicensee comply with the terms of Precision's sublicense to the Precision Sublicensee (the "Primary Sublicense") and the Duke License Agreement shall mean the following with respect to payment obligations:

[***]

III. The parties hereby agree that Section 2.03 of the Duke License Agreement (as regards the survival of sublicenses) survives termination of the Duke License Agreement.

Remainder of Page Intentionally Left Blank

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Please sign and return a copy of this letter to us to acknowledge our mutual agreement on this matter. Thank you for your assistance.

PRECISION BIOSCIENCES, INC.

By: /s/ Matthew Kane
Matthew Kane
Chief Executive Officer

Acknowledged and Agreed:

DUKE UNIVERSITY

By: /s/ Rose Ritts
Name: Rose Ritts, PhD
Title: Executive Director Office of Licensing & Ventures
Duke University & DUMC

PRECISION BIOSCIENCES, INC.
302 East Pettigrew Street
Dibrell Building, Suite A-100
Durham, NC 27701

January 17, 2012

Office of Licensing and Ventures
Duke University
Attn: Agreement Coordinator
Box 90083
Durham, NC 27708

To Whom This May Concern:

Reference is made to the License Agreement, dated as of April 17, 2006, by and between Duke University ("Duke") and Precision BioSciences, Inc. ("Precision") as amended on May 31, 2007, and as clarified by letter agreements on December 10, 2007 and February 13, 2009 (collectively, the "Duke License Agreement"). Precision proposes to enter into the agreement attached hereto as Exhibit A (the "Plantco License Agreement") with Precision PlantSciences, Inc. ("Plantco"), a wholly-owned subsidiary of Precision formed to conduct business exclusively in the plant field, pursuant to which Precision would grant to Plantco among other things a sublicense under the rights and licenses granted to Precision under the Duke License Agreement.

In connection with Precision's proposal to enter into the Plantco License Agreement, Duke and Precision wish to clarify certain terms and conditions of the Duke License Agreement, as follows. Terms not defined herein have the meaning ascribed to them in the Duke License Agreement.

1. Section 1.14 of the Duke License Agreement states that "'SUBLICENSE REVENUES' shall mean any and all upfront fees, license fees, royalties, option fees, milestone payments, and other amounts payable to LICENSEE (and/or its AFFILIATES, as the case maybe) under a SUBLICENSE to any of the licenses granted by DUKE to LICENSEE under this AGREEMENT."

    a. The parties hereby agree that as long as Plantco remains an AFFILIATE of Precision, [***]. [***]. The foregoing is illustrated for convenience by the example chart set forth below.

    Example: SUBLICENSE FEES while Precision and Plantco are AFFILIATES

	[***]	[***]	[***]
Example 1	[***]	[***]	[***]
Example 2	[***]	[***]	[***]
Example 3	[***]	[***]	[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

b. The parties hereby agree that at such time as Plantco no longer remains an AFFILIATE of Precision, Duke will be entitled in accordance with the Duke License Agreement to [***].

2. Section 2.03 of the Duke License Agreement states that "All SUBLICENSES shall be subject to the terms and conditions of this AGREEMENT, shall be no less favorable to or protective of DUKE than this AGREEMENT except as expressly stated in this AGREEMENT, and shall not be further sublicenseable without the express written approval of DUKE, such approval not to be unreasonably withheld." Without limiting anything set forth in the letter agreement between the parties dated February 13, 2009, the parties hereby agree that the express written approval requirement shall not apply to any SUBLICENSES entered into by Plantco or, to the extent described in such letter agreement, Plantco's sublicensees; provided, however, that Plantco provides Duke with a copy of any SUBLICENSES entered into by Plantco [***] prior to execution of each subject SUBLICENSE with the ability to review and comment, such comments to be reasonably considered by Plantco, and Plantco provides Duke with an executed copy of such SUBLICENSE within [***] of the effective date of such SUBLICENSE.

3. Article 7 of the Duke License Agreement provides LICENSEE with certain rights and obligations with respect to infringement of THIRD PARTY rights. Duke agrees that for so long as Plantco remains an AFFILIATE of Precision, each instance of the term "LICENSEE" in Article 7 of the Duke License Agreement shall be deemed to mean "LICENSEE and/or Precision PlantSciences, Inc., as applicable." For clarity, as long as Plantco remains an AFFILIATE of Precision, in accordance with Section 7.01(b) of the Duke License Agreement, [***].

4. Article 8 of the Duke License Agreement provides LICENSEE with certain rights to enforce the PATENT RIGHTS against potential infringers. Duke agrees that to the extent that LICENSEE grants a SUBLICENSEE such enforcement rights, each instance of the term "LICENSEE" in Article 8 of the Duke License Agreement shall be deemed to mean "LICENSEE and/or SUBLICENSEE, as applicable" and that Duke will cooperate with any such SUBLICENSEE as set forth in Section 8,05 of the Duke License Agreement as if such SUBLICENSEE were a party to the Duke License Agreement. For clarity, if such SUBLICENSEE enforces the PATENT RIGHTS and there is a balance remaining from recovery of damages by SUBLICENSEE, in accordance with Section 8.03 of the Duke License Agreement, [***].

Duke acknowledges that Precision will be assigning to Plantco (as an AFFILIATE of Precision) the following SUBLICENSES in accordance with their terms: (i) License Agreement between [***] and Precision dated [***], (ii) Research and Commercial Option Agreement between [***] and Precision dated [***], and (iii) Research and Commercial Option Agreement between [***] and Precision dated [***], each as amended from time to time (collectively, the "Existing Plant Sublicenses"). In support thereof, Duke acknowledges and agrees that the Plantco License Agreement constitutes a valid SUBLICENSE under and is consistent with the terms of the Duke License Agreement as modified herein, and the Existing Plant Sublicenses, upon such assignment,

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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

shall continue to constitute valid SUBLICENSES under the Duke License Agreement consistent with the terms thereof as so modified. Duke further acknowledges and agrees that in the event of any termination of the Duke License Agreement, the Existing Plant Sublicenses shall survive such termination in accordance with Section 2.03 of the Duke License Agreement.

Subject to any confidentiality or nondisclosure obligations to any third parties or legal restrictions, Precision agrees to provide Duke with a copy of any proposed amendment to the Plantco License Agreement prior to the execution thereof with the ability to review and comment for a reasonable period (but not to exceed [***], such comments to be reasonably considered by Precision.

Please sign and return a copy of this letter to us to acknowledge our mutual agreement on this matter. Thank you for your assistance.

PRECISION BIOSCIENCES, INC.

By: /s/ Matthew Kane 1/18/2012
Matthew Kane
Chief Executive Officer

Acknowledged and Agreed:

DUKE UNIVERSITY

By: /s/ Rose Ritts 1/17/2012
Name: Rose Ritts, PhD
Title: Executive Director Office of Licensing & Ventures Duke University & DUMC

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

EXHIBIT A

PLANTCO LICENSE AGREEMENT

PRECISION BIOSCIENCES, INC.
302 East Pettigrew Street
Dibrell Building, Suite A-100
Durham, NC 27701

December 6, 2013

Office of Licensing and Ventures
Duke University
Attn: Agreement Coordinator
Box 90083
Durham, NC 27708

To Whom This May Concern:

Reference is made to the License Agreement, dated as of April 17, 2006, by and between Duke University ("Duke") and Precision BioSciences, Inc. ("Precision") as amended on May 31, 2007, and as clarified by letter agreements on December 10, 2007, February 13, 2009, and January 17, 2012 (collectively, the "Duke License Agreement"). Duke and Precision now wish to acknowledge and agree that the milestones listed in the COMMERCIALIZATION SCHEDULE in APPENDIX B of the Duke License Agreement have been achieved and fully satisfied.

Please sign and return a copy of this letter to us to acknowledge our mutual agreement on this matter. Thank you for your assistance.

PRECISION BIOSCIENCES, INC.

By: /s/ Matthew Kane
Matthew Kane
Chief Executive Officer

Acknowledged and Agreed:

DUKE UNIVERSITY

By: /s/ Rose Ritts
Name: Rose Ritts, PhD
Title: Executive Director Office of Licensing & Ventures
Duke University & DUMC

PRECISION BIOSCIENCES, INC.
302 East Pettigrew Street
Dibrell Building, Suite A-100
Durham, NC 27701

December 13, 2013

Office of Licensing and Ventures
Duke University
Attn: Agreement Coordinator
Box 90083
Durham, NC 27708

To Whom This May Concern:

Reference is made to the License Agreement, dated as of April 17, 2006, by and between Duke University ("Duke") and Precision BioSciences, Inc. ("Precision") as amended on May 31, 2007, and as clarified by letter agreements on December 10, 2007, February 13, 2009, January 17, 2012, and December 6, 2013 (collectively, the "Duke License Agreement"). As Precision has discussed with Duke, Precision's business model may from time to time include the creation and licensing of products such as a modified cell line, a mouse with a modified genome, or a therapeutic, each created, in part, through use of Precision's meganuclease technology and licensed to customers for commercial applications. Because the financial dynamics of these transactions are more akin to sales of a product than a typical technology "sublicense", the parties wish to modify the financial provisions of the Duke License Agreement to facilitate Precision's efforts to execute on this new business model. The parties anticipate that Precision's success in such execution will greatly benefit Duke by operation of the Duke License Agreement.

1. Terms not defined herein have the meaning ascribed to them in the Duke License Agreement.

2. Duke and Precision agree that SUBLICENSES to make, use, sell, offer for sale, import, distribute or otherwise exploit LICENSED PRODUCTS created by Precision and/or its AFFILIATES (including derivatives thereof), where such SUBLICENSE includes the right to use a LICENSED PRODUCT (or derivative) and where the applicable SUBLICENSE includes a negotiated royalty rate that may equal [***], shall constitute "Commercial Product Sublicenses" and shall be subject to the remaining terms of this letter agreement. For clarity, but without limiting the foregoing, a SUBLICENSE that satisfies the foregoing royalty rate criteria and that includes a LICENSED PRODUCT (or derivative) constituting [***], shall be considered Commercial Product Sublicenses. [***].

3. Duke and Precision agree that Commercial Product Sublicenses shall, in lieu of the SUBLICENSE FEES set forth in Section 3.01(e) of the Duke License Agreement, bear a SUBLICENSE FEE equal to the applicable percent of SUBLICENSE REVENUES from such Commercial Product Sublicenses as set forth in the following chart:

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Highest Negotiated Royalty Rate in Commercial Product Sublicense:	3.01(e)(i) SUBLICENSE FEE = ___ Percent of SUBLICENSE REVENUES from royalties	3.01(e)(ii) SUBLICENSE FEE = ___ Percent of SUBLICENSE REVENUES from non-royalties
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
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[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]

4. Duke and Precision agree that all Commercial Product Sublicenses shall be entered into on terms consistent with and shall be subject to the terms and conditions of the Duke License Agreement, except that the second and eighth sentences of Section 2.03 of the Duke License Agreement shall not apply to Commercial Product Sublicenses, and notwithstanding the first sentence of Section 2.03 of the Duke License Agreement, Commercial Product Sublicenses shall be freely sublicenseable without the express written approval of Duke. Except as specifically modified in this letter agreement, all provisions of the Duke License Agreement applicable to SUBLICENSES shall apply to Commercial Product Sublicenses.

Please sign and return a copy of this letter to us to acknowledge our mutual agreement on this matter. Thank you for your assistance.

PRECISION BIOSCIENCES, INC.

By: /s/ Matthew Kane
Matthew Kane
Chief Executive Officer

Acknowledged and Agreed:

DUKE UNIVERSITY

By: /s/ Rose Ritts
Name: Rose Ritts, PhD
Title: Executive Director Office of Licensing & Ventures
Duke University & DUMC

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

PATENT CROSS-LICENSE AGREEMENT

This Patent Cross-License Agreement (**"Agreement"**) is made as of January 23, 2014 (**"Effective Date"**) by and between the following:

Cellectis SA, a French corporation with its principal place of business at 8, rue de la Croix Jarry, 75013 Paris, France (**"Cellectis"**); and **Precision BioSciences, Inc.**, a Delaware corporation with its principal place of business at 302 East Pettigrew Street, Dibrell Building, Suite A-100, Durham, North Carolina 27701 (**"Precision"**).

Cellectis and Precision are each referred to herein as a **"Party"** and collectively as the **"Parties."**

RECITALS

WHEREAS, Precision owns or controls certain patents and patent applications covering Engineered I-Crel Meganuclease (defined below) technology that is useful for modifying the genome of cells, including for biomanufacturing purposes and certain other uses;

WHEREAS, Cellectis owns or controls certain patents and patent applications covering Engineered I-Crel Meganuclease technology that is useful for modifying the genome of cells, including for biomanufacturing purposes and certain other uses;

WHEREAS, the Parties are entering into a Settlement Agreement (the **"Settlement Agreement**"), and Precision is entering into a Stipulation of Dismissal with Lonza Group Ltd. and certain of its Affiliates, pursuant to which the Parties have agreed to settle certain disputes between them, including the Pending Litigations (defined below);

WHEREAS, this Agreement shall have no force or effect until such time as the Parties have signed the Settlement Agreement and satisfied the obligations set forth in Article 2 and Article 3 of the Settlement Agreement with respect to filing the Stipulations of Dismissal and the Stipulation of Dismissal With Prejudice of the Lonza Litigation set forth in such Articles; and

WHEREAS, the Parties have agreed to enter into this Agreement to establish cross-licenses to the Licensed Precision Patents and Licensed Cellectis Patents (each defined below), as consideration for one another and in further consideration for each Party's entry into the Settlement Agreement, which cross-licenses shall provide each Party with certain non-exclusive patent rights with respect to Engineered I-Crel Meganuclease technology.

NOW, THEREFORE, in consideration of the mutual covenants, representations, warranties and other terms and conditions contained herein and in the Settlement Agreement, the sufficiency of which is hereby acknowledged, the Parties hereto agree as follows:

ARTICLE 1. DEFINITIONS

In addition to other terms defined elsewhere herein, the following terms, as used in this Agreement, shall have the meanings indicated:

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.1. **"Affiliate"** shall mean any corporation, firm, partnership, entity or other person that directly or indirectly controls, is controlled by, or is under common control with a Party; where "control" means the capacity to designate, appoint or otherwise determine the board of directors or other governing authority of such person, whether by law or in fact, or whether by ownership of more than fifty percent (50%) of the equity or other ownership interests of such person (or such lesser percentage which is the maximum allowed to be owned by a foreign corporation in a particular jurisdiction).

1.2. **"Control"** with respect to a Party's rights in or to a Patent, means that the Party owns the Patent, or has the right to grant licenses or immunities from suit (other than pursuant to the rights granted in this Agreement) to the other Party, or bring or release claims or actions for infringement of such Patent as to the other Party, each without violating the terms of any agreement or other arrangement with any Third Party.

1.3. **"Design"** shall mean, with respect to any person or entity, the design of Engineered I-Crel Meganucleases by such person or entity, whether for itself or for or on behalf of any Third Party; provided, however, that "Design" does not include [***].

1.4. **"Engineered I-Crel Meganuclease"** shall mean a [***].

1.5. **"Exclusive Field"** shall have the meaning set forth in Article 2.1.2.

1.6. **"Existing Licensee"** shall mean a licensee under the licenses (the "**Existing Licenses**") in effect prior to the Effective Date granting to a Third Party any rights under any of the Licensed Cellectis Patents (with respect to licenses granted by Cellectis) or Licensed Precision Patents (with respect to licenses granted by Precision).

1.7. **"Field"** shall mean any and all fields of use.

1.8. **"Licensee"** shall mean:

(i) with respect to Licensed Cellectis Patents, Precision and its Affiliates.

(ii) with respect to Licensed Precision Patents, Cellectis and its Affiliates.

1.9. **"Licensor"** shall mean:

(i) with respect to Licensed Cellectis Patents, Cellectis and its Affiliates.

(ii) with respect to Licensed Precision Patents, Precision and its Affiliates.

1.10. **"Licensed Cellectis Patents"** shall mean any Patent Controlled by Cellectis or its Affiliates that contains one or more claims claiming a priority date prior to the Effective Date; which Patent also (i) was the basis of any claim asserted in the Pending Litigations (collectively, "**Litigated Cellectis Patents**") or (ii) [***]. Without limiting the foregoing, the Licensed Cellectis Patents shall include the Patents of the families of patents listed in **Exhibit A**, as may be updated from time to time by Cellectis during the Term (including an annual update on the anniversary date of the Effective Date, if applicable, and an update if Cellectis later discovers a Patent that should have been listed in **Exhibit A**). For the further sake of clarity, an application listed on **Exhibit A** that, at any time, falls within the foregoing definition of Licensed Cellectis Patents later shall no longer be a Licensed Cellectis Patent if, subsequently during its prosecution

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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

as an application and on issuance as a patent, it no longer satisfies the requirements of this definition. For further clarity, practice of the subject matter of a patent that does not meet the foregoing definition is not authorized under this Agreement.

1.11. "Product" shall mean any product [***].

1.12. "Licensed Patents" shall mean:

(i) when the Licensee is Precision or its Affiliates: Licensed Cellectis Patents

(ii) when the Licensee is Cellectis or its Affiliates: Licensed Precision Patents.

1.13. "Licensed Precision Patents" shall mean any Patent Controlled by Precision or its Affiliates that contains one or more claims claiming a priority date prior to the Effective Date, which Patent also (i) was the basis of any claim asserted in the Pending Litigations (collectively, "**Litigated Precision Patents**") or (ii) [***]. Without limiting the foregoing, the Licensed Precision Patents shall include the Patents listed in **Exhibit B**, as may be updated from time to time by Precision during the Term (including an annual update on the anniversary date of the Effective Date, if applicable, and an update if Precision later discovers a Patent that should have been listed in **Exhibit B**). For the further sake of clarity, an application listed on **Exhibit B** that, at any time, falls within the foregoing definition of Licensed Precision Patents later shall no longer be a Licensed Precision Patent if, subsequently during its prosecution as an application and on issuance as a patent, it no longer satisfies the requirements of this definition. For further clarity, practice of the subject matter of a patent that does not meet the foregoing definition is not authorized under this Agreement.

1.14. "Litigated Patents" shall mean the Litigated Cellectis Patents and Litigated Precision Patents.

1.15. "Ongoing Proceedings" shall mean the proceedings listed in **Exhibit E**.

1.16. "Patent" shall mean the rights and interests in and to any and all issued patents and pending patent applications (including inventors certificates and utility models) in any country or jurisdiction, including any and all provisionals, non-provisionals, substitutions, continuations, continuations-in-part, divisionals and other continuing applications, supplementary protection certificates, renewals and letters patent on any of the foregoing, and any and all reissues, reexaminations, extensions, confirmations, registrations and patents of addition, as well as any patent resulting from any post-grant proceeding provided under Title 35 of the U.S. Code.

1.17. "Pending Litigations" shall mean the litigation cases pending as of the Effective Date, under the docket numbers set forth on **Exhibit C**.

1.18. "Term" shall mean the time period from the Effective Date until the date on which the last Valid Claim within the Licensed Patents ceases to be in effect.

1.19. "Territory" shall mean any and all countries throughout the world in which Licensed Patents are in force or are pending during the Term.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.20. **"Third Party"** shall mean any and all persons, other than Cellectis and its Affiliates, and Precision and its Affiliates.

1.21. **"Valid Claim"** shall mean any claim contained in an issued and unexpired Licensed Patent, which claim has not been held unenforceable, unpatentable or invalid by a decision of a court or other governmental agency or competent jurisdiction, unappealable or unappealed within the time allowed for appeal, and which has not been admitted to be invalid or unenforceable through abandonment, reissue, disclaimer or otherwise.

ARTICLE 2. CROSS-LICENSES

2.1. Non-exclusive License to Precision in the Field; Non-exclusive License to Cellectis in the Field

2.1.1. Subject to the terms and conditions of this Agreement, Cellectis, on behalf of itself and its Affiliates, hereby grants to Precision and its Affiliates a non-exclusive, sublicensable (pursuant to Article 2.1.4), fully paid-up, royalty-free license under the Licensed Cellectis Patents to make, have made, use, lease, transfer, sell, offer for sale, export, import and otherwise exploit Engineered I-Crel Meganucleases or Products within the Field (except within the Exclusive Field, as specified in Article 2.1.2) in the Territory.

2.1.2. The Parties acknowledge that, prior to the Effective Date, Cellectis has entered into an Existing License pursuant to which Cellectis has granted certain exclusive license rights under certain of the Licensed Cellectis Patents within the field listed in **Exhibit F** (the **"Exclusive Agreement"**) to the counterparty to such Existing License (the **"Cellectis Exclusive Licensee"**). The Parties agree that, during the period in which any such exclusive rights under those Licensed Cellectis Patents that have actually been granted by Cellectis to a Cellectis Exclusive Licensee in such field pursuant to the Exclusive Agreement remain exclusive and in full force and effect, the license granted to Precision pursuant to Article 2.1.1 shall not include any rights within the scope of such exclusive license granted by Cellectis to such Cellectis Exclusive Licensee (the **"Exclusive Field**"), solely as and to the extent necessary for Cellectis to be in compliance with such exclusive rights grants to such Cellectis Exclusive Licensee. Likewise, during such period the license granted to Cellectis pursuant to Article 2.1.3 shall not include any rights within the Exclusive Field. At such time as any such exclusive rights granted by Cellectis under the Exclusive Agreement cease, in whole or in part, to be exclusive or to be in full force and effect (a **"Non-exclusivity Event"**), effective automatically without any further action required by either of the Parties, such rights, to the full extent that they are no longer licensed exclusively to a Cellectis Exclusive Licensee under the Exclusive Agreement and would otherwise be part of the non-exclusive rights granted under this Agreement, shall be removed from the Exclusive Field and included under each of the non-exclusive license granted to Precision in the Field pursuant to Article 2.1.1 and the non-exclusive license granted to Cellectis in the Field pursuant to Article 2.1.3. Within thirty (30) days of Cellectis's first awareness of the occurrence of a Non-exclusivity Event, Cellectis shall notify Precision in writing of the scope of rights that are the subject of such Non-exclusivity Event, and the Parties promptly shall update **Exhibit F** in order to properly reflect the additional scope of non-exclusive rights that has been granted to Precision and Cellectis, if applicable. Beginning within a reasonable time of the Effective Date, Cellectis shall use reasonable efforts to cause all license rights granted under the Licensed Cellectis Patents that are included within the Exclusive Agreement to be amended to be non-

exclusive. Without limiting the foregoing, Cellectis shall not, except as required by the terms of the Exclusive Agreement as of the Effective Date, amend the Exclusive Agreement in a manner that would reduce or restrict Precision's rights under this Agreement without the prior written consent of Precision. The Parties agree that it shall not be a breach of this Agreement if Cellectis is unable to secure any such amendment to the Exclusive Agreement, notwithstanding its reasonable efforts to achieve same, and Cellectis makes no representations or warranties that it will be able to amend the Exclusive Agreement in the foregoing manner or any other manner.

2.1.3. Subject to the terms and conditions of this Agreement, Precision, on behalf of itself and its Affiliates, hereby grants to Cellectis and its Affiliates a non-exclusive, sublicensable (pursuant to Article 2.1.4), fully paid-up, royalty-free license under the Licensed Precision Patents to make, have made, use, lease, transfer, sell, offer for sale, export, import and otherwise exploit Engineered I-Crel Meganucleases or Products within the Field (except within the Exclusive Field, as specified in Article 2.1.2) in the Territory.

2.1.4. Each Party and its Affiliates (the **"Sublicensor"**) may grant sublicenses (**"First Tier Sublicenses"**) under the license grants in this Article 2.1 solely (a) to an Existing Licensee; or (b) to a Third Party (subject to the restrictions in Article 5.5) (together with an Existing Licensee, a **"Sublicensee"**), in each case pursuant to an agreement with such Sublicensee wherein the license grant to the Sublicensee under the Sublicensor's own Licensed Patents is at least as broad in scope of rights granted as the license granted to the Sublicensee under the other Party's Licensed Patents. However, for the sake of clarity, the remaining terms and conditions of any such Sublicense to a Sublicensee need not be the same for the Sublicensor's own Licensed Patents as compared to the other Party's Licensed Patents being licensed to the Sublicensee. Any First Tier Sublicense may be further sublicenseable by Sublicensee only pursuant to the foregoing restrictions, as applied to the Sublicensee. Notwithstanding the foregoing, except pursuant to an Existing License in which rights to Design Engineered I-Crel Meganucleases were granted under a Party's own Licensed Patents as of the Effective Date, neither Party nor any of its Sublicensees may grant any Sublicensee a sublicense under the other Party's Licensed Patents to Design Engineered I-Crel Meganucleases. Subject to the foregoing, all sublicenses to Existing Licensees executed or otherwise automatically incorporated into an Existing License within the period of forty-five (45) days after the Effective Date shall be deemed to be effective as of the Effective Date, and the Parties acknowledge that, as of the Effective Date and as part of the Settlement Agreement, each Party's Existing Licensees are released by the other Party as set forth in the Settlement Agreement. Moreover, notwithstanding any other provision of this Agreement, the Parties agree that, as of the Effective Date of this Agreement, Cellectis shall have been deemed to have granted a First Tier Sublicense under the Licensed Precision Patents to Lonza Group Ltd. and/or certain of its Affiliates under the terms of this Agreement, pursuant to a sublicense granted by Cellectis to such Lonza entities, and the Parties acknowledge that the ongoing litigation against such Lonza entities shall be dismissed pursuant to the terms of the Settlement Agreement. The foregoing sublicense to such Lonza entities may be executed at any time after the Effective Date and shall have retroactive effect to the Effective Date.

2.2. Retained Rights. Each Party expressly retains any rights not expressly granted to the other Party under this Article 2 (or otherwise under this Agreement). Nothing in this Agreement shall be construed to effect a transfer or change in ownership with respect to either Party's Patents or other intellectual property rights.

2.3. **Duke Patents.** Precision represents and warrants, and Cellectis understands, that the licenses and rights granted by Precision or its Affiliates to Cellectis and its Affiliates under any Patent owned by Duke University ("**Duke**", and such Patents, the "**Duke IP**") are granted subject to the terms and conditions of the License Agreement entered into by Precision and Duke on April 17, 2006, as amended from time to time, including but not limited to Duke's right to practice under the Duke IP for its own internal, non-commercial, educational, research and clinical purposes, and subject to the rights of the United States Government and applicable limitations under 37 C.F.R. 401, Public Law 96-517 and Public Law 98-620 resulting from the United States Government's funding of research leading to creation of the Duke IP. Duke shall be a third party beneficiary of this Agreement to the extent its terms and conditions apply or relate to the Duke IP.

2.4. **No Other Licenses.** No right or license under or to any invention, information, know-how or other intellectual property or Patent is granted or shall be granted by implication or estoppel. All such rights or licenses are or shall be granted only as expressly provided in the terms of this Agreement. Neither Party shall be obligated to provide the other Party with: (i) any information other than that disclosed in the Licensed Patents, or (ii) any technical assistance, including hands-on technical support by such Party's personnel, relating to the practice of the Licensed Patents or manufacture or use of Engineered I-Crel Meganucleases.

2.5. **Rights in Bankruptcy.** If applicable, the Parties agree that all intellectual property rights licensed hereunder, including any Patents of a Party in any country covered by the license grants under this Agreement, are part of the "intellectual property" as defined under Section 101(35A) of the Bankruptcy Code subject to the protections afforded the non-terminating Party under Section 365(n) of the U.S. Bankruptcy Code, and any similar law or regulation in any other country.

2.6. **Registration of Licenses.** Each Party agrees to cooperate with the other Party regarding registration of the licenses granted under this Agreement, solely as may be required under the law in order to preserve or maintain any rights of such other Party under this Agreement, including by executing and recording with the appropriate authorities an appropriate short-form statement of license, if so required.

2.7. **Party Releases.** The Parties acknowledge that, as of the Effective Date and as part of the Settlement Agreement, each Party's Existing Licensees are released by the other Party as set forth in the Settlement Agreement.

ARTICLE 3. INVALIDITY CHALLENGES.

3.1. During the Term of this Agreement, except as required by law (e.g., compelled by subpoena) or in response to an infringement allegation in a court of competent jurisdiction, a Party to this Agreement shall not directly or indirectly commence, participate in or provide assistance to a Third Party with respect to a proceeding in any court or other administrative body of any sort (including any patent office in any country) related to (i) the validity, enforceability and/or patentability of any claim of any Litigated Patent Controlled by the other Party or its Affiliates, or (ii) an interference, derivation, re-examination, opposition, post-grant review or other form of patent challenge of any claim of any Litigated Patent Controlled by the other Party or its Affiliates. For the sake of clarity, notwithstanding the foregoing, a Party may participate as required in an interference proceeding initiated by the USPTO or in response to a subpoena, or as otherwise required by law.

3.2. During the Term of this Agreement, except as required by law (e.g., compelled by subpoena) or in response to an infringement allegation in a court of competent jurisdiction, a Party to this Agreement shall not directly or indirectly commence, participate in or provide assistance to a Third Party with respect to a proceeding in any court or other administrative body of any sort (including any patent office in any country) related to (i) the validity, enforceability and/or patentability of any claim of any other Licensed Patents Controlled by the other Party or its Affiliates, or (ii) an interference, derivation, re-examination, opposition, post-grant review or other form of patent challenge of any claim of any other Licensed Patents Controlled by the other Party or its Affiliates. For the sake of clarity, notwithstanding the foregoing, a Party may participate as required in an interference proceeding initiated by the USPTO or in response to a subpoena, or as otherwise required by law.

3.3. For clarity, the existence of the Ongoing Proceedings shall not be deemed to be a breach of or default under this Agreement by a Party, so long as such Party carries out all required acts specified in the Settlement Agreement and does not participate in or provide assistance to a Third Party with respect to any such Ongoing Proceeding in relation to the other Party's Patents after the Effective Date. For further clarity, a Party's participation after the Effective Date in a proceeding solely to defend the validity or enforceability of any Licensed Patents Controlled by such Party or its Affiliates (e.g., to defend a re-examination) shall not be deemed to be a breach of or default under this Agreement by such Party.

ARTICLE 4. CONSIDERATION; LICENSE REQUEST.

4.1. **Consideration.** The Parties acknowledge that each of the licenses and rights granted by each Party to the other Party, along with the benefits exchanged through the Settlement Agreement, individually and collectively, constitute good, valuable, and sufficient consideration for each and all of the other licenses, rights, and entry into the Settlement Agreement contemplated hereunder.

4.2. **Precision License Request.** From time to time during the Term, if Precision desires to obtain exclusive rights under the Licensed Cellectis Patents to make, have made, use, lease, transfer, sell, offer for sale, export or import Engineered I-Crel Meganucleases or products made using Engineered I-Crel Meganucleases within the Field or any particular field in the Territory, Precision shall provide Cellectis with a written notice requesting a license to Precision that would grant such rights to Precision (a "**Precision License Request**"). Upon Cellectis's receipt of a Precision License Request, provided that Cellectis has no obligation to a Third Party or under applicable law that would conflict with such Precision License Request (e.g., Cellectis has not previously granted rights to a Third Party with respect to the subject matter of the Precision License Request that are inconsistent in any way with the rights requested by Precision, as determined by Cellectis), Cellectis will discuss with Precision, using its best efforts in good faith for up to [***], commercially reasonable terms under which the rights that are the subject of the Precision License Request may

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be made available to Precision for licensing. However, Cellectis (at its sole discretion and for any reason) may decline to grant the rights requested by Precision under any Precision License Request, and Cellectis is not obligated under any circumstances to grant such rights, and nothing in this Agreement or elsewhere shall be interpreted otherwise.

4.3. Cellectis License Request. From time to time during the Term, if Cellectis desires to obtain exclusive rights under the Licensed Precision Patents to make, have made, use, lease, transfer, sell, offer for sale, export or import Engineered I-Crel Meganucleases or products made using Engineered I-Crel Meganucleases within the Field or any particular field in the Territory, Cellectis shall provide Precision with a written notice requesting a license to Cellectis that would grant such rights to Cellectis (a "**Cellectis License Request**"). Upon Precision's receipt of a Cellectis License Request, provided that Precision has no obligation to a Third Party or under applicable law that would conflict with such Cellectis License Request (e.g., Precision has not previously granted rights to a Third Party with respect to the subject matter of the Cellectis License Request that are inconsistent in any way with the rights requested by Cellectis, as determined by Precision), Precision will discuss with Cellectis, using its best efforts in good faith for up to [***], commercially reasonable terms under which the rights that are the subject of the Cellectis License Request may be made available to Cellectis for licensing. However, Precision (at its sole discretion and for any reason) may decline to grant the rights requested by Cellectis under any Cellectis License Request, and Precision is not obligated under any circumstances to grant such rights, and nothing in this Agreement or elsewhere shall be interpreted otherwise.

ARTICLE 5. INTELLECTUAL PROPERTY

5.1. Licensed Cellectis Patents. Cellectis (or its Affiliate, as applicable) will have the sole right and responsibility, at Cellectis' discretion and at Cellectis' expense, to file, prosecute, and maintain Patent protection in the Territory for all Licensed Cellectis Patents.

5.2. Licensed Precision Patents. Precision (or its Affiliate, as applicable) will have the sole right and responsibility, at Precision's discretion and at Precision's expense, to file; prosecute, and maintain Patent protection in the Territory for all Licensed Precision Patents.

5.3. Third Party Infringement of Licensed Cellectis Patents. Cellectis will have the sole and exclusive right (but not the obligation) to initiate an infringement or other appropriate suit (including defense of declaratory judgment actions) in the Territory with respect to infringements or suspected infringements of any of the Licensed Cellectis Patents and to any and all recoveries obtained in connection therewith. Cellectis will have the sole and exclusive right to select counsel for any suit referred to in this Article 5.3 initiated by Cellectis and will pay all expenses of the suit, including attorneys' fees and court costs. Notwithstanding the foregoing, for a period of [***] beginning on the Effective Date, neither Cellectis nor its Affiliates shall initiate any infringement action against any Third Party under the Licensed Cellectis Patents.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

5.4. **Third Party Infringement of Licensed Precision Patents.** Precision will have the sole and exclusive right (but not the obligation) to initiate an infringement or other appropriate suit (including defense of declaratory judgment actions) in the Territory with respect to infringements or suspected infringements of any of the Licensed Precision Patents and to any and all recoveries obtained in connection therewith. Precision will have the sole and exclusive right to select counsel for any suit referred to in this Article 5.4 initiated by Precision and will pay all expenses of the suit, including attorneys' fees and court costs. Notwithstanding the foregoing, for a period of [***] beginning on the Effective Date, neither Precision nor its Affiliates shall initiate any infringement action against any Third Party under the Licensed Precision Patents.

5.5. **Non-Interference with Enforcement Activities.** Without limiting the obligations set forth in the final sentence of Article 5.3 and the final sentence of Article 5.4, Cellectis or Precision (or their Affiliates), as applicable, (the "**Enforcing Party**") shall provide written notice (an "**Intent to Enforce Notice**") to the other Party (the "**Non-Enforcing Party**") at least [***] prior to (i) providing a Third Party (the "**Purported Infringer**") with written notice of infringement of the Licensed Cellectis Patents or Licensed Precision Patents, as applicable, or (ii) commencing any action against a Purported Infringer to enforce the Licensed Cellectis Patents or Licensed Precision Patents, as applicable. Upon receipt of such Intent to Enforce Notice, [***]. For any avoidance of any doubt, a Party may not enforce the other Party's Licensed Patents.

ARTICLE 6. CONFIDENTIALITY

6.1. During the term of this Agreement and for a period of three (3) years following its termination or expiration, the Parties shall keep strictly confidential and not publish, or disclose to any Third Party any of the terms of this Agreement, without the prior written approval of the other Party, provided, however, that either Party may disclose the terms and conditions of this Agreement (a) to the extent such terms must be disclosed in response to a valid order of a court or other governmental body, or are otherwise required to be disclosed by law or regulation (provided, however, in such event that the receiving Party shall first have given reasonable prior notice to the disclosing Party and shall have made a reasonable effort to obtain a protective order requiring that the information so disclosed be limited to information necessarily responsive to the order issued), or (b) to a Third Party bound by an obligation of confidentiality in connection with the Party's merger, consolidation, change of control, sublicense, or sale of all or substantially all of its assets with or to such Third Party, or an equity or debt investment in such Party by such Third Party.

6.2. Notwithstanding the foregoing, the Parties will issue the joint press release set forth on **Exhibit D** concerning the Parties' entry into the Agreement. A Party shall not be required to seek the permission of the other Party to repeat or disclose any information as to the terms of this Agreement that has already been publicly disclosed by such Party in accordance with the foregoing or by the other Party, or any similar or comparable information.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

ARTICLE 7. WARRANTIES AND INDEMNITY

7.1. Mutual Representations and Warranties. Each Party represents, warrants and covenants to the other Party that:

(a) at the Effective Date it has the full power to enter into this Agreement and to perform its obligations hereunder:

(b) at the Effective Date it is a corporation duly organized, validly existing and in good standing under the laws of its jurisdiction of incorporation;

(c) at the Effective Date the execution, delivery and performance of this Agreement have been duly authorized by all necessary corporate actions of such Party;

(d) at the Effective Date this Agreement constitutes the legal, valid and binding obligation of such Party, enforceable against it in accordance with its terms, subject to (i) laws of general application relating to bankruptcy, insolvency and the relief of debtors, and (ii) rules of law governing specific performance, injunctive relief and other equitable remedies;

(e) at the Effective Date (i) it has never approved or commenced any proceeding, or made any election contemplating, the winding up or cessation of its business or affairs or the assignment of material assets for the benefit of creditors, and no such proceeding is pending or (to its knowledge) threatened; and (ii) no steps have been taken, and no event has occurred, that gives any Third Party a right to enforce any lien or security right over any of the Licensed Patents Controlled by such Party or any of its Affiliates;

(f) at the Effective Date and at all times during the Term it has the full right, power and authority to enter into this Agreement and grant the rights, licenses, releases and immunities granted hereunder, without the need for any licenses, releases, consents, approvals or immunities not yet granted or obtained, and without conflicting with rights granted to any Third Party;

(g) the execution, delivery and performance by it of this Agreement and its compliance with the terms and provisions of this Agreement does not at the Effective Date and will not during the Term (i) conflict with or result in a violation or breach of any of the terms, conditions or provisions of its certificate or articles of incorporation or by-laws (or other comparable corporate charter documents); (ii) conflict with or result in a violation or breach of any term or provision of any law or order applicable to it; or (iii) (A) conflict with or result in a violation or breach of, (B) constitute (with or without notice or lapse of time or both) a default under, (C) require it to obtain any consent, approval or action of, make any filing with or give any notice to any person as a result or under the terms of, or (D) result in the creation or imposition of any lien or other similar interest upon it or any of the Licensed Patents Controlled by such Party or any of its Affiliates under, any contract, instrument or license to which it is a party or by which any of its assets and properties is bound;

(h) at the Effective Date there are no actions, claims, demands, suits, citations, summons, subpoenas, inquiries or investigations of any nature, civil, criminal, regulatory or otherwise, in law or in equity, or arbitral proceedings or any proceedings by or before any governmental authority, pending or, to its knowledge, threatened

against, relating to or affecting it or any of the Licensed Patents Controlled by such Party or any of its Affiliates (with the exception of normal prosecution at the United States Patent and Trademark Office and equivalent foreign patent offices or customary actions with the relevant regulatory authorities) which (A) could reasonably be expected to result in the issuance of an order restraining, enjoining or otherwise prohibiting or making illegal the consummation of any of the transactions contemplated by this Agreement or otherwise result in a diminution of the benefits contemplated by this Agreement to the other Party; or (B) if determined adversely to it, could reasonably be expected to result in any injunction or other equitable relief against it that would interfere in any material respect with its ability to perform its duties and obligations under this Agreement;

(i) at all times during the Term it shall not grant to any Third Party any rights that conflict with the rights and licenses granted to the other Party under this Agreement; and

(j) at all times during the Term it shall promptly notify the other Party in writing upon becoming aware of any actual action, suit or proceeding by any Third Party which, if adversely determined, would have a material adverse effect upon the other Party's rights under this Agreement with respect to the Licensed Patents Controlled by such Party or any of its Affiliates.

7.2. Cellectis Representations, Warranties and Covenants. Cellectis represents, warrants and covenants that:

(a) Cellectis is the owner of the entire right, title and interest in and to the Licensed Cellectis Patents (including the inventions claimed therein);

(b) **Exhibit A** contains a true, complete and accurate list of all Licensed Cellectis Patents Controlled by Cellectis or any of its Affiliates as of the Effective Date (other than patent applications having a priority date prior to the Effective Date that are not yet published), with the understanding that applications listed in **Exhibit A** are subject to ongoing prosecution and possible amendment of claims;

(c) Cellectis and its Affiliates have not assigned, transferred, conveyed or otherwise encumbered its right, title and interest in the Licensed Cellectis Patents in a manner that conflicts with any rights granted to Precision hereunder. Cellectis and its Affiliates have not granted to any Third Party a right to assert or cause to be asserted any claim of infringement based on any of the Licensed Cellectis Patents against a licensee of the Licensed Cellectis Patents (including Precision);

(d) to the best of its knowledge and belief, Cellectis shall at all times operate under this Agreement (including the licenses granted to Cellectis under Licensed Precision Patents) in compliance with all applicable laws and governmental regulations and guidelines;

(e) as of the Effective Date, subject only to the exclusive licenses granted to the Cellectis Exclusive Licensee in the Exclusive Agreement, Cellectis has not granted any exclusive licenses to any Third Party under any of the Licensed Cellectis Patents in the Field; and

(f) Cellectis shall maintain in effect any applicable in-licenses pursuant to which Cellectis or any of its Affiliates Controls any Licensed Cellectis Patents, subject to the terms of any such in-licenses.

7.3. Precision Representations, Warranties and Covenants. Precision represents, warrants and covenants that:

(a) Precision is either the owner of or otherwise Controls the entire right, title and interest in and to the Licensed Precision Patents (including the inventions claimed therein);

(b) **Exhibit B** contains a true, complete and accurate list of all Licensed Precision Patents Controlled by Precision or any of its Affiliates as of the Effective Date (other than patent applications having a priority date prior to the Effective Date that are not yet published), with the understanding that applications listed in **Exhibit B** are subject to ongoing prosecution and possible amendment of claims;

(c) Precision and its Affiliates have not assigned, transferred, conveyed or otherwise encumbered its right, title and interest in the Licensed Precision Patents in a manner that conflicts with any rights granted to Cellectis hereunder. Precision and its Affiliates have not granted to any Third Party a right to assert or cause to be asserted any claim of infringement based on any of the Licensed Precision Patents;

(d) to the best of its knowledge and belief, Precision shall at all times operate under this Agreement (including the licenses granted to Precision under Licensed Cellectis Patents) in compliance with all applicable laws and governmental regulations and guidelines;

(e) as of the Effective Date, Precision has not granted any exclusive licenses to any Third Party under any of the Licensed Precision Patents in the Field; and

(f) Precision shall maintain in effect any applicable in-licenses pursuant to which Precision or any of its Affiliates Controls any Licensed Precision Patents, subject to the terms of any such in-licenses.

7.4. DISCLAIMER. EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN ARTICLES 7.1, 7.2 AND 7.3 OF THIS AGREEMENT. NO PARTY MAKES ANY OTHER REPRESENTATIONS OR WARRANTIES, WHETHER EXPRESS OR IMPLIED, AND ALL SUCH REPRESENTATIONS OR WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED, INCLUDING ANY WARRANTY REGARDING ENGINEERED I-CREI MEGANUCLEASES OR THEIR USE, SAFETY, EFFICACY, OR PERFORMANCE, ANY WARRANTY OF MERCHANTABILITY OR ANY WARRANTY FOR FITNESS FOR ANY PARTICULAR PURPOSE OR A WARRANTY OR REPRESENTATION THAT ANY ACT OR ANYTHING MADE, USED, SOLD, OR OTHERWISE DISPOSED OF UNDER THE LICENSE GRANTED IN THIS AGREEMENT IS OR WILL BE FREE FROM INFRINGEMENT OF PATENTS, COPYRIGHTS, AND OTHER RIGHTS OF THIRD PARTIES OR ANY OTHER EXPRESS OR IMPLIED LEGAL OR CONTRACTUAL WARRANTY.

NEITHER PARTY (INCLUDING ITS AFFILIATES AND SUBLICENSEES) SHALL BE LIABLE UNDER THIS AGREEMENT FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OR FOR LOSS OF PROFIT OR LOST REVENUE, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH

DAMAGES. NOTWITHSTANDING THE FOREGOING, NOTHING IN THIS ARTICLE 7.4 IS INTENDED TO OR SHALL LIMIT OR RESTRICT (A) THE INDEMNIFICATION RIGHTS OF A PARTY OR DAMAGES AVAILABLE FOR A PARTY'S BREACH OF CONFIDENTIALITY OBLIGATIONS IN ARTICLE 6, OR (B) EITHER PARTY'S LIABILITY FOR ITS (OR ITS AFFILIATES') BREACH OF ARTICLE 2, ARTICLE 3 OR THE COVENANTS IN ARTICLES 5.4 OR 5.5, OR (C) EITHER PARTY'S (OR ITS AFFILIATES' OR SUBLICENSEES') LIABILITY FOR INFRINGEMENT (WHETHER DIRECT, PARTIAL OR CONTRIBUTORY INFRINGEMENT OR INDUCEMENT TO INFRINGE), VIOLATION OR MISAPPROPRIATION OF ANY INTELLECTUAL PROPERTY (WHETHER PATENT, TRADE SECRET OR OTHERWISE) CONTROLLED BY THE OTHER PARTY.

7.5. Precision agrees to indemnify Cellectis and its Affiliates, and their respective officers, employees, directors, and agents (the "**Cellectis Indemnitees**") from and against any and all liability, demands, claims, damages and losses actually incurred by a Cellectis Indemnitee arising out of or in connection with any claim, suit, demand, investigation or proceeding brought by a Third Party based on (a) the manufacture, use, sale, or other exploitation of Engineered I-Crel Meganucleases and their derivatives by Precision or its Affiliates, sublicensees, contractors, agents or customers under the licenses granted by Cellectis to Precision in this Agreement, or (b) any breach of any representation, warrant, covenant and/or obligation of Precision in this Agreement. The foregoing indemnification shall not apply to the extent that any liability, demands, claims, damages and losses are due to a breach of any of Cellectis' representations, warranties, covenants and/or obligations under this Agreement.

7.6. Cellectis agrees to indemnify Precision and its Affiliates, and their respective officers, employees, directors, and agents (the "**Precision Indemnitees**") from and against any and all liability, demands, claims, damages and losses actually incurred by a Precision Indemnitee arising out of or in connection with any claim, suit, demand, investigation or proceeding brought by a Third Party based on (a) the manufacture, use, sale, or other exploitation of Engineered I-Crel Meganucleases and their derivatives by Cellectis or its Affiliates, sublicensees, contractors, agents or customers under the licenses granted by Precision to Cellectis in this Agreement, or (b) any breach of any representation, warrant, covenant and/or obligation of Cellectis in this Agreement. The foregoing indemnification shall not apply to the extent that any liability, demands, claims, damages and losses are due to a breach of any of Precision's representations, warranties, covenants and/or obligations under this Agreement.

7.7. The obligation to indemnify pursuant to this Article 7 shall be contingent upon timely notification by the indemnitee to the indemnitor of any claims, suits or service of process; the tender by the indemnitee to the indemnitor of full control over the conduct and disposition of any claim, demand or suit; and reasonable cooperation by the indemnitee in the defense of the claim, demand or suit. No indemnitor will be bound by or liable with respect to any settlement or admission entered or made by any indemnitee without the prior written consent of the indemnitor. The indemnitee will have the right to retain its own counsel to participate in its defense in any proceeding hereunder. The indemnitee shall pay for its own counsel except to the extent it is determined that (a) one or more legal defenses may be available to it which are different from or additional to those available to the indemnitor, or (b) representation of both Parties by the same counsel would be inappropriate due to actual or potential differing interests between them. In any such case and to such extent, the indemnitor shall be responsible to pay for the reasonable costs and expenses of one separate

counsel retained to participate in the defense of the indemnitee, provided that such expenses are otherwise among those covered by the indemnitor's indemnity obligations under this Article 7. Notwithstanding the foregoing, if the indemnitor reasonably believes that any of the exceptions to its obligation of indemnification of the indemnitee set forth in Articles 7.5 or 7.6 may apply, the indemnitor shall promptly notify the indemnitee, which shall then have the right to be represented in any such action or proceeding by separate counsel at the indemnitee's expense; provided, that the indemnitor shall be responsible for payment of such expenses if the indemnitee is ultimately determined to be entitled to indemnification from the indemnitor.

ARTICLE 8. DURATION – TERMINATION

The Agreement shall come into effect at the Effective Date and shall continue for the duration of the Term, unless sooner terminated as provided in Article 8.3 and Article 8.4 hereinafter. Notwithstanding the foregoing, the Agreement shall have no force or effect until such time as the Parties have signed the Settlement Agreement and satisfied the obligations set forth in Article 2 and Article 3 of the Settlement Agreement with respect to the filing the Stipulations of Dismissal and the Stipulation of Dismissal With Prejudice of the Lonza Litigation.

8.1. Either Party may terminate any license granted to it under this Agreement for any reason or no reason, upon thirty (30) days written notice to the other Party.

8.2. Failure by either Party to comply with any of its respective material obligations and conditions contained in this Agreement (including Article 3) shall entitle the other Party to give to the Party in default notice. If such default is not cured within [***] after receipt of such notice by the Party alleged to be in default, the notifying Party shall be entitled (without prejudice of any of its other rights conferred on it by this Agreement) to terminate (a) this Agreement in its entirety, or (b) any or all licenses granted to the Party in default, each by giving a written termination notice, which shall take effect immediately.

The right of either Party to terminate this Agreement or any licenses granted hereunder as set forth in this Article 8.3 shall not be affected in any way by its waiver of, or failure to take action with respect to any previous default.

8.3. If, other than in the Ongoing Proceedings, either Party or one of its Affiliates (the "**Challenging Party**") directly or indirectly commences or participates in any interference, derivation, re-examination, opposition, post-grant review or other form of patent challenge related to the validity, enforceability and/or patentability of, or challenges the validity or enforceability of, any Licensed Patent Controlled by the other Party (the "**Non-Challenging Party**") to this Agreement before any tribunal or patent office, or intentionally provides assistance to a Third Party for any such purposes, except as required by law, then the Non-Challenging Party may terminate this Agreement in its entirety or any or all licenses granted to the Challenging Party under this Agreement immediately upon written notice to the Challenging Party. Notwithstanding anything to the contrary herein, no act or omission committed by a Challenging Party that otherwise would fall within the scope of the immediately preceding sentence shall give rise to a right for the Non-Challenging Party to elect the

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foregoing remedy if such act or omission is an act or omission that is expressly exempted from the prohibitions set forth in Section 3.1 or Section 3.2. For the sake of clarity, notwithstanding the foregoing and without triggering the provisions of this paragraph, a Party may participate as required in an interference proceeding initiated by the USPTO.

8.4. Upon any termination of this Agreement in its entirety, all licenses granted hereunder shall terminate and all rights granted thereunder shall revert to the applicable Licensor. Notwithstanding the foregoing, in the event any Party's license under any Licensed Patent is terminated, other than pursuant to (i) such Party's breach of Article 3, (ii) such Party's voluntary termination of a license pursuant to Article 8.2, or (iii) the operation of Article 8.4, then in each such event the terminating Party shall grant, and hereby grants, effective only in the event of such a termination, to each then-existing (as of the effective date of such termination) Sublicensee (including without limitation the Existing Licensees under the Existing Licenses, as applicable) of the terminated Party's rights hereunder, the right, exercisable by written notice to the terminating Party within [***] after such termination, to obtain a direct license from the terminating Party under the relevant Licensed Patents on terms substantially similar in scope, grant and financial compensation, to those of the sublicense; provided, that (i) such sublicense was properly granted in compliance with the terms of this Agreement, and (ii) the sublicensee is in material compliance with the terms of such sublicense and the applicable provisions of this Agreement.

8.5. Any rights and obligations accrued prior to termination or expiration of this Agreement shall not be affected by such termination or expiration.

8.6. The provisions of Articles 1 (to the extent required to support surviving rights and obligations), 2.2, 2.3, 2.4, 5.1, 5.2, 5.3, 5.4, 6, 7, 8.5, 8.6, 8.7, 9 and 10 shall survive the expiration or termination of this Agreement.

ARTICLE 9. MISCELLANEOUS

9.1. No amendment to this Agreement shall be valid unless embodied in a writing executed by each of the Parties hereto. No waiver of any of the provisions of this Agreement shall be valid unless embodied in a writing executed by the Party against whom the waiver is sought to be enforced.

9.2. This Agreement, together with the Settlement Agreement, constitutes the entire understanding and agreement between the Parties with respect to the subject matter hereof and supersedes all prior agreements, understanding or arrangements, whether written or oral. Notwithstanding the foregoing, the Confidentiality Agreement dated November 16, 2011 and Supplement to Confidentiality Agreement dated September 1, 2012 between Cellectis and Precision shall remain in full force and effect in accordance with its terms.

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9.3. Any notice of communication authorized or required to be given hereunder or for the purpose hereof shall be deemed duly given by either Party if sent by prepaid registered post or by any other method of delivery capable of providing reasonable proof of receipt thereof and sent to the other party hereto, as follows:

If to Cellectis:
Name: [***]
Title: [***]
Address: 8, rue de la Croix Jarry
75013 Paris, France
Email: [***]

If to Precision:
Name: [***]
Title: [***]
Address: 302 East Pettigrew Street
Dibrell Building, Suite A-100
Durham, North Carolina, USA 27701
Email: [***]

9.4. It is expressly agreed that the relationship between the Parties is that of independent contractors and shall not constitute a partnership, franchise, joint venture, agency, employment or other similar relationship. Neither Party shall have any express or implied right or authority to make any statements, representations or commitments of any kind, or to take any action, which shall be binding on the other, without the prior consent of the other Party to do so, with the understanding that each Party has the right to grant sublicenses under the other Party's Licensed Patents pursuant to the terms of this Agreement.

9.5. In performing this Agreement, each Party shall comply with all applicable laws to the best of its knowledge and belief. If any provision of this Agreement is held by any competent authority to be invalid or unenforceable in whole or in part, this Agreement shall continue to be valid as to the other provisions thereof and the remainder of the affected provision; provided that if the absence of such provision causes a material adverse change in either the risks or benefits of this Agreement to either Party, the Parties shall negotiate in good faith a commercially reasonable substitute or replacement for the invalid or unenforceable provision.

9.6. Captions and paragraph headings are for convenience only and shall not form an interpretative part of this Agreement. Unless otherwise specifically provided, all references to an Article incorporate all sections or subsections thereunder. This Agreement has been prepared jointly and shall not be strictly construed against either party hereto. The plural shall be substituted for the singular number in any place in which the context may require such substitution. The word "including" will not be construed as limiting the immediately preceding general term or statement.

9.7. This Agreement may not be assigned by either Party without the prior written consent of the other Party. Notwithstanding the foregoing, such other Party's consent shall not be required for any assignment to an entity that succeeds to all or substantially all of the assigning Party's business or assets relating to this Agreement, whether by sale,

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merger, operation of law or otherwise provided that, in any such event, the intellectual property rights of the acquiring party to such transaction (if other than one of the Parties to this Agreement) shall not be included in the licenses granted hereunder or otherwise be subject to this Agreement. This Agreement shall be binding upon and shall inure to the benefit of the Parties and their respective permitted successors and assigns. In any case, the assignor shall guarantee the compliance of the terms of the Agreement by the assignee. Further, each Party agrees that any assignment of any of the Licensed Patents by either Party shall be subject to the terms and conditions of this Agreement, and no Licensed Patent may be assigned without the simultaneous assignment of this Agreement.

9.8. The Parties will execute and deliver, or cause to be executed or delivered, such further documents and do or cause to be done such further acts and things as may be required to carry out the intent and purpose of this Agreement.

9.9. Except as otherwise provided herein, all legal and other costs and expenses incurred in connection with this Agreement and the transactions contemplated hereby are to be paid by the Party incurring such costs and expenses.

9.10. All written materials, correspondence, technical information, notices and oral assistance supplied by either Party hereto shall be in the English language. The English language version of this Agreement will be controlling on the Parties.

9.11. Except as and to the extent set forth in Article 2.3, this Agreement is solely for the benefit of the Parties and their respective successors and permitted assigns, and no other person or entity has any right, benefit, priority or interest under or because of the existence of this Agreement.

9.12. Precision and Cellectis have each consulted counsel of their choice regarding this Agreement, and each acknowledges and agrees that this Agreement shall not be deemed to have been drafted by one Party or another and shall be construed accordingly.

9.13. Each Party shall ensure that its Affiliates comply with all terms and conditions of this Agreement, including those that are stated to be applicable to such Affiliates, and each Party shall remain responsible and be directly and primarily liable for any non-compliance of its Affiliates with such terms and conditions. Without limiting the foregoing, to the extent that any Affiliate of a Licensee exercises rights under the licenses granted hereunder, the applicable Licensee shall ensure that such Affiliate complies, in relation to such activities, with all covenants and obligations that are imposed on such Licensee under this Agreement.

ARTICLE 10. GOVERNING LAW

This Agreement is acknowledged to have been made in and shall be construed in accordance with the laws of the State of Delaware, U.S.A., without regard to conflict of laws principles which would dictate the application of the law of a different jurisdiction.

ARTICLE 11. DISPUTE SETTLEMENT

11.1. The Parties shall attempt in good faith to settle any disputes between the Parties relative to the interpretation of this Agreement or intellectual property licensed from one Party to the other hereunder. In the event that the Parties fail to resolve a dispute within [***] of written notice of such a dispute from one disputing Party to the other disputing Party, the dispute shall be referred at the written request of either Party to a committee that consists of the Chief Executive Officer or President of Precision and the Chief Executive Officer or President of Cellectis ("**Executive Committee**"). The written request shall contain a description of the dispute, including the factual and legal basis for the Parties' respective positions with respect to the dispute and the relief sought by the Party making the request. The Executive Committee members shall diligently attempt to resolve the dispute, including, if they deem it necessary, meeting directly in order to provide full consideration of the dispute. The Executive Committee members shall have [***] to attempt to do so before any Party can seek to resolve the dispute through the following provisions.

11.2. If the Executive Committee is unable to resolve the dispute within the [***] specified above, then the dispute, at the written request of either Party made within [***] following the end of that [***] period during which the Executive Committee attempted to resolve it, shall be subject to non-binding mediation by a neutral mediator selected by the Parties, with such mediation administered by the International Chamber of Commerce in accordance with its commercial mediation procedures. Any such mediation may be initiated by a Party by written notice (the "**Mediation Notice**") to the other Party specifying the subject of the requested mediation. The dispute shall be mediated by one mediator, to be mutually selected by the Parties. If the Parties fail to agree on the mediator within [***] following the date of the Mediation Notice, then the recommended individuals named by the Parties shall select a third individual to act as the mediator. The mediator shall not be any employee, director, shareholder or agent of any Party or an Affiliate of any Party, or otherwise involved (whether by contract or otherwise) in the affairs of any Party. The mediation shall be conducted in the English language in New York City, New York. The mediation shall be completed within [***] of selection of the mediator. The costs of mediation (exclusive of the expense of a Party in preparing for and participating in the mediation, all of which shall be borne by such Party) shall be shared equally by the Parties.

11.3. All disputes with respect to this Agreement that are not otherwise resolved pursuant to the foregoing Articles 11.1 and 11.2 shall be brought and heard in the federal district court in Delaware, USA, as the sole and exclusive jurisdiction. The Parties agree that none of their communications resulting from Articles 11.1 or 11.2 shall be discoverable or admissible as evidence for any purpose in any such litigation resulting from this paragraph; including any communications of an oral or written nature from a mediator pursuant to Article 11.2. The Parties each consent to the in personam jurisdiction and venue of such courts. The Parties agree that service of process upon them in any such action may be made if delivered in person, by courier service, by telegram, by facsimile or by first class mail, and shall be deemed effectively given upon receipt.

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11.4. Nothing herein shall be construed to prevent either Party from obtaining, in case of urgency, equitable relief, including injunction or specific performance, in the event of a breach or threatened breach of the provisions of this Agreement.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed on their behalf by their respective duly authorized officers.

CELLECTIS SA

By: /s/ André Choulika
Name: André Choulika
Title: Chairman and CEO
Date:

PRECISION BIOSCIENCES, INC.

By: /s/ Matthew Kane
Name: Matthew Kane
Title: CEO
Date: January 23, 2014

Initials PB: /s/ MK

Initials CLS: /s/ AC

Exhibit A:	Licensed Cellectis Patents
Exhibit B:	Licensed Precision Patents
Exhibit C:	Pending Litigations
Exhibit D:	Joint Press Release
Exhibit E:	Ongoing Proceedings
Exhibit F:	Exclusive Field granted to Cellectis Exclusive Licensee

Initials PB: /s/ MK

Initials CLS: /s/ AC

EXHIBIT A: LICENSED CELLECTIS PATENTS

TITLE	APPLICATION NUMBER	APPLICATION DATE	PUBLICATION NUMBER	PUBLICATION DATE	GRANT NUMBER	GRANT DATE	
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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

TITLE	APPLICATION NUMBER	APPLICATION DATE	PUBLICATION NUMBER	PUBLICATION DATE	GRANT NUMBER	GRANT DATE	
	[***]	[***]	[***]	[***]			
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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

TITLE	APPLICATION NUMBER	APPLICATION DATE	PUBLICATION NUMBER	PUBLICATION DATE	GRANT NUMBER	GRANT DATE	
	[***]	[***]	[***]	[***]			
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[***]	[***]	[***]	[***]	[***]			
	[***]	[***]	[***]	[***]			

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

TITLE	APPLICATION NUMBER	APPLICATION DATE	PUBLICATION NUMBER	PUBLICATION DATE	GRANT NUMBER	GRANT DATE
	[***]	[***]	[***]	[***]		
	[redacted]					
	[***]	[***]	[***]	[***]	[redacted]	
	[***]	[***]	[***]	[***]		
	[***]	[***]	[***]	[***]		
	[***]	[***]	[***]	[***]		
[***]	[***]	[***]	[***]	[***]		
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	[***]	[***]				
	[***]	[***]	[***]	[***]	[redacted]	
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	[***]	[***]	[***]	[***]	[redacted]	
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	[***]	[***]	[***]	[***]		
	[***]	[***]	[***]	[***]		
[***]	[***]	[***]	[***]	[***]	[redacted]	

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

TITLE	APPLICATION NUMBER	APPLICATION DATE	PUBLICATION NUMBER	PUBLICATION DATE	GRANT NUMBER	GRANT DATE
	[***]	[***]	[***]	[***]		
	[***]	[***]	[***]	[***]		
	[***]	[***]	[***]	[***]		
	[***]	[***]				
[***]	[***]	[***]	[***]	[***]		
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	[***]	[***]	[***]	[***]		
	[***]	[***]	[***]	[***]		
	[***]	[***]	[***]	[***]		
[***]	[***]	[***]	[***]	[***]		
	[***]	[***]	[***]	[***]		
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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

TITLE	APPLICATION NUMBER	APPLICATION DATE	PUBLICATION NUMBER	PUBLICATION DATE	GRANT NUMBER	GRANT DATE
	[***]	[***]	[***]	[***]		
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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

EXHIBIT B: LICENSED PRECISION PATENTS

Country	Status	Application Number	Filing Date	Patent Number	Issue Date
[***]	[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]		
[***]	[***]	[***]	[***]	[***]	[***]
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[***]	[***]	[***]	[***]	[***]	[***]
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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Country	Status	Application Number	Filing Date	Patent Number	Issue Date
[***]	[***]	[***]	[***]		
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Country	Status	Application Number	Filing Date	Patent Number	Issue Date
[***]	[***]	[***]	[***]	[***]	[***]
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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Initials PB: /s/ MK

Initials CLS: /s/ AC

Country	Status	Application Number	Filing Date	Patent Number	Issue Date
[***]	[***]	[***]	[***]	[***]	[***]
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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

EXHIBIT C: PENDING LITIGATIONS

Cellectis S.A. v. Precision BioSciences, Inc., No. 5:08-CV-00119-H (E.D.N.C.)

Cellectis S.A. v. Precision BioSciences, Inc. and Precision PlantSciences, Inc., No. 1:11-CV-00173-SLR (D. Del.)

Cellectis S.A. v. Precision BioSciences, Inc., No. 1:11-CV-00890-SLR (D. Del.)

Cellectis S.A. v. Precision BioSciences, Inc., No. 1:12-CV-00204-SLR (D. Del.)

Cellectis S.A. v. Precision BioSciences, Inc., No. 1:12-CV-01662-SLR (D. Del.)

Precision BioSciences, Inc. and Duke University v. Cellectis S.A., Cellectis bioresearch and Cellectis bioresearch Inc., No. 1:13-CV-00247-SLR (D. Del.)

EXHIBIT D: JOINT PRESS RELEASE

PRESS RELEASE

Precision BioSciences and Cellectis SA Announce Cross-License and Settlement Agreement for Gene Editing Technology

Enables Broad Commercialization of Highly Specific Engineered Meganuclease Technology

RESEARCH TRIANGLE PARK, North Carolina, USA and PARIS, France, **January XX, 2014** — Precision BioSciences, Inc. and Cellectis SA (Alternext: ALCLS), today announced that they have reached an agreement to settle patent litigation involving engineered I-CreI meganuclease technology. As part of the settlement, the companies will cross-license certain genome engineering patents and drop their on-going lawsuits and patent challenges. This agreement provides clear freedom to operate for both companies in the engineered I-CreI meganuclease genome engineering field.

Engineered meganucleases are one of the preferred genome engineering technology for most high-value applications. Their small size and exquisite specificity make them safer and easier to deliver than alternative gene editing tools. In addition, current embodiments of the technology are versatile enough to edit any gene in a genome.

“We are pleased to have reached this agreement with our colleagues at Cellectis,” said Matthew Kane, Precision BioSciences’ CEO, “and are very much looking forward to focusing fully on the commercial development of highly needed products utilizing our Directed Nuclease Editor genome engineering technology.”

“This agreement with our colleagues of Precision Biosciences sets the value of innovation of a proven and effective genome engineering tool: meganucleases,” stated Dr. Andre Choulika, Chairman and CEO of Cellectis, “This natural technology has tremendous advantages and has now the full potential to be developed in a number important applications such as agricultural biology and bioproduction.”

About Precision BioSciences

Precision BioSciences’ mission is to continually provide, improve, and enable the world’s most powerful genome engineering technology. Precision’s proprietary *Directed Nuclease Editor*™ (DNE) technology enables the production of genome editing enzymes that can insert, remove, modify, and regulate essentially any gene in mammalian or plant cells.

Initials PB: /s/ MK Initials CLS: /s/ AC

Precision BioSciences' vision is to be the conduit through which the world's greatest genome engineering challenges are solved. Precision has successfully utilized its DNE technology to create innovative products in partnerships with many of the world's largest biopharmaceutical and agbiotech firms. Internally, Precision is developing DNE-based products for biologics manufacturing and human therapeutics. For additional information, please visit www.precisionbiosciences.com.

About Cellectis

Founded in Paris in 1999, Cellectis is a life science group focusing on oncology. We develop next generation T-Cell CAR allogeneic adoptive immunotherapy for leukemia and solid tumors. The strength of our company is based of 14 years of expertise in cell line engineering with a leading TALENT?" based genome-engineering technology and Pulsagile a proprietary vector electroporation system. The Company has a strong partnership with University College London (UCL) on UCART19, the first allogeneic T-Cell CAR technology to enter clinical development in CLL/ALL in 2015. We have also a strong pipeline of products addressing series of liquid and solid tumors. Cellectis' application sectors are human health, agricultural biotechnology, bio-energies and genome customization gene editing tools and services.

Since 2007, Cellectis has been listed on the NYSE Euronext Alternext market (code: ALCLS) in Paris.

For more information, visit our website: www.cellectis.com.

Contacts:

Cellectis: Philippe Valachs, phone: +33 (0)1 81 69 16 00

E-mail: media@cellectis.com

Precision BioSciences: Chelsea Lynam, phone: +1 919 314-5512

E-mail: cheisea.lynam@precisionbiosciences.com

Disclaimer

This press release and the information contained herein do not constitute an offer to sell or subscribe, or a solicitation of an offer to buy or subscribe, for shares in Cellectis in any country.

EXHIBIT E: ONGOING PROCEEDINGS

Reexaminations of Cellectis Owned or Licensed Patents

Reexam Control No. [***]
U.S. Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

Reexam Control No. [***]
U.S Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

Reexam Control No. [***]
U.S. Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

Reexam Control No. [***]
U.S. Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

Reexam Control No. [***]
U.S. Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

Reexam Control No. [***]
U.S. Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

Reexam Control No. [***]
U.S. Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Reexaminations of Precision Owned or Licensed Patents

Reexam Control No. [***]
U.S. Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

Reexam Control No. [***]
U.S. Patent No. [***]
Patent Owner: [***]
Third Party Requester: [***]
Status: [***]

European Oppositions to Cellectis Owned or Licensed Patents

European Patent No. [***]
Proprietor: [***]
Opponent: [***]
Status: [***]

European Patent No. [***]
Proprietor: [***]
Opponent: [***]
Status: [***]

European Patent No. [***]
Proprietor: [***]
Opponent: [***]
Status: [***]

European Oppositions to Precision Owned or Licensed Patents

European Patent No. [***]
Proprietor: [***]
Opponent: [***]
Status: [***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

EXHIBIT F: EXCLUSIVE FIELD GRANTED TO CELLECTIS EXCLUSIVE LICENSEE

[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Exhibit 10.4

COLLABORATION AND LICENSE AGREEMENT

between

GILEAD SCIENCES, INC.

and

PRECISION BIOSCIENCES, INC.

Dated as of September 10, 2018

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

TABLE OF CONTENTS

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

SCHEDULES

COLLABORATION AND LICENSE AGREEMENT

This Collaboration and License Agreement (the "**Agreement**") is made and entered into effective as of September 10, 2018 (the "**Effective Date**") by and between Gilead Sciences, Inc., a corporation organized and existing under the laws of the State of Delaware and having its principal place of business at 333 Lakeside Drive, Foster City, California 94404 ("**Gilead**"), and Precision Biosciences, Inc., a corporation organized and existing under the laws of the State of Delaware and having its principal place of business at 302 East Pettigrew St., Suite A-100, Durham, North Carolina 27701 ("**Precision**"). Gilead and Precision are sometimes referred to herein individually as a "**Party**" and collectively as the "**Parties**."

RECITALS

WHEREAS, Precision has developed a proprietary genome editing platform, the ARCUS Technology (as defined herein), and controls certain intellectual property rights with respect to using the ARCUS Technology to create fully synthetic nucleases derived from homing endonucleases*;*

WHEREAS, Gilead and Precision desire to collaborate on a research and pre-clinical development program to construct, optimize and develop one or more gene editing therapy(ies) that incorporates or otherwise uses one or more nucleases made using the ARCUS Technology and that targets the hepatitis B virus DNA, as further described below, in accordance with the terms and conditions set forth below; and

WHEREAS, following the end of the collaboration, Gilead wishes to assume sole responsibility for the development and commercialization of such gene editing therapies and products containing such gene editing therapies, as further described below, in accordance with the terms and conditions set forth below.

NOW, THEREFORE, in consideration of the premises and the mutual promises and conditions hereinafter set forth, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, intending to be legally bound, do hereby agree as follows:

ARTICLE 1
DEFINITIONS

Unless otherwise specifically provided herein, the following terms shall have the following meanings:

1.1 "**Acquirer**" means, with respect to a Party, collectively (a) any Third Party that acquires a Party after the Effective Date (whether by transfer or sale of all or any portion of such Party's assets, equity or business, or by a Change of Control or similar business combination transaction or otherwise) and (b) the Affiliates of such Third Party, but excluding such Party and such Party's Affiliates existing immediately prior to the closing of such acquisition of such Party.

1.2 "**Act**" means the United States Federal Food, Drug, and Cosmetic Act, as amended, and the rules, regulations, guidelines, guidance documents and requirements promulgated thereunder, as may be in effect from time to time.

1.3 "**Action**" means any claim or threatened claim, action, suit, arbitration, inquiry, audit, proceeding or investigation (including any investigation by, before or otherwise involving any governmental authority or Regulatory Authority).

1.4 "**Active Component**" means a component that confers a therapeutic effect on a standalone basis or on an incremental or synergistic basis, excluding, for clarity and without limitation, [***] and compounds that potentiate nucleases but which themselves do not confer a therapeutic effect on such basis.

1.5 "**Affiliate**" means, with respect to any Person, any other Person that directly or indirectly Controls, is directly or indirectly Controlled by, or is under direct or indirect common Control with, such first Person. For purposes of this definition, a Person shall be deemed, in any event, to Control another Person if it (a) owns or Controls, directly or indirectly, or has the ability to direct or cause the direction or Control of, more than fifty percent (50%) of the voting equity of such other Person, or (b) has the ability to direct, cause the direction of or Control the management or policies of such other Person, whether through direct or indirect ownership of voting equity, by contract or otherwise.

1.6 "**Affordable Basis**" means sale or other disposition of the Licensed Product by Gilead or its Affiliate or Sublicensee [***].

1.7 "**Agreement**" has the meaning set forth in the preamble hereto.

1.8 "**Alliance Manage**r" has the meaning set forth in Section 2.3.5.

1.9 "**Applicable Law**" means any applicable federal, state, local or foreign constitution, treaty, law, statute, ordinance, rule, regulation, interpretation, guidance document, directive, policy, order, writ, award, decree, injunction, judgment, stay or restraining order of any governmental authority or Regulatory Authority, the terms of any permit, and any other ruling or decision of, agreement with or by, or any other requirement of, any governmental authority or Regulatory Authority having proper jurisdiction over the matter.

1.10 "**ARC Nuclease**" means any fully synthetic nuclease derived from a homing endonuclease and made using the ARCUS Technology.

1.11 "**ARCUS Assigned IP**" [***].

1.12 "**ARCUS IP**" means the ARCUS Technology and the ARCUS Patents.

1.13 "**ARCUS Patents**" means any and all Patents Controlled by Precision or any of its Affiliates as of the Effective Date or at any time during the Term that claim or cover ARCUS Technology, excluding Patents that claim or cover ARCUS Assigned IP.

1.14 "**ARCUS Technology**" means the proprietary genome editing platform Controlled by Precision, known as ARCUS™, relating to the design, creation, selection and optimization of fully synthetic enzymes derived from homing endonucleases, including any modifications or improvements to such platform, excluding ARCUS Assigned IP. For the sake of clarity, ARCUS Technology does not include the sequence(s) (including amino acid sequences and mRNA sequences) of any Gilead ARC Nuclease, the use of any Gilead ARC Nuclease, or the formulation of any Gilead ARC Nuclease or the Licensed Products.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.15 "**Bayh-Dole Act**" means the Patent and Trademark Law Amendments Act of 1980, as amended, codified at 35 U.S.C. §§ 200-212, as amended, as well as any regulations promulgated pursuant thereto, including in 37 C.F.R. Part 401.

1.16 [***].

1.17 "**Biosimilar Product**" means, with respect to a Licensed Product in a country or jurisdiction specified below, any product sold by a Third Party that (a)(i) in the United States, is subject to a license by the FDA under Section 351(k) of the PHSA as a product that is "biosimilar" (as defined in Section 351(i)(2) of the PHSA) to, or "interchangeable" (as defined in Section 351(i)(3) of the PHSA) with, such Licensed Product, (ii) in the EU, has been licensed as a similar biological medicinal product by the EMA pursuant to Directive 2001/83/EC, as may be amended, or any subsequent or superseding law, statute or regulation, or (iii) in any country outside the United States and the EU, has received Regulatory Approval in an abbreviated licensure procedure as a biogeneric, biosimilar or interchangeable product from the applicable Regulatory Authority in such country or jurisdiction, in reliance upon the prior Regulatory Approval (or data therein) of such Licensed Product; and (b) is not an Authorized Biosimilar Version of such Licensed Product; where "**Authorized Biosimilar Version**" means any product that (1) is sold under the BLA filed by Gilead or its Affiliate or Sublicensee for such Licensed Product, and (2) is not sold under the product trademark under which such Licensed Product is sold by Gilead, its Affiliate or Sublicensee, as applicable.

1.18 "**BLA**" means Biologics License Application as described in 21 C.F.R §601.2, or equivalent FDA application.

1.19 "**Business Day**" means any day excluding Saturdays, Sundays, December 26 through December 31, and any day that is a legal holiday under the Applicable Laws of the United States or that is a day on which banking institutions located in Durham, North Carolina or San Francisco, California, are authorized or required by Applicable Law or other governmental action to close.

1.20 "**Calendar Quarter**" means each successive period of three (3) calendar months commencing on January 1, April 1, July 1 and October 1, except that the first Calendar Quarter of the Term shall commence on the Effective Date and end on the day immediately prior to the first to occur of January 1, April 1, July 1 or October 1 after the Effective Date, and the last Calendar Quarter shall end on the last day of the Term.

1.21 "**Calendar Year**" means each successive period of twelve (12) calendar months commencing on January 1 and ending on December 31, except that the first Calendar Year of the Term shall commence on the Effective Date and end on December 31 of the year in which the Effective Date occurs and the last Calendar Year of the Term shall commence on January 1 of the year in which the Term ends and end on the last day of the Term.

1.22 "**Cellectis Agreement**" has the meaning set forth in Section 4.6.1.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

1.23 "**Cellectis Patents**" has the meaning set forth in Section 4.6.1.

1.24 "**Change of Control**" means, with respect to a Party, (a) a merger or consolidation of such Party with a Third Party that results in the voting securities of such Party outstanding immediately prior thereto, or any securities into which such voting securities have been converted or exchanged, ceasing to represent at least fifty percent (50%) of the combined voting power of the surviving entity or the parent of the surviving entity immediately after such merger or consolidation, (b) a transaction or series of related transactions in which a Third Party, together with its Affiliates, becomes the beneficial owner of fifty percent (50%) or more of the combined voting power of the outstanding securities of such Party, or (c) the sale or other transfer to a Third Party of all or substantially all of such Party's business. For clarity, an initial public offering of capital stock of Precision that is effected pursuant to a registration statement or an offering statement filed with, and declared effective or qualified, as the case may be, by the Securities and Exchange Commission under the Securities Act of 1933, as amended, shall not in and of itself constitute a Change of Control.

1.25 "**Clinical Studies**" means a Phase I Clinical Study, a Phase II Clinical Study, a Proof of Concept Clinical Study, a Phase III Clinical Study, a Registrational Clinical Study and such other tests and studies in human subjects that are required by Applicable Law, or otherwise recommended by the Regulatory Authorities, to obtain or maintain Regulatory Approvals for a Licensed Product.

1.26 "**COGS**" means in respect of each Licensed Product, [***].

1.27 "**Collaboration Budget**" has the meaning set forth in Section 2.1.3(b).

1.28 "**Collaboration Program**" has the meaning set forth in Section 3.1.

1.29 "**Collaboration R&D Plan**" has the meaning set forth in Section 3.1.

1.30 "**Collaboration Term**" has the meaning set forth in Section 3.1.

1.31 "**Combination Product**" means a Licensed Product that contains one or more Gilead ARC Nuclease(s) as one component as well as one or more other Active Components that do not constitute a Gilead ARC Nuclease, whether co-formulated, co-packaged or otherwise sold together for one price.

1.32 "**Commercially Reasonable Efforts**" means:

1.32.1 with respect to the obligations of a Party under this Agreement relating to Development activities, of a Licensed Product, the level of efforts and expenditure of resources typically devoted in the research-based biopharmaceutical industry by a company to Development, of a product of similar commercial potential at a similar stage in its development or product life, in each case taking into account the Relevant Factors and as measured by the facts and circumstances at the time such efforts are due;

1.32.2 with respect to the level of obligations of a Party under this Agreement relating to other Exploitation activities, the level of efforts and expenditure of resources typically devoted in the research-based biopharmaceutical industry by a company to a

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product of similar market potential at a similar stage in its development or product life, taking into account Relevant Factors and as measured by the facts and circumstances at the time such efforts are due; or

1.32.3 with respect to the obligations of a Party under this Agreement relating to any other objective, reasonable, good-faith efforts typically devoted to similar objectives in the research-based pharmaceutical industry by a company, taking into account industry practices;

provided that, [***].

1.33 "**Competitive Infringement**" means any alleged or threatened infringement of the Precision Patents or Joint Collaboration Program Patents, as applicable, by a Third Party (including alleged or threatened infringement based on the development or commercialization of, or an application to market, a Licensed Product) that is based on the manufacture, use or sale of a Gene Editing Therapy.

1.34 "**Competitive Program**" means [***].

1.35 "**Competitor**" means any Person, other than the Parties and their Affiliates, that is conducting any Competitive Program, for so long as such conduct continues.

1.36 "**Confidential Information**" has the meaning set forth in Section 7.1.

1.37 "**Confidentiality Agreement**" means that certain Mutual Confidential Disclosure Agreement by and between the Parties, dated September 3, 2015.

1.38 "**Control**" means (a) when used with respect to any Person, the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such entity, whether through the ownership of voting securities, by contract or otherwise, (b) when used with respect to any security, the possession, directly or indirectly, of the power to vote, or to direct the voting of, such security or the power to dispose of, or to direct the disposition of, such security and (c) when used with respect to any item of Information, Regulatory Documentation, material, Patent, or other IP Rights, possession of the right, whether directly or indirectly, and whether by ownership, license or otherwise, to assign or grant a license, sublicense or other right to or under such Information, Regulatory Documentation, material, Patent or other IP Rights to the extent that it does not violate the terms of any written agreement with any Third Party existing as of the date of such assignment or such grant, as applicable; *provided that*, any such Third Party agreement entered into after the Effective Date and requiring additional payment will meet this definition of Control only if such agreement is entered into in compliance with the requirements set forth in Section 5.4.3. "**Controlled**" and "**Controlling**" have corresponding meanings. For clarity, in the case of clause (c), a Person may Control in-licensed IP Rights from a Third Party even if its license to such IP Rights is non-exclusive or otherwise more limited than licenses granted in Sections 4.1 or 4.2, provided that the rights granted under such in-licensed IP Rights will be limited to the extent and scope of the license granted by the licensor Third Party.

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1.39 "**Development**" means all activities related to discovery, identification, research, pre-clinical and other non-clinical testing, test method development and stability testing, toxicology, formulation, process development, manufacturing scale-up, qualification and validation, quality assurance/quality control, clinical studies, including manufacturing in support thereof, statistical analysis and report writing, the preparation and submission of applications for Regulatory Approvals, regulatory affairs with respect to the foregoing and all other activities necessary or reasonably useful or otherwise requested or required by a Regulatory Authority as a condition or in support of obtaining or maintaining a Regulatory Approval. "**Develop**" and "**Developing**" have corresponding meanings.

1.40 "**Dispute**" has the meaning set forth in Section 11.6.

1.41 "**Distributor**" means any person appointed by Gilead or any of its Affiliates or its or their Sublicensees, and that is not an Affiliate of any of them, to distribute, market and sell the Licensed Products in one or more countries in the Territory, in circumstances where the Person purchases its requirements of the Licensed Products from Gilead or its Affiliates or its or their Sublicensees but does not make any royalty or other payment to Gilead or its Affiliates or its or their Sublicensees for (sub)license rights under Precision Know-How or Precision Patents with respect to such Licensed Products.

1.42 "**Divest**" means, as it relates to a Competitive Program: (a) the sale of all right, title and interest in such Competitive Program, including all technology, intellectual property and other assets relating solely thereto, to a Third Party, without the retention or reservation of any rights, license or interest (other than an economic interest such as a right to receive payments) by the selling entity or its Affiliates; or (b) the complete termination and/or shut-down of such Competitive Program such that no technology, intellectual property or other asset solely relating thereto is used by the terminating entity or its Affiliates for the conduct of such Competitive Program.

1.43 "**Dollars**" or "**$**" means United States Dollars.

1.44 "**Duke Agreement**" means the License Agreement entered into by Precision and Duke University ("**Duke**") on April 17, 2006, as amended from time to time.

1.45 "**Duke IP**" means all Patents and Information licensed to Precision under the Duke Agreement that constitute ARCUS Technology. The patent numbers and patent application numbers of the Patents that are included within the Duke IP as of the Effective Date are set forth in Schedule 1.45.

1.46 "**Effective Date**" has the meaning set forth in the preamble hereto.

1.47 "**EMA**" means the European Medicines Agency and any successor agency thereto.

1.48 "**Europe**" means the countries of the European Union as constituted on the Effective Date.

1.49 "**Existing In-License Agreements**" means the Duke Agreement and the Cellectis Agreement.

1.50 "**Exploit**" means to make, have made, import, use, sell, or offer for sale, research, develop, commercialize, register, manufacture, have manufactured, hold, or keep (whether for disposal or otherwise), have used, export, transport, distribute, promote, market, or have sold or otherwise dispose of. "**Exploitation**" and "**Exploiting**" have corresponding meanings.

1.51 "**FDA**" means the United States Food and Drug Administration, or any successor agency thereto.

1.52 "**Field**" means the diagnosis, treatment and prevention of all diseases.

1.53 "**First Commercial Sale**" means, on a Licensed Product-by-Licensed Product and country-by-country basis, the first invoiced commercial sale for monetary value for use or consumption by the general public of a Licensed Product in any country in the Territory after the Marketing Approval for such Licensed Product has been obtained in such country. For the avoidance of doubt, sales prior to receipt of all Marketing Approvals necessary to commence regular commercial sales, such as so-called "named patient sales" and "compassionate use sales", shall not be construed as a First Commercial Sale.

1.54 "**Formulation and Delivery Combination Patent**" means a Patent that includes a use in combination claim that covers the use of an ARC Nuclease in combination with a formulation or [***] developed by either Party outside the Collaboration Program.

1.55 "**FTE**" has the meaning set forth in the definition of "**FTE Rate**."

1.56 "**FTE Rate**" means a rate of [***] based on a total of [***] of work performed by one or more full time employees ("**FTE**"), to be pro-rated on a daily basis if necessary [***]; such rate to be restricted to scientific work and managerial activities related directly to the Collaboration R&D Plan and included in the Collaboration Budget or otherwise provided for in this Agreement. For the avoidance of doubt (a) such rate includes all benefits, travel, and overhead; and (b) in no event shall any one (1) individual be counted as more than one (1) FTE.

1.57 "**GAAP**" means generally accepted accounting principles, as applied in the United States.

1.58 "**Gene Editing Therapy**" means any product that functions through a mechanism of action of targeting, editing, deleting or otherwise modifying an HBV Target.

1.59 "**Generally Applicable Utility**" means, with respect to any Patent or Information, that the utility of such Patent or Information is not limited to (a) the field of HBV, (b) any Gilead ARC Nuclease, or (c) any Active Component contained in a Licensed Product.

1.60 "**Generic Sublicensee**" means a Sublicensee with respect to which Gilead's sublicense is non-exclusive, is granted in accordance with Gilead's "Developing World Access" program as consistently applied by Gilead to its hepatitis B product lines or, if such program is not active, then in accordance with Gilead's successor program with respect to its hepatitis B product lines and so applied, and is limited to the right to manufacture and sell a generic version of the Licensed Product in a country in which Gilead generally provides services through its "Developing World Access" program, or if such program is not active, then in a country then listed by the World Bank's latest rankings in the "low" and "lower middle" income group or equivalent.

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1.61 "**Gilead**" has the meaning set forth in the preamble hereto.

1.62 "**Gilead ARC Nuclease**" means any ARC Nuclease designed, created, selected or optimized by Precision for Gilead, as disclosed or presented to Gilead pursuant to the Collaboration R&D Plan, [***].

1.63 "**Gilead Dual IP**" means the Gilead Dual Know-How and the Gilead Dual Patents.

1.64 "**Gilead Dual Know-How**" means any and all Information to the extent Controlled by Gilead or its Affiliates that (a) is conceived, discovered, developed or otherwise made by or on behalf of Gilead or its Affiliates or Sublicensees [***] or (b)(i) Gilead or its Affiliates elect to provide or disclose to Precision under this Agreement at any time during the Term other than in the case of this clause (b) [***] and (ii) [***]. For clarity, Gilead Dual Know-How does not include any Patents.

1.65 "**Gilead Dual Patents**" means (a) any and all Patents (i) that claim or cover Gilead Dual Know-How and (ii) to the extent such Patents are Controlled by Gilead or its Affiliates at any time during the Term; and (b) any and all Patents [***].

1.66 "**Gilead Funding Commitment**" has the meaning set forth in Section 5.1.1.

1.67 "**Gilead Know-How**" means any and all Information to the extent Controlled by Gilead or any of its Affiliates at any time during the Term that is necessary for Precision to conduct its Development activities under the Collaboration R&D Plan, excluding Gilead Dual Know-How, ARCUS Assigned IP and Joint Collaboration Program Know-How. For clarity, Gilead Know-How does not include any Patents.

1.68 "**Gilead Patents**" means any and all Patents that claim or cover the Gilead Know-How that are Controlled by Gilead or its Affiliates at any time during the Term.

1.69 "**Grant-Back Right**" has the meaning set forth in Section 4.3.1.

1.70 "**HBV**" means the hepatitis B virus.

1.71 "**HBV Target**" means any HBV DNA, [***].

1.72 "**IND**" means (a) an investigational new drug application filed with the FDA for authorization to commence Clinical Studies and its equivalent in other countries or regulatory jurisdictions, and (b) all supplements and amendments that may be filed with respect to the foregoing.

1.73 "**Indemnification Claim Notice**" has the meaning set forth in Section 9.3.

1.74 "**Indemnified Party**" has the meaning set forth in Section 9.3.

1.75 "**Indemnifying Party**" has the meaning set forth in Section 9.3.

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1.76 "**Information**" means all technical, scientific and other know-how and information, trade secrets, ideas, inventions, discoveries, knowledge, technology, means, methods, processes, practices, formulae, instructions, skills, techniques, procedures, experiences, ideas, designs, drawings, assembly procedures, computer programs, specifications, data, results and other information, including: biological, chemical, pharmacological, toxicological, pharmaceutical, physical and analytical, pre-clinical, clinical, safety, manufacturing and quality control data and information, including study designs and protocols, assays and biological methodology, in each case (whether or not confidential, proprietary, patented or patentable) in written, electronic or any other form now known or hereafter developed.

1.77 "**Initial Term**" has the meaning set forth in Section 3.1.

1.78 "**Initiation**" or "**Initiate**" means, with respect to a Clinical Study, the first dosing of the [***] human subject in such Clinical Study.

1.79 "**IP Assignee"** has the meaning set forth in Section 6.1.5.

1.80 "**IP Assignor"** has the meaning set forth in Section 6.1.5.

1.81 "**IP Rights**" means any and all legal means of establishing rights in and to ideas, inventions, discoveries, Information, data, databases, documentation, reports, materials, writings, designs, computer software, processes, principles, methods, techniques and other information, including Patents, trade secrets, trademarks, service marks, trade names, registered designs, design rights, copyrights (including rights in computer software and database rights) and any rights or property similar to any of the foregoing in any part of the world, whether registered or not, together with the right to apply for the registration of any such rights.

1.82 "**Joint Collaboration Program IP**" means the Joint Collaboration Program Know-How and the Joint Collaboration Program Patents.

1.83 "**Joint Collaboration Program Know-How**" has the meaning set forth in Section 6.1.3(a).

1.84 "**Joint Collaboration Program Patents**" has the meaning set forth in Section 6.1.3(b).

1.85 "**Joint Committee**" means the JSC, the JRDC, or any subcommittee established to carry out the functions of the JSC or JRDC, including the Joint Tech Transfer Team.

1.86 "**Joint Research and Development Committee**" or "**JRDC**" has the meaning set forth in Section 2.2.1.

1.87 "**Joint Steering Committee**" or "**JSC**" has the meaning set forth in Section 2.1.1.

1.88 "**Joint Tech Transfer Team**" or "**JTTT**" means the Subcommittee established by the JSC pursuant to Section 2.1.3(f) to oversee, and provide guidance to the Parties regarding the implementation of the Technology Transfer Plan.

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1.89 "**Knowledge**" means the actual knowledge of Precision's Chief Executive Officer, Chief Science Officer, Vice President of Business Development and Director of Intellectual Property, with internal due inquiry.

1.90 "**Licensed Product**" means any Gene Editing Therapy that incorporates one or more Gilead ARC Nuclease(s), in any and all forms, presentations, delivery systems, dosages, and formulations.

1.91 "**Licensed Product Family**" has the meaning set forth in Section 5.4.2.

1.92 "[***] **In-License Agreements**" means any agreements between Precision or its Affiliates and a Third Party entered into as a Third Party License to [***] subject to Section 5.4.3(b) during the Term, in each case under which Precision has obtained rights to [***] for the Exploitation of the Licensed Products and which are used to Exploit the Licensed Products for Gilead.

1.93 "**Losses**" has the meaning set forth in Section 9.1.

1.94 "**Major Market**" means any of [***].

1.95 "**Manufacture**" and "**Manufacturing**" means all activities related to the manufacture, processing, filling, finishing, packaging, labeling, shipping, and holding of any Licensed Product, including process development, process qualification and validation, scale-up, pre-clinical, clinical and commercial manufacture and analytic development, Licensed Product characterization, stability testing, quality assurance, and quality control.

1.96 "**Marketing Approval**" means, with respect to a Licensed Product for a particular country, the grant of a Regulatory Approval that is required in such country from the competent Regulatory Authority to market and sell such Licensed Product in such country, including a BLA in the United States.

1.97 "**Net Sales**" means [***].

1.98 "**Non-Prosecuting Party**" means the Party that is not the Prosecuting Party.

1.99 "**Other Infringement**" means any alleged or threatened infringement of the Precision Patents or Joint Collaboration Program Patents, as applicable, by a Third Party and such alleged or threatened infringement is not a Competitive Infringement.

1.100 "**Party**" and "**Parties**" has the meaning set forth in the preamble hereto.

1.101 "**Patent Challenge**" has the meaning set forth in Section 5.4.8.

1.102 "**Patent Challenge Criteria**" shall have the meaning set forth in Section 5.4.8.

1.103 "**Patents**" means (a) all national, regional and international patents and patent applications, including provisional patent applications; (b) all patent applications filed from such patents, patent applications or provisional applications or from an application claiming

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priority from either of these, including divisionals, continuations, continuations-in-part, substitutions, provisionals, converted provisionals, and continued prosecution applications; (c) any and all patents that have issued or in the future issue from the foregoing patent applications described in clauses (a) and (b), including utility models, petty patents and design patents and certificates of invention; (d) any and all extensions or restorations by existing or future extension or restoration mechanisms, including revalidations, reissues, re-examinations and extensions (including any supplementary protection certificates and the like) of the foregoing patents or patent applications described in clauses (a), (b), and (c); and (e) any similar rights, including so-called pipeline protection, or any importation, revalidation, confirmation or introduction patent or registration patent or patent of addition to any such foregoing patent applications and patents.

1.104 "**Person**" means an individual, corporation, partnership, limited liability company, joint venture, association, trust, unincorporated organization or other entity or any governmental authority or Regulatory Authority.

1.105 "**Phase I Clinical Study**" means a human clinical trial of any product conducted during Phase 1 of a clinical investigation as defined in 21 C.F.R. 312.21(a) or corresponding foreign regulations.

1.106 "**Phase Ib Clinical Study**" means a Phase I Clinical Study within the HBV patient population that is designed to establish an initial indication of efficacy.

1.107 "**Phase II Clinical Study**" means a human clinical trial of any product conducted during Phase 2 of a clinical investigation as defined in 21 C.F.R. 312.21(b) or corresponding foreign regulations, including any such trial conducted as an open label clinical trial.

1.108 "**Phase III Clinical Study**" means a human clinical trial of any product on sufficient numbers of patients that is designed to demonstrate statistically that such product is safe and efficacious for its intended use and to define warnings, precautions and adverse reactions that are associated with such product in the dosage range to be prescribed, as described in 21 C.F.R. 312.21(c) or corresponding foreign regulations, and that is intended to support Marketing Approval of such product.

1.109 "**PHSA**" means the United States Public Health Service Act, as may be amended, or any subsequent or superseding law, statute or regulation.

1.110 [***].

1.111 "**Precision**" has the meaning set forth in the preamble hereto.

1.112 "**Precision Existing Patents**" means the Patents listed in Schedule 1.112.

1.113 "**Precision HBV Patents**" means any Precision Patent that, without expanding the definition of Precision Patents, [***], including the Patents listed in Schedule 1.113, as such schedule may be updated by Precision during the Term in accordance with this Agreement.

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1.114 "**Precision IP**" means the Precision Know-How, the Precision Patents and, to the extent not included in the Precision Know-How and the Precision Patents, the ARCUS Assigned IP.

1.115 "**Precision Know-How**" means any and all Information to the extent Controlled by Precision or any of its Affiliates: (a) as of the Effective Date or at any time during the Collaboration Term and resulting from the conduct of the Collaboration Program, in each case that is necessary or reasonably useful for the Exploitation of any Licensed Product or any Gilead ARC Nuclease, or (b) at any time during the Term that Precision or its Affiliates elect to provide or disclose to Gilead under this Agreement, that is necessary or reasonably useful for the Exploitation of any Licensed Product or any Gilead ARC Nuclease; and in each case ((a) and (b)) excluding Joint Collaboration Program Know-How, ARCUS Technology, and any [***]. For clarity, Precision Know-How does not include any Patents.

1.116 "**Precision Patents**" means any and all Patents to the extent Controlled by Precision or any of its Affiliates (a) as of the Effective Date or at any time during the Collaboration Term and resulting from the conduct of the Collaboration Program, in each case that are necessary or reasonably useful for the Exploitation of any Licensed Product or any Gilead ARC Nuclease; (b) at any time during the Term that cover or claim Precision Know-How; or (c) at any time during the Term that cover or claim any Licensed Product or Gilead ARC Nuclease or are necessary for the Exploitation of Licensed Products or Gilead ARC Nucleases, in the case of Licensed Products under this clause (c) in the form in which such Licensed Products exist as of the end of the Collaboration Term (and including any Regulatory Authority-required modifications made thereto after the Collaboration Term) and in any form supplied under the Supply Agreement but excluding in all cases of clause (c) any Patents that claim or cover any formulation or [***] developed or in-licensed by Precision or its Affiliates after the Effective Date outside the Collaboration Program unless such Patent is a Formulation and Delivery Combination Patent, in which case only claims that cover the use, composition or production of such formulation or [***] apart from the combination shall be excluded; and in each of cases (a) through (c), including the Precision Existing Patents, but excluding any Joint Collaboration Program Patents, ARCUS Patents and any [***].

1.117 "**Proof of Concept Clinical Study**" [***].

1.118 "**Prosecuting Party**" means the Party preparing, filing, prosecuting, maintaining, enforcing or defending the relevant Patent(s), as applicable, in exercise of its rights under, and in accordance, with ARTICLE 6.

1.119 "**Publications**" has the meaning set forth in Section 7.5.

1.120 "**Quality Agreement**" has the meaning set forth in Section 3.5.2.

1.121 "**Registrational Clinical Study**" [***].

1.122 "**Regulatory Approval**" means, with respect to any jurisdiction, any and all approvals (including pricing and reimbursement approvals), licenses, registrations or

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authorizations of any Regulatory Authority necessary or useful for the Exploitation of any Licensed Product in such jurisdiction, including, where applicable, (a) IND, Marketing Approval applications and supplements and amendments thereto; (b) Marketing Approvals and pre- and post-Marketing Approval marketing authorizations (including any prerequisite manufacturing approval or authorization related thereto); (c) labeling approval; and (d) technical, medical and scientific licenses.

1.123 "**Regulatory Authority**" means any applicable supra-national, federal, national, regional, state, provincial or local regulatory agencies, departments, bureaus, commissions, councils or other government entities regulating or otherwise having legal authority with respect to the Exploitation of Licensed Products in the Territory.

1.124 "**Regulatory Documentation**" means any and all (a) applications, registrations, licenses, authorizations and approvals (including all Regulatory Approvals), and non-clinical and clinical study authorization applications or notifications (including all supporting files, writings, data, studies and reports) prepared for submission to a Regulatory Authority or research ethics committee with a view to the obtaining or maintaining of any Regulatory Approval, (b) correspondence to or with the FDA or any other Regulatory Authority (including minutes and official contact reports relating to any communications with any Regulatory Authority), (c) pharmacovigilance databases, adverse drug experience reports and associated documents, and investigations of adverse drug experience reports, (d) manufacturing records, and (e) nonclinical, clinical and other data contained or referenced in or supporting any of the foregoing.

1.125 "**Regulatory Exclusivity Period**" means, with respect to each Licensed Product in any country in the Territory, a period of exclusivity (other than Patent exclusivity) granted or afforded by Applicable Law or by a Regulatory Authority in such country that confers exclusive marketing rights with respect to such Licensed Product in such country or prevents another Person from using, referencing or otherwise relying on data supporting the Marketing Approval for such Licensed Product without the prior written consent of the Marketing Approval holder, including regulatory data exclusivity, new chemical entity exclusivity, new use or indication exclusivity, new formulation exclusivity, pediatric exclusivity and orphan drug designations.

1.126 "**Relevant Factors**" means all factors that are relevant to the Development, Manufacture or Exploitation of a product, including its safety and efficacy, product profile, cost to develop, cost and availability of supply, the time required to complete Development, the competitiveness of the marketplace (including the proprietary position and anticipated market share of the product), the patent position with respect to such product (including the ability to obtain or enforce, or have obtained or enforced, such patent rights), the Third Party patent landscape relevant to the product, the regulatory structure involved, the likelihood of regulatory approval, the anticipated or actual profitability of the applicable product and other technical, commercial, legal, scientific, regulatory and medical considerations.

1.127 "**Representatives**" means, with respect to any Person, such Person's directors, officers, managers, employees, counsel, accountants, financial advisors, lenders and other agents and representatives.

1.128 "**Reversion IP**" means any Patents and Know-How that are Controlled by Gilead or any of its Affiliates as of the date of termination of this Agreement (in whole or in part,

and including, for clarity, Patents filed or issued at any later date covering or claiming applicable inventions conceived on or prior to such date) that are necessary for Precision to continue the Development, Manufacture, use or Exploitation of Licensed Products in the form existing as of the date of termination of this Agreement (and including any Regulatory Authority-required modifications made thereto after such date), excluding any Patent or Know-How that covers or claims, or in the case of Know-How, relates specifically to, (i) any Active Component of any Licensed Product that is not a Gilead ARC Nuclease or (ii) any use of a Gilead ARC Nuclease in combination with any such other Active Component of such Licensed Product.

1.129 "**Reversion Patents**" means, with respect to any particular Licensed Product, Patents within Reversion IP that come to be Controlled by Gilead or any of its Affiliates as a result of activities conducted, under the Collaboration Program or in connection with this Agreement, [***].

1.130 "**Royalty Term**" means, with respect to each Licensed Product, on a country-by-country basis, the period commencing on the date of First Commercial Sale of such Licensed Product by Gilead, its Affiliate or Sublicensee in such country until [***].

1.131 "**Senior Officer**" means, with respect to Gilead, its Chief Scientific Officer or his or her designee, and with respect to Precision, its Chief Executive Officer or his or her designee.

1.132 "**Subcommittee**" means any Joint Committee other than the JSC.

1.133 "**Sublicensee**" means a Third Party to which Gilead has granted a sublicense under the licenses granted to Gilead hereunder to Exploit a Licensed Product under Section 4.3.1, but excluding Distributors.

1.134 "**Supplied Product**" has the meaning set forth in Section 3.5.1.

1.135 "**Supply Agreement**" has the meaning set forth in Section 3.5.2.

1.136 "**Technology Transfer**" has the meaning set forth in Section 3.6.2.

1.137 "**Technology Transfer Plan**" has the meaning set forth in Section 3.6.2.

1.138 "**Term**" has the meaning set forth in Section 10.1.

1.139 "**Territory**" means all countries and territories of the world.

1.140 "**Third Party**" means any Person other than Gilead, Precision and their respective Affiliates.

1.141 "**Third Party Claims**" has the meaning set forth in Section 9.1.

1.142 "[***]" has the meaning set forth in Section 5.4.3(b).

1.143 "**Third Party License**" has the meaning set forth in Section 5.4.3.

1.144 "**United States**" or "**U.S.**" means the United States of America and its territories and possessions (including the District of Columbia and Puerto Rico).

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1.145 "**Valid Claim**" means (a) a claim of an issued and unexpired Patent included within the Precision Patents or Joint Collaboration Program Patents which has not been abandoned, cancelled or held permanently revoked, unenforceable or invalid by a decision of a court or other governmental agency of competent jurisdiction unappealed within the time allowed for appeal, or which has not been admitted to be invalid or unenforceable through reissue or disclaimer or otherwise; [***].

ARTICLE 2
COLLABORATION MANAGEMENT

2.1 Joint Steering Committee.

2.1.1 **Formation.** Within [***] after the Effective Date, the Parties shall establish a joint steering committee (the "**Joint Steering Committee**" or "**JSC**").

2.1.2 **Membership.** The JSC shall consist of two (2) representatives from each of the Parties, each with the requisite experience and seniority to enable such person to make decisions on behalf of the Parties with respect to the issues falling within the jurisdiction of the JSC. The initial JSC members from each Party are set forth on Schedule 2.1.2. From time to time, each Party may substitute one or more of its representatives to the JSC on written notice to the other Party. Each Party shall select from its representatives a co-chairperson for the JSC. From time to time, each Party may change the representative who will serve as its co-chairperson on written notice to the other Party.

2.1.3 **Specific Responsibilities during the Collaboration Term.** During the Collaboration Term, the JSC shall oversee the Collaboration Program, and shall in particular:

(a) monitor and coordinate the activities of the Parties under the Collaboration Program, including overseeing the JRDC, the JTTT, and any other Subcommittees and facilitating communications between the Parties with respect to the Development of the Licensed Products;

(b) except for the initial budget included in the Collaboration R&D Plan that is to be executed by the Parties contemporaneously with the execution of this Agreement, discuss and facilitate the Parties' agreement on a reasonable budget (the "**Collaboration Budget**") for the tasks to be completed in each six-month period of the Collaboration Term and for any adjustments to such tasks, subject to Section 3.2.4;

(c) approve any amendments to the Collaboration R&D Plan in accordance with Section 3.2.2;

(d) review and discuss each Party's written reports, including the results of the Development activities, provided to the JSC pursuant to Section 3.8.3;

(e) approve subcontractors proposed to be used by Precision for the purposes of performing "material" services (as the term "material" is used in Section 4.3.2) in connection with the Collaboration Program, such approval not to be unreasonably withheld, conditioned or delayed, pursuant to Section 4.3.2;

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(f) establish Subcommittees, including a Joint Tech Transfer Team, as appropriate, to carry out its functions and to establish the rules governing and the responsibilities of the Joint Tech Transfer Team;

(g) resolve disputes that may arise in any Subcommittee;

(h) without limiting clause (g) above, resolve disputes that may arise between the Parties or the JTTT regarding the content of the Technology Transfer Plan;

(i) discuss and consider optimal technologies or methodologies for delivery, Manufacture and administration of Licensed Products, such as [***] and other potential Third Party Licenses pursuant to Section 5.4.3(a), *provided however* that [***], and *provided further* that Precision shall timely (A) provide Gilead through the JSC with such information with respect to any [***] that it intends to in-license from a Third Party in reasonable detail to enable Gilead to understand the reasons for the potential selection of such [***], (B) reasonably respond to Gilead's questions relating thereto and (C) consider in good faith Gilead's feedback with respect to such selection; and

(j) perform such other functions as may be assigned to the JSC hereunder.

2.1.4 **Specific Responsibilities following the Collaboration Term.** The JSC shall automatically be disbanded immediately after the First Commercial Sale of the first Licensed Product. During the period after the Collaboration Term and prior to such First Commercial Sale, the JSC shall serve only (a) as a forum for sharing and discussing information with respect to the Technology Transfer, Manufacture, Development and other Exploitation of the Licensed Products and (b) if the Technology Transfer has not been completed, to resolve disputes between the Parties or the JTTT.

2.2 Joint Research and Development Committee.

2.2.1 **Formation.** Within [***] after the Effective Date, the Parties shall establish a joint research and development committee (the "**Joint Research and Development Committee**" or "**JRDC**"). The JRDC shall consist of two (2) representatives from each of the Parties, each with the requisite experience and seniority to enable such person to make decisions on behalf of the Parties with respect to the issues falling within the jurisdiction of the JRDC. The initial JRDC members from each Party are set forth on Schedule 2.2.1. From time to time, each Party may substitute one or more of its representatives to the JRDC on written notice to the other Party.

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2.2.2 **Specific Responsibilities during the Collaboration Term.** The JRDC shall:

(a) provide guidance to the Parties on the implementation of the Collaboration Program;

(b) propose amendments to the Collaboration R&D Plan to the JSC for its review and approval in accordance with Section 3.2.2;

(c) discuss the Regulatory Documentation prepared by Gilead pursuant to Section 3.7.1(a);

(d) discuss the reports to be provided by Precision pursuant to Section 3.7.1(b), including the chemistry, manufacturing and control (CMC) reports; and

(e) perform such other functions as may be assigned to the JRDC hereunder.

For clarity, the JRDC shall not have the authority to modify the Collaboration R&D Plan.

2.2.3 **Specific Responsibilities after the Collaboration Term and Disbandment**. The JRDC shall be disbanded and have no further responsibilities or authority under this Agreement upon the expiry of the Collaboration Term.

2.3 General Provisions Applicable to Committees.

2.3.1 **Meetings and Minutes.**

(a) Unless otherwise agreed to by the Parties, the JSC shall meet quarterly during every twelve (12) month period after the Effective Date until expiration of the Collaboration Term, and thereafter the JSC shall meet annually until disbanded pursuant to Section 2.1.4, and the JRDC shall meet monthly during every twelve (12) month period after the Effective Date until the expiration of the Collaboration Term; *provided that*, the JSC and the JRDC shall each meet in person once during each such twelve (12) month period after the Effective Date if mutually agreed. The location of such in person meetings shall alternate between locations designated by Gilead and locations designated by Precision.

(b) The Alliance Manager for each Party shall be responsible for calling meetings with notice provided a reasonable time in advance of such meeting. Each Party shall make all proposals for agenda items and shall provide all appropriate information with respect to such proposed items a reasonable time in advance of the applicable meeting; *provided that*, under exigent circumstances requiring input by the Joint Committee, a Party may provide its agenda items to the other Party within a shorter period of time in advance of the meeting, or may propose that there not be a specific agenda for a particular meeting, so long as the other Party consents to such later addition of such agenda items or the absence of a specific agenda for such meeting, such consent not to be unreasonably withheld, conditioned or delayed. At the conclusion of each meeting, the Parties will decide which Party shall prepare and circulate for review and approval of the Parties minutes of each meeting within ten (10) Business Days after the meeting. The Parties shall agree on the minutes of each meeting promptly, but in no event later than thirty (30) days after such meeting.

2.3.2 **Procedural Rules.** Each Joint Committee shall have the right to adopt such standing rules as shall be necessary for its work, to the extent that such rules are not

inconsistent with this Agreement. A quorum of the Joint Committee shall exist whenever there is present at a meeting at least one (1) representative appointed by each Party. Subject to the proviso in Section 2.3.1(a), representatives of the Parties on a Joint Committee may attend a meeting either in person or by telephone, video conference or similar means in which each participant can hear what is said by, and be heard by, the other participants. Representation by proxy shall be allowed. Each Joint Committee shall take action by consensus of the representatives present at a meeting at which a quorum exists, with each Party having a single vote irrespective of the number of representatives of such Party in attendance, or by a written resolution signed by at least one (1) representative appointed by each Party. Employees or consultants of a Party that are not representatives of such Party on a Joint Committee may attend meetings of such Joint Committee with advance written notice to the other Party; *provided*, *however*, that such attendees (a) shall not vote or otherwise participate in the decision-making process of the Joint Committee, and (b) are bound by obligations of confidentiality and non-disclosure equivalent to those set forth in ARTICLE 7.

2.3.3 **Decision-making and Dispute Resolution.** If the JRDC or any other Subcommittee cannot, or does not, reach consensus on an issue arising within the scope of its responsibilities within a period of [***], then either Party may refer the matter to the JSC for resolution and a special meeting of the JSC may be called for such purpose. If during the Collaboration Term, and thereafter for so long as the Technology Transfer has not been completed, the JSC cannot, or does not, reach consensus on an issue, including any dispute arising in the JRDC or a Subcommittee, within a period of [***] after referral to the JSC, then the JSC shall refer such dispute to the Senior Officers for resolution. If such Senior Officers cannot resolve such dispute within [***] of it being referred to them, then, subject to the remaining provisions of this Section 2.3.3, and without limiting Gilead's diligence obligations under Sections 3.3 and 3.4 of this Agreement, Gilead shall have final decision-making authority with respect to such matter; *provided that*, Gilead may not exercise such authority (i) to require Precision to license any particular IP Rights for use in the Collaboration Program beyond those already contemplated herein, (ii) to expand the scope of the Collaboration Program beyond HBV Targets, (iii) to expand the scope of the definition of Precision IP, (iv) to accelerate the timelines for Precision Development activities, (v) to establish or modify the Collaboration Budget (for the avoidance of doubt, this clause (v) shall not be construed to limit Gilead's right to modify the Collaboration R&D Plan in a manner that requires the Parties to agree on a modified Collaboration Budget pursuant to Section 3.2.4), (vi) to modify the Collaboration R&D Plan to add additional activities to the Collaboration R&D Plan that Precision reasonably demonstrates would cause Precision's costs or resources for meeting the work plans and timelines set forth in the Collaboration R&D Plan to exceed the Collaboration Budget or the Gilead Funding Commitment, (vii) to dictate the content of the Technology Transfer Plan, or (viii) to select a [***] other than [***] for any Licensed Product. Notwithstanding the foregoing, subject to the terms of this Agreement, Precision shall have final decision-making authority with respect to: (a) the design, creation, and optimization of ARC Nucleases to be proposed to Gilead as Gilead

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ARC Nucleases other than site selection for the HBV Target, which shall be within Gilead's final decision-making authority; (b) the selection of specific [***] for any Licensed Products for [***] or such substitute [***] selected by the JSC; and (c) the selection of subcontractors for conducting activities assigned to Precision under the Collaboration R&D Plan other than those subcontractors performing "material" services in connection with the Collaboration R&D Plan, which subcontractors shall be subject to approval of the JSC pursuant to Section 4.3.2; *provided however,* that with respect to the foregoing (a), Precision shall timely (A) provide Gilead with such information based on which Precision makes its decisions with respect to such design, creation, and optimization of ARC Nucleases under the Collaboration R&D Plan in reasonable detail to enable Gilead to understand the reasons for such decisions, (B) reasonably respond to Gilead's questions relating thereto and (C) consider in good faith Gilead's feedback with respect to such decisions. Following the Collaboration Term, the JSC shall have no decision-making authority with respect to any matter arising under this Agreement and, for clarity, subject to the terms and conditions of this Agreement (including Section 3.4 and Section 4.5), Gilead shall have sole decision-making authority with respect to any matter relating to the Technology Transfer, Manufacture, Development or Exploitation of the Licensed Products.

2.3.4 **Limitations on Authority.** Each Party shall retain the rights, powers, and discretion granted to it under this Agreement and no such rights, powers, or discretion shall be delegated to or vested in a Joint Committee unless such delegation or vesting of rights is expressly provided for in this Agreement or the Parties expressly so agree in writing. No Joint Committee shall have the power to amend, modify, or waive compliance with this Agreement, which may only be amended or modified as provided in Section 11.10 or compliance with which may only be waived as provided in Section 11.10.

2.3.5 **Alliance Manager.** Each Party shall appoint a person(s) who shall oversee contact between the Parties for all matters between meetings of the Joint Committees and shall have such other responsibilities as the Parties may agree in writing after the Effective Date (each, an "**Alliance Manager**"). Each Party may replace its Alliance Manager at any time by notice in writing to the other Party.

ARTICLE 3
DEVELOPMENT AND REGULATORY

3.1 Collaboration Program. Subject to the terms and conditions of this Agreement, the Parties shall collaborate on a research and pre-clinical program to construct, optimize and develop one or more Gene Editing Therapy(ies) made using the ARCUS Technology that targets the HBV Target (the "**Collaboration Program**") and conduct the Development activities set forth in the collaboration research and development plan described in Section 3.2.1 (such plan, as amended from time to time, the "**Collaboration R&D Plan**"). The Collaboration Program shall commence on the Effective Date and will, unless otherwise mutually agreed by the Parties in writing, continue until the third anniversary of the Effective Date or, if earlier, the later of (a) acceptance by the FDA or other competent foreign Regulatory Authority of [***] of the first IND filing for the first Licensed Product and (b) the satisfactory

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completion (as mutually agreed upon by the Parties) of all tasks and activities required under the Collaboration R&D Plan ("**Initial Term**"); *provided that*, if either (a) or (b) has not occurred by the third anniversary of the Effective Date, Gilead, at its option, may extend the Initial Term (or then-current term, as the case may be) for one or more additional six (6) month periods until such time as the later of (a) and (b) has occurred, by serving a written notice(s) to Precision; *provided that*, Gilead pays to Precision the funding payment for such additional period(s) in accordance with Section 5.1 (the Initial Term together with any such extensions, the "**Collaboration Term**").

3.2 Collaboration R&D Plan.

3.2.1 **Initial Collaboration R&D Plan.** The initial Collaboration R&D Plan as agreed to by the Parties as of the date hereof, including the applicable Collaboration Budget, has been signed and acknowledged by each Party and copies of such signed document have been exchanged between the Parties concurrently with the execution of this Agreement.

3.2.2 **Amendments.** During the Collaboration Term, either Party, directly or through its representatives on the JRDC or the JSC, may propose any amendment to the Collaboration R&D Plan, including in light of changed circumstances, and, if the Collaboration Term is extended pursuant to Section 3.1, the Parties shall update the Collaboration R&D Plan to include such additional period(s). Any and all such amendments or updates shall be subject to approval by the JSC, subject to the dispute resolution procedures set forth in Section 2.3.3.

3.2.3 **Contents.** The Collaboration R&D Plan shall include, without limitation: (a) the Development activities to be conducted by each Party pursuant to the Collaboration Program; (b) Development goals; (c) the estimated timelines for such activities; (d) the anticipated costs of and resources for the Development activities, which shall, with respect to Precision's Development activities under the Collaboration R&D Plan, not exceed the Gilead Funding Commitment and shall reflect the FTE Rate and the payment schedule set forth in Section 5.1.1; and (e) the preliminary design parameters for pre-clinical studies to be performed under the Collaboration R&D Plan.

3.2.4 **Collaboration Budget.** With respect to each six-month period of the Collaboration Term, Precision shall propose to the JSC a Collaboration Budget for the performance of the activities in the Collaboration R&D Plan including required FTEs at the FTE Rate, materials, Third Party services and any other cost items. In addition, Precision will propose to the JSC an update to the Collaboration Budget to reflect any adjustments made to the Collaboration R&D Plan by the JSC; *provided however*, that the first Collaboration Budget shall be included in the initial Collaboration R&D Plan to be executed by the Parties contemporaneously with the execution of this Agreement, as described in Section 3.2.1. The Parties, through the JSC, shall use reasonable efforts to agree promptly on each proposed Collaboration Budget. For the avoidance of doubt, the Collaboration Budget must be mutually agreed by Precision and Gilead prior to conducting the relevant activities in the Collaboration Program and will not be subject to final decision-making authority of either Party under Section 2.3.3.

3.2.5 **Inconsistency.** If the terms of the Collaboration R&D Plan contradict, or create inconsistencies or ambiguities with, the terms of this Agreement, then the terms of this Agreement shall govern.

3.3 Performance of the Collaboration R&D Plan. Precision and Gilead shall each use Commercially Reasonable Efforts to carry out or to cause to be carried out the activities assigned to it under the Collaboration R&D Plan in good scientific manner, in compliance with all Applicable Law and in accordance with the timelines set forth therein, and shall, in particular, use Commercially Reasonable Efforts to perform the activities within the time periods set forth in the Collaboration R&D Plan. In the event of any delay in any payments required under Section 5.1.1 beyond the due date for such payment, and without limiting any right of Precision under Section 10.2, Precision may suspend performance of its activities assigned to it under the Collaboration R&D Plan for so long as such delay continues. Neither Party makes any representation, warranty or guarantee that the Development activities conducted under the Collaboration R&D Plan will be successful or that any particular result will be achieved.

3.4 Development Following Expiry of the Collaboration Term. Following expiry of the Collaboration Term, Gilead, at its sole cost, shall be solely responsible for the Development and other Exploitation of the Licensed Products throughout the Territory. Gilead shall provide to Precision an annual high-level summary (consistent with Section B of Schedule 3.8.3) prepared in good faith of its plans to Develop the Licensed Products. Gilead will use Commercially Reasonable Efforts to Develop and otherwise Exploit a Licensed Product in each of the Major Markets, and to comply with such plans, in accordance with the terms of this Agreement and in compliance with all applicable Laws. If Gilead and its Affiliates and Sublicensees have collectively permanently ceased all Development and other Exploitation of Licensed Products under this Agreement, Gilead shall deliver notice to Precision and such notice will be deemed a termination of this Agreement pursuant to Section 10.3.1.

3.5 Clinical Supply of the Licensed Products.

3.5.1 With respect to any Licensed Product developed under the Collaboration Program and specified in the Supply Agreement (and any such additional Licensed Products as the parties may mutually agree), until the later of the completion of a [***] for a Licensed Product and the completion of the Technology Transfer for such Licensed Product, Precision shall be solely responsible for manufacturing and supplying clinical supplies of such Licensed Product(s) ("**Supplied Product**") for use by or on behalf of Gilead under this Agreement, and thereafter Gilead shall assume all manufacturing and supply activities for such Licensed Product (including, for clarity, commercial manufacture and supply).

3.5.2 Within ninety (90) days of identifying the Gilead ARC Nucleases to be used in any Licensed Product, the Parties shall discuss in good faith and enter into (a) a reasonable and customary supply agreement pursuant to which Precision shall manufacture and supply and Gilead shall purchase Supplied Products incorporating such Gilead ARC Nucleases, for use in Clinical Studies and under which Gilead would purchase clinical requirements of such Licensed Products for a price equal to [***] of COGS (the "**Supply Agreement**") and (b) a reasonable and customary quality agreement that shall set forth the terms and conditions upon which Precision shall conduct its quality activities in connection with such supply (the "**Quality Agreement**"), in each case (a) and (b), in a form reasonably acceptable to Gilead and Precision.

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In the event that by [***] prior to the expected date of the first IND filing for the first Licensed Product the Parties do not mutually agree to the Supply Agreement and the Quality Agreement, Gilead shall have the right to require Precision to conduct an early Technology Transfer to Gilead or its designee so that Gilead or such designee can commence the Manufacture of the Licensed Products.

3.6 Technology Transfer.

3.6.1 Upon Gilead's request, and no later than upon the expiration of the Collaboration Term, Precision shall promptly disclose and transfer to Gilead such Precision Know-How and such Information that Precision Controls under the [***] In-License Agreements or other Third Party Licenses that are licensed to Gilead hereunder as is required pursuant to the Technology Transfer Plan; *provided that*, before the expiration of the Collaboration Term, Gilead shall only receive such Precision Know-How as is necessary or reasonably useful for Gilead to meet its obligations under the Collaboration R&D Plan or as the Parties may otherwise reasonably agree in good faith.

3.6.2 The Parties shall, no later than upon the expiration of the Collaboration Term, agree to a technology transfer plan with reasonable limitations on access to Precision personnel (including reasonable caps on hours of access) and facilities, for the full technology transfer of the Manufacture of the Licensed Products to any facility of Gilead or its designee, approved in advance in writing by Precision (such approval not to be unreasonably withheld, conditioned or delayed, and will not be required for facilities located in [***], including the transfer of all Precision Know-How relating to the Manufacture of the Supplied Products and any such Information that Precision Controls under the [***] In-License Agreements or other Third Party Licenses that may be obtained under this Agreement, in a form reasonably acceptable to the Parties ("**Technology Transfer Plan**"). Any further transfer by Gilead or its designee following the initial Technology Transfer shall be subject to the approval process set forth above in this Section 3.6.2. The Parties agree that ARCUS Technology will not be transferred to Gilead or its designee under this Agreement. Any disputes regarding the content of the Technology Transfer Plan shall be resolved in accordance with Section 2.3.3. Following expiration of the Collaboration Term, Precision shall conduct such technology transfer to Gilead or its designee in accordance with the Technology Transfer Plan (the "**Technology Transfer**"), under the oversight and guidance of the JTTT (if any).

3.6.3 Without limiting the foregoing, for a period of [***] following completion of the Technology Transfer Plan, upon Gilead's request made reasonably in advance of the commencement of anticipated Manufacture by Gilead, Precision shall provide Gilead or its designee with such Precision Know-How relating to the Manufacture of the Supplied Products supplemental to the Technology Transfer Plan (i.e., items inadvertently omitted from the Technology Transfer Plan) as is reasonably necessary for Gilead or its designee to commence the Manufacture of the Licensed Products as permitted by this Agreement and the Supply Agreement. For the avoidance of doubt, Gilead acknowledges that after the [***] period described in this Section 3.6.3, Precision shall have no obligation to provide Gilead any such additional support.

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3.6.4 In the event the Supply Agreement is entered into by the Parties pursuant to Section 3.5.2, the Supply Agreement shall remain in effect until the completion of the Technology Transfer and shall either cover the Parties' respective rights and obligations with respect to the Technology Transfer or the Parties will enter into a separate written technology transfer agreement.

3.6.5 All Technology Transfer responsibilities, costs and expenses of Precision and its Affiliates will be set forth in the Collaboration R&D Plan and Collaboration Budget and considered Development activities funded under Section 5.1.1, except for such activities conducted following filing of an IND for any Licensed Product. For any such post-IND activities, (a) Precision will [***] and (b) [***].

3.7 Regulatory Matters.

3.7.1 **Regulatory Activities.**

(a) As between the Parties, subject to Section 3.7.1(b) and Section 3.7.1(d), Gilead shall be responsible for (i) preparing and filing all Regulatory Documentation, including the IND filing for the first Licensed Product, (ii) obtaining and maintaining all Regulatory Approvals for the Licensed Products and (iii) conducting communications with the Regulatory Authorities for the Licensed Products. Gilead shall prepare and file all clinical Regulatory Documentation under the Collaboration Program, including the first IND filing for the first Licensed Product, in consultation with the JRDC.

(b) As between the Parties, during the Collaboration Term, Precision shall be responsible for preparing all non-clinical and chemistry, manufacturing and control (CMC) reports, in each case, as reasonably required by Gilead, for inclusion in the first IND filing for the first Licensed Products. Precision shall prepare all such reports, and provide Gilead with copies of any such reports, in each case, in a timely manner to permit Gilead to make such IND filing without delay, which shall then be discussed in consultation with the JRDC. Without limiting the foregoing, Precision shall support Gilead as may be reasonably necessary in connection with Gilead's preparation of clinical Regulatory Documentation under the Collaboration Program during the Collaboration Term pursuant to Section 3.7.1(a). The responsibilities, costs and expenses of Precision and its Affiliates under this Section 3.7.1(b) during the Collaboration Term will be set forth in the Collaboration R&D Plan and Collaboration Budget and considered Development activities funded under Section 5.1.1. Thereafter, for any such activities, (i) Precision will [***] and (ii) Gilead shall [***].

(c) All Regulatory Documentation generated under this Agreement, including in the course of conducting the Collaboration Program, shall be owned by Gilead and held in the name of Gilead (or its designee).

(d) Except as otherwise provided in the Supply Agreement or the Quality Agreement, with respect to each Licensed Product (i) Gilead shall have sole

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responsibility for attending all meetings (whether occurring in person, by telephone or other remote means) with applicable Regulatory Authorities; *provided that*, Gilead, where permitted by Applicable Law, shall permit a reasonable number of Precision employees to attend (A) each pre-IND meeting for the Licensed Product, (B) the end of phase 2 meeting for the Licensed Product with the FDA, and (C) any other meeting with FDA or EMA (or other competent Regulatory Authority in the United Kingdom) if such meeting has one or more items on the agenda directed toward the safety or delivery of ARC Nucleases; and (ii) Gilead shall have the sole right and responsibility to correspond with applicable Regulatory Authorities; *provided that*, Gilead, where permitted by Applicable Law, will provide draft communications with the FDA and EMA (or other competent Regulatory Authority in the United Kingdom) to Precision for review and comment to the extent it relates to the Gilead ARC Nuclease, the ARCUS Technology, ARCUS Assigned IP or any [***] to the extent licensed or sublicensed by Precision to Gilead, and will consider Precision's comments in good faith before submitting the communications to the FDA or EMA (or other competent Regulatory Authority in the United Kingdom). If either Party or its Affiliates or subcontractors receive any material written correspondence or other communication from the Regulatory Authorities in the Major Markets regarding (x) in the case of Precision as the Party receiving such correspondence from the Regulatory Authorities, the Licensed Products or any components thereof, or (y) in the case of Gilead as the Party receiving such correspondence from the Regulatory Authorities, the Gilead ARC Nuclease, any [***] in-licensed by Precision or the ARCUS Technology or ARCUS Assigned IP, such Party shall provide the other Party with access to or copies of all such material written or electronic correspondence promptly after its receipt.

3.7.2 **Pharmacovigilance.** To the extent safety reporting is required by Applicable Law, upon the request of either Party, the Parties shall enter into an agreement to cover the exchange of adverse event safety data in a mutually agreed format in order to monitor the safety of the Licensed Products and to meet reporting requirements with any applicable Regulatory Authority.

3.8 Records and JSC Reporting.

3.8.1 Precision shall, and shall ensure that its subcontractors shall, maintain records in sufficient detail and in good scientific manner appropriate for patent and regulatory purposes, and in compliance with Applicable Law, which shall be complete and accurate and shall properly reflect all work done and results achieved in the performance of its Development activities under the Collaboration Program which shall record only such activities and shall not include or be commingled with records of activities outside the scope of this Agreement. Such records shall be retained by Precision for at least [***] after the expiration or termination of this Agreement, or for such longer period as may be required by Applicable Law. Upon the request of Gilead, Precision shall provide copies of the records it has maintained pursuant to this Section 3.8.1 to Gilead. Gilead shall maintain such records and the information disclosed therein in confidence in accordance with ARTICLE 7.

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3.8.2 Gilead shall have the right, during normal business hours and upon reasonable notice not more than twice annually during the Collaboration Term without Precision's consent (not to be unreasonably withheld, conditioned or delayed), to inspect and copy all records of Precision maintained pursuant to Section 3.8.1, which may at Gilead's reasonable request, be at Precision's facilities, or as permitted by Precision's agreements with its subcontractors, at the facilities of any such subcontractor. Gilead shall maintain such records and the information disclosed therein in confidence in accordance with ARTICLE 7.

3.8.3 At each JSC meeting during the Collaboration Term, each Party's members on the JSC shall provide a written report to the JSC of its activities with respect to the Collaboration Program conducted since the last JSC meeting, including a reasonable summary of the results of such activities and the progress of the Collaboration Program. In addition, Precision will provide Gilead with a semi-annual report summarizing its activities under the Collaboration Program, which report shall be in the form set forth on Schedule 3.8.3 and shall include disclosure of Precision Know-How required by Section 6.1.1 that has not been previously disclosed. The JSC may request of a Party any such additional written reports describing its activities with respect to the Collaboration Program, as it determines necessary or useful in its discretion.

3.8.4 Without limiting any other rights of Precision hereunder, in the event a Regulatory Authority requests, in connection with a request to obtain regulatory approval for a product (other than a Licensed Product) containing an ARC Nuclease (other than a Gilead ARC Nuclease) that Precision provide clinical data Controlled by Gilead or any of its Affiliates or Sublicensees relating to (a) the safety of (i) the ARCUS Technology generally, or (ii) ARCUS Assigned IP, or (b) if relevant to such other product, a Gilead ARC Nuclease or its delivery, Precision may request that Gilead provide such information within Gilead's Control (and Gilead will use Commercially Reasonable Efforts to obtain and provide such information from its Sublicensees) to Precision solely for use in response to such Regulatory Authority's request with respect to such other product and Gilead shall promptly provide such information for provision to such Regulatory Authority.

3.8.5 Without limiting any other rights of Gilead hereunder, in the event a Regulatory Authority requests, in connection with a request to obtain Regulatory Approval for a Licensed Product, that Gilead provide clinical data Controlled by Precision or any of its Affiliates or sublicensees relating to (a) the safety of the Gilead ARC Nuclease or its delivery, or (b) if relevant to a Licensed Product, a Gilead ARC Nuclease or its delivery, Gilead may request that Precision provide such information to Gilead solely for use in response to such Regulatory Authority's request with respect to the Licensed Product and Precision shall promptly provide such information within Precision's Control (and will use Commercially Reasonable Efforts to obtain and provide such information from its sublicensees) for provision to such Regulatory Authority.

ARTICLE 4
GRANT OF RIGHTS AND COVENANTS

4.1 Grants to Gilead. Subject to the terms and conditions of this Agreement and continuing unless and until terminated pursuant to ARTICLE 10, Precision hereby grants to Gilead:

4.1.1 a worldwide, royalty-bearing, non-transferable (except pursuant to Section 11.3), exclusive license (or sublicense, as the case may be), with the right to grant sublicenses in accordance with Section 4.3, under the Precision IP, [***] (subject to Section 4.1.3) and Precision's interest in the Joint Collaboration Program IP, to Exploit the Licensed Products (including the Gilead ARC Nucleases incorporated in or for incorporation into a Licensed Product) in the Field in the Territory, including to perform its Development activities under the Collaboration R&D Plan; and

4.1.2 a worldwide, royalty-bearing, non-transferable (except pursuant to Section 11.3), non-exclusive license, with the right to grant sublicenses in accordance with Section 4.3, under the ARCUS IP, to the extent necessary for Gilead to Exploit the Licensed Products (including the Gilead ARC Nucleases incorporated in or for incorporation into a Licensed Product) in the Field in the Territory.

4.1.3 The license under Section 4.1.1 with respect to [***] shall be (A) effective only upon execution of the applicable [***] license granted to Precision, and (B) exclusive solely as between the Parties. Any licenses granted by Precision under Section 4.1.1 under any [***] license are subject to and limited by any limitation, restriction or additional terms set forth in the agreement under which Precision or its Affiliates obtained rights under such [***] license from such Third Party. Precision shall (i) use Commercially Reasonable Efforts to ensure the terms of such license (a) confer IP Rights sufficient to grant the license to Gilead under Section 4.1.1, (b) do not result in any material expansion of Gilead's obligations under this Agreement, and (c) do not require Gilead to make any additional representations or warranties or to provide any additional indemnities materially different from those set forth herein, and (ii) disclose to Gilead in writing all terms of such agreement which materially limit or otherwise materially impact Gilead's rights or obligations with respect to such [***]. In connection with such disclosure of terms, and prior to entering into any such license, Precision shall provide Gilead reasonable opportunities to review and comment on the draft during negotiations of the draft with the applicable Third Party (which may be reasonably redacted by Precision, including to redact provisions relating to financials, IP Rights not relevant to this Agreement, and targets not relevant to this Agreement), reasonably consider any comments made by Gilead and provide to Gilead a copy of the unexecuted final version of such redacted agreement no later than [***]. Upon receipt of such unexecuted final version, Gilead may elect by written notice to Precision to (1) accept inclusion of the IP Rights licensed to Precision under such agreement in the licenses granted to Gilead herein or (2) reject such inclusion in good faith, in which case, for clarity, Gilead may enter into a license for such [***] or similar [***] directly with the applicable licensor in accordance with Section 5.4.3(b). In the event Gilead elects to accept such license entered into by Precision, Gilead shall comply with the terms or obligations, as disclosed to Gilead in writing in such unexecuted final version shared with Gilead pursuant to the above prior to Gilead's election pursuant to the immediately preceding sentence, that Precision is required to impose under any such agreement for [***]. Precision shall make Commercially Reasonable Efforts to ensure that the license rights to [***] will include rights for Gilead to modify or improve such technology. Gilead acknowledges that, notwithstanding Precision making such Commercially Reasonable Efforts, the license rights to [***] may not

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include rights for Gilead to modify or improve such technology, or if such rights are included, such rights may be subject to allocation of IP Rights in such modifications or improvements that differ from those contained in this Agreement. For the sake of clarity, if Gilead has accepted its inclusion as set forth above, upon execution the [***] licensed by Precision under the [***] In-License Agreements will fall within the scope of licenses set forth in Section 4.1.1.

4.2 Grants to Precision. Subject to the terms and conditions of this Agreement, Gilead (on behalf of itself and its Affiliates) hereby grants to Precision:

4.2.1 a worldwide, fully paid-up, royalty-free, non-exclusive license, with the right to grant sublicenses to subcontractors (that have been, if required, approved by Gilead) in accordance with Section 4.3, under the Gilead Dual IP, Gilead Patents and Gilead Know-How (but Gilead shall not be required to disclose any Know-How except as otherwise specifically provided herein), to perform, or have performed by such subcontractors, its Development activities under the Collaboration R&D Plan during the Collaboration Term; and

4.2.2 [***].

4.3 Sublicensing and Subcontracting.

4.3.1 Gilead shall have the right: (a) to grant sublicenses under Section 4.1 through multiple tiers of sublicenses to any Affiliate or Third Party; and (b) to subcontract to any Affiliate or Third Party the performance of any of its obligations under this Agreement. Notwithstanding the foregoing, during the Collaboration Term Gilead shall not grant any sublicenses to a Third Party with respect to any Development of a Licensed Product in or for a Major Market without Precision's prior written consent. Gilead shall provide Precision with written notice of any sublicense under this Agreement within [***] after its execution. [***].

4.3.2 Precision shall have the right: (a) to subcontract any of its Development activities under the Collaboration Program to any Affiliate or Third Party; (b) to grant sublicenses under Section 4.2.1 to its subcontractors; and (c) subject to the last sentence of this Section 4.3.2, to grant sublicenses under Section 4.2.2 through multiple tiers of sublicenses to any Affiliates or Third Parties; *provided however*, Precision shall only subcontract activities or services under the Collaboration Program that are designated as "material" in the Collaboration R&D Plan to a vendor that has not been pre-approved by Gilead in the Collaboration R&D Plan after receiving written consent from Gilead, such consent not to be unreasonably withheld, conditioned or delayed. Precision shall provide Gilead with written notice of any sublicense it grants under any issued or published Patents, or Patents that have otherwise been disclosed to Precision, in each case licensed by Gilead to Precision under Section 4.2.2 within [***] after Precision is aware that it has sublicensed such a Patent of Gilead's. In the event Gilead denies consent for such subcontracting, then if Precision requests a recommendation from Gilead for an alternative subcontractor, Gilead shall provide to Precision the name and contact information of at least one subcontractor approved for the conduct of the applicable activity or service within

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[***] of Precision's request for consent. Notwithstanding anything to the contrary in this Agreement, Precision's right to sublicense under clause (c) above shall be subject to Gilead's prior written consent if [***].

4.3.3 Each sublicense or subcontract agreement entered into by a Party under this Section 4.3 shall be consistent with the applicable terms and conditions of this Agreement, including the confidentiality provisions of ARTICLE 7 and the intellectual property provisions of ARTICLE 6, and the applicable Party shall be fully responsible for any breach of this Agreement by any of its Affiliates, Sublicensees or subcontractors. In addition, to the extent required by the Cellectis Agreement, each sublicense granted by Gilead under any Precision Patent must grant the same scope of rights for all Precision Patents and each sublicense granted by Gilead under any ARCUS Patent must grant the same scope of rights for all ARCUS Patents.

4.4 Retention of Rights. Subject to Section 4.5, Precision retains the right to (a) practice the Precision IP and its interest in the Joint Collaboration Program IP to exercise its rights and perform its obligations under this Agreement (in each case in a manner consistent with this Agreement), including the Collaboration Program, and under any Supply Agreement or Quality Agreement, (b) conduct research related to the ARCUS Technology and ARCUS Assigned IP; and (c) practice and license ARCUS Patents, ARCUS Assigned IP, Precision Patents and Precision Know-How outside the scope of the licenses granted to Gilead under Section 4.1.1. Gilead hereby retains the right to practice all intellectual property licensed by Gilead to Precision under this Agreement for any and all purposes. Except as set forth herein, neither Party shall acquire any license or other intellectual property interest, by implication or otherwise, under or to any trademarks, patents or patent applications, Information, or other IP Rights owned or Controlled by the other Party. Neither Party grants to the other Party any rights, licenses or covenants in or to any IP Rights, whether by implication, estoppel, or otherwise, other than the license rights that are expressly granted under this Agreement. Each Party shall not, and shall not permit any of its Affiliates or Sublicensees to, practice any Patents or Information licensed to it by the other Party outside of the scope of the license granted to it under this Agreement (other than such practices as would be otherwise permitted by applicable safe harbors under Applicable Law). Without limiting the foregoing, nothing in this Agreement shall be deemed to grant Gilead any right to access or receive any ARCUS Technology or any right to design, create, select, or optimize any ARC Nucleases using the ARCUS Technology or to otherwise use the ARCUS Technology as a genome engineering tool. Except as expressly set forth in this Article 4, the foregoing licenses from Precision to Gilead do not include any rights under the ARCUS Patents or ARCUS Technology. Neither Party grants hereunder any rights with respect to other products or therapies with which a Licensed Product may be combined.

4.5 Exclusivity.

4.5.1 The Parties acknowledge both their possession of confidential or proprietary information and the highly competitive nature of the industry in which they operate and, accordingly, agree that, in consideration of entering into this Agreement and the promises contained herein, in the Territory, [***] Precision shall not, during the Term [***] (a) conduct, participate in, or enable or directly fund, [***] other than [***] in accordance with this

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Agreement, or (b) license, authorize, or appoint or otherwise enable any Third Party (other than subcontractors to the extent permitted herein) to engage in any of the activities set forth in clause (a) of this Section 4.5.1. Notwithstanding the foregoing, in no event shall [***] be prohibited or otherwise restricted by this Section 4.5.1 from engaging in, directly or indirectly, or funding or otherwise enabling, [***]. Each Party acknowledges and agrees that (A) this Section 4.5 has been negotiated by the Parties, (B) the geographical and time limitations on activities set forth in this Section 4.5 are reasonable, valid and necessary in light of the Parties' circumstances and necessary for the adequate protection of the business of Exploiting the Licensed Products and (C) [***]. If, notwithstanding the foregoing, a court of competent jurisdiction determines that the restrictions set forth in this Section 4.5 are too broad or otherwise unreasonable under Applicable Law, including with respect to duration, geographic scope or space, the court is hereby requested and authorized by the Parties to revise this Section 4.5 to include the maximum restrictions allowable under Applicable Law.

4.5.2 Notwithstanding anything to the contrary in this Agreement, the restrictions on Precision set forth in Section 4.5.1 shall not apply to any Acquirer of Precision [***].

4.5.3 Notwithstanding Section 4.5.1, [***] acquires a Competitor, continuation of the relevant Competitive Program(s) shall not be a breach of this Agreement; *provided that* (i) [***], and (ii) [***].

4.6 Existing In-License Agreements.

4.6.1 **Cellectis Patents.** Gilead acknowledges and agrees that rights under certain ARCUS Patents and/or Precision Patents are licensed to Precision by Cellectis S.A. (the "**Cellectis Patents**") under that certain Patent Cross-License Agreement between Cellectis S.A. and Precision dated January 23, 2014 (the "**Cellectis Agreement**"), and, notwithstanding any exclusive license granted to Gilead under this Agreement, (a) Cellectis S.A. retains rights under the Cellectis Patents and is not restricted from granting rights to Third Parties under the Cellectis Patents, (b) any licenses and rights granted by Precision to Gilead under the Cellectis Patents are granted only within the permissible scope of sublicenses granted under the Cellectis Agreement, and (c) pursuant to the Cellectis Agreement, Cellectis S.A. retains non-exclusive rights under certain ARCUS Patents and/or Precision Patents identified in the Cellectis Agreement, which may be further sublicensed by Cellectis S.A. without Precision control or consent. Gilead acknowledges and agrees that any exercise of any right by Cellectis S.A, or by any Third Party through Cellectis S.A, under the Cellectis Agreement shall not constitute a breach of this Agreement by Precision.

4.6.2 **Duke IP.** Gilead acknowledges and agrees that any licenses and rights granted by Precision to Gilead under the Duke IP are granted subject to the terms and conditions of the Duke Agreement, including Duke's right to practice under the Duke IP for its own internal, non-commercial, educational, research and clinical purposes, and subject to the rights of the United States Government and applicable limitations under 37 C.F.R. § 401, Public Law 96-517 and Public Law 98-620 resulting from the United States Government's funding of

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research leading to creation of the Duke IP. Without limiting the foregoing, Gilead agrees to comply with any obligations resulting from such government rights with respect to its practice of the Duke IP (if any) under this Agreement. Duke shall be a third party beneficiary of the Agreement to the extent its terms and conditions apply or relate to the Duke IP.

4.7 Preservation of Existing In-License Agreements and [***] **In-License Agreements.** To the extent relating to the Gilead ARC Nucleases or the Licensed Products, Precision shall, and shall procure that its Affiliates shall, maintain all licenses to all [***], including the Existing In-License Agreements and any [***] In-License Agreements, in full force and effect in accordance with their terms and conditions and keep Gilead reasonably informed in this regard. Without limiting the foregoing and Section 5.4.9, Precision shall not (a) commit any acts or permit the occurrence of any omissions that would cause breach or termination of any license to [***], including Existing In-License Agreements or any [***] In-License Agreements or (b) amend or otherwise modify or permit to be amended or modified, any license to [***], including the Existing In-License Agreements or any [***] In-License Agreements, in any way that would prejudice Gilead's rights under this Agreement or its ability to continue to Exploit Licensed Products.

ARTICLE 5
PAYMENTS AND RECORDS

5.1 Payments during the Collaboration Program.

5.1.1 **Payments.** In consideration of Precision's agreement to perform its Development activities under the Collaboration R&D Plan, Gilead shall pay Precision (a) [***] for the first six (6) month period of the Collaboration Term, (b) [***] for the second six (6) month period of the Collaboration Term and (c) [***] for each six month period of the Collaboration Term thereafter (in aggregate, the "**Gilead Funding Commitment**"); *provided that*, (i) if the Collaboration Budget at any time is less than the Gilead Funding Commitment for any six-month period, then Precision shall hold the difference for use later in the Collaboration Term if required based on the Collaboration Budget (i.e. if the Collaboration Budget exceeds the Gilead Funding Commitment for a six month period), and (ii) if the Collaboration Budget at any time exceeds the Gilead Funding Commitment for any six-month period, then after application of any amounts held by Precision under clause (i) Gilead shall pay Precision the difference in the then-current period as an advance from later portions of the Gilead Funding Commitment in the Collaboration Term. For clarity, the aggregate Collaboration Budget for the entire Collaboration Term shall not exceed the aggregate Gilead Funding Commitment without the written consent of both Parties.

5.1.2 **Invoicing.** On the Effective Date, Precision shall issue to Gilead an invoice for the first [***] tranche referred to in Section 5.1.1 and Gilead shall pay such tranche to Precision within [***] of receipt of invoice by Gilead. Thereafter Precision shall issue

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an invoice for each [***] tranche or [***] tranche, as applicable, referred to in Section 5.1.1 at least [***] in advance of the relevant six (6) month period. All invoices described in the immediately preceding sentence or this Section 5.1.2 shall be due within [***] of receipt by Gilead. Invoices shall be in accordance with the template set forth on Schedule 5.1.2.

5.2 Development and Regulatory Milestones.

5.2.1 In partial consideration of the rights granted under this Agreement and subject to Section 5.2.2 below, Gilead shall pay to Precision the following one-time milestone payments after the achievement of the following corresponding milestone events with respect to the first Licensed Product to achieve the applicable milestone in the Territory during the Term. Gilead shall notify Precision in writing no later than [***] following the achievement of a milestone event and shall pay to Precision the milestone payment corresponding to such milestone event [***] of receipt of an invoice from Precision.

Development and Regulatory Milestone Event	**Milestone Payment**
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
[***]	[***]
Maximum total:	[***]

5.2.2 Each milestone payment in Section 5.2.1 shall be payable only upon the first achievement of such milestone and no amounts shall be due for subsequent or repeated achievements of such milestone, whether for the same or a different Licensed Product. The maximum aggregate amount payable by Gilead pursuant to Section 5.2.1 is [***].

5.3 Commercial Milestones.

5.3.1 In partial consideration of the rights granted hereunder and subject to Section 5.3.2 below, Gilead shall pay to Precision the following one-time milestone payments after the achievement of the following milestone events with respect to the first occurrence of the Licensed Products achieving the milestone in the Territory during the Term (including any wind-down period following the end of the Term). Gilead shall notify Precision in writing no later than [***] following the end of the Calendar Quarter in which the commercial milestone event occurs and shall pay to Precision the milestone payment corresponding to such milestone event within [***] of receipt of an applicable invoice from Precision.

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Commercial Milestone Event	Milestone Payment
The first time aggregate global Net Sales of Licensed Products in a Calendar Year are equal to or greater than [***] and less than [***]	[***]
The first time aggregate global Net Sales of Licensed Products in a Calendar Year are equal to or greater than [***] and less than [***]	[***]
The first time aggregate global Net Sales of Licensed Products in a Calendar Year are equal to or greater than [***] and less than [***]	[***]
The first time aggregate global Net Sales of Licensed Products in a Calendar Year are equal to or greater than [***]	[***]
Maximum total:	[***]

5.3.2 Each milestone payment in Section 5.3.1 shall be payable only once upon the first achievement of such milestone and no amounts shall be due for subsequent or repeated achievements of such milestone. The maximum aggregate amount payable by Gilead pursuant to Section 5.3.1 is [***].

5.3.3 For the avoidance of doubt, for the purposes of this Section 5.3, all Net Sales of Licensed Products shall be aggregated globally for all sales made by Gilead or any of its Affiliates or Sublicensees in any and all forms, presentations, delivery systems, dosages, and formulations for purposes of determining whether the above Net Sales thresholds have been achieved. For clarity, all Licensed Products shall be aggregated for the purposes of this Section 5.3 even if they do not have the same Active Components as one another.

5.4 Royalties.

5.4.1 In partial consideration of the rights granted hereunder and subject to Sections 5.4.2 through 5.4.8, during the applicable Royalty Term, on a Licensed Product-by-Licensed Product and country-by-country basis, Gilead shall pay to Precision royalties on the Net Sales of such Licensed Product at the rates set forth below, as determined by the aggregate annual global Net Sales of all Licensed Products in the Licensed Product Family for such Licensed Product:

Annual Global Net Sales of the Applicable Licensed Product	Royalty Rate
For the portion of Net Sales of such Licensed Product Family in the Territory in any given Calendar Year that is less than [***]	[***]
For the portion of Net Sales of such Licensed Product Family in the Territory in any given Calendar Year that is equal to or greater than [***] and less than [***]	[***]

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Annual Global Net Sales of the Applicable Licensed Product	Royalty Rate
For the portion of Net Sales of such Licensed Product Family in the Territory in any given Calendar Year that is equal to or greater than [***] and less than or equal to [***]	[***]
For the portion of Net Sales of such Licensed Product Family in the Territory in any given Calendar Year that is greater than [***]	[***]

5.4.2 [***]:

5.4.3 **Third Party Licenses.** With respect to the Exploitation of any Licensed Product under this Agreement, and without prejudice to any other right of each Party, Gilead and Precision may obtain licenses from Third Parties for any rights for the Exploitation of any Licensed Product in accordance with the following provisions of this Section 5.4.3 (each, a "**Third Party License**"):

(a) If during the Collaboration Term, either Party considers that a license(s) to additional technology, including [***], or IP Rights of a Third Party are necessary or reasonably useful to Develop, Manufacture or otherwise Exploit a Licensed Product under this Agreement, such Party may refer the matter to the JSC for discussion. If the JSC concludes that such a Third Party License is required or reasonably useful, the Parties shall negotiate in good faith which Party shall enter into the Third Party License and the allocation between the Parties of responsibility for the costs and expenses of obtaining such Third Party License, including any royalty reductions under the payments otherwise payable to Precision under Section 5.4.1. Notwithstanding the foregoing, after the Collaboration Term, if rights to Patents controlled by any Third Party cover or claim the applicable Licensed Product or its Manufacture, then Gilead may negotiate and obtain a Third Party License from such Third Party for Gilead, its Affiliates or Sublicensees to Exploit such Licensed Product in such country in accordance with this Agreement. If, pursuant to this Section 5.4.3(a), Gilead has obtained a Third Party License, and owes a royalty under such Third Party License for sales of a Licensed Product in a particular country, then Gilead shall have the right to reduce the royalty payments otherwise payable to Precision under Section 5.4 based on such sales by up to [***] of such payments under such Third Party License; *provided that*, no royalty payment to Precision for a Licensed Product hereunder shall be reduced, pursuant to this Section 5.4.3(a), to less than [***] of the royalty payment that would otherwise be due to Precision in the absence of a reduction pursuant to this Section 5.4.3(a).

(b) Notwithstanding Section 5.4.3(a) above, Precision shall be responsible for obtaining any licenses from Third Parties to Gilead ARC Nuclease delivery technology, including [***], used in the Collaboration Program in the Licensed Products ("[***]"), [***], and following the execution of any such Third Party License shall notify Gilead promptly of the same. Precision shall not incorporate or use any such [***] in the Manufacture

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of the Licensed Products unless Precision has the right to sublicense such [***] to Gilead consistent with Section 4.1.3 and transfers such [***] to Gilead as set forth in Section 3.6.2. In the event Precision fails to obtain a Third Party License with respect to the [***] that Precision uses in the Collaboration Program in the Licensed Products, or fails to so transfer such [***], or if the terms of such proposed Third Party License as disclosed under Section 4.1.3 are not acceptable to Gilead, then Gilead may do so independently and may in such case [***].

(c) For clarity, to the extent an agreement includes rights with respect to any active therapeutic ingredient, having a different mode of action than the Gilead ARC Nuclease or a different active component than the Gilead ARC Nuclease, it is not a Third Party License.

5.4.4 **No Valid Claim.** In the event that, at the time a Licensed Product is sold in a country, there is no Valid Claim in such country with respect to such Licensed Product and the Regulatory Exclusivity Period has expired in such country with respect to the Licensed Product but the Royalty Term remains in effect, then for the purposes of calculating the royalties owed based on the sale of such Licensed Product in such country under Section 5.4.1 at that time, in such country the royalties that would otherwise be owed and payable under Section 5.4.1 based on such sale shall be reduced by [***]. The calculation of the royalty reduction under this Section 5.4.4 shall be conducted separately for each Licensed Product.

5.4.5 **Biosimilar Products.** On a Licensed Product-by-Licensed Product basis, if in any country in the Territory during the Royalty Term for a Licensed Product a Biosimilar Product launches with respect to such Licensed Product in such country, then the royalties that would otherwise be owed and payable under Section 5.4.1 for the Net Sales of such Licensed Product in such country shall be reduced by [***], from the date of launch of such Biosimilar Product in such country until the end of the Royalty Term for such Licensed Product in such country. In the event that Gilead does not learn of such launch until after royalties are paid, Gilead shall be entitled to such adjustment retroactively to such launch date in the form of a credit against future royalty obligations of Gilead under this Agreement.

5.4.6 **Royalty Floor.** Under no circumstances will the application of the reductions in Section 5.4.3, Section 5.4.4 and Section 5.4.5 together ever result in a reduction of the royalties payable by Gilead to Precision to less than [***] of the amounts specified in Section 5.4.1.

5.4.7 **Compulsory Licensing; Generic Sublicensees.** If a Regulatory Authority requires Gilead or any of its Affiliates or Sublicensees to grant a compulsory license to a Third Party permitting such Third Party to make and sell a Licensed Product in a country in the Territory, or Gilead sublicenses to a Generic Sublicensee, then all amounts received from the compulsory licensee in consideration for grant of the license and received from the Generic Sublicensee in consideration for the sublicense, including any royalties so received, shall be [***]. For the avoidance of doubt, the reductions in Section 5.4.3, Section 5.4.4 and Section 5.4.5 shall not apply to reduce amounts payable to Precision pursuant to this Section 5.4.7.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

5.4.8 **Patent Challenge.** [***]

5.4.9 **Payments under Existing In-License Agreements and** [***] **In-License Agreements.** The Parties acknowledge and agree that, without limiting the right of Gilead to take a license to [***] set forth in Section 5.4.3(b), Precision shall be solely responsible for, and shall promptly discharge, any and all payments payable pursuant to the Existing In-License Agreements and [***] In-License Agreements. Notwithstanding anything in this Agreement to the contrary, in the event Precision terminates any of the Existing In-License Agreements and therefore Gilead enters into a license directly with the licensor or otherwise makes payments pursuant to any of the Existing In-License Agreements in order to maintain its rights as a sublicensee under such Existing In-License Agreement, [***].

5.4.10 **Royalty Payments and Reporting.** Gilead shall calculate all amounts payable to Precision pursuant to Section 5.4.1 at the end of each Calendar Quarter. Gilead shall pay to Precision the royalty amounts due with respect to a given Calendar Quarter within [***] after the end of such Calendar Quarter. Each payment of royalties due to Precision shall be accompanied by a statement of the amount of gross sales and Net Sales (including applicable deductions) of each Licensed Product, in each country of the Territory during the applicable Calendar Quarter (including such amounts expressed in local currency and as converted to Dollars), a calculation of the amount of royalty payment due on such Net Sales for such Calendar Quarter, and details on the determination of incremental royalty rates including the aggregation of Licensed Products into Licensed Product Families.

5.5 Mode of Payment. All payments to Precision under this Agreement shall be made by deposit of Dollars in the requisite amount to the following bank account of Precision or such other account as Precision may from time to time designate by notice to Gilead:

[***]

ACCOUNT NAME: [***]

5.6 Currency. For the purpose of calculating any sums due under, or otherwise reimbursable pursuant to, this Agreement (including the calculation of Net Sales expressed in currencies other than Dollars), Gilead shall convert any amount expressed in a foreign currency into Dollars equivalents using its, its Affiliate's or Sublicensee's standard conversion methodology consistent with GAAP.

5.7 Taxes.

5.7.1 A Party making payments to the other Party under this Agreement shall make such payments without deduction or withholding for taxes except to the extent that any such deduction or withholding is required by Applicable Law in effect at the time of payment.

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5.7.2 Any tax required to be withheld on amounts payable under this Agreement shall promptly be paid by the applicable paying Party on behalf of the other Party to the appropriate governmental authority or Regulatory Authority, and such paying Party shall furnish the other Party with proof of payment of such tax within [***]. Any such tax required to be withheld shall be an expense of and borne by such other Party.

5.7.3 The Parties shall cooperate with respect to all documentation required by any taxing authority or reasonably requested by either Party to secure a reduction in the rate of applicable withholding taxes.

5.7.4 If the applicable paying Party had a duty to withhold taxes in connection with any payment it made to the other Party under this Agreement but such paying Party failed to withhold, and such taxes were assessed against and paid by such paying Party, then the other Party shall indemnify and hold harmless such paying Party from and against such taxes (including interest, but not including any related penalties). If such paying Party makes a claim under this Section 5.7.4, it shall comply with the obligations imposed by Section 5.7.2 as if such paying Party had withheld taxes from a payment to the other Party.

5.7.5 Notwithstanding the foregoing, if Gilead assigns its rights and obligations hereunder to an Affiliate or successor pursuant to Section 11.3, and if such Affiliate or successor shall be required by applicable law to withhold any additional nonrecoverable taxes from or in respect of any amount payable under this Agreement as a result of such assignment, then any such amount payable under this Agreement shall be increased to take into account the additional taxes withheld so that, after making all required withholdings, Precision receives an amount equal to the sum it would have received had no such assignment been made.

5.8 Financial Records. Gilead shall, and shall cause its Affiliates and Sublicensees to, keep complete and accurate books and records pertaining to its gross sales and Net Sales of the Licensed Products, in sufficient detail to calculate all amounts payable hereunder and to verify compliance with its obligations under this Agreement. Such books and records shall be retained by Gilead and its Affiliates and Sublicensee until the later of (a) three (3) years after the end of the period to which such books and records pertain, and (b) the expiration of the applicable tax statute of limitations (or any extensions thereof), or for such longer period as may be required by Applicable Law.

5.9 Audit. At the request of Precision, Gilead shall, and shall cause its Affiliates and Sublicensees to, permit an independent auditor designated by Precision and reasonably acceptable to the Gilead, at reasonable times and upon reasonable notice, to audit the books and records maintained by Gilead pursuant to Section 5.8 to ensure the accuracy of all reports and payments made hereunder. Such examinations may not (a) be conducted for any Calendar Quarter more [***] after the end of such Calendar Quarter, (b) be conducted more than [***] or (c) be repeated for any Calendar Quarter. Except as provided below, the cost of this audit shall be borne by the Precision, unless the audit reveals a variance of more than [***] from

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the reported amounts, in which case Gilead shall bear the cost of the audit. If such audit concludes that (x) the amount Gilead paid to the Precision for a given period exceeded the amount that was payable to Precision, then Precision shall reimburse Gilead for such variance within [***] of the date on which such audit was completed by Precision, or (y) the amount Gilead paid to the Precision for a given period was less than the amount that was payable to Precision, Gilead shall reimburse Precision for such variance within [***] after the date on which such audit is completed by Precision.

5.10 Confidentiality. The auditing party shall treat all information subject to review under Sections 5.8 and 5.9 in accordance with the confidentiality provisions of ARTICLE 7.

ARTICLE 6
INTELLECTUAL PROPERTY

6.1 Ownership of Intellectual Property.

6.1.1 **Ownership of Arising IP; Disclosure.** As between the Parties, subject to Sections 6.1.2 and 6.1.3, each Party shall own and retain all right, title and interest in and to any and all Information that is conceived, discovered, developed or otherwise made by or on behalf of such Party or its Affiliates under this Agreement, and any and all Patents and other IP Rights with respect thereto. Gilead shall promptly disclose to Precision in writing during the Collaboration Term and shall cause its Affiliates and make Commercially Reasonable Efforts to cause its Sublicensees to so disclose during the Collaboration Term, the conception, discovery, development or making of any Gilead Dual Know-How described in clause (a) of the definition of Gilead Dual Know-How, and shall make available to Precision, in the form that Gilead has available (including by providing copies thereof), all such Gilead Dual Know-How in connection with each JSC meeting. During the Collaboration Term, Precision shall disclose to Gilead in writing and shall cause its Affiliates and make Commercially Reasonable Efforts to cause its sublicensees to so disclose, the conception, discovery, development or making of any Precision Know-How described in clause (a) of the definition of Precision Know-How and shall make available to Gilead, in the form that Precision has available (including by providing copies thereof), all such Precision Know-How, in connection with each JSC Meeting and semi-annual report described in Section 3.8.3. Within [***] following the end of the Collaboration Term, each Party shall disclose to the other Party in writing any additional Gilead Dual Know-How or Precision Know-How required to be disclosed by this Section 6.1.1 that has not previously been disclosed pursuant to this Section 6.1.1.

6.1.2 **Ownership of ARCUS Assigned IP;** [***]**.**

(a) [***]

(b) [***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

6.1.3 **Ownership of Joint Collaboration Program IP.** As between the Parties, each Party shall own an equal, undivided interest in any and all:

(a) Information which is conceived, discovered, developed or otherwise made jointly by or on behalf of Gilead or its Affiliates, on the one hand, and Precision or its Affiliates or subcontractors, on the other hand, in the performance of the Collaboration Program [***] ("**Joint Collaboration Program Know-How**"); and

(b) Patents that claim or cover the Joint Collaboration Program Know-How ("**Joint Collaboration Program Patents**") or any other IP Rights with respect to the Joint Collaboration Program Know-How.

Subject to the license granted under Sections 4.1.1, the Parties' obligations under Section 4.5, and the payment obligations in ARTICLE 5, each Party shall have the right to Exploit the Joint Collaboration Program Know-How and the Joint Collaboration Program Patents without a duty of seeking consent or accounting to the other Party; *provided however,* that [***]. Each Party shall promptly disclose to the other Party in writing and shall cause its Affiliates to so disclose, the conception, discovery, development or making of any Joint Collaboration Program Know-How or Joint Collaboration Program Patents by or on behalf of such Party or its Affiliates and shall make available to the other Party, in whatever form such other Party may reasonably request (including by providing copies thereof), all such Joint Collaboration Program Know-How within ten (10) Business Days of such generation.

6.1.4 **Assignment Obligation.** Each Party shall cause all Persons who perform Collaboration Program activities for such Party, including subcontractors, to be under an obligation to assign their rights in any IP Rights resulting therefrom to such Party, except where Applicable Law requires otherwise and except in the case of governmental, not-for-profit and public institutions which have standard policies against such an assignment (in which case a suitable license, or right to obtain such a license, shall be obtained).

6.1.5 **IP Transfer.** The licenses and other rights granted in this Agreement are intended to be and will be binding on any permitted assignee or other transferee of any right, title, or interest with respect to any IP Rights licensed hereunder. Without limiting the generality of the foregoing, and without limiting anything else in this Agreement, if a Party ("**IP Assignor**") assigns or otherwise transfers any right, title or interest to a Third Party ("**IP Assignee**") with respect to any of the IP Rights licensed by IP Assignor to the other Party hereunder, IP Assignor will cause the IP Assignee to agree in writing that such rights are subject to the licenses and other rights granted under or with respect to such IP Rights pursuant to this Agreement, and such assignment or other transfer shall only be effective if such IP Assignee does so agree.

6.1.6 **United States Law.** The determination of whether information and inventions are conceived, discovered, developed, or otherwise made by a Party for the purpose of allocating proprietary rights (including Patent, copyright or other IP Rights) therein, shall, for purposes of this Agreement, be made in accordance with Applicable Law in the United States as such law exists as of the Effective Date irrespective of where such conception, discovery, development or making occurs.

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6.2 Maintenance and Prosecution of Patents.

6.2.1 **Precision Patents.**

(a) Subject to Section 6.2.4, Precision shall have the first right, but not the obligation, through the use of internal or outside counsel, to prepare, file, prosecute, and maintain the Precision Patents worldwide, at [***] sole cost and expense [***]. Precision shall keep Gilead consulted in a timely fashion with respect to the strategy of such preparation, filing, prosecution and maintenance, and in the event of a disagreement with respect to such strategy in relation to a Precision HBV Patent, Gilead shall have final decision-making authority in accordance with Section 6.2.4 and subject to Section 6.2.5; *provided*, *however*, that Gilead may relinquish such final decision-making authority with respect thereto, in which case Gilead shall no longer be obligated to pay for such activities with respect to the applicable Patent.

(b) In the event that Precision decides not to prepare, file, prosecute, or maintain a Precision Patent pursuant to Section 6.2.1(a), Precision shall provide reasonable prior written notice to Gilead of such intention (which notice shall, in any event, be given no later than [***] prior to the next deadline for any action that may be taken with respect to such Patent). Gilead shall thereupon have the option, in its sole discretion, to assume the control and direction of the preparation, filing, prosecution, and maintenance of such Patent (unless Precision's decision to allow the lapse of any provisional patent application, or abandonment of any patent application, is intended to be in favor of trade secret protection or in favor of a continuation), at [***] cost and expense. The rights and obligations of the Parties shall not otherwise be affected by such assumption of control by Gilead. For the purpose of this ARTICLE 6, "prosecution" shall include any post-grant proceeding including supplemental examination, post grant review proceeding, inter parties review proceeding, patent interference proceeding, opposition proceeding and re-examination.

(c) Gilead acknowledges and agrees that Precision has no rights or responsibility for preparing, filing, prosecuting or maintaining the Cellectis Patents.

(d) In the event that Precision decides to allow the lapse of any patent application in favor of trade secret protection as described in Section 6.2.1(b) or Section 6.2.2(b), Precision shall first discuss such decision with Gilead in good faith (including the potential strategic rationale for not disclosing Information in patent filings and preserving such Information as a trade secret). If, following such discussion, Precision proceeds with allowing any such lapse, Precision shall [***].

(e) Prior to Precision filing a patent application that would constitute a Precision HBV Patent, [***].

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6.2.2 **Joint Collaboration Program Patents.**

(a) Precision shall have the first right, but not the obligation, through the use of internal or outside counsel, to prepare, file, prosecute, and maintain the Joint Collaboration Program Patents worldwide, with the cost and expense of such activities to be [***].

(b) In the event that Precision decides not to prepare, file, prosecute, or maintain a Joint Collaboration Program Patent pursuant to Section 6.2.2(a), Precision shall provide reasonable prior written notice to Gilead of such intention (which notice shall, in any event, be given no later than [***] prior to the next deadline for any action that may be taken with respect to such Patent), and Gilead shall thereupon have the option, in its sole discretion, to assume the control and direction of the preparation, filing, prosecution, and maintenance of such Patent (unless Precision's decision to allow the lapse of any provisional patent application, or abandonment of any patent application, is intended to be in favor of trade secret protection or in favor of a continuation), with the cost and expense of such activities to be [***]. In the event Gilead chooses not to assume such control and direction, [***] for the cost and expense of such activities. [***] the costs and expenses of the filing, prosecution, and maintenance of any Joint Collaboration Program Patents shall by so choosing relinquish all ownership rights in such Joint Collaboration Program Patents (but not its license rights) and, [***] all such costs and expenses, then such other Party shall be deemed the sole owner thereof and the relinquishing Party shall assign its interest in such Joint Collaboration Program Patents to such other Party.

6.2.3 **Gilead Dual Patents.**

(a) Gilead shall have the first right, but not the obligation, through the use of internal or outside counsel, to prepare, file, prosecute, maintain and otherwise control the Gilead Dual Patents worldwide, at [***]. Gilead shall provide Precision with notice of the filing of, and a copy of, any patent applications for a Gilead Dual Patent.

(b) In the event that Gilead decides not to prepare, file, prosecute, or maintain a Gilead Dual Patent pursuant to Section 6.2.3(a), Gilead shall provide reasonable prior written notice to Precision of such intention (which notice shall, in any event, be given no later than [***] prior to the next deadline for any action that may be taken with respect to such Gilead Dual Patent), and Precision shall thereupon have the option, in its sole discretion, to assume the control and direction of the preparation, filing, prosecution, and maintenance of a Patent that covers the patentable subject matter of the Gilead Dual Know-How to the extent relating to ARCUS Technology, ARCUS Assigned IP or ARC Nucleases (unless Gilead's decision to allow the lapse of any provisional patent application, or abandonment of any patent application, is intended to be in favor of trade secret protection or in favor of a continuation), at [***]. The rights and obligations of the Parties shall not otherwise be affected by such assumption of control by Precision.

6.2.4 **Cooperation; Precision HBV Patents.** With respect to a Precision Patent, Joint Collaboration Program Patent, or Gilead Dual Patent, the Prosecuting Party shall keep the Non-Prosecuting Party reasonably informed of all steps with regard to such preparation, filing, prosecution, and maintenance, including by providing the Non-Prosecuting

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Party with a copy of material communications to and from any patent authority regarding such Patent, and by providing the drafts to the Non-Prosecuting Party of any material filings or responses to be made to such patent authorities sufficiently in advance of submitting such filings or responses so as to allow for a reasonable opportunity for the Non-Prosecuting Party to review and comment thereon; *provided that*, with respect to the Precision HBV Patents, and subject to Section 6.2.1(a) and Section 6.2.5, Precision shall obtain Gilead's prior written approval for such activities, and in the event of a dispute Gilead shall have the final decision-making authority with respect to such matter. If Gilead does not provide a response within [***] after a request from Precision with respect to a filing or response, approval shall be deemed to have been provided by Gilead. The Prosecuting Party shall consider in good faith any comments of the Non-Prosecuting Party with respect to such drafts of the Prosecuting Party and with respect to strategies for filing and prosecuting the applicable Precision Patent, Joint Collaboration Program Patent or Gilead Dual Patent; *provided that*, with respect to the Precision HBV Patents (subject to Section 6.2.1(a) and Section 6.2.5) and Joint Collaboration Program Patents, Precision shall incorporate any and all good faith comments of Gilead, and with respect to Gilead Dual Patents, Gilead shall consider in good faith any comments provided by Precision. Notwithstanding the foregoing, the Prosecuting Party shall promptly inform the Non-Prosecuting Party of any adversarial patent office proceeding or *sua sponte* filing, including a request for, or filing or declaration of, any interference, opposition, or reexamination relating to the applicable Precision Patents, Joint Collaboration Program Patents or Gilead Dual Patents. The Parties shall thereafter consult and the Prosecuting Party shall consider in good faith all comments, requests and suggestions provided by the Non-Prosecuting Party. Each Party shall provide the other Party all reasonable assistance and cooperation in the patent prosecution efforts under this Section 6.2, including providing any necessary powers of attorney and executing any other required documents or instruments for such prosecution. When a Party assumes the responsibilities for the prosecution and maintenance of a Patent under Section 6.2.1(b), 6.2.2(b) or 6.2.3(b), the other Party shall promptly transfer to such Party the patent prosecution files for such Patent and provide reasonable assistance in the transfer of the prosecution responsibilities. The Party assuming such prosecution and maintenance responsibilities shall have the right to engage its own counsel to do so. In connection with the activities set forth in Section 6.2.1, 6.2.2, and 6.2.3 the Prosecuting Party shall consult with the Non-Prosecuting Party as to the strategy for the prosecution and maintenance of the Precision Patents, Joint Collaboration Program Patents and Gilead Dual Patents, as applicable.

6.2.5 [***].

6.2.6 **Joint Research Agreement.** Each Party shall have the right to make an election under 35 U.S.C. 102(c) when exercising its rights under this ARTICLE 6 without the prior written consent of the other Party; *provided that*, the electing Party shall notify the other Party in advance of any such election and shall consider comments provided by the other Party with respect to such election in good faith. With respect to any such election, the Parties shall coordinate their activities with respect to any submissions, filings, or other activities in support thereof. The Parties acknowledge and agree that this Agreement is a "joint research agreement" as defined in 35 U.S.C. 100(h).

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6.2.7 **Other Maintenance and Prosecution.** Except as set forth in this Section 6.2, neither Party shall have any rights to prepare, file, prosecute or maintain Patents owned or in-licensed by the other Party or its Affiliates.

6.2.8 **Patent Schedules.**

(a) **Precision HBV Patents.** At least [***], Precision shall deliver to Gilead an updated Schedule 1.113 listing the Precision HBV Patents as of the date of such delivery. Such updated Schedule 1.113 shall be incorporated into this Agreement upon receipt by Gilead.

(b) **Schedule of ARCUS Patents and Precision Patents.** Without limiting clause (a), at least every [***] commencing as of the first anniversary of this Agreement, Precision shall deliver to Gilead a Schedule 6.2.8 listing all ARCUS Patents and all Precision Patents, including Precision HBV Patents, as of the date of such delivery. In addition, without limiting clause (a) or limiting the foregoing obligation in this clause (b), within [***] of Precision delivering to Gilead each Gilead ARC Nuclease under this Agreement, Precision shall deliver to Gilead an updated Schedule 6.2.8 which schedule shall list all ARCUS Patents and all Precision Patents, including Precision HBV Patents, as of the date of such delivery. In addition, within [***] of the conclusion of the Collaboration Term, Precision shall deliver to Gilead an updated Schedule 6.2.8, which updated schedule shall list all ARCUS Patents and all Precision Patents, including Precision HBV Patents as of the date of such delivery. Such updated Schedule 6.2.8 shall be incorporated into this Agreement upon receipt by Gilead.

6.3 Enforcement of Patents.

6.3.1 **Precision Patents.**

(a) Each Party shall promptly notify the other Party in writing of any alleged or threatened infringement of the Precision Patents by a Third Party of which such Party becomes aware (including alleged or threatened infringement based on the development or commercialization of, or an application to market, a Licensed Product), subject in each case to any confidentiality obligations of the applicable Party owed to the Third Party who made such Party aware of such infringement. Neither Party shall prosecute any Competitive Infringement of the Precision Patents prior to [***]. Thereafter, Gilead shall have the first right, but not the obligation, to prosecute any Competitive Infringement of the Precision Patents, at [***] cost and expense, and Gilead shall retain control of the prosecution of such suit. At all times, Precision shall have the sole right, but not the obligation, to prosecute any Other Infringement of the Precision Patents at [***] cost and expense, and Precision shall retain control of the prosecution of such suit.

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(b) In the event that Gilead decides not to prosecute any Competitive Infringement of the Precision Patents following [***], Gilead shall provide reasonable prior written notice to Precision of such intention (which notice shall, where reasonably practical, be given no later than [***] prior to the next deadline for any action that may be taken with respect to such Patent), and Precision shall thereupon have the option to assume the control and direction of the prosecution of the Competitive Infringement, at [***] cost and expense; *provided that*, in deciding whether to exercise its option, and in prosecuting such infringement, Precision shall take into consideration Gilead's business reasons for deciding not to prosecute the infringement of such Precision Patent.

(c) In the event a Party prosecutes infringement of a Precision Patent against Competitive Infringement pursuant to this Section 6.3.1, the Non-Prosecuting Party shall have the right to join as a party to such claim, suit, or proceeding and participate with its own counsel at [***] cost and expense; *provided that* the Prosecuting Party shall retain control of the prosecution of such claim, suit, or proceeding. During any such claim, suit, or proceeding, the Prosecuting Party shall: (i) provide the Non-Prosecuting Party with drafts of all official papers and statements (whether written or oral) prior to their submission in such claim, suit, or proceeding, in sufficient time to allow the Non-Prosecuting Party to review, consider and substantively comment thereon; (ii) reasonably consider taking action to incorporate the Non-Prosecuting Party's comments on all such official papers and statements; (iii) allow the Non-Prosecuting Party the opportunity to participate in the preparation of witnesses and other participants in such claim, suit, or proceeding; and (iv) not settle any such claim, suit, or proceeding except in a manner that it believes in good faith is in the best interests of the Licensed Products.

(d) Gilead acknowledges and agrees that (i) Precision has no rights or responsibility for enforcing the Cellectis Patents, and therefore all references to Precision Patents in this Section 6.3.1 shall be deemed to exclude the Cellectis Patents for all purposes, (ii) prior to initiating enforcement actions against a Third Party with respect to certain Precision Patents which were subject to the non-exclusive license granted by Precision to Cellectis S.A. pursuant to the Cellectis Agreement, Precision is required by the Cellectis Agreement to confirm that Cellectis S.A. has not granted a license to such Third Party under such Precision Patents, and Gilead will cooperate with Precision in taking such actions as required by the Cellectis Agreement, and (iii) Duke retains discretion as to whether to become a party plaintiff and has certain rights with respect to enforcement of Patents contained within the Duke IP in the event Precision does not enforce such Patents.

6.3.2 **Joint Collaboration Program Patents.**

(a) Each Party shall promptly notify the other Party in writing of any alleged or threatened infringement of the Joint Collaboration Program Patents by a Third Party of which such Party becomes aware (including alleged or threatened infringement based on the development, commercialization, or an application to market a Licensed Product), subject in

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each case to any confidentiality obligations of the applicable Party owed to the Third Party who made such Party aware of such infringement. Gilead shall have the first right, but not the obligation, to prosecute any Competitive Infringement of the Joint Collaboration Program Patents, at [***] cost and expense, and Precision shall have the first right, but not the obligation, to prosecute any Other Infringement of the Joint Collaboration Program Patents, at [***] cost and expense.

(b) In the event that Gilead decides not to prosecute any Competitive Infringement of the Joint Collaboration Program Patents, Gilead shall provide reasonable prior written notice to Precision of such intention (which notice shall, in any event, be given no later than [***] prior to the next deadline for any action that may be taken with respect to such Patent), and Precision shall thereupon have the option to assume the control and direction of the prosecution of the Competitive Infringement, at [***] cost and expense; *provided that*, in deciding whether to exercise its option, and in prosecuting such Competitive Infringement, Precision shall take into consideration Gilead's business reasons for deciding not to prosecute the infringement of such Joint Collaboration Program Patents.

(c) In the event that Precision decides not to prosecute any Other Infringement of the Joint Collaboration Program Patents, Precision shall provide reasonable prior written notice to Gilead of such intention (which notice shall, where reasonably practical, be given no later than [***] prior to the next deadline for any action that may be taken with respect to such Patent), and Gilead shall thereupon have the option to assume the control and direction of the prosecution of the Other Infringement, at [***] cost and expense; *provided that*, in deciding whether to exercise its option, and in prosecuting such infringement, Gilead shall take into consideration Precision's business reasons for deciding not to prosecute the infringement of such Joint Collaboration Program Patents.

(d) In the event a Party prosecutes infringement of a Joint Collaboration Program Patent pursuant to this Section 6.3.2 and (i) the Prosecuting Party finds it necessary or desirable for the Non-Prosecuting Party to join the Prosecuting Party as a party to any such claim, suit or proceeding, the Non-Prosecuting Party shall, at the Prosecuting Party's request, or (ii) the Non-Prosecuting Party otherwise desires to join such claim, suit or proceeding, the Non-Prosecuting Party shall have the right to, join as a party to such claim, suit or proceeding and participate with its own counsel at [***] cost and expense; *provided that* the Prosecuting Party shall retain control of the prosecution of such claim, suit or proceeding. During any such claim, suit, or proceeding with respect to the Joint Collaboration Program Patents in which the Non-Prosecuting Party has joined pursuant to this Section 6.3.2, the Prosecuting Party shall: (A) provide the Non-Prosecuting Party with drafts of all official papers and statements (whether written or oral) prior to their submission in such claim, suit, or proceeding, in sufficient time to allow the Non-Prosecuting Party to review, consider and substantively comment thereon; (B) reasonably consider taking action to incorporate the Non-Prosecuting Party's comments on all such official papers and statements; and (C) allow the Non-Prosecuting Party the opportunity to participate in the preparation of witnesses and other participants in such claim, suit, or proceeding.

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

6.3.3 **Gilead Dual Patents.** Each Party shall promptly notify the other Party in writing of any alleged or threatened infringement of the Gilead Dual Patents by a Third Party of which such Party becomes aware (including alleged or threatened infringement based on the development or commercialization, or an application to market, a Licensed Product or any Licensed Product), subject in each case to any confidentiality obligations of the applicable Party owed to the Third Party who made such Party aware of such infringement. Gilead shall have the right, but not the obligation, to prosecute any such infringement at [***] cost and expense and Gilead shall retain control of the prosecution of such suit. With respect to any such alleged or threatened infringement of the Gilead Dual Patents, if Gilead finds it necessary or desirable for Precision to join Gilead as a party to any such action, Precision shall, at Gilead's request, join as a party to such suit and participate with its own counsel at [***] cost and expense; *provided that*, Gilead shall retain control of the prosecution of such suit.

6.3.4 **Cooperation.** Each Party agrees to cooperate fully with the other Party in any infringement action pursuant to this Section 6.3. Where the Prosecuting Party brings such an action, the Non-Prosecuting Party shall, where necessary, furnish a power of attorney solely for such purpose or shall join in, or be named as a necessary party to, such action. Unless otherwise set forth herein, the Prosecuting Party shall have the right to settle such claim; *provided that*, the Prosecuting Party shall not have the right to settle any Patent infringement litigation under this Section 6.3 in a manner that diminishes or has a material adverse effect on the rights or interest of the Non-Prosecuting Party, or in a manner that imposes any costs or liability on, or involves any admission by, the Non-Prosecuting Party, without the express written consent of the Non-Prosecuting Party. The Prosecuting Party shall provide the Non-Prosecuting Party with copies of all pleadings and other material documents filed with the court and shall consider reasonable input from the Non-Prosecuting Party during the course of the proceedings. In connection with the activities set forth in Sections 6.3.1 and 6.3.2, the Prosecuting Party shall consult with the Non-Prosecuting Party as to the strategy for the enforcement of the Precision Patents against a Competitive Infringement and Joint Collaboration Program Patents, as applicable.

6.3.5 **Recovery.** Except as otherwise agreed by the Parties in connection with a cost sharing arrangement, any recovery realized as a result of such litigation described in Section 6.3.1, 6.3.2 and 6.3.3 (whether by way of settlement or otherwise) shall be [***].

6.3.6 **Other Enforcement.** Except as set forth in this Section 6.3, neither Party shall have any rights to enforce Patents owned or in-licensed by the other Party or its Affiliates.

6.4 Infringement Claims by Third Parties.

6.4.1 If the Manufacture or use of a Licensed Product pursuant to this Agreement results in, or may result in, any claim, suit, or proceeding by a Third Party alleging

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patent infringement by either Party, its Affiliates, Sublicensees or subcontractors, such Party shall promptly notify the other Party thereof in writing. Gilead shall have the first right, but not the obligation, to defend and control the defense of any such claim, suit, or proceeding alleging patent infringement against Gilead, its Affiliate or Sublicensee at [***] cost and expense, using counsel of its own choice. Precision may participate in any such claim, suit, or proceeding with counsel of its choice at [***] cost and expense. Without limitation of the foregoing, if Gilead finds it necessary or desirable for Precision to join Gilead as a party to any such action, the Parties shall cooperate to execute all papers and perform such acts as shall be reasonably required for Precision to join such action. If Gilead elects (in a written communication submitted to Precision within a reasonable amount of time after notice of the alleged patent infringement) not to defend or control the defense of, or otherwise fails to initiate and maintain the defense of, any such claim, suit, or proceeding, within such time periods so that Precision is not prejudiced by any delays, Precision may conduct and control the defense of any such claim, suit, or proceeding at [***] cost and expense. Each Party shall keep the other Party reasonably informed of all material developments in connection with any such claim, suit, or proceeding.

6.4.2 Except as otherwise agreed by the Parties in connection with a cost sharing arrangement, any recovery realized as a result of such litigation described in Section 6.4 (whether by way of settlement or otherwise) shall be [***]. For avoidance of doubt, any recovery realized for infringement of any Precision Patent, Joint Collaboration Program Patents or Gilead Dual Patents shall be subject to Section 6.3.5.

6.4.3 [***].

6.4.4 Nothing in this Section 6.4 shall be construed to limit any rights or obligations of the Parties under ARTICLE 9.

6.5 Invalidity or Unenforceability Defenses or Actions.

6.5.1 **Notice**. Each Party shall promptly notify the other Party in writing of any alleged or threatened assertion of invalidity or unenforceability of any of the Precision Patents, Joint Collaboration Program Patents or Gilead Dual Patents by a Third Party, in each case, of which such Party becomes aware.

6.5.2 **Precision Patents.** Gilead shall have the first right, but not the obligation, at [***] cost and expense, to defend and control the defense of the validity and enforceability of the Precision Patents where such defense is pursuant to Gilead's indemnification obligations under Section 9.1, in response to a claim brought against Gilead or its Affiliates or Sublicensees by a Third Party, or where the other party to the action is engaging in Competitive Infringement. In all other cases of defense of Precision Patents, or if Gilead elects not to defend or control such defense, or otherwise fails to initiate and maintain the defense, Precision shall control such defense. Precision may participate in any such claim, suit, or proceeding defended by Gilead with counsel of its choice at [***] cost and expense; *provided that*, Gilead shall retain control of the defense in such claim, suit, or proceeding. With respect to any such action involving the validity or enforceability of the Precision Patents, if the defending Party finds it necessary or desirable for the other Party to join the defending Party as a party to

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any such action, the other Party shall, at the defending Party's request, join the defending Party as a party to such suit and participate with its own counsel at [***] cost and expense; *provided that*, the defending Party shall retain control of the defense in such claim, suit, or proceeding. If Precision elects not to defend or control the defense of the Precision Patents in a suit brought, or otherwise fails to initiate and maintain the defense of any such claim, suit, or proceeding, then, subject to Precision's rights under Section 6.3.1, Gilead may conduct and control the defense of any such claim, suit, or proceeding at [***] cost and expense. With respect to any such action involving the validity or enforceability of the Precision Patents, if Gilead finds it necessary or desirable for Precision to join Gilead as a party to any such action, Precision shall, at Gilead's request, join Gilead as a party to such suit and participate with its own counsel at [***] cost and expense.

6.5.3 **Joint Collaboration Program Patents.** Gilead shall have the first right, but not the obligation, to defend and control the defense of the validity and enforceability of the Joint Collaboration Program Patents at [***] cost and expense. With respect to any such action involving the validity or enforceability of the Joint Collaboration Program Patents, if Gilead finds it necessary or desirable for Precision to join Gilead as a party to any such action, Precision shall, at Gilead's request, join Gilead as a party to such suit and participate with its own counsel at [***] cost and expense; *provided that*, Gilead shall retain control of the defense in such claim, suit, or proceeding. If Gilead elects not to defend or control the defense of the Joint Collaboration Program Patents in a suit brought, or otherwise fails to initiate and maintain the defense of any such claim, suit, or proceeding, then, subject to Gilead's rights under Section 6.3.1, Precision may conduct and control the defense of any such claim, suit, or proceeding at [***] cost and expense. With respect to any such action involving the validity or enforceability of the Joint Collaboration Program Patents, if Precision finds it necessary or desirable for Gilead to join Precision as a party to any such action, Gilead shall, at Precision's request, join Precision as a party to such suit and participate with its own counsel at [***] cost and expense; *provided that*, Precision shall retain control of the defense in such claim, suit, or proceeding.

6.5.4 **Gilead Dual Patents.** Gilead shall have the right, but not the obligation, to defend and control the defense of the validity and enforceability of the Gilead Dual Patents at [***] cost and expense. With respect to any such action involving the validity or enforceability of the Gilead Dual Patents, if Gilead finds it necessary or desirable for Precision to join Gilead as a party to any such action, Precision shall, at Gilead's request, join Gilead as a party to such suit and participate with its own counsel at [***] cost and expense; *provided that*, Gilead shall retain control of the defense in such claim, suit, or proceeding.

6.5.5 **Cooperation.** Each Party shall assist and cooperate with the other Party as such other Party may reasonably request from time to time in connection with its activities set forth in this Section 6.5, including by being joined as a party plaintiff in such action or proceeding, providing access to relevant documents and other evidence, and making its employees available at reasonable business hours. In connection with any such defense or claim or counterclaim, the controlling Party shall consider in good faith any comments from the other

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Party and shall keep the other Party reasonably informed of any steps taken, and shall provide copies of all documents filed, in connection with such defense, claim, or counterclaim. In connection with the activities set forth in Sections 6.5.2 and 6.5.3, the Prosecuting Party shall consult with the Non-Prosecuting Party as to the strategy for the defense of the Precision Patents and Joint Collaboration Program Patents, as applicable.

6.6 Patent Term Extensions in the Territory. As between the Parties, Gilead shall have the sole right to make decisions regarding, and to apply for, patent term extensions in the Territory, including in the United States with respect to extensions pursuant to 35 U.S.C. §156 et. seq. and in other jurisdictions pursuant to supplementary protection certificates, and in all jurisdictions with respect to any other extensions that are now or become available in the future, wherever applicable, in each case for the Precision HBV Patents and any Joint Collaboration Program Patents, with respect to the Licensed Product(s), including whether or not to do so. Prior to Gilead making any such decisions, the patent counsel of each Party shall discuss and recommend for which, if any, of the Precision HBV Patents and Joint Collaboration Program Patents in the Territory the Parties should seek any term extension, supplementary protection certificates, and equivalents thereof. Precision shall provide prompt and reasonable assistance, as requested by Gilead, including by taking such action as patent holder as is required under any Applicable Law to obtain such extension or supplementary protection certificate. Further, and without limiting the foregoing, Precision shall not apply for any patent term extension based on a Marketing Approval for any Gilead ARC Nuclease or Licensed Product without Gilead's prior written consent and further consultation with Gilead. With respect to Precision Patents that are not Precision HBV Patents, Precision shall discuss with Gilead in good faith options for applying for patent term extensions on such Precision Patents based on a Marketing Approval for any Gilead ARC Nuclease or Licensed Product prior to deciding whether to apply for any such extension.

ARTICLE 7
CONFIDENTIALITY AND NON-DISCLOSURE

7.1 Confidentiality Obligations. At all times during the Term and for a period of [***] following the expiration or termination of this Agreement in its entirety, or, with respect to Confidential Information of either Party comprising trade secrets of such Party that have been labeled by such disclosing Party or identified by such disclosing Party to the other Party as being the disclosing Party's trade secrets, for so long as such Confidential Information is a trade secret of such Party, each Party shall, and shall cause its officers, directors, employees and agents to, keep confidential and not publish or otherwise disclose to a Third Party and not use, directly or indirectly, for any purpose, any Confidential Information furnished or otherwise made known to it, directly or indirectly, by the other Party, except to the extent such disclosure or use is expressly permitted by the terms of this Agreement or is reasonably necessary or useful for the performance of, or the exercise of such Party's rights under, this Agreement. "**Confidential Information**" of a Party means any technical, business, or other information provided by or on behalf of such Party to the other Party in connection with this Agreement,

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whether prior to, on, or after the Effective Date, including (a) the terms and conditions of this Agreement, (b) the ARCUS Technology and the ARCUS Assigned IP, (c) any unpublished Patents, (d) information relating to the Licensed Products (including the Regulatory Documentation generated pursuant to the Collaboration Program), (e) any Development of Gilead ARC Nucleases or the Licensed Products, and any Information with respect thereto developed by or on behalf of the disclosing Party or its Affiliates (including Gilead Dual Know-How and Precision Know-How, as applicable), and (f) information regarding the scientific, regulatory or business affairs or other activities of either Party. All Joint Collaboration Program Know-How and the terms and conditions of this Agreement shall be deemed to be the Confidential Information of both Parties, and both Parties shall be deemed to be the receiving Party and the disclosing Party with respect thereto. Except with respect to the Precision Know-How contained in the chemistry, manufacturing and control (CMC) section of any Regulatory Documentation, all Information contained in the Regulatory Documentation and the Gilead Dual Know-How shall be deemed to be the Confidential Information of Gilead. All ARCUS IP, ARCUS Assigned IP and Precision Know-How shall be deemed to be the Confidential Information of Precision. Notwithstanding the foregoing, the confidentiality and non-use obligations under this Section 7.1 with respect to any Confidential Information shall not include any information that:

7.1.1 is or hereafter becomes part of the public domain by public use, publication, general knowledge or the like through no wrongful act, fault or negligence on the part of the receiving Party;

7.1.2 can be demonstrated by documentation or other competent proof to have been in the receiving Party's possession prior to disclosure by the disclosing Party without any obligation of confidentiality with respect to such information; *provided that*, the foregoing exception shall not apply with respect to the Joint Collaboration Program Know-How;

7.1.3 is subsequently received by the receiving Party from a Third Party who is not bound by any obligation of confidentiality with respect to such information; or

7.1.4 can be demonstrated by documentation or other competent evidence to have been independently developed by or for the receiving Party without use of or reference to the disclosing Party's Confidential Information; *provided that*, the foregoing exception shall not apply with respect to the Joint Collaboration Program Know-How.

Specific aspects or details of Confidential Information shall not be deemed to be within the public domain or in the possession of the receiving Party merely because the Confidential Information is embraced by more general information in the public domain or in the possession of the receiving Party. Further, any combination of Confidential Information shall not be considered in the public domain or in the possession of the receiving Party merely because individual elements of such Confidential Information are in the public domain or in the possession of the receiving Party unless the combination and its principles are in the public domain or in the possession of the receiving Party.

7.2 Permitted Disclosures. Each Party may disclose Confidential Information of the other Party to the extent that such disclosure is:

7.2.1 made by or on behalf of the receiving Party to the Regulatory Authorities as required in connection with any filing, application or request for Regulatory Approval; *provided, however*, that reasonable measures shall be taken to assure confidential treatment of such information to the extent practicable and consistent with Applicable Law;

7.2.2 made by or on behalf of the receiving Party in response to a valid order of a court of competent jurisdiction or other supra-national, federal, national, regional, state, provincial and local governmental or regulatory body of competent jurisdiction or, if in the opinion of the receiving Party's legal counsel and without limiting Section 7.4, such disclosure is otherwise required by Applicable Law (including, for clarity, any disclosure required by Applicable Law on clinicaltrials.gov or disclosure required by reason of filing with securities regulators); *provided, however*, that the receiving Party shall first have given notice to the disclosing Party and given the disclosing Party (a) a reasonable opportunity to quash any such order or to obtain a protective order or confidential treatment requiring that the Confidential Information and documents that are the subject of any such order be held in confidence by such court or agency or, if disclosed, be used only for the purposes for which the order was issued and (b) a right to review and comment upon such disclosure, which comments shall be considered in good faith by the receiving Party; and *provided further* that the Confidential Information disclosed in response to any such court or governmental order shall be limited to that information which is legally required to be disclosed in response to such court or governmental order;

7.2.3 made by or on behalf of the receiving Party to a patent authority as may be reasonably necessary or useful for purposes of obtaining or enforcing a Patent pursuant to the terms of this Agreement in a manner not inconsistent with Article 6; *provided, however*, that reasonable measures shall be taken to assure confidential treatment of such information, to the extent such protection is available; or

7.2.4 made by the receiving Party or its Affiliates, sublicensees or subcontractors to its or their agents, attorneys, auditors, advisors, consultants, contractors, existing or prospective collaboration partners, licensees, sublicensees, investors, insurers or acquirers in connection with the performance of its obligations or exercise of its rights as contemplated by this Agreement; *provided, however*, that such persons shall be subject to obligations of confidentiality and non-use with respect to such Confidential Information substantially similar to the obligations of confidentiality and non-use of the receiving Party pursuant to this ARTICLE 7 (with a duration of confidentiality and non-use obligations as appropriate that is no less than [***] from the date of disclosure); or

7.2.5 made by or on behalf of the receiving Party where such disclosure is required by a Regulatory Authority (including in filings with the Securities and Exchange Commission or other agency) of certain material developments or material information generated under this Agreement; *provided that*, to the extent permitted, the Party seeking such disclosure first provides the other Party a copy of the proposed disclosure; and *provided, further,* that the receiving Party shall afford to the other Party an opportunity to review and comment, which period shall be no less than [***], and the receiving Party shall accept any reasonable comments so provided; or

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7.2.6 made by or on behalf of Precision to Duke solely as and to the extent necessary to fulfill Precision's reporting obligations under the Duke Agreement as of the Effective Date so long as such information is disclosed subject to the confidentiality provisions of the Duke Agreement as of the Effective Date.

7.3 Use of Name. Except as expressly provided herein, neither Party shall mention or otherwise use the name, logo, or trademark of the other Party or any of its Affiliates (or any abbreviation or adaptation thereof) in any publication, press release, marketing and promotional material, or other form of publicity without the prior written approval of such other Party in each instance. The restrictions imposed by this Section 7.3 shall not prohibit either Party from making any disclosure identifying the other Party that is required by Applicable Law.

7.4 Public Announcements. The Parties have agreed upon the content of press release(s) which shall be issued substantially in the form attached hereto as Schedule 7.4, the release of which the Parties shall coordinate in order to accomplish such release at a time following execution of the Agreement to be agreed upon by the Parties. Neither Party shall issue any other public announcement, press release, or other public disclosure regarding this Agreement or its subject matter without the other Party's prior written consent, except for any such disclosure that is, in the opinion of the disclosing Party's counsel, required by Applicable Law, any Regulatory Authority (including filings with the Securities and Exchange Commission or other agency) or the rules of a stock exchange on which the securities of the disclosing Party are listed (or to which an application for listing has been submitted). In the event a Party is, in the opinion of its counsel, required by Applicable Law, any Regulatory Authority (including filings with the Securities and Exchange Commission or other agency) or the rules of a stock exchange on which its securities are listed (or to which an application for listing has been submitted) to make such a public disclosure, and notwithstanding anything to the contrary in Section 7.2, such Party shall submit the proposed disclosure in writing to the other Party as far in advance as reasonably practicable (and in no event less than [***] prior to the anticipated date of disclosure) so as to provide a reasonable opportunity to comment thereon; *provided, however*, if a Party is required by Applicable Law, any Regulatory Authority (including filings with the Securities and Exchange Commission or other agency) or the rules of a stock exchange on which the securities of the disclosing Party are listed (or to which an application for listing has been submitted) to disclose this Agreement, such Party shall prepare a proposed redacted version of this Agreement to request confidential treatment for this Agreement, and the other Party may promptly (and in any event, no less than [***] after receipt of such proposed redactions) provide its comments, which comments shall be considered in good faith by the Party required to make such disclosure.

7.5 Publications. Precision shall not publish any papers or make any oral presentations regarding results of, and other information regarding, activities pursuant to the Collaboration Program (such papers and oral presentations, including abstracts of any of the foregoing, "**Publications**") if such papers or presentations disclose any Information relating specifically to HBV, any Gilead ARC Nuclease or the Licensed Product, except as required by Applicable Law, in which case Section 7.2.2 shall apply *mutatis mutandis*. Notwithstanding the

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foregoing, subject to the obligations set forth in Sections 7.1, 7.2, and 7.3, Precision may make Publications relating specifically to the ARCUS Technology or ARCUS Assigned IP, *provided that* for any Publication that discloses Information relating to HBV, any Gilead ARC Nuclease or the Licensed Product, Precision shall (a) provide Gilead with a draft of such Publication at least [***] prior to submission to the publisher, (b) remove any confidential or sensitive Information as requested by Gilead that Gilead reasonably deems to be of a confidential or sensitive nature, (c) delay the submission for publication of such Publication for an additional [***] period to permit the applicable Party under Section 6.2 to seek patent protection with respect to the content of such Information, and (d) consider in good faith any comments from Gilead with respect to the information contained therein pertaining to Licensed Products, Gilead ARC Nucleases or HBV. Gilead may, in its discretion, publish any Publication; *provided that*, Gilead shall (i) provide Precision with a draft of such Publication at least [***] prior to submission to the publisher, (ii) remove any confidential or sensitive Information of Precision related to ARCUS Technology, ARCUS Assigned IP or ARC Nucleases generally, as requested by Precision, (iii) delay the submission for publication of such Publication for an additional [***] period to permit the applicable Party under Section 6.2 the opportunity to seek patent protection with respect to the content of such Information, and (iv) give Precision a pre-publication right to review and comment upon such Publication, which comments shall be considered in good faith by Gilead.

7.6 Return of Confidential Information. Upon the effective date of the termination of this Agreement for any reason, either Party may request in writing, and the other Party shall either, with respect to Confidential Information to which such first Party does not retain rights under the surviving provisions of this Agreement: (a) promptly destroy all copies of such Confidential Information in the possession of the other Party and confirm such destruction in writing to the requesting Party; or (b) promptly deliver to the requesting Party, at the [***] cost and expense, all copies of such Confidential Information in the possession of the other Party; *provided, however*, the other Party shall be permitted to retain one (1) copy of such Confidential Information for the sole purpose of performing any continuing obligations hereunder or for archival purposes. Notwithstanding the foregoing, such other Party also shall be permitted to retain such additional copies of or any computer records or files containing such Confidential Information that have been created solely by such Party's automatic archiving and back-up procedures, to the extent created and retained in a manner consistent with such other Party's standard archiving and back-up procedures, but not for any other use or purpose. All Confidential Information shall continue to be subject to the terms of this Agreement for the period set forth in Section 7.1.

ARTICLE 8
REPRESENTATIONS AND WARRANTIES

8.1 Mutual Representations and Warranties. Each Party represents and warrants to the other Party as of the Effective Date that:

8.1.1 such Party is an entity duly organized, validly existing and in good standing under the Applicable Law of the state or country (as applicable) of its organization, is

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qualified to do business and is in good standing as a foreign entity in each jurisdiction in which the conduct of its business or the ownership of its properties requires such qualification and failure to have such would prevent it from performing its obligations under this Agreement, and has full power and authority to enter into this Agreement and to carry out the provisions hereof;

8.1.2 such Party is duly authorized, by all requisite action, to execute and deliver this Agreement and the execution, delivery and performance of this Agreement by such Party does not require any shareholder action or approval, and the person executing this Agreement on behalf of such Party is duly authorized to do so by all requisite action;

8.1.3 no consent, approval, order or authorization of, or registration, qualification, designation, declaration or filing with, any governmental authority or Regulatory Authority is required on the part of such Party in connection with the valid execution, delivery and performance of this Agreement by it;

8.1.4 such Party has not employed (and, to its knowledge, has not used a contractor or consultant that has employed) and in the future shall not employ (or, to its knowledge , use any contractor or consultant that employs; *provided that*, such Party may reasonably rely on a representation made by such contractor or consultant) any person debarred by the FDA (or subject to a similar sanction of a foreign equivalent), or any person which is the subject of an FDA debarment investigation or proceeding (or similar proceeding of a foreign equivalent), in the conduct of its activities under this Agreement;

8.1.5 this Agreement is a legal and valid obligation binding upon such Party and enforceable in accordance with its terms except as enforceability may be limited by (a) bankruptcy, insolvency, reorganization, moratorium or similar laws affecting the enforcement of creditors' rights; and (b) equitable principles of general applicability; and

8.1.6 the execution, delivery and performance by it of this Agreement and its compliance with the terms and provisions of this Agreement does not and shall not conflict with or result in a breach of any of the terms or conditions of (a) any other contractual or other obligations of such Party, (b) the provisions of its operating documents or bylaws, or (c) any order, writ, injunction or decree of any governmental authority or Regulatory Authority entered against it or by which it or any of its property is bound.

8.2 Additional Representations and Warranties of Precision. Precision further represents and warrants to Gilead as of the Effective Date that:

8.2.1 The Precision Existing Patents comprise all Precision Patents existing as of the Effective Date, other than Cellectis Patents. Precision is the sole and exclusive owner of the entire right, title and interest in, or otherwise Controls, all Precision Existing Patents and all existing ARCUS IP. All Precision Existing Patents owned by Precision, and to the Knowledge of Precision, all Precision Existing Patents in-licensed by Precision, are subsisting and have not been determined by any competent court or other governmental authority to be invalid or unenforceable, in whole or in part. In respect of the Precision Existing Patents owned by Precision, to Precision's Knowledge, Precision and its Affiliates have presented all relevant references, documents, or information to the relevant patent examiner at the relevant patent office as required by any applicable duty of candor. To Precision's Knowledge, each of the Precision Existing Patents properly identifies each and every inventor of the claims thereof as determined in accordance with the laws of the jurisdiction in which such Precision Existing Patent is issued or such application is pending.

8.2.2 There are no pending claims or claims threatened in writing (or to its Knowledge, otherwise threatened), judgments, or settlements against, or amounts with respect thereto, owed by Precision or any of its Affiliates relating to the ARCUS IP or the Precision IP. Except as was resolved in connection with the Cellectis Agreement, no claim or litigation has been brought against Precision or its Affiliates, or, to Precision's Knowledge, threatened in writing by any Person alleging that (a) the ARCUS IP or the Precision IP is invalid or unenforceable or misappropriates any intellectual property or proprietary right of any Person other than the Parties, or (b) the Exploitation of the ARCUS Technology as contemplated herein violates, infringes, or otherwise conflicts or interferes with, or would violate, infringe, or otherwise conflict or interfere with, any intellectual property or proprietary right of any Person other than the Parties.

8.2.3 To Precision's Knowledge, (a) Precision has the right to use all ARCUS IP and Precision IP as necessary to conduct the Development activities in the Collaboration R&D Plan, and (b) the use of the ARCUS IP and the Precision IP in the Development of the Licensed Products as contemplated herein (i) is not subject to any other license or agreement to which Precision or any of its Affiliates is a party other than the Existing In-License Agreements, (ii) does not infringe any Patent or other intellectual property or proprietary right of any Person other than the Parties, or (iii) does not constitute or involve the misappropriation of trade secrets or other rights or property of any Person other than the Parties, but excluding, in each case ((i), (ii) and (iii)), any intellectual property or proprietary right of any Person other than the Parties relating specifically to any HBV Target. For purposes of the representation and warranty in this Section 8.2.3, "Precision's Knowledge" shall also require review of the foregoing representation and warranty with Precision's external patent counsel within [***] prior to execution of this Agreement.

8.2.4 Neither Precision nor any of its Affiliates has previously entered into any agreement, whether written or oral, with respect to, or otherwise assigned, transferred, licensed, conveyed, or otherwise encumbered its right, title, or interest in or to the ARCUS IP, the Precision IP or the Gilead ARC Nucleases (including by granting any covenant not to sue with respect thereto), or any Patent or other intellectual property or proprietary right that would be ARCUS IP or Precision IP but for such assignment, transfer, license, conveyance, or encumbrance, except in each case where such assignment, transfer, license, conveyance, or encumbrance is (a) terminated and no longer in force or effect or (b) not inconsistent with the rights and licenses granted to Gilead under this Agreement.

8.2.5 A true, complete and accurate copy of each of the Existing In-License Agreements has been provided or made available to Gilead in an electronic data room maintained by Precision.

8.2.6 To Precision's Knowledge, each of the Existing In-License Agreements is valid, enforceable and binding on the parties thereto.

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8.2.7 Precision (or its Affiliates) has in all material respects performed its obligations under each of the Existing In-License Agreements, including with respect to any obligations relating to funding received under any of the Existing In-License Agreements, and neither Precision nor any other party thereto has given or received any notice to terminate, or asserted any breach of or default under, any Existing In-License Agreement nor, to Precision's Knowledge, are there any grounds for the termination, avoidance, rescission or repudiation of any Existing In-License Agreement.

8.2.8 To Precision's Knowledge, no Person is infringing or threatening to infringe, or misappropriating or threatening to misappropriate, the Precision IP.

8.2.9 All material adverse information with respect to the safety of the ARCUS Technology within the Knowledge of Precision has been provided or made available to Gilead in an electronic data room maintained by Precision prior to the Effective Date.

8.2.10 All current and former officers, employees, agents and consultants of Precision or any of its Affiliates who are inventors of, or have otherwise contributed in a material manner to the creation or development of, the ARCUS IP or any Precision IP have executed and delivered to Precision or such Affiliate, and to Precision's Knowledge are not in violation of, an assignment or other agreement regarding the protection of proprietary information and the assignment to Precision or such Affiliate of the ARCUS IP or any Precision IP, the current form of which has been made available for review by Gilead.

8.2.11 Neither Precision nor any of its Affiliates has been debarred or is subject to debarment pursuant to Section 306 of the Act, or is the subject of a conviction described in such section.

8.2.12 Except as set forth on Schedule 8.2.12, the inventions claimed or covered by the Precision IP (a) were not conceived, discovered, developed, or otherwise made in connection with any research activities funded, in whole or in part, by the federal government of the United States or any agency thereof, (b) are not a "subject invention" as that term is described in 35 U.S.C. Section 201(f), and (c) are not otherwise subject to the provisions of the Bayh-Dole Act. With regard to any inventions set forth on Schedule 8.2.12 that are subject to the Bayh-Dole Act, Precision and its Affiliates have complied with the applicable provisions of the Bayh-Dole Act, in a manner that protects and preserves Precision's right, title and interest in such inventions to the maximum extent permitted by law.

8.2.13 This Agreement satisfies the requirements to be a "Commercial Product Sublicense" under the Duke Agreement, as amended, as that term is used in such agreement.

8.3 Additional Covenants of Precision.

8.3.1 Neither Precision nor any of its Affiliates shall enter into any agreement, whether written or oral, with respect to, or otherwise assign, transfer, license, convey, or otherwise encumber its right, title, or interest in or to the ARCUS IP, the Precision IP, [***] or the Gilead ARC Nucleases (including by granting any covenant not to sue with respect thereto),

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or any Patent or other intellectual property or proprietary right that would be ARCUS IP or Precision IP but for such assignment, transfer, license, conveyance, or encumbrance, in each case where such assignment, transfer, license, conveyance, or encumbrance is inconsistent with the rights and licenses granted to Gilead under this Agreement.

8.3.2 Neither Precision nor any of its Affiliates shall use in any capacity, in connection with the services to be performed under this Agreement, any Person who has been debarred pursuant to Section 306 of the Act, or who is the subject of a conviction described in such section. Precision agrees to inform Gilead in writing immediately if it or any Person who is performing services hereunder is debarred or is the subject of a conviction described in Section 306 of the Act, or if any action, suit, claim, investigation or legal or administrative proceeding is pending or, to Precision's Knowledge, is threatened, relating to the debarment or conviction of Precision or any Person performing such services.

8.3.3 With regard to any inventions set forth on Schedule 8.2.12 that are subject to the Bayh-Dole Act or other inventions that are subject to the Bayh-Dole Act in the Precision IP, Precision shall, and shall cause its Affiliates to, to comply with the applicable provisions of the Bayh-Dole Act, in a manner that protects and preserves Precision's right, title and interest in such inventions to the maximum extent permitted by law.

8.4 DISCLAIMER OF WARRANTIES. EXCEPT FOR THE EXPRESS REPRESENTATIONS AND WARRANTIES SET FORTH HEREIN, NEITHER PARTY MAKES ANY REPRESENTATIONS OR GRANTS ANY WARRANTIES, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, BY STATUTE OR OTHERWISE, AND EACH PARTY SPECIFICALLY DISCLAIMS ANY OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, OR EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR USE OR PURPOSE OR ANY WARRANTY AS TO THE VALIDITY OF ANY PATENTS OR THE NON-INFRINGEMENT OF ANY IP RIGHTS OF THIRD PARTIES OR THE AVAILABILITY OF ANY LICENSES WITH RESPECT TO IP RIGHTS OF THIRD PARTIES.

ARTICLE 9
INDEMNITY

9.1 Indemnification of Precision. Gilead shall indemnify Precision, its Affiliates, Duke, and its and their respective directors, officers, employees, and agents, and defend and save each of them harmless, from and against any and all losses, damages, liabilities, costs, and expenses (including reasonable attorneys' fees and expenses) (collectively, "**Losses**") in connection with any and all suits, investigations, claims, or demands of Third Parties (collectively, "**Third Party Claims**") arising from or occurring as a result of: (a) the breach by Gilead of any representation, warranty or covenant in this Agreement, (b) the gross negligence or willful misconduct on the part of Gilead or its Affiliates or its or their respective directors, officers, employees, and agents in performing its or their obligations under this Agreement,

(c) [***], or (d) [***], except, in each case of clause (a) - (d), for those Losses for which Precision has an obligation to indemnify Gilead pursuant to Section 9.2 hereof, as to which Losses each Party shall indemnify the other to the extent of their respective liability.

9.2 Indemnification of Gilead. Precision shall indemnify Gilead, its Affiliates and its and their respective directors, officers, employees, and agents, and defend and save each of them harmless, from and against any and all Losses in connection with any and all Third Party Claims arising from or occurring as a result of: (a) the breach by Precision of any representation, warranty or covenant of this Agreement, (b) the gross negligence or willful misconduct on the part of Precision or its Affiliates or its or their respective directors, officers, employees, and agents in performing its obligations under this Agreement, (c) [***], or (d) [***], except, in each case of clause (a) - (d), for those Losses for which Gilead has an obligation to indemnify Precision pursuant to Section 9.1 hereof, as to which Losses each Party shall indemnify the other to the extent of their respective liability.

9.3 Notice of Claim. All indemnification claims in respect of a Party, its Affiliates, or their respective directors, officers, employees and agents shall be made solely by such Party to this Agreement (the "**Indemnified Party**"). The Indemnified Party shall give the indemnifying Party (the "**Indemnifying Party**") written notice (an "**Indemnification Claim Notice**") of any Losses or discovery of fact upon which such Indemnified Party intends to base a request for indemnification under this ARTICLE 9 within [***] after receipt by such Indemnified Party of actual notice of the Third Party Claim; *provided that*, failure to give such notification shall not affect the indemnification provided under Section 9.1 or Section 9.2, as applicable, except to the extent the Indemnifying Party has been actually prejudiced as a result of such failure. Each Indemnification Claim Notice must contain a description of the claim and the nature and amount of such Loss (to the extent that the nature and amount of such Loss is known at such time). The Indemnified Party shall furnish promptly to the Indemnifying Party copies of all papers and official documents received in respect of any Losses and Third Party Claims.

9.4 Control of Defense.

9.4.1 **In General.** At its option, the Indemnifying Party may assume the defense of any Third Party Claim by giving written notice to the Indemnified Party within [***] after the Indemnifying Party's receipt of an Indemnification Claim Notice only if the Indemnifying Party has acknowledged to the Indemnified Party in writing that the Indemnifying Party is liable to indemnify the Indemnified Party in respect of such Third Party Claim. Upon assuming the defense of a Third Party Claim, the Indemnifying Party may appoint as lead counsel in the defense of the Third Party Claim any legal counsel selected by the Indemnifying Party. In the event the Indemnifying Party assumes the defense of a Third Party Claim, the Indemnified Party shall immediately deliver to the Indemnifying Party all original notices and documents (including court papers) received by the Indemnified Party in connection with the Third Party Claim. Should the Indemnifying Party assume the defense of a Third Party Claim, except as provided in Section 9.4.2, the Indemnifying Party shall not be liable to the Indemnified Party for any legal expenses subsequently incurred by such Indemnified Party in connection with the analysis, defense or settlement of the Third Party Claim unless specifically requested in

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writing by the Indemnifying Party. In the event that it is ultimately determined that the Indemnifying Party is not obligated to indemnify, defend or hold harmless the Indemnified Party from and against the Third Party Claim, the Indemnified Party shall reimburse the Indemnifying Party for any and all costs and expenses (including attorneys' fees and costs of suit) and any Losses incurred by the Indemnifying Party in its defense of the Third Party Claim.

9.4.2 **Right to Participate in Defense.** Without limiting Section 9.4.1, any Indemnified Party shall be entitled to participate in, but not control, the defense of such Third Party Claim and to employ counsel of its choice for such purpose; *provided*, *however*, that such employment shall be at the [***] cost and expense unless (a) the employment thereof has been specifically authorized by the Indemnifying Party in writing, (b) the Indemnifying Party has failed to assume the defense and employ counsel in accordance with Section 9.4.1 (in which case the Indemnified Party shall control the defense), or (c) the interests of the indemnitee and the Indemnifying Party with respect to such Third Party Claim are sufficiently adverse to prohibit the representation by the same counsel of both Parties under Applicable Law, ethical rules or equitable principles.

9.4.3 **Settlement.** With respect to any Losses relating to a Third Party Claim, the Indemnifying Party shall have the sole right to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Loss, at [***] cost and expense, on such terms as the Indemnifying Party, in its sole discretion, shall deem appropriate; *provided that*, such settlement shall not result in the Indemnified Party's becoming subject to injunctive or other relief or otherwise adversely affecting the business of the Indemnified Party in any manner. For any other settlement, the Indemnifying Party shall have the right to consent to the entry of any judgment, enter into any settlement or otherwise dispose of such Loss only if it obtains the prior written consent of the Indemnified Party (which consent shall not be unreasonably withheld, conditioned or delayed). If the Indemnifying Party does not assume and conduct the defense of a Third Party Claim as provided above, the Indemnified Party may defend against such Third Party Claim and enter into any settlements of otherwise dispose of such Loss at the [***] cost and expense.

9.4.4 **Cooperation.** Regardless of whether the Indemnifying Party chooses to defend any Third Party Claim, the Indemnified Party shall, and shall cause each indemnitee to, cooperate in the defense thereof and shall furnish such records, information and testimony, provide such witnesses and attend such conferences, discovery proceedings, hearings, trials and appeals as may be reasonably requested in connection therewith. Such cooperation shall include access during normal business hours afforded to the Indemnifying Party to, and reasonable retention by the Indemnified Party of, records and information that are reasonably relevant to such Third Party Claim, and making the Indemnified Party and other employees and agents available on a mutually convenient basis to provide additional information and explanation of any material provided hereunder, and the Indemnifying Party shall reimburse the Indemnified Party for all its reasonable out-of-pocket expenses in connection therewith.

9.4.5 **Expenses.** Except as provided above, the costs and expenses, including fees and disbursements of counsel, incurred by the Indemnified Party in connection

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with any claim shall be reimbursed on a Calendar Quarter basis by the Indemnifying Party, without prejudice to the Indemnifying Party's right to contest the Indemnified Party's right to indemnification and subject to refund in the event the Indemnifying Party is ultimately held not to be obligated to indemnify the Indemnified Party.

9.5 Special, Indirect, and Other Losses. EXCEPT IN THE EVENT OF A PARTY'S BREACH OF ITS OBLIGATIONS UNDER ARTICLE 7, AND EXCEPT TO THE EXTENT ANY SUCH DAMAGES ARE REQUIRED TO BE PAID TO A THIRD PARTY AS PART OF A CLAIM FOR WHICH A PARTY PROVIDES INDEMNIFICATION UNDER THIS ARTICLE 9, NEITHER PARTY NOR ANY OF ITS AFFILIATES SHALL BE LIABLE IN CONTRACT, TORT, NEGLIGENCE, BREACH OF STATUTORY DUTY OR OTHERWISE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES (INCLUDING DAMAGES RESULTING FROM LOSS OF USE, LOSS OF PROFITS, INTERRUPTION OR LOSS OF BUSINESS, DIMINUTION IN VALUE, OR OTHER ECONOMIC LOSSES) ARISING OUT OF ANY ACTIVITIES WITHIN THE SCOPE OF THIS AGREEMENT OR WITH RESPECT TO A PARTY'S PERFORMANCE OR NON PERFORMANCE HEREUNDER.

9.6 Insurance.

9.6.1 **Insurance Maintained by Precision.** During the Term, Precision shall have and maintain in full force and effect, at its own expense, insurance coverage to include:

(a) Commercial general liability insurance, including personal and advertising injury, and Licensed Products and completed operations, with limits of liability not less than [***] per occurrence and [***] in the aggregate. General liability limit requirements may be satisfied by a combination of primary and umbrella or excess liability insurance coverage;

(b) Workers' compensation insurance in compliance with Applicable Law (including the local law requirements of the state or jurisdiction in which the work is to be performed). Employer's liability insurance in amounts not less than [***] for each of (i) bodily injury by accident (each accident), (ii) bodily injury by disease (policy limit), and (iii) bodily injury by disease (each employee). Where permitted by Applicable Law, such policies shall contain a waiver of the insurer's subrogation rights against Gilead; and

(c) Automobile liability insurance for bodily injury, property damage and automobile contractual liability covering all owned, hired and non-owned automobiles with a combined single limit of liability for each accident of not less than [***].

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9.6.2 **Insurance Maintained by Gilead.** During the Term, Gilead shall have and maintain in full force and effect, at its own expense, insurance coverage to include:

(a) Commercially purchased insurance in accordance with the following:

(i) Commercial general liability insurance, including personal and advertising injury, and Licensed Products and completed operations with limits of liability not less than [***] per occurrence and [***] in the aggregate. General liability limit requirements may be satisfied by a combination of primary and umbrella or excess liability insurance coverage;

(ii) Workers' compensation insurance in compliance with Applicable Law (including the local law requirements of the state or jurisdiction in which the work is to be performed). Employer's liability insurance in amounts not less than [***] for each of (A) bodily injury by accident (each accident), (B) bodily injury by disease (policy limit), and (C) bodily injury by disease (each employee). Where permitted by Applicable Law, such policies shall contain a waiver of the insurer's subrogation rights against Precision;

(iii) Automobile Liability insurance for bodily injury, property damage and automobile contractual liability covering all owned, hired and non-owned automobiles with a combined single limit of liability for each accident of not less than [***]; and

(iv) Clinical trials liability insurance with limits not less than [***] per occurrence; or

(b) Self-insurance substantially equivalent to the coverage described in Section 9.6.2(a) above.

9.6.3 **Additional Requirements.**

(a) **Additional Insured.** Each Party shall name the other Party as an additional insured on the insurance policies maintained pursuant to Section 9.6.1(a), Section 9.6.1(c), Section 9.6.2(a)(i), Section 9.6.2(a)(iii) and Section 9.6.2(a)(iv), as applicable, either by endorsement or blanket additional insured endorsement.

(b) **Evidence of Insurance.** Each Party will provide evidence of insurance maintained pursuant to this Section 9.6 on request of the other Party.

(c) **Notice of Cancellation.** Each Party will provide the other Party a notice of insurance policy cancellation in accordance with the provisions of the applicable insurance policy maintained pursuant to this Section 9.6.

(d) **Policy Type.** Insurance policies maintained pursuant to this Section 9.6 should be occurrence type. If policies maintained pursuant to this Section 9.6 are claims made, then insurance shall be maintained for at least [***] following expiration or termination of this Agreement.

(e) **Insurance Carrier Rating.** All insurance maintained pursuant to this Section 9.6 will be underwritten by companies with an AM best rating of at least A-VII.

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ARTICLE 10
TERM AND TERMINATION

10.1 Term. This Agreement shall commence on the Effective Date and, unless earlier terminated in accordance herewith, shall continue in force and effect, on a Licensed Product-by-Licensed Product and country-by-country basis until the expiration of the Royalty Term for such Licensed Product in such country (the "**Term**"). Upon expiration of the Royalty Term (but not on early termination of this Agreement), on a Licensed Product-by-Licensed Product and country-by-country basis the license granted to Gilead pursuant to Section 4.1.1 shall be a fully paid-up, irrevocable, perpetual license that will be exclusive unless and until such time as a Biosimilar Product launches or has launched with respect to the applicable Licensed Product in the applicable country (and from such time will be non-exclusive), and the non-exclusive license granted to Gilead pursuant to Section 4.1.2 shall be fully paid-up, irrevocable and perpetual.

10.2 Termination by Either Party.

10.2.1 **Termination for Material Breach.** Without prejudice and in addition to any other contractual remedy the non-breaching Party may have with respect to this Agreement, either Party may, upon a material breach of this Agreement by the other Party, terminate this Agreement by providing [***] prior written notice (or [***]' prior written notice in the event such material breach is solely based on the breaching Party's failure to pay any amounts due hereunder) to the breaching Party, specifying in such notice the breaching Party's material breach and demanding its cure, with such termination being effective upon the end of such [***] (or [***], as applicable) cure period or, if applicable, the end of the extended cure period set forth in the immediately following sentence, in each case if the applicable material breach has not then been cured. Notwithstanding the foregoing, with respect to a material breach that is not solely based on the breaching Party's failure to pay any amounts due hereunder, if such material breach is not reasonably curable within the [***] cure period, the non-breaching Party's right to terminate this Agreement pursuant to this Section 10.2.1 shall be suspended only if, and only for so long as, (x) the breaching Party has provided to the non-breaching Party a written plan that is reasonably calculated to effect a cure and that includes a proposed extended cure period (not to exceed [***] after the original [***] cure period), (y) the non-breaching Party confirms in writing that such plan is reasonably acceptable to the non-breaching Party and (z) the breaching Party commits to and does carry out such plan no later than the end of the extended cure period set forth in the written plan described in clause (x) of this sentence.

10.2.2 **Termination for Insolvency.** In the event that either Party (a) makes an assignment for the benefit of creditors, (b) appoints or suffers appointment of a receiver or trustee over substantially all of its property that is not discharged within [***] after such filing, (c) proposes a written agreement of composition with its creditors, (d) proposes or is a party to any dissolution or liquidation, (e) files a petition under any bankruptcy or insolvency act or has any such petition filed against that is not discharged within [***] of the filing thereof (excluding a reorganization proceeding under Chapter 11 of the U.S. Bankruptcy Code if the

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debtor Party is continuing to perform all of its obligations under this Agreement), or (f) admits in writing its inability generally to meet its obligations as they fall due in the general course, then the other Party may terminate this Agreement in its entirety effective immediately upon written notice to such Party.

10.3 Additional Termination Rights by Gilead.

10.3.1 **For Convenience.** Gilead may terminate this Agreement, for any reason or no reason, upon:

(a) [***] prior written notice to Precision, if such notice is provided during the Collaboration Term; and

(b) [***] prior written notice to Precision, if such notice is provided on or after the expiry of the Collaboration Term.

10.3.2 **For Certain Events of Change of Control of Precision or Assignment of Agreement during the Collaboration Term.** Precision agrees to notify Gilead promptly in writing in the event Precision has entered into a transaction that effects a Change of Control of Precision or assignment or transfer of this Agreement by Precision, or would effect a Change of Control of Precision or assignment or transfer of this Agreement by Precision upon the closing of the transaction, or an event occurs that triggers a Change of Control of Precision or assignment or transfer of this Agreement by Precision. During the Collaboration Term, Gilead may terminate this Agreement in the event of a Change of Control that results in Precision being controlled by, or assignment or transfer of this Agreement by Precision to, a Third Party that is clinically developing or commercializing products in the field of HBV, upon [***] prior written notice to Precision, so long as such notice is sent no later than [***] after Gilead becomes aware of such Change of Control.

10.4 Additional Termination Rights by Precision [***].

10.5 Rights in Bankruptcy. All rights and licenses granted under or pursuant to this Agreement by Gilead or Precision are, and shall otherwise be deemed to be, for purposes of Section 365(n) of the U.S. Bankruptcy Code or any analogous provisions in any other country or jurisdiction, licenses of rights to "intellectual property" as defined under Section 101 of the U.S. Bankruptcy Code. The Parties agree that the Parties, as licensees of such rights under this Agreement, shall retain and may fully exercise all of their rights and elections under the U.S. Bankruptcy Code or any analogous provisions in any other country or jurisdiction. The Parties further agree that, in the event of the commencement of a bankruptcy proceeding by or against either Party under the U.S. Bankruptcy Code or any analogous provisions in any other country or jurisdiction, the Party that is not a party to such proceeding shall be entitled to a complete duplicate of (or complete access to, as appropriate) any such intellectual property and all embodiments of such intellectual property to which such Party is entitled to have access under this Agreement, which, if not already in the non-debtor Party's possession, shall be promptly delivered to it (a) upon any such commencement of a bankruptcy proceeding upon the non-debtor Party's written request therefor, unless the Party subject to such proceeding elects to

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continue to perform all of its obligations under this Agreement, or (b) if not delivered under clause (a) above, following the rejection of this Agreement by or on behalf of the Party subject to such proceeding upon written request therefor by the non-debtor Party. The Parties acknowledge and agree that payments made under Section 5.1 shall not (x) constitute royalties within the meaning of Section 365(n) of the U.S. Bankruptcy Code or any analogous provisions in any other country or jurisdiction or (y) relate to licenses of intellectual property hereunder.

10.6 Effects of Termination.

10.6.1 **Termination by Gilead for Convenience or by Precision for Material Breach or Insolvency.** In the event of a termination of this Agreement by Gilead under Section 10.3.1 or by Precision under Section 10.2.1, Section 10.2.2 or Section 10.4:

(a) The rights and licenses granted to Gilead under Section 4.1, including any sublicenses, shall be terminated and all such rights shall revert to Precision, except to the extent and for so long as necessary for Gilead to fulfil its responsibilities under the surviving terms of this Agreement as provided in Section 10.8, it being agreed that all such activities shall be discontinued and cease (unless otherwise agreed or required under Applicable Law, by transitioning such activities and responsibilities to Precision) as promptly as possible, subject to Applicable Law.

(b) If a payment pursuant to the Gilead Funding Commitment is due after notice of termination is given and before the effective date of termination, the payment due by Gilead shall be pro-rated based on the portion of the applicable six (6) month period of the Collaboration Term to have elapsed upon the effective date of termination.

(c) If at the effective date of termination, Gilead is Manufacturing Licensed Product(s), then, if Precision requests in writing to Gilead within [***] of the effective date of termination, Gilead agrees to Manufacture and supply such Licensed Product(s) to Precision for a reasonable transitional period (not to exceed [***]) from the effective date of termination pursuant to a reasonable and customary transitional supply and quality agreement to be agreed by the Parties in a form reasonably acceptable to Gilead and Precision. Such Licensed Products shall be supplied at [***] of COGS as further defined in the Supply Agreement, plus any amounts due to a Third Party as a result of the sale of such Licensed Product by Gilead or Precision.

(d) [***].

(e) At Precision's request, Gilead agrees to enter into an agreement with Precision, to be negotiated promptly and in good faith, that includes all terms reasonably necessary to transition the Development, use, Manufacture, promotion, marketing and Exploitation of the Licensed Products to Precision, including the following:

(i) a worldwide, royalty-bearing, non-transferable (except as permitted by such agreement), exclusive or non-exclusive (as requested by Precision), license (or sublicense, as the case may be), with the right to grant sublicenses in accordance with such agreement, to Precision under the Reversion IP (to the extent not licensed pursuant to Section 10.6.1(d)) to Exploit the Licensed Products in the Field in the Territory;

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(ii) transition to Precision of all reasonably necessary materials, licenses, Third Party agreements, preclinical and clinical data, safety data, Clinical Studies, Regulatory Documentation, Regulatory Approvals and applications and product trademarks; and

(iii) provision of technical assistance (including reasonable caps on hours of access) from Gilead relating to the Manufacture, testing and supply of the Licensed Products.

(f) The Parties shall negotiate in good faith the commercially reasonable compensation to Gilead for the obligations of Gilead under the agreement entered into Section 10.6.1(e), based on Gilead's contributions to the Licensed Products up to the time of termination. In the event the Parties cannot agree on such compensation terms, or any other terms of such agreement, then either Party may refer the disputed terms to one or more arbitrator(s) under the principles of baseball arbitration (i.e., each Party submits a proposed resolution to the arbitrator, and the arbitrator is required to select one of the proposed resolutions), the procedures of which shall be reasonably acceptable to both Parties and shall include express consideration by the arbitrator of the fair market value of the license provided by Gilead in Section 10.6.1(e)(i), the materials transferred under Section 10.6.1(e) and other Relevant Factors.

10.6.2 **Termination by Gilead for Material Breach, Insolvency or Change of Control.** If Gilead is entitled to terminate this Agreement pursuant to Section 10.2.1, Section 10.2.2 or 10.3.2, Gilead may elect to terminate this Agreement subject to the provisions set forth in Section 10.6.1(a) and (b) and, in the case of termination pursuant to Section 10.3.2, Section 10.6.1(d).

10.7 Remedies. Except as otherwise expressly provided herein, termination of this Agreement in accordance with the provisions hereof shall not limit remedies that may otherwise be available in law or equity.

10.8 Accrued Rights; Surviving Obligations. Expiration or termination of this Agreement shall not affect the rights and obligations of each Party under this Agreement that have accrued prior to such date of expiration or termination, and the following provisions shall survive expiration or termination of this Agreement: ARTICLE 1, Sections 4.1.1 and 4.1.2 (solely to the extent provided in Section 10.1 on expiration of this Agreement), Sections 4.2.2 (to the extent that the applicable Information constituted Gilead Dual Know-How or the applicable Patents constituted Gilead Dual Patents, in each case as of the date of termination of this Agreement, including, for clarity, Patents filed or issued at any later date covering or claiming applicable inventions conceived on or prior to such date), 4.3.2, and 4.3.3 (solely to the extent applicable to the license set forth in Section 4.2.2), Sections 4.4, 5.8, 5.9 and 5.10, 6.1 (excluding the proviso in Section 6.1.3(b)), 6.2.2, 6.2.3, 6.2.4, 6.3.2, 6.5.3, ARTICLE 7, ARTICLE 8, ARTICLE 9, Sections 10.6, 10.7 and 10.8 and ARTICLE 11.

ARTICLE 11
MISCELLANEOUS

11.1 Force Majeure. Neither Party shall be held liable or responsible to the other Party or be deemed to have defaulted under or breached this Agreement for failure or delay in fulfilling or performing any term of this Agreement (other than an obligation to make payments) when such failure or delay is caused by or results from events beyond the reasonable control of the non-performing Party, including fires, floods, earthquakes, hurricanes, embargoes, shortages, epidemics, quarantines, war, acts of war (whether war be declared or not), terrorist acts, insurrections, riots, civil commotion, strikes, lockouts, or other labor disturbances (whether involving the workforce of the non-performing Party or of any other Person), acts of God or acts, omissions or delays in acting by any governmental authority or Regulatory Authority (except to the extent such delay results from the breach by the non-performing Party or any of its Affiliates of any term or condition of this Agreement). The non-performing Party shall notify the other Party of such force majeure within [***] after such occurrence by giving written notice to the other Party stating the nature of the event, its anticipated duration, and any action being taken to avoid or minimize its effect. The suspension of performance shall be of no greater scope and no longer duration than is necessary and the non-performing Party shall use Commercially Reasonable Efforts to remedy its inability to perform as promptly as possible.

11.2 Export Control. This Agreement is made subject to any restrictions concerning the export of Licensed Products or technical information from the United States or other countries that may be imposed on the Parties from time to time. Each Party agrees that it shall not export, directly or indirectly, any technical information acquired from the other Party under this Agreement or any Licensed Products using such technical information to a location or in a manner that at the time of export requires an export license or other governmental approval, without first obtaining the written consent to do so from the appropriate agency or other governmental authority or Regulatory Authority in accordance with Applicable Law.

11.3 Assignment. This Agreement and the rights and obligations hereunder shall not be assignable, transferable or delegable by either Party without the prior written consent of the other Party; *provided that*, either Party may assign or transfer any or all of its rights and assign, transfer or delegate any or all of its obligations under this Agreement to (a) any of its Affiliates or (b) a successor to all or substantially all of its business related to this Agreement (including in connection with a merger, consolidation, or sale of all or substantially all of its assets related to this Agreement), in each case (a) and (b), without the prior written consent of the other Party. Notwithstanding the foregoing, Precision shall not be required to obtain Gilead's consent to sell, assign, pledge as security, contribute, or otherwise transfer, in whole or in part, to any Third Party its rights to receive any payment under this Agreement, and, as it relates to any such transfer, Precision may provide to such Third Party (i) a copy of reports received from Gilead pursuant to Section 5.4.10 and (ii) the result of any audit conducted pursuant to Section 5.9, in each case of (i) and (ii), so long as any such Third Party is bound by confidentiality and non-use obligations equivalent in scope to those set forth in ARTICLE 7 of this Agreement. Any attempted assignment, transfer or delegation in violation of this Section 11.3 shall be null and

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void, except to the extent otherwise permitted under Section 4.3. Notwithstanding anything to the contrary in this Agreement, the Patents and Information Controlled by an Acquirer (or any Affiliate of any such Acquirer existing prior to the closing of the transaction) of a Party under this Agreement shall be automatically excluded from the rights licensed to the other Party under this Agreement to the extent (A) such Patents and Information were filed or developed, respectively, prior to the transaction that was the basis for such assignment, transfer or succession or resulted in such Person becoming an Affiliate, or (B) such Patents and Information were developed after such transaction under a separate and firewalled program not under this Agreement without use of any Patents, Know-How or Confidential Information of the other Party that is licensed hereunder.

11.4 Severability. If any provision of this Agreement is held to be illegal, invalid, or unenforceable under any present or future law, and if the rights or obligations of either Party under this Agreement shall not be materially and adversely affected thereby, (a) such provision shall be fully severable, (b) this Agreement shall be construed and enforced as if such illegal, invalid, or unenforceable provision had never comprised a part hereof, (c) the remaining provisions of this Agreement shall remain in full force and effect and shall not be affected by the illegal, invalid, or unenforceable provision or by its severance herefrom, and (d) in lieu of such illegal, invalid, or unenforceable provision, there shall be added automatically as a part of this Agreement a legal, valid, and enforceable provision as similar in terms to such illegal, invalid, or unenforceable provision as may be possible and reasonably acceptable to the Parties. To the fullest extent permitted by Applicable Law, each Party hereby waives any provision of law that would render any provision hereof illegal, invalid, or unenforceable in any respect.

11.5 Governing Law.

11.5.1 **Governing Law.** This Agreement shall be governed by, and construed in accordance with, the laws of the state of New York, regardless of the laws that might otherwise govern under applicable principles of conflicts of laws thereof.

11.5.2 **Jurisdiction; Venue; Service of Process.** Each Party irrevocably submits to the exclusive jurisdiction of the state or federal courts located in the State and County of New York for the purposes of any Action arising out of this Agreement. Each Party agrees to commence any such Action either in the state courts of New York or the United States District Court for the Southern District of New York. Each Party further agrees that service of any process, summons, notice or document by the U.S. registered mail to such Party's respective address set forth in Section 11.7 shall be effective service of process for any Action in New York with respect to any matters to which it has submitted to jurisdiction in this Section 11.5.2. Each Party irrevocably and unconditionally waives any objection to the laying of venue of any Action arising out of this Agreement in the state or federal courts of New York, and hereby and thereby further irrevocably and unconditionally waives and agrees not to plead or claim in any such court that any such Action brought in any such court has been brought in an inconvenient forum.

11.5.3 **Waiver of Right to Trial by Jury.** EACH PARTY HERETO WAIVES ITS RIGHT TO TRIAL OF ANY ISSUE BY JURY. Each Party hereto (a) certifies that no Representative or attorney of the other Party has represented, expressly or otherwise, that such Party would not, in the event of any Action, seek to enforce the foregoing waiver and (b) acknowledges that it and the other Party have been induced to enter into this Agreement, by, among other things, the mutual waiver and certifications in this Section 11.5.3.

11.5.4 **Equitable Relief.** Each Party acknowledges and agrees that the restrictions set forth in Section 4.5 and ARTICLE 6 and ARTICLE 7 are reasonable and necessary to protect the legitimate interests of the other Party and that such other Party would not have entered into this Agreement in the absence of such restrictions, and that any breach or threatened breach of any provision of such Section or Articles may result in irreparable injury to such other Party for which there will be no adequate remedy at law. In the event of a breach or threatened breach of any provision of such Section or Articles, the non-breaching Party shall be authorized and entitled to seek injunctive relief, whether preliminary or permanent, specific performance, and an equitable accounting of all earnings, profits, and other benefits arising from such breach, which rights shall be cumulative and in addition to any other rights or remedies to which such non-breaching Party may be entitled in law or equity to prevent such breach or threatened breach of this Agreement and to enforce specifically the terms and provisions of such Section or Articles of this Agreement in the state and federal courts of New York. Both Parties agree to waive any requirement that the other (a) post a bond or other security as a condition for obtaining any such relief, and (b) show irreparable harm, balancing of harms, consideration of the public interest, or inadequacy of monetary damages as a remedy. Nothing in this Section 11.5.4 is intended, or should be construed, to limit either Party's right to equitable relief or any other remedy for a breach of any other provision of this Agreement.

11.6 Dispute Resolution. The Parties recognize that disputes as to certain matters may from time to time arise that relate to either Party's rights or obligations hereunder, including the interpretation, alleged breach, enforcement, termination or validity of this Agreement (a "**Dispute**"). For clarity, Dispute shall not include matters within the JSC's authority, which are resolved under Section 2.3.3 including through the exercise by Gilead or Precision of its final decision making authority in accordance therewith. Any Dispute shall be referred to the Senior Officers of the Parties, who shall confer in good faith on the resolution of the issue. Any final decision mutually agreed to by the Senior Officers shall be conclusive and binding on the Parties. If the Senior Officers are not able to agree on the resolution of any such issue within [***] after such issue was first referred to them, then, either Party may initiate litigation in accordance with Section 11.5 or with respect to Disputes that involve the infringement or validity of any Precision Patents, Joint Collaboration Program Patents or Gilead Dual Patents outside the United States, such Dispute shall be resolved by a court of competent jurisdiction, notwithstanding Section 11.5, in any country in which such rights apply. Notwithstanding anything herein to the contrary, nothing in this Section 11.6 shall preclude either Party from seeking interim or provisional relief, including a temporary restraining order, preliminary injunction or other interim equitable relief concerning a Dispute, if necessary to protect the interests of such Party.

11.7 Notices.

11.7.1 **Notice Requirements.** Any notice, request, demand, waiver, consent, approval, or other communication permitted or required under this Agreement shall be in writing, shall refer specifically to this Agreement and shall be deemed given only if delivered by hand or sent by facsimile transmission (with transmission confirmed) or by internationally

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[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

recognized overnight delivery service that maintains records of delivery, addressed to the Parties at their respective addresses specified in Section 11.7.2 or to such other address as the Party to whom notice is to be given may have provided to the other Party in accordance with this Section 11.7.1. Such notice shall be deemed to have been given as of the date delivered by hand or transmitted by facsimile (with transmission confirmed) or on the second Business Day (at the place of delivery) after deposit with an internationally recognized overnight delivery service. Any notice delivered by facsimile shall be confirmed by a hard copy delivered as soon as practicable thereafter. This Section 11.7.1 is not intended to govern the day-to-day business communications necessary between the Parties in performing their obligations under the terms of this Agreement.

11.7.2 **Address for Notice.**

If to Gilead, to:

Gilead Sciences, Inc.
333 Lakeside Drive
Foster City, CA 94404
Attn: Alliance Management
Email: [***]

with a copy (which shall not constitute notice) to:

Gilead Sciences, Inc.
333 Lakeside Drive
Foster City, CA 94404
Attn: General Counsel
Email: [***]

If to Precision, to:

Precision BioSciences, Inc.
302 East Pettigrew Street, Suite A-100
Durham, NC 27701
Attention: Michael Dombeck, Vice President, Business Development
Facsimile: (480) 393-5553

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

with a copy (which shall not constitute notice) to:

Smith, Anderson, Blount, Dorsett, Mitchell & Jernigan, LLP
150 Fayetteville Street, Suite 2300
Raleigh, NC 27601
Attention: John R. Therien, Esq.
Facsimile: (919) 821-6800

11.8 Entire Agreement. This Agreement, together with the Schedules expressly contemplated hereby and attached hereto, and together with the Supply Agreement and the Quality Agreement (once executed), contains the entire agreement among the parties with respect to the subject matter hereof and supersede all prior agreements or understandings between the Parties with respect to the subject matter hereof, including the Confidentiality Agreement and the Material Transfer Agreement between the Parties dated as of February 22, 2016 (as amended). Each Party confirms that it is not relying on any representations or warranties of the other Party except as specifically set forth in this Agreement.

11.9 English Language. This Agreement shall be written and executed in, and all other communications under or in connection with this Agreement shall be in, the English language. Any translation into any other language shall not be an official version thereof, and in the event of any conflict in interpretation between the English version and such translation, the English version shall control.

11.10 Amendments and Waivers.

11.10.1 No modification, amendment or waiver of any provision of, or consent or approval required by, this Agreement, nor any consent to or approval of any departure herefrom, shall be effective unless it is in writing and signed by the Party against whom enforcement of any such modification, amendment, waiver, consent or approval is sought. Such modification, amendment, waiver, consent or approval shall be effective only in the specific instance and for the purpose for which given.

11.10.2 Neither the failure of either Party to enforce, nor the delay of either Party in enforcing, any condition or part of this Agreement at any time shall be construed as a waiver of that condition or part or forfeit any rights to future enforcement thereof. No action taken pursuant to this Agreement, including any investigation by or on behalf of either Party, shall be deemed to constitute a waiver by the Party taking action of compliance by the other Party with any representation, warranty, covenant, agreement or obligation contained herein.

11.11 Cumulative Rights. Except as expressly provided herein, the various rights under this Agreement shall be construed as cumulative, and no one of them is exclusive of any other or exclusive of any rights allowed by Applicable Law.

11.12 Benefits of Agreement. All of the terms and provisions of this Agreement shall be binding upon and inure to the benefit of the Parties and their respective successors and permitted assigns. Except for the provisions of ARTICLE 9, this Agreement is for the sole benefit of the Parties and not for the benefit of any other Person other than Duke to the extent required by the Duke Agreement.

11.13 Further Assurance. Each Party shall duly execute and deliver, or cause to be duly executed and delivered, such further instruments and do and cause to be done such further acts and things, including the filing of such assignments, agreements, documents, and instruments, as may be necessary or as the other Party may reasonably request in connection with this Agreement or to carry out more effectively the provisions and purposes hereof, or to better assure and confirm unto such other Party its rights and remedies under this Agreement.

11.14 Relationship of the Parties. It is expressly agreed that Gilead, on the one hand, and Precision, on the other hand, shall be independent contractors and that the relationship between the two Parties shall not constitute a partnership, joint venture, or agency. Neither Gilead, on the one hand, nor Precision, on the other hand, shall have the authority to make any statements, representations, or commitments of any kind, or to take any action, which shall be binding on the other, without the prior written consent of the other Party to do so. All persons employed by a Party shall be employees of such Party and not of the other Party and all costs and obligations incurred by reason of any such employment shall be for the account and expense of such Party.

11.15 Counterparts. This Agreement may be executed in two counterparts, and each such counterpart hereof shall be deemed to be an original instrument, but both such counterparts together shall constitute but one agreement. Delivery of an executed counterpart of a signature page of this Agreement by facsimile or other electronic transmission shall be effective as delivery of a manually executed original counterpart of this Agreement.

11.16 Schedules. In the event of any inconsistencies between this Agreement and any Schedules or other attachments hereto, the terms of this Agreement shall control.

11.17 Descriptive Headings; Certain Interpretations.

11.17.1 Descriptive headings are for convenience only and shall not control or affect the meaning or construction of any provision of this Agreement.

11.17.2 Except as otherwise expressly provided in this Agreement or as the context otherwise requires, the following rules of interpretation apply to this Agreement: (a) the singular includes the plural and the plural includes the singular; (b) “or” and “any” are not exclusive and the words “include” and “including,” and variations thereof, shall not be deemed to be terms of limitation, but rather shall be deemed to be followed by the words “without limitation;” (c) a reference to any contract includes permitted supplements and amendments; (d) a reference to Applicable Law includes any amendment or modification to such Applicable Law; (e) a reference to a Person includes its successors, heirs and permitted assigns; (f) a reference to one gender shall include any other gender; (g) a reference in this Agreement to an Article, Section, Exhibit or Schedule is to the referenced Article, Section, Exhibit or Schedule of this Agreement, unless expressly specified otherwise; (h) “hereunder,” “hereof,” and words of similar import shall be deemed references to this Agreement as a whole and not to any particular Article, Section or other provision; (i) “extent” in the phrase “to the extent” means the degree to which a subject or other thing extends, and such phrase does not mean simply “if” and (j) a reference to the right to “approve” includes the right to reject.

11.17.3 The Parties agree that they have been represented by counsel during the negotiation, drafting, preparation and execution of this Agreement and, therefore, waive the application of any Applicable Law or rule of construction providing that ambiguities in an agreement or other document shall be construed against the Party drafting such agreement or document.

[SIGNATURE PAGE FOLLOWS.]

THIS AGREEMENT IS EXECUTED by the authorized representatives of the Parties as of the date first written above.

GILEAD SCIENCES, INC.

By: /s/ John F. Milligan
Name: John F. Milligan
Title: President & Chief Executive Officer

PRECISION BIOSCIENCES, INC.

By: /s/ Matthew Kane
Name: Matthew Kane
Title: Chief Executive Officer

Schedule 1.45
Duke IP

Precision Docket No.	Country	Application No.	Patent No.	Status
[***]				
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
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[***]				

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Schedule 1.112
Precision Existing Patents

Precision Docket No.	Country	Application No.	Patent No.	Status
[***]				
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]	[***]	[***]
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[***]	[***]	[***]	[***]	[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Precision Docket No.	Country	Application No.	Patent No.	Status
[***]	[***]	[***]	[***]	[***]
[***]	[***]	[***]		[***]
[***]	[***]	[***]		[***]
[***]				
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[***]	[***]	[***]		[***]
[***]				
[***]	[***]	[***]		[***]
[***]				
[***]	[***]	[***]		[***]
[***]	[***]	[***]		[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Schedule 1.113
Precision HBV Patents

Precision Docket No.	Country	Application No.	Patent No.	Status
[***]				
[***]	[***]	[***]		[***]
[***]	[***]	[***]		[***]
[***]	[***]	[***]		[***]
[***]	[***]	[***]		[***]
[***]	[***]	[***]		[***]
[***]				
[***]	[***]	[***]		[***]
[***]				
[***]	[***]	[***]		[***]
[***]	[***]	[***]		[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Schedule 2.1.2
Initial JSC Members

For Precision:

[***]

For Gilead:

[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Schedule 2.2.1
Initial JRDC Members

For Precision:

[***]

For Gilead:

[***]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Schedule 3.8.3

Template Report

GILEAD SCIENCES - PRECISION BIOSCIENCES COLLABORATION REPORT

A. Preclinical R&D

- **Pre-Clinical R&D Progress: Months 1 – 6**

Executive Summary:

Include:

- Key strategic goals
- Milestones achieved
- GO/NO GO decisions
- Plan amendments (scope, timelines, resources, other)

Details:

Gilead Funding: [***]

Activity Goal	Activity Details	Activity Status	Timeline	Costs, FTEs (Budgeted/Actual)
1.				
2.				

- **Pre-Clinical R&D Progress: Months 7 – 12**

Executive Summary:

Include:

- Key strategic goals
- Milestones achieved
- GO/NO GO decisions
- Plan amendments (scope, timelines, resources, other)

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Details:

Gilead Funding: [***]

Activity Goal	Activity Details	Activity Status	Timeline	Costs, FTEs (Budgeted/Actual)
1.				
2.				

- **Pre-Clinical R&D Progress: Months 13 – 18**

Executive Summary:

Include:

- Key strategic goals
- Milestones achieved
- GO/NO GO decisions
- Plan amendments (scope, timelines, resources, other)

Details:

Gilead Funding: [***]

Activity Goal	Activity Details	Activity Status	Timeline	Costs, FTEs (Budgeted/Actual)
1.				
2.				

- **Pre-Clinical R&D Progress: Months 19 – 24**

Executive Summary:

Include:

- Key strategic goals
- Milestones achieved
- GO/NO GO decisions
- Plan amendments (scope, timelines, resources, other)

Details:

Gilead Funding: [***]

Activity Goal	Activity Details	Activity Status	Timeline	Costs, FTEs (Budgeted/Actual)
1.				
2.				

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

B. Clinical Development

- **Development and Regulatory Activities Progress**

Activity	Status	Details
Phase 1 Trial		
Phase 2 Trial		
Phase 3 Trial		

- **Development Milestones Progress (as described in Section 5.2.1 of the Agreement)**

Development Milestones	Status	Comments
[***]		
[***]		
[***]		
[***]		
[***]		

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

- **Commercialization Milestones Progress (as described in Section 5.3.1 of the Agreement)**

Commercial Milestones	Status	Comments
The first time aggregate global Net Sales of Licensed Products in a Calendar Year are equal to or greater than [***] and less [***]		
The first time aggregate global Net Sales of Licensed Products in a Calendar Year are equal to or greater than [***] and less [***]		
The first time aggregate global Net Sales of Licensed Products in a Calendar Year are equal to or greater than [***] and [***]		
The first time aggregate global Net Sales of Licensed Products in a Calendar Year are equal to or greater than [***]		

C. Functional Group Resource Allocation:

Representatives from the following functional groups worked on the program during this semiannual period:

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Schedule 5.1.2
Invoicing Template

[Company Name]

INVOICE

[Street Address]
[City, ST ZIP]
Phone: (000) 000-0000

INVOICE #	DATE
[123456]	5/1/2014

BILL TO
Accounts Payable
Gilead Sciences, Inc.
333 Lakeside Drive
Foster City, California 94404
APInvoices@gilead.com

DESCRIPTION	AMOUNT
Gilead Funding Commitment Pursuant to Section 5.1.1 of the Collaboration and License Agreement between Gilead Sciences, Inc. and Precision Biosciences, Inc. dated September 7, 2018, for the six (6) month period to .	XX
TOTAL	**$ XX**

Payment Terms: *Payment shall be due within [***] of receipt by Gilead.*

If you have any questions about this invoice, please contact
[Name, Phone, email@address.com]

[***] Confidential treatment requested pursuant to a request for confidential treatment filed with the Securities and Exchange Commission. Omitted portions have been filed separately with the Commission.

Schedule 6.2.8

ARCUS Patents and Precision Patents

Schedule to be provided upon the timing set forth in Section 6.2.8.

Schedule 7.4
Press Release(s)

Gilead & Precision Biosciences logos

CONTACTS: Sung Lee, Gilead Investors
650-524-7792

Amy Flood, Gilead Media
650-522-5643

Heather King, Precision Media
919-314-5512 x1332

GILEAD SCIENCES AND PRECISION BIOSCIENCES ANNOUNCE COLLABORATION TO DEVELOP THERAPIES AGAINST HEPATITIS B VIRUS USING ARCUS GENOME EDITING

FOSTER CITY, Calif. and DURHAM, NC, Sept XX, 2018 - Gilead Sciences (Nasdaq: GILD) and Precision Biosciences announced today that the companies have entered into a strategic collaboration to develop therapies targeting the *in vivo* elimination of hepatitis B virus (HBV) with Precision's proprietary genome editing platform, ARCUS.

An estimated 257 million people are living with HBV infection around the world. Current HBV treatments suppress HBV viral replication but do not completely clear the virus. The presence of covalently closed circular DNA (cccDNA) enables HBV replication if treatment is stopped. Preliminary studies at Gilead using ARCUS nucleases to target HBV cccDNA *in vitro* have demonstrated significant activity against cccDNA and integrated HBV DNA in human hepatocytes.

"Gilead is committed to developing innovative therapies to achieve functional cure for patients with chronic Hepatitis B virus infection," said John McHutchison, MD, Chief Scientific Officer and Head of Research and Development at Gilead. "We are excited about the potential of genome editing and Precision's ARCUS technology, which has demonstrated promising *in vitro* activity. We look forward to exploring this technology as an important component of our HBV cure research efforts."

Under the terms of the collaboration agreement, Precision will be primarily responsible for the development, formulation, and preclinical evaluation of the investigational nucleases, and Gilead will be responsible for the clinical development and commercialization of potential therapies. Gilead will fully fund the research and development. Precision is eligible to receive milestone payments of up to an aggregate of $445 million and tiered royalties that go up to the mid-teens for commercial products developed through the collaboration.

Precision Chief Scientific Officer Derek Jantz commented, "Gilead's cure-based approach to Hepatitis B is comprehensive and exciting. Precision is pleased that initial studies with our ARCUS platform have established an important role for genome editing in their HBV program. This is an excellent application for our technology, which has made notable progress toward therapeutic *in vivo* editing in relevant models over the last year."

- more -

About Precision BioSciences

Precision BioSciences is dedicated to improving life. Our mission is to cure genetic disease, overcome cancer, and feed the planet. We are striving to achieve this goal with ARCUS, our therapeutic-grade, naturally-derived genome editing system that combines both specificity and efficacy to help overcome life's greatest genetic challenges. For additional information, please visit www.precisionbiosciences.com

About Gilead Sciences

Gilead Sciences, Inc. is a research-based biopharmaceutical company that discovers, develops and commercializes innovative medicines in areas of unmet medical need. The company strives to transform and simplify care for people with life-threatening illnesses around the world. Gilead has operations in more than 35 countries worldwide, with headquarters in Foster City, California.

Gilead Forward-Looking Statement

This press release includes forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 that are subject to risks, uncertainties and other factors, including the risk that the parties may not realize the potential benefits of this collaboration. All statements other than statements of historical fact are statements that could be deemed forward-looking statements. These risks, uncertainties and other factors could cause actual results to differ materially from those referred to in the forward-looking statements. The reader is cautioned not to rely on these forward-looking statements. These and other risks are described in detail in Gilead's Annual Report on Form 10-K for the year ended December 31, 2017, as filed with the U.S. Securities and Exchange Commission. All forward-looking statements are based on information currently available to Gilead, and Gilead assumes no obligation to update any such forward-looking statements.

# # #

For more information on Gilead Sciences, please visit the company's website at www.gilead.com, follow Gilead on Twitter (@GileadSciences) or call Gilead Public Affairs at 1-800-GILEAD-5 or 1-650-574-3000.

Schedule 8.2.12
Precision IP Subject to U.S. Federal Government Rights

None.

LEASE AGREEMENT

THIS LEASE AGREEMENT (this "**Lease**") is made this 29th day of March, 2018, between **ARE-NC REGION NO. 17, LLC**, a Delaware limited liability company ("**Landlord**"), and **ELO LIFE SYSTEMS, INC.**, a Delaware corporation ("**Tenant**").

Building: 3054 E. Cornwallis Road, Research Triangle Park, North Carolina (also known as 5 Laboratory Drive, Research Triangle Park, North Carolina).

Premises: That portion of the Project, containing approximately 15,558 rentable square feet of laboratory and office space in the Building, as shown on **Exhibit A**, subject to adjustment pursuant to Section 5 hereof.

Project: The real property on which the Building is located, together with all improvements thereon and appurtenances thereto as described on **Exhibit B**.

Base Rent: $27.00 per rentable square foot of the Premises per year, which shall all be subject to adjustment pursuant to Section 4 hereof.

Rentable Area of Premises: 15,558 sq. ft., subject to adjustment pursuant to Section 5 hereof

Rentable Area of Project: 181,029 sq. ft., subject to adjustment pursuant to Section 5 hereof

Rentable Area of Building: 135,719 sq. ft., subject to adjustment pursuant to Section 5 hereof

Tenant's Share of Operating Expenses of Project: 8.59%, subject to adjustment pursuant to Section 5 hereof

Building Share of Project: 74.97%, subject to adjustment pursuant to Section 5 hereof

Tenant's Share of Operating Expenses of Building: 11.46%, subject to adjustment pursuant to Section 5 hereof

Security Deposit: $35,005.50 (1 month of Base Rent with respect to the entire Premises)

Target Commencement Date: May 15, 2018

Rent Adjustment Percentage: 3%

Base Term: Beginning on the Commencement Date, and ending 84 months from the first day of the first full month following the Rent Commencement Date. For clarity, if the Rent Commencement Date occurs on the first day of a month, the Base Term shall be measured from that date. If the Rent Commencement Date occurs on a day other than the first day of a month, the Base Term shall be measured from the first day of the following month.

Permitted Use: Research and development laboratory, related office and other related uses consistent with the character of the Project and otherwise in compliance with the provisions of Section 7 hereof.

Address for Rent Payment:
Alexandria Real Estate Equities, Inc.
PO Box 896541
Charlotte, NC 28289-6541

Landlord's Notice Address:
385 E. Colorado Boulevard, Suite 299
Pasadena, CA 91101
Attention: Corporate Secretary

Tenant's Notice Address:
c/o Precision Biosciences, Inc.
302 E. Pettigrew ST.
Durham, NC 27701
Attention: Sinu Bhandaru, Director, Head of Operations & IT

The following Exhibits and Addenda are attached hereto and incorporated herein by this reference:

[X] **EXHIBIT A** - PREMISES DESCRIPTION
[X] **EXHIBIT B** - DESCRIPTION OF PROJECT
[X] **EXHIBIT C** - WORK LETTER
[X] **EXHIBIT D** - COMMENCEMENT DATE
[X] **EXHIBIT E** - RULES AND REGULATIONS
[X] **EXHIBIT F** - TENANT'S PERSONAL PROPERTY
[X] **EXHIBIT G** - FORM OF GUARANTY
[X] **EXHIBIT H** - INTENTIONALLY OMITTED
[X] **EXHIBIT I** - SHARED LAB AREA

1. **Lease of Premises**. Upon and subject to all of the terms and conditions hereof, Landlord hereby leases the Premises to Tenant and Tenant hereby leases the Premises from Landlord. The portions of the Project which are for the non-exclusive use of tenants of the Project are collectively referred to herein as the "**Common Areas**." Landlord reserves the right to modify Common Areas, provided that such modifications do not materially adversely affect Tenant's use of the Premises for the Permitted Use. From and after the Commencement Date through the expiration of the Term, Tenant shall have access to the Building and the Premises 24 hours a day, 7 days a week, except in the case of emergencies, as the result of Legal Requirements (as defined in Section 7 hereof), the performance by Landlord of any installation, maintenance or repairs, or any other temporary interruptions, and otherwise subject to the terms of this Lease.

2. **Delivery; Acceptance of Premises; Commencement Date**. Landlord shall use reasonable efforts to deliver ("**Delivery**" or "**Deliver**") the Premises to Tenant for the construction of the Tenant Improvements in the Premises under the Work Letter in Tenant Improvement Work Readiness Condition on or before the Target Commencement Date. If Landlord fails to timely Deliver the Premises, Landlord shall not be liable to Tenant for any loss or damage resulting therefrom, and this Lease shall not be void or voidable except as provided herein. If Landlord does not Deliver the Premises within 120 days of the Target Commencement Date for any reason other than Force Majeure delays and delays caused by Tenant, this Lease may be terminated by Tenant by written notice to Landlord, and if so terminated by Tenant: (a) the Security Deposit, or any balance thereof (i.e., after deducting therefrom all amounts to which Landlord is entitled under the provisions of this Lease), shall be returned to Tenant, and (b) neither Landlord nor Tenant shall have any further rights, duties or obligations under this Lease, except with respect to provisions which expressly survive termination of this Lease. As used herein, the term "**Tenant Improvements**" and "**Tenant Improvement Work Readiness Condition**" shall have the meanings set forth for such terms in the Work Letter. If Tenant does not elect to void this Lease within 10 business days of the lapse of such 120 day period, such right to void this Lease shall be waived and this Lease shall remain in full force and effect.

The "**Commencement Date**" shall be the date Landlord Delivers the Premises to Tenant. The "**Rent Commencement Date**" shall be the date that is 6 months after the Commencement Date.

Prior to the Commencement Date, Landlord and Tenant shall conduct an inspection of the HVAC systems serving the Premises at a time and date reasonably acceptable to Landlord and Tenant to confirm that the HVAC systems serving the Premises are in normal operating condition. If, through such inspection, it is reasonably determined by Landlord and Tenant that a particular component of the HVAC system serving the Premises is not then in normal operating condition, Landlord shall be responsible, at its sole cost and expense (which shall not constitute an Operating Expense), for any repairs that are required to be made to such HVAC system serving the Premises to cause it to be in normal operating condition, which repairs shall be made within a reasonable period after the Commencement Date.

For the period of 30 consecutive days after the Commencement Date, Landlord shall, at its sole cost and expense (which shall not constitute an Operating Expense), be responsible for any repairs that are required to be made to the Building Systems (as defined in Section 13) serving the Premises, unless Tenant or any Tenant Party was responsible for the cause of such repair, in which case Tenant shall pay the cost.

Except as otherwise expressly set forth in this Lease or as set forth in the Work Letter: (i) Tenant shall accept the Premises in their condition as of the Commencement Date, subject to all applicable Legal Requirements; (ii) Landlord shall have no obligation for any defects in the Premises; and (iii) Tenant's taking possession of the Premises shall be conclusive evidence that Tenant accepts the Premises and that the Premises were in good condition at the time possession was taken. Any occupancy of the Premises by Tenant before the Commencement Date shall be subject to all of the terms and conditions of this Lease, excluding the obligation to pay Base Rent and Operating Expenses.

During the Term, Tenant shall have the right to use the furniture, fixtures and equipment belonging to Landlord located within the Premises on the Commencement Date ("**Landlord's Furniture**"). Tenant shall have no right to remove any of Landlord's Furniture from the Premises without Landlord's prior written consent and Landlord's Furniture shall be returned to Landlord at the expiration or earlier termination of the Term in substantially the same condition as received by Tenant, except for ordinary wear and tear and casualty.

Upon request of Landlord, Tenant shall execute and deliver a written acknowledgment of the Commencement Date, the Rent Commencement Date and the expiration date of the Term when such are established in the form of the "Acknowledgement of Commencement Date" attached to this Lease as **Exhibit D**; provided, however, Tenant's failure to execute and deliver such acknowledgment shall not affect Landlord's rights hereunder. The "**Term**" of this Lease shall be the Base Term, as defined above on the first page of this Lease and the Extension Terms which Tenant may elect pursuant to Section 40 hereof.

Tenant agrees and acknowledges that, except as otherwise expressly set forth in this Lease, neither Landlord nor any agent of Landlord has made any representation or warranty with respect to the condition of all or any portion of the Premises or the Project, and/or the suitability of the Premises or the Project for the conduct of Tenant's business, and Tenant waives any implied warranty that the Premises or the Project are suitable for the Permitted Use. This Lease constitutes the complete agreement of Landlord and Tenant with respect to the subject matter hereof and supersedes any and all prior representations, inducements, promises, agreements, understandings and negotiations which are not contained herein. Landlord in executing this Lease does so in reliance upon Tenant's representations, warranties, acknowledgments and agreements contained herein.

3. **Rent**.

(a) **Base Rent**. Base Rent for the month in which the Rent Commencement Date occurs and the Security Deposit shall be due and payable on delivery of an executed copy of this Lease to Landlord. Tenant shall pay to Landlord in advance, without demand, abatement, deduction or set-off, equal monthly installments of Base Rent on or before the first day of each calendar month during the Term hereof after the Rent Commencement Date, in lawful money of the United States of America, at the office of Landlord for payment of Rent set forth above, or to such other person or at such other place as Landlord may from time to time designate in writing. Payments of Base Rent for any fractional calendar month shall be prorated. The obligation of Tenant to pay Base Rent and other sums to Landlord and the obligations of Landlord under this Lease are independent obligations. Tenant shall have no right at any time to abate, reduce, or set-off any Rent (as defined in Section 5) due hereunder except for any abatement as may be expressly provided in this Lease.

(b) **Additional Rent**. In addition to Base Rent, Tenant agrees to pay to Landlord as additional rent ("**Additional Rent**"): (i) commencing on the earlier of the Rent Commencement Date or the date that Tenant commences doing business in all or any portion of the Premises (the "**OPEX Commencement Date**"), Tenant's Share of "Operating Expenses" (as defined in Section 5), and (ii) any and all other amounts Tenant assumes or agrees to pay under the provisions of this Lease, including, without limitation, any and all other sums that may become due by reason of any default of Tenant or failure to comply with the agreements, terms, covenants and conditions of this Lease to be performed by Tenant, after any applicable notice and cure period.

4. **Base Rent Adjustments**.

(a) **Annual Adjustments**. Base Rent shall be increased on each annual anniversary of the Rent Commencement Date (each an "**Adjustment Date**") by multiplying the Base Rent payable immediately before such Adjustment Date by the Rent Adjustment Percentage and adding the resulting amount to the Base Rent payable immediately before such Adjustment Date. Base Rent, as so adjusted, shall thereafter be due as provided herein. Base Rent adjustments for any fractional calendar month shall be prorated.

(b) **TI Allowance**. Landlord shall, subject to the terms of the Work Letter, provide to tenant the TI Allowance (as defined in the Work Letter) of up to $70.00 per rentable square foot of the Premises for the construction of Tenant Improvements in the Premises. For each of the following incremental levels of the TI Allowance disbursed in connection with the Tenant Improvements in the Premises, Tenant shall pay "**TI Rent**" in an amount equal to the amount (per rentable square foot per year) for such increment of TI Allowance on the schedule set forth below:

TI Allowance (per rentable square foot)	Incremental Increase in Base Rent (per rentable square foot)
$0.00 - $55.00	$ 0.00
$55.01 - $70.00	$ 3.00

For example, if the entire TI Allowance was disbursed by Landlord, the initial annual Base Rent and TI Rent, collectively, would be $30.00 per rentable square foot of the Premises per year. The incremental increase in TI Rent shall be equal to $0.200 per rentable square foot of the Premises per year for every $1.00 of TI Allowance Tenant elects to use in excess of $55.00. TI Rent shall be increased on each annual anniversary of the Rent Commencement Date by multiplying the TI Rent payable immediately before such Adjustment Date by the Rent Adjustment Percentage and adding the resulting amount to the TI Rent payable immediately before such Adjustment Date.

5. **Operating Expense Payments**. Landlord shall deliver to Tenant a written estimate of Operating Expenses for each calendar year during the Term (the "**Annual Estimate**"), which may be revised by Landlord from time to time during such calendar year. Commencing on the OPEX Commencement Date, and continuing thereafter on the first day of each month during the Term, Tenant shall pay to Landlord an amount equal to 1/12th of Tenant's Share of the Annual Estimate. Payments for any fractional calendar month shall be prorated.

The term "**Operating Expenses**" means all costs and expenses of any kind or description whatsoever incurred or accrued each calendar year by Landlord with respect to the Building (including the Building's Share of all costs and expenses of any kind or description incurred or accrued by Landlord with respect to the Project which are not specific to the Building or any other building located in the Project) (including, without duplication, Taxes (as defined in Section 9); the cost of common area amenities ("**Amenities**") now or hereafter located at the Project, which Amenities may include, without limitation, a fitness center, restaurant/café and/or conference center; capital repairs and improvements amortized over the lesser of 10 years and the useful life of such capital items; and the costs of Landlord's third party property manager or, if there is no third party property manager, administration rent in the amount of 4.0% of Base Rent), excluding only:

(a) the original construction costs of the Project and renovation prior to the date of the Lease and costs of correcting defects in such original construction or renovation;

(b) capital expenditures for expansion of the Project;

(c) interest, principal payments of Mortgage (as defined in Section 27) debts of Landlord, financing costs and amortization of funds borrowed by Landlord, whether secured or unsecured;

(d) depreciation of the Project (except for capital improvements, the cost of which are includable in Operating Expenses);

(e) advertising, legal and space planning expenses and leasing commissions and other costs and expenses incurred in procuring and leasing space to tenants for the Project, including any leasing office maintained in the Project, free rent and construction allowances for tenants;

(f) legal and other expenses incurred in the negotiation or enforcement of leases;

(g) completing, fixturing, improving, renovating, painting, redecorating or other work, which Landlord pays for or performs for other tenants within their premises, and costs of correcting defects in such work;

(h) costs to be reimbursed by other tenants of the Project or Taxes to be paid directly by Tenant or other tenants of the Project, whether or not actually paid;

(i) salaries, wages, benefits and other compensation paid to (i) personnel of Landlord or its agents or contractors above the position of the person, regardless of title, who has day-to-day management responsibility for the Project or (ii) officers and employees of Landlord or its affiliates who are not assigned in whole or in part to the operation, management, maintenance or repair of the Project; provided, however, that with respect to any such person who does not devote substantially all of his or her employed time to the Project, the salaries, wages, benefits and other compensation of such person shall be prorated to reflect time spent on matters related to operating, managing, maintaining or repairing the Project in comparison to the time spent on matters unrelated to operating, managing, maintaining or repairing the Project;

(j) general organizational, administrative and overhead costs relating to maintaining Landlord's existence, either as a corporation, partnership, or other entity, including general corporate, legal and accounting expenses;

(k) costs (including attorneys' fees and costs of settlement, judgments and payments in lieu thereof) incurred in connection with disputes with tenants, other occupants, or prospective tenants, and costs and expenses, including legal fees, incurred in connection with negotiations or disputes with employees, consultants, management agents, leasing agents, purchasers or mortgagees of the Building;

(l) costs incurred by Landlord due to the violation by Landlord, its employees, agents or contractors or any tenant of the terms and conditions of any lease of space in the Project or any Legal Requirement (as defined in Section 7);

(m) penalties, fines or interest incurred as a result of Landlord's inability or failure to make payment of Taxes and/or to file any tax or informational returns when due, or from Landlord's failure to make any payment of Taxes required to be made by Landlord hereunder before delinquency;

(n) overhead and profit increment paid to Landlord or to subsidiaries or affiliates of Landlord for goods and/or services in or to the Project to the extent the same exceeds the costs of such goods and/or services rendered by unaffiliated third parties on a competitive basis;

(o) costs of Landlord's charitable or political contributions, or of fine art maintained at the Project;

(p) costs in connection with services (including electricity), items or other benefits of a type which are not standard for the Project and which are not available to Tenant without specific charges therefor, but which are provided to another tenant or occupant of the Project, whether or not such other tenant or occupant is specifically charged therefor by Landlord;

(q) costs incurred in the sale or refinancing of the Project;

(r) net income taxes of Landlord or the owner of any interest in the Project, franchise, capital stock, gift, estate or inheritance taxes or any federal, state or local documentary taxes imposed against the Project or any portion thereof or interest therein; and

(s) any expenses otherwise includable within Operating Expenses to the extent actually reimbursed by persons other than tenants of the Project under leases for space in the Project.

In addition, notwithstanding anything to the contrary contained in this Lease, Operating Expenses incurred or accrued by Landlord with respect to any capital improvements which are reasonably expected by Landlord to reduce overall Operating Expenses (for example, without limitation, by reducing energy usage at the Project) (the "**Energy Savings Costs**") shall be amortized over a period of years equal to the least of (A) 10 years, (B) the useful life of such capital items, or (C) the quotient of (i) the Energy Savings Costs, divided by (ii) the annual amount of Operating Expenses reasonably expected by Landlord to be saved as a result of such capital improvements.

Following the first year after the Commencement Date, that part of Operating Expenses which is comprised of Controllable Operating Expenses (as defined below) shall be increased by no more than 5% per year. Such limitation of 5% per year on increases shall be cumulative year to year, so that if in any year the increase in cumulative Operating Expenses is more or less than 5%, then the difference between 5% and the actual percentage increase in that year may be carried forward to any future year, and may be applied in such future year to increase the actual percentage increase (even if more than 5% for such year) subject to the limitation that Controllable Operating Expenses shall not have increased by more than 5% compounded annually since the beginning of the Term. "**Controllable Operating Expenses**" shall mean those Operating Expenses for which increases are reasonably within the control of Landlord, and shall specifically not include, without limitation, Taxes, assessments, refuse and or trash removal, insurance, collectively bargained union wages, electricity and other utilities. There shall be no limitation on the amount of increase from year to year on Operating Expenses which are not Controllable Operating Expenses.

Within 90 days after the end of each calendar year (or such longer period as may be reasonably required), Landlord shall furnish to Tenant a statement (an "**Annual Statement**") showing in reasonable detail: (a) the total and Tenant's Share of actual Operating Expenses for the previous calendar year, and (b) the total of Tenant's payments in respect of Operating Expenses for such year. If Tenant's Share of actual Operating Expenses for such year exceeds Tenant's payments of Operating Expenses for such year, the excess shall be due and payable by Tenant as Rent within 30 days after delivery of such Annual Statement to Tenant. If Tenant's payments of Operating Expenses for such year exceed Tenant's Share of actual Operating Expenses for such year Landlord shall pay the excess to Tenant within 30 days after delivery of such Annual Statement, except that after the expiration, or earlier termination of the Term or if Tenant is delinquent in its obligation to pay Rent, Landlord shall pay the excess to Tenant after deducting all other amounts due Landlord. Landlord's and Tenant's obligations to pay any overpayments or deficiencies due pursuant to this paragraph shall survive the expiration or earlier termination of this Lease.

The Annual Statement shall be final and binding upon Tenant unless Tenant, within 60 days after Tenant's receipt thereof, shall contest any item therein by giving written notice to Landlord, specifying each item contested and the reason therefor. If, during such 60 day period, Tenant reasonably and in good faith questions or contests the accuracy of Landlord's statement of Tenant's Share of Operating Expenses, Landlord will provide Tenant with access to Landlord's books and records relating to the operation of the Project and such information as Landlord reasonably determines to be responsive to Tenant's questions (the "**Expense Information**"). If after Tenant's review of such Expense Information, Landlord and Tenant cannot agree upon the amount of Tenant's Share of Operating Expenses, then

Tenant shall have the right to have a regionally or nationally recognized independent public accounting firm selected by Tenant and approved by Landlord (which approval shall not be unreasonably withheld, conditioned or delayed), working pursuant to a fee arrangement other than a contingent fee (at Tenant's sole cost and expense), audit and/or review the Expense Information for the year in question (the "**Independent Review**"). The results of any such Independent Review shall be binding on Landlord and Tenant. If the Independent Review shows that the payments actually made by Tenant with respect to Operating Expenses for the calendar year in question exceeded Tenant's Share of Operating Expenses for such calendar year, Landlord shall at Landlord's option either (i) credit the excess amount to the next succeeding installments of estimated Operating Expenses or (ii) pay the excess to Tenant within 30 days after delivery of such statement, except that after the expiration or earlier termination of this Lease or if Tenant is delinquent in its obligation to pay Rent, Landlord shall pay the excess to Tenant after deducting all other amounts due Landlord. If the Independent Review shows that Tenant's payments with respect to Operating Expenses for such calendar year were less than Tenant's Share of Operating Expenses for the calendar year, Tenant shall pay the deficiency to Landlord within 30 days after delivery of such statement. If the Independent Review shows that Tenant has overpaid with respect to Operating Expenses by more than 5% then Landlord shall reimburse Tenant for all costs incurred by Tenant for the Independent Review. Operating Expenses for the calendar years in which Tenant's obligation to share therein begins and ends shall be prorated. Notwithstanding anything set forth herein to the contrary, if the Project is not at least 95% occupied on average during any year of the Term, Tenant's Share of Operating Expenses for such year shall be computed as though the Project had been 95% occupied on average during such year.

"**Tenant's Share of Operating Expenses of Project**" shall be the percentage set forth on page 1 of this Lease as Tenant's Share of Operating Expenses of Project, "**Tenant's Share of Operating Expenses of Building**" shall be the percentage set forth on page 1 of this Lease for Tenant's Share of Operating Expenses of Building, as may be reasonably adjusted for changes in the physical size of the Premises, Building, or the Project occurring thereafter. Landlord may cause, within 90 days after Commencement Date the rentable square footage of the Premises, the Building and/or the Project to be re-measured by Integrated Design, based upon the Core and Shell Plans (as defined in the Work Letter), in accordance with the Standard Method of Measuring Floor Area in Office Buildings as adopted by the Building Owners and Managers Association International (ANSI/BOMA Z65.1-2010). If the actual rentable square footage of the Premises, the Building or the Project deviates from the amount specified in the definitions of "Premises," "Rentable Area of Premises," "Rentable Area of Building" or "Rentable Are of Project" on page 1 of this Lease, then, promptly following such measurement, this Lease shall be amended so as to (i) reflect the actual rentable square footage thereof in the definitions of ""Premises," "Rentable Area of Premises," "Rentable Area of Building" or "Rentable Are of Project", and (ii) appropriately adjust the amounts set forth in the definitions of "Tenant's Share of Operating Expenses of Project," "Building Share of Project" and "Tenant's Share of Operating Expenses of Building" which were calculated based on the estimated rentable square footage of the Premises, the Building and the Project set forth on page 1 of this Lease and the Premises shall not be subject to further re-measurement. Notwithstanding anything to the contrary contained herein, in no event shall Tenant have the right to reduce the size of the footprint of the Premises reflected on **Exhibit A** attached hereto. If Landlord has a reasonable basis for doing so, Landlord may equitably increase Tenant's Share of the Building for any item of expense or cost reimbursable by Tenant that relates to a repair, replacement, or service that benefits only the Premises or only a portion of the Building or Project that includes the Premises or that varies with occupancy or use. Base Rent, Tenant's Share of Operating Expenses and all other amounts payable by Tenant to Landlord hereunder are collectively referred to herein as "**Rent**."

6. **Security Deposit**. Tenant shall deposit with Landlord, upon delivery of an executed copy of this Lease to Landlord, a security deposit (the "**Security Deposit**") for the performance of all of Tenant's obligations hereunder in the amount set forth on page 1 of this Lease, which Security Deposit shall be in the form of an unconditional and irrevocable letter of credit (the "**Letter of Credit**"): (i) in form and substance satisfactory to Landlord, (ii) naming Landlord as beneficiary, (iii) expressly allowing Landlord to draw upon it at any time from time to time by delivering to the issuer notice that Landlord is entitled to draw thereunder, (iv) issued by an FDIC-insured financial institution satisfactory to Landlord, and (v) redeemable by presentation of a sight draft in the state of Landlord's choice. If Tenant does not

provide Landlord with a substitute Letter of Credit complying with all of the requirements hereof at least 10 days before the stated expiration date of any then current Letter of Credit, Landlord shall have the right to draw the full amount of the current Letter of Credit and hold the funds drawn in cash without obligation for interest thereon as the Security Deposit. The Security Deposit shall be held by Landlord as security for the performance of Tenant's obligations under this Lease. The Security Deposit is not an advance rental deposit or a measure of Landlord's damages in case of Tenant's default. Upon each occurrence of a Default (as defined in Section 20), Landlord may use all or any part of the Security Deposit to pay delinquent payments due under this Lease, future rent damages, and the cost of any damage, injury, expense or liability caused by such Default, without prejudice to any other remedy provided herein or provided by law. Landlord's right to use the Security Deposit under this Section 6 includes the right to use the Security Deposit to pay future rent damages following the termination of this Lease pursuant to Section 21(c) below. Upon any use of all or any portion of the Security Deposit, Tenant shall pay Landlord within 5 business days after written demand the amount that will restore the Security Deposit to the amount set forth on Page 1 of this Lease. Tenant hereby waives the provisions of any law, now or hereafter in force which provide that Landlord may claim from a security deposit only those sums reasonably necessary to remedy defaults in the payment of Rent, to repair damage caused by Tenant or to clean the Premises, it being agreed that Landlord may, in addition, claim those sums reasonably necessary to compensate Landlord for any other loss or damage, foreseeable or unforeseeable, caused by the act or omission of Tenant or any officer, employee, agent or invitee of Tenant. Upon bankruptcy or other debtor-creditor proceedings against Tenant, the Security Deposit shall be deemed to be applied first to the payment of Rent and other charges due Landlord for periods prior to the filing of such proceedings. If Tenant shall fully perform every provision of this Lease to be performed by Tenant, the Security Deposit, or any balance thereof (i.e., after deducting therefrom all amounts to which Landlord is entitled under the provisions of this Lease), shall be returned to Tenant (or, at Landlord's option, to the last assignee of Tenant's interest hereunder) within 90 days after the expiration or earlier termination of this Lease.

If Landlord transfers its interest in the Project or this Lease, Landlord shall either (a) transfer any Security Deposit then held by Landlord to a person or entity assuming Landlord's obligations under this Section 6, or (b) return to Tenant any Security Deposit then held by Landlord and remaining after the deductions permitted herein. Upon such transfer to such transferee or the return of the Security Deposit to Tenant, Landlord shall have no further obligation with respect to the Security Deposit, and Tenant's right to the return of the Security Deposit shall apply solely against Landlord's transferee. The Security Deposit is not an advance rental deposit or a measure of Landlord's damages in case of Tenant's default. Landlord's obligation respecting the Security Deposit is that of a debtor, not a trustee, and no interest shall accrue thereon.

7. **Use**. The Premises shall be used solely for the Permitted Use set forth in the basic lease provisions on page 1 of this Lease, and in compliance with all laws, orders, judgments, ordinances, regulations, codes, directives, permits, licenses, covenants and restrictions now or hereafter applicable to the Premises, and to the use and occupancy thereof, including, without limitation, the Americans With Disabilities Act, 42 U.S.C. § 12101, et seq. (together with the regulations promulgated pursuant thereto, "**ADA**") (collectively, "**Legal Requirements**" and each, a "**Legal Requirement**"). Tenant shall, upon 5 days' written notice from Landlord, discontinue any use of the Premises which is declared by any Governmental Authority (as defined in Section 9) having jurisdiction to be a violation of a Legal Requirement. Tenant will not use or permit the Premises to be used for any purpose or in any manner that would void Tenant's or Landlord's insurance, increase the insurance risk, or cause the disallowance of any sprinkler or other credits. Tenant shall not permit any part of the Premises to be used as a "place of public accommodation", as defined in the ADA or any similar legal requirement. Tenant shall reimburse Landlord promptly upon demand (and delivery of reasonable supporting documentation) for any additional premium charged for any such insurance policy by reason of Tenant's failure to comply with the provisions of this Section or otherwise caused by Tenant's particular use and/or occupancy of the Premises. Tenant will use the Premises in a careful, safe and proper manner and will not commit or permit waste, overload the floor or structure of the Premises, subject the Premises to use that would damage the Premises or obstruct or interfere with the rights of Landlord or other tenants or occupants of the Project, including conducting or giving notice of any auction, liquidation, or going out of business sale

on the Premises, or using or allowing the Premises to be used for any unlawful purpose. Tenant shall cause any equipment or machinery to be installed in the Premises so as to reasonably prevent sounds or vibrations from the Premises from extending into Common Areas, or other space in the Project. Tenant shall not place any machinery or equipment weighing 500 pounds or more in or upon the Premises or transport or move such items through the Common Areas of the Project or in the Project elevators without the prior written consent of Landlord. Except as may be provided under the Work Letter, Tenant shall not, without the prior written consent of Landlord, use the Premises in any manner which will require ventilation, air exchange, heating, gas, steam, electricity or water beyond the existing capacity of the Project as proportionately allocated to the Premises based upon Tenant's Share as usually furnished for the Permitted Use.

Landlord shall, as an Operating Expense (to the extent such Legal Requirement is generally applicable to similar buildings in the area in which the Project is located) and at Tenant's expense (to the extent such Legal Requirement is triggered by reason of Tenant's, as compared to other tenants of the Project, particular use of the Premises, the Tenant Improvements or Tenant's Alterations) make any alterations or modifications to the Common Areas or the exterior of the Building that are required by Legal Requirements, including the ADA. Tenant, at its sole expense, shall make any alterations or modifications to the interior or the exterior of the Premises or the Project that are required by Legal Requirements (including, without limitation, compliance of the Premises with the ADA) related to Tenant's particular use or occupancy of the Premises, the Tenant Improvements or Tenant's Alterations. Notwithstanding any other provision herein to the contrary, except as otherwise expressly set forth in the first sentence of this paragraph, Tenant shall be responsible for any and all demands, claims, liabilities, losses, costs, expenses, actions, causes of action, damages or judgments, and all reasonable expenses incurred in investigating or resisting the same (including, without limitation, reasonable attorneys' fees, charges and disbursements and costs of suit) (collectively, "**Claims**") arising out of or in connection with Tenant's failure to comply with Legal Requirements related to Tenant's use or occupancy of the Premises, the Tenant Improvements or Tenant's Alterations, and Tenant shall indemnify, defend, hold and save Landlord harmless from and against any and all Claims arising out of or in connection with any failure of the Premises to comply with any Legal Requirement related to Tenant's use or occupancy of the Premises, the Tenant Improvements or Tenant's Alterations.

Tenant acknowledges that Landlord may, but shall not be obligated to, seek to obtain Leadership in Energy and Environmental Design (LEED), WELL Building Standard, or other similar "green" certification with respect to the Project and/or the Premises, and Tenant agrees to reasonably cooperate with Landlord, and to provide such information and/or documentation as Landlord may reasonably request, in connection therewith.

8. **Holding Over**. If, with Landlord's express written consent, Tenant retains possession of the Premises after the termination of the Term, (i) unless otherwise agreed in such written consent, such possession shall be subject to immediate termination by Landlord at any time, (ii) all of the other terms and provisions of this Lease (including, without limitation, the adjustment of Base Rent pursuant to Section 4 hereof) shall remain in full force and effect (excluding any expansion or renewal option or other similar right or option) during such holdover period, (iii) Tenant shall continue to pay Base Rent in the amount payable upon the date of the expiration or earlier termination of this Lease or such other amount as Landlord may indicate, in Landlord's sole and absolute discretion, in such written consent, and (iv) all other payments shall continue under the terms of this Lease. If Tenant remains in possession of the Premises after the expiration or earlier termination of the Term without the express written consent of Landlord, (A) Tenant shall become a tenant at sufferance upon the terms of this Lease except that the monthly rental shall be equal to (x) 125% of Rent in effect during the last 30 days of the Term for the first 30 days of such hold over, and (y) thereafter, 150% of Rent in effect during the last 30 days of the Term, and (B) Tenant shall be responsible for all damages suffered by Landlord resulting from or occasioned by Tenant's holding over, including consequential damages. No holding over by Tenant, whether with or without consent of Landlord, shall operate to extend this Lease except as otherwise expressly provided, and this Section 8 shall not be construed as consent for Tenant to retain possession of the Premises. Acceptance by Landlord of Rent after the expiration of the Term or earlier termination of this Lease shall not result in a renewal or reinstatement of this Lease.

9. **Taxes**. Landlord shall pay, as part of Operating Expenses, all taxes, levies, fees, assessments and governmental charges of any kind, existing as of the Commencement Date, or thereafter enacted (collectively referred to as "**Taxes**"), imposed by any federal, state, regional, municipal, local or other governmental authority or agency, including, without limitation, quasi-public agencies (collectively, "**Governmental Authority**") during the Term, including, without limitation, all Taxes: (i) imposed on or measured by or based, in whole or in part, on rent payable to (or gross receipts received by) Landlord under this Lease and/or from the rental by Landlord of the Project or any portion thereof, or (ii) based on the square footage, assessed value or other measure or evaluation of any kind of the Premises or the Project, or (iii) assessed or imposed by or on the operation or maintenance of any portion of the Premises or the Project, including parking, or (iv) assessed or imposed by, or at the direction of, or resulting from Legal Requirements, or interpretations thereof, promulgated by any Governmental Authority, or (v) imposed as a license or other fee, charge, tax, or assessment on Landlord's business or occupation of leasing space in the Project. Landlord may contest by appropriate legal proceedings the amount, validity, or application of any Taxes or liens securing Taxes. Taxes shall not include any net income taxes imposed on Landlord except to the extent such net income taxes are in substitution for any Taxes payable hereunder. If any such Tax is levied or assessed directly against Tenant, then Tenant shall be responsible for and shall pay the same at such times and in such manner as the taxing authority shall require. Tenant shall pay, prior to delinquency, any and all Taxes levied or assessed against any personal property or trade fixtures placed by Tenant in the Premises, whether levied or assessed against Landlord or Tenant. If any Taxes on Tenant's personal property or trade fixtures are levied against Landlord or Landlord's property, or if the assessed valuation of the Project is increased by a value attributable to improvements in or alterations to the Premises, whether owned by Landlord or Tenant and whether or not affixed to the real property so as to become a part thereof, higher than the base valuation on which Landlord from time-to-time allocates Taxes to all tenants in the Project, Landlord shall have the right, but not the obligation, to pay such Taxes. Landlord's determination of any excess assessed valuation shall be binding and conclusive, absent manifest error. The amount of any such payment by Landlord shall constitute Additional Rent due from Tenant to Landlord immediately upon demand.

10. **Parking**. Subject to all applicable Legal Requirements, Force Majeure, a Taking (as defined in Section 19 below) and the exercise by Landlord of its rights hereunder, Tenant shall have the right commencing on the Commencement Date, at no additional cost to Tenant during the Base Term, in common with other tenants of the Project pro rata in accordance with the rentable area of the Premises and the rentable areas of the Project occupied by such other tenants, to park in those areas designated for non-reserved parking, subject in each case to Landlord's rules and regulations. As of the Commencement Date, Tenant's pro rata share of parking is equal to 3.2 parking spaces per 1,000 rentable square feet of the Premises. Landlord may allocate parking spaces among Tenant and other tenants in the Project pro rata as described above if Landlord determines that such parking facilities are becoming crowded. Landlord shall not be responsible for enforcing Tenant's parking rights against any third parties, including other tenants of the Project.

11. **Utilities, Services**. Landlord shall provide, subject to the terms of this Section 11, water, electricity, heat, light, power, sewer, and other utilities (including gas and fire sprinklers to the extent the Project is plumbed for such services), refuse and trash collection and janitorial services (collectively, "**Utilities**"). Except for any separately metered Utilities provided to the Premises paid for directly by Tenant, Landlord shall pay, as Operating Expenses or subject to Tenant's reimbursement obligation, for all Utilities used on the Premises, all maintenance charges for Utilities, and any storm sewer charges or other similar charges for Utilities imposed by any Governmental Authority or Utility provider, and any taxes, penalties, surcharges or similar charges thereon. Landlord may cause, at Tenant's expense, any Utilities to be separately metered or charged directly to Tenant by the provider. Tenant shall pay directly to the Utility provider, prior to delinquency, any separately metered Utilities and services which may be furnished to Tenant or the Premises during the Term. Tenant shall pay, as part of Operating Expenses, its share of all charges for jointly metered Utilities based upon consumption, as reasonably determined by Landlord. No interruption or failure of Utilities, from any cause whatsoever other than Landlord's willful misconduct, shall result in eviction or constructive eviction of Tenant, termination of this Lease or the abatement of Rent. Tenant agrees to limit use of water and sewer with respect to Common Areas to normal restroom use. Notwithstanding the foregoing, Tenant may elect by delivery of written notice to Landlord to be responsible for obtaining and paying for its own janitorial services to the Premises using vendors reasonably acceptable to Landlord.

Landlord's sole obligation for either providing emergency generators or providing emergency back-up power to Tenant shall be: (i) to provide emergency generators with not less than the capacity of the emergency generators located in the Building as of the Commencement Date, and (ii) to contract with a third party to maintain the emergency generators as per the manufacturer's standard maintenance guidelines. Except as otherwise provided in the immediately preceding sentence, Landlord shall have no obligation to provide Tenant with operational emergency generators or back-up power or to supervise, oversee or confirm that the third party maintaining the emergency generators is maintaining the generators as per the manufacturer's standard guidelines or otherwise. Notwithstanding anything to the contrary contained herein, Landlord shall, at least once per quarter as part of the maintenance of the Building, run the emergency generator for a period reasonably determined by Landlord for the purpose of determining whether it operates when started. Landlord shall, upon written request from Tenant (not more frequently than once per calendar year), make available for Tenant's inspection the maintenance contract and maintenance records for the emergency generators for the 12 month period immediately preceding Landlord's receipt of Tenant's written request. During any period of replacement, repair or maintenance of the emergency generators when the emergency generators are not operational, including any delays thereto due to the inability to obtain parts or replacement equipment, Landlord shall have no obligation to provide Tenant with an alternative back-up generator or generators or alternative sources of back-up power. Tenant expressly acknowledges and agrees that Landlord does not guaranty that such emergency generators will be operational at all times or that emergency power will be available to the Premises when needed.

Tenant agrees to provide Landlord with access to Tenant's water and/or energy usage data on a monthly basis, either by providing Tenant's applicable utility login credentials to Landlord's Measurabl online portal, or by another delivery method reasonably agreed to by Landlord and Tenant. The costs and expenses incurred by Landlord in connection with receiving and analyzing such water and/or energy usage data (including, without limitation, as may be required pursuant to applicable Legal Requirements) shall be included as part of Operating Expenses.

12. **Alterations and Tenant's Property**. Except for the Tenant Alterations (which shall be governed by the Work Letter), any alterations, additions, or improvements made to the Premises by or on behalf of Tenant, including additional locks or bolts of any kind or nature upon any doors or windows in the Premises, but excluding installation, removal or realignment of furniture systems (other than removal of furniture systems owned or paid for by Landlord) not involving any modifications to the structure or connections (other than by ordinary plugs or jacks) to Building Systems (as defined in Section 13) ("**Alterations**") shall be subject to Landlord's prior written consent, which may be given or withheld in Landlord's sole discretion if any such Alteration affects the structure or Building Systems and shall not be otherwise unreasonably withheld. Tenant may construct nonstructural Alterations in the Premises without Landlord's prior approval if the aggregate cost of all such work in any 12 month period does not exceed $50,000.00 (a "**Notice-Only Alteration**"), provided Tenant notifies Landlord in writing of such intended Notice-Only Alteration, and such notice shall be accompanied by plans, specifications, work contracts and such other information concerning the nature and cost of the Notice-Only Alteration as may be reasonably requested by Landlord, which notice and accompanying materials shall be delivered to Landlord not less than 10 business days in advance of any proposed construction. If Landlord approves any Alterations, Landlord may impose such conditions on Tenant in connection with the commencement, performance and completion of such Alterations as Landlord may deem appropriate in Landlord's reasonable discretion. Any request for approval shall be in writing, delivered not less than 10 business days in advance of any proposed construction, and accompanied by plans, specifications, bid proposals, work contracts and such other information concerning the nature and cost of the alterations as may be reasonably requested by Landlord, including the identities and mailing addresses of all persons performing work or supplying materials. Landlord shall use reasonable efforts to respond to any such request for approval within 10 business days after Tenant's delivery of such request along with the items required pursuant to the immediately preceding sentence. Landlord's right to review plans and specifications and to monitor construction shall be solely for its own benefit, and Landlord shall have no

duty to ensure that such plans and specifications or construction comply with applicable Legal Requirements. Tenant shall cause, at its sole cost and expense, all Alterations to comply with insurance requirements and with Legal Requirements and shall implement at its sole cost and expense any alteration or modification required by Legal Requirements as a result of any Alterations. Tenant shall pay to Landlord, as Additional Rent, on demand an amount equal to 3% of all charges incurred by Tenant or its contractors or agents in connection with any Alteration to cover Landlord's overhead and expenses for plan review, coordination, scheduling and supervision. Before Tenant begins any Alteration, Landlord may post on and about the Premises notices of non-responsibility pursuant to applicable law. Tenant shall reimburse Landlord for, and indemnify and hold Landlord harmless from, any expense incurred by Landlord by reason of faulty work done by Tenant or its contractors, delays caused by such work, or inadequate cleanup.

With respect to any Alterations exceeding $50,000, Tenant shall furnish security or make other arrangements satisfactory to Landlord to assure payment for the completion of all Alterations work free and clear of liens. With respect to all Alterations, Tenant shall provide (and cause each contractor or subcontractor to provide) certificates of insurance for workers' compensation and other coverage in amounts and from an insurance company satisfactory to Landlord protecting Landlord against liability for personal injury or property damage during construction. Upon completion of any Alterations, Tenant shall deliver to Landlord: (i) sworn statements setting forth the names of all contractors and subcontractors who did the work and final lien waivers from all such contractors and subcontractors; and (ii) "as built" plans for any such Alteration.

Except for Removable Installations (as hereinafter defined), all Installations (as hereinafter defined) shall be and shall remain the property of Landlord during the Term and following the expiration or earlier termination of the Term, shall not be removed by Tenant at any time during the Term, and shall remain upon and be surrendered with the Premises as a part thereof. Notwithstanding the foregoing, Landlord may, at the time its approval of any such Installation is requested, or at the time it receives notice of a Notice-Only Alteration, notify Tenant that Landlord requires that Tenant remove such Installation upon the expiration or earlier termination of the Term, in which event Tenant shall remove such Installation in accordance with the immediately succeeding sentence. Upon the expiration or earlier termination of the Term, Tenant shall remove (i) all wires, cables or similar equipment which Tenant has installed in the Premises or in the risers or plenums of the Building, (ii) any Installations for which Landlord has given Tenant notice of removal in accordance with the immediately preceding sentence, and (iii) all of Tenant's Property (as hereinafter defined), and Tenant shall restore and repair any damage caused by or occasioned as a result of such removal, including, without limitation, capping off all such connections behind the walls of the Premises and repairing any holes. During any restoration period beyond the expiration or earlier termination of the Term, Tenant shall pay Rent to Landlord as provided herein as if said space were otherwise occupied by Tenant.

For purposes of this Lease, (x) "**Removable Installations**" means any items listed on **Exhibit F** attached hereto and any items agreed by Landlord in writing to be included on **Exhibit F** in the future, (y) "**Tenant's Property**" means Removable Installations and, other than Installations, any personal property or equipment of Tenant that may be removed without material damage to the Premises, and (z) "**Installations**" means all property of any kind paid for with the TI Fund, all Alterations, all fixtures, and all partitions, hardware, built-in machinery, built-in casework and cabinets and other similar additions, equipment, property and improvements built into the Premises so as to become an integral part of the Premises, including, without limitation, fume hoods which penetrate the roof or plenum area, built-in cold rooms, built-in warm rooms, walk-in cold rooms, walk-in warm rooms, deionized water systems, glass washing equipment, autoclaves, chillers, built-in plumbing, electrical and mechanical equipment and systems, and any power generator and transfer switch.

Notwithstanding anything to the contrary contained in this Lease, Tenant shall not be required to remove the Tenant Improvements at the expiration or earlier termination of the Term and Tenant shall have no right to remove the Tenant Improvements at any time (other than as part of Alterations approved by Landlord pursuant to this Section 12).

13. **Landlord's Repairs**. Landlord, as an Operating Expense, shall maintain all of the structural, exterior, parking and other Common Areas of the Project, including HVAC, plumbing, fire sprinklers, elevators and all other building systems serving the Premises and other portions of the Project ("**Building Systems**"), in good repair, reasonable wear and tear and uninsured losses and damages caused by Tenant, or by any of Tenant, or by any of Tenant's assignees, sublessees, licensees, agents, servants, employees, invitees and contractors (or any of Tenant's assignees, sublessees and/or licensees respective agents, servants, employees, invitees and contractors) (collectively, "**Tenant Parties**") excluded. Losses and damages caused by Tenant or any Tenant Party shall be repaired by Landlord, to the extent not covered by insurance, at Tenant's sole cost and expense. Landlord reserves the right to stop Building Systems services when necessary (i) by reason of accident or emergency, or (ii) for planned repairs, alterations or improvements, which are, in the reasonable judgment of Landlord, desirable or necessary to be made, until said repairs, alterations or improvements shall have been completed. Landlord shall have no responsibility or liability for failure to supply Building Systems services during any such period of interruption; provided, however, that Landlord shall, except in case of emergency, make a commercially reasonable effort to give Tenant 48 hours advance notice (e-mail being sufficient) of any planned stoppage of Building Systems services for routine maintenance, repairs, alterations or improvements. Landlord shall use reasonable efforts to minimize interference with Tenant's operations within the Premises resulting from the stoppage of Building Systems pursuant to this Section 13. Tenant shall promptly give Landlord written notice of any repair required by Landlord pursuant to this Section, after which Landlord shall make a commercially reasonable effort to effect such repair within a reasonable period. Landlord shall not be liable for any failure to make any repairs or to perform any maintenance unless such failure shall persist for an unreasonable time after Tenant's written notice of the need for such repairs or maintenance. Tenant waives its rights under any state or local law to terminate this Lease or to make such repairs at Landlord's expense and agrees that the parties' respective rights with respect to such matters shall be solely as set forth herein. Repairs required as the result of fire, earthquake, flood, vandalism, war, or similar cause of damage or destruction shall be controlled by Section 18.

14. **Tenant's Repairs**. Subject to Section 13 hereof, Tenant, at its expense, shall repair, replace and maintain in good condition all portions of the Premises, including, without limitation, entries, doors, ceilings, interior windows, interior walls, and the interior side of demising walls. Should Tenant fail to make any such repair or replacement or fail to maintain the Premises, Landlord shall give Tenant written notice of such failure. If Tenant fails to commence cure of such failure within 10 business days of Landlord's written notice, and thereafter diligently prosecute such cure to completion, Landlord may perform such work and shall be reimbursed by Tenant within 15 business days after demand therefor; provided, however, that if such failure by Tenant creates or could reasonably create an emergency, Landlord may immediately commence cure of such failure and shall thereafter be entitled to recover the actual costs of such cure from Tenant. Subject to Sections 17 and 18, Tenant shall bear the full uninsured cost of any repair or replacement to any part of the Project that results from damage caused by Tenant.

15. **Mechanic's Liens**. Tenant shall discharge, by bond or otherwise, any mechanic's lien filed against the Premises or against the Project for work claimed to have been done for, or materials claimed to have been furnished to, Tenant within 15 days after Tenant receives notice of the filing thereof, at Tenant's sole cost and shall otherwise keep the Premises and the Project free from any liens arising out of work performed, materials furnished or obligations incurred by Tenant. Should Tenant fail to discharge any lien described herein, Landlord shall have the right, but not the obligation, to pay such claim or post a bond or otherwise provide security to eliminate the lien as a claim against title to the Project and the cost thereof shall be immediately due from Tenant as Additional Rent. If Tenant shall lease or finance the acquisition of office equipment, furnishings, or other personal property of a removable nature utilized by Tenant in the operation of Tenant's business, Tenant warrants that any Uniform Commercial Code Financing Statement filed as a matter of public record by any lessor or creditor of Tenant will upon its face or by exhibit thereto indicate that such Financing Statement is applicable only to removable personal property of Tenant located within the Premises. In no event shall the address of the Project be furnished on the statement without qualifying language as to applicability of the lien only to removable personal property, located in an identified suite held by Tenant.

16. **Indemnification**. Tenant hereby indemnifies and agrees to defend, save and hold Landlord, its officers, directors, employees, managers, agents, sub-agents, constituent entities and lease signators (collectively, "**Landlord Indemnified Parties**") harmless from and against any and all Claims for injury or death to persons or damage to property occurring within or about the Premises or the Project arising directly or indirectly out of use or occupancy of the Premises, the Shared Lab Area or the Project (including, without limitation, any act, omission or neglect by Tenant or any Tenant's Parties in or about the Premises, the Shared Lab Area or at the Project) or the a breach or default by Tenant in the performance of any of its obligations hereunder, except to the extent caused by the willful misconduct or gross negligence of Landlord Indemnified Parties. Landlord shall not be liable to Tenant for, and Tenant assumes all risk of damage to, personal property (including, without limitation, loss of records kept within the Premises). Tenant further waives any and all Claims for injury to Tenant's business or loss of income relating to any such damage or destruction of personal property (including, without limitation, any loss of records). Landlord Indemnified Parties shall not be liable for any damages arising from any act, omission or neglect of any tenant in the Project or of any other third party or Tenant Parties.

17. **Insurance**. Landlord shall maintain all risk property and, if applicable, sprinkler damage insurance covering the full replacement cost of the Project. Landlord shall further procure and maintain commercial general liability insurance with a single loss limit of not less than $2,000,000 for bodily injury and property damage with respect to the Project. Landlord may, but is not obligated to, maintain such other insurance and additional coverages as it may deem necessary, including, but not limited to, flood, environmental hazard and earthquake, loss or failure of building equipment, errors and omissions, rental loss during the period of repair or rebuilding, workers' compensation insurance and fidelity bonds for employees employed to perform services and insurance for any improvements installed by Tenant or which are in addition to the standard improvements customarily furnished by Landlord without regard to whether or not such are made a part of the Project. All such insurance shall be included as part of the Operating Expenses. The Project may be included in a blanket policy (in which case the cost of such insurance allocable to the Project will be determined by Landlord based upon the insurer's cost calculations). Following reasonable advance written notice to Tenant and documentation reasonably reflecting the increased premiums or additional insurance, Tenant shall also reimburse Landlord for any increased premiums or additional insurance which Landlord reasonably deems necessary as a result of Tenant's particular use of the Premises.

Tenant, at its sole cost and expense, shall maintain during the Term: all risk property insurance with business interruption and extra expense coverage, covering the full replacement cost of all property and improvements installed or placed in the Premises by Tenant at Tenant's expense; workers' compensation insurance with no less than the minimum limits required by law; employer's liability insurance with employers liability limits of $1,000,000 bodily injury by accident – each accident, $1,000,000 bodily injury by disease – policy limit, and $1,000,000 bodily injury by disease – each employee; and commercial general liability insurance, with a minimum limit of not less than $2,000,000 per occurrence for bodily injury and property damage with respect to the Premises. The commercial general liability insurance maintained by Tenant shall name Alexandria Real Estate Equities, Inc., and Landlord, its officers, directors, employees, managers, agents, sub-agents, constituent entities and lease signators (collectively, "**Landlord Insured Parties**"), as additional insureds; insure on an occurrence and not a claims-made basis; be issued by insurance companies which have a rating of not less than policyholder rating of A and financial category rating of at least Class X in "Best's Insurance Guide"; shall not be cancelable for nonpayment of premium unless 30 days prior written notice shall have been given to Landlord from the insurer; not contain a hostile fire exclusion; contain a contractual liability endorsement; and provide primary coverage to Landlord Insured Parties (any policy issued to Landlord Insured Parties providing duplicate or similar coverage shall be deemed excess over Tenant's policies, regardless of limits). Copies of such policies (if requested by Landlord), or certificates of insurance showing the limits of coverage required hereunder and showing Landlord as an additional insured, along with reasonable evidence of the payment of premiums for the applicable period, shall be delivered to Landlord by Tenant prior to the earlier of (y) Commencement Date or (z) the date that Tenant accesses the Premises under this Lease, and (ii) each renewal of said insurance. Tenant's policy may be a "blanket policy" with an aggregate per location endorsement which specifically provides that the amount of insurance shall not be prejudiced by other losses covered by the policy. Tenant shall, at least 5 days prior to the expiration of such policies, furnish Landlord with renewal certificates.

In each instance where insurance is to name Landlord as an additional insured, Tenant shall upon written request of Landlord also designate and furnish certificates so evidencing Landlord as additional insured to: (i) any lender of Landlord holding a security interest in the Project or any portion thereof, (ii) the landlord under any lease wherein Landlord is tenant of the real property on which the Project is located, if the interest of Landlord is or shall become that of a tenant under a ground or other underlying lease rather than that of a fee owner, and/or (iii) any management company retained by Landlord to manage the Project.

The property insurance obtained by Landlord and Tenant shall include a waiver of subrogation by the insurers and all rights based upon an assignment from its insured, against Landlord or Tenant, and their respective officers, directors, employees, managers, agents, invitees and contractors ("**Related Parties**"), in connection with any loss or damage thereby insured against. Neither party nor its respective Related Parties shall be liable to the other for loss or damage caused by any risk insured against under property insurance required to be maintained hereunder, and each party waives any claims against the other party, and its respective Related Parties, for such loss or damage. The failure of a party to insure its property shall not void this waiver. Landlord and its respective Related Parties shall not be liable for, and Tenant hereby waives all claims against such parties for, business interruption and losses occasioned thereby sustained by Tenant or any person claiming through Tenant resulting from any accident or occurrence in or upon the Premises or the Project from any cause whatsoever. If the foregoing waivers shall contravene any law with respect to exculpatory agreements, the liability of Landlord or Tenant shall be deemed not released but shall be secondary to the other's insurer.

Landlord may require insurance policy limits to be raised to conform with requirements of Landlord's lender and/or to bring coverage limits to levels then being generally required of new tenants within the Project; provided, however, that the increased amount of coverage is consistent with coverage amounts then being required by institutional owners of similar projects with tenants occupying similar size premises in the geographical area in which the Project is located.

18. **Restoration**. If, at any time during the Term, the Project or the Premises are damaged or destroyed by a fire or other insured casualty, Landlord shall notify Tenant within 60 days after discovery of such damage as to the amount of time Landlord reasonably estimates it will take to restore the Project or the Premises, as applicable (the "**Restoration Period**"). If the Restoration Period is estimated to exceed 12 months (the "**Maximum Restoration Period**"), Landlord may, in such notice, elect to terminate this Lease as of the date that is 75 days after the date of discovery of such damage or destruction; provided, however, that notwithstanding Landlord's election to restore, Tenant may elect to terminate this Lease by written notice to Landlord delivered within 5 business days after receipt of a notice from Landlord estimating a Restoration Period for the Premises longer than the Maximum Restoration Period. Unless either Landlord or Tenant so elects to terminate this Lease, Landlord shall, subject to receipt of sufficient insurance proceeds (with any deductible to be treated as a current Operating Expense), promptly restore the Premises (excluding the improvements installed by Tenant or by Landlord and paid for by Tenant unless covered by the insurance Landlord maintains as an Operating Expense hereunder, in which case such improvements shall be included, to the extent of such insurance proceeds, in Landlord's restoration), subject to delays arising from the collection of insurance proceeds, from Force Majeure events or as needed to obtain any license, clearance or other authorization of any kind required to enter into and restore the Premises issued by any Governmental Authority having jurisdiction over the use, storage, handling, treatment, generation, release, disposal, removal or remediation of Hazardous Materials (as defined in Section 30) in, on or about the Premises (collectively referred to herein as "**Hazardous Materials Clearances**"); provided, however, that if repair or restoration of the Premises is not substantially complete as of the end of the Maximum Restoration Period or, if longer, the Restoration Period, Landlord may, in its sole and absolute discretion, elect not to proceed with such repair and restoration, or Tenant may by written notice to Landlord delivered within 5 business days of the expiration of the Maximum Restoration Period or, if longer, the Restoration Period, elect to terminate this Lease, in which event Landlord shall be relieved of its obligation to make such repairs or

restoration and this Lease shall terminate as of the date that is 75 days after the later of: (i) discovery of such damage or destruction, or (ii) the date all required Hazardous Materials Clearances are obtained, but Landlord shall retain any Rent paid and the right to any Rent payable by Tenant prior to such election by Landlord or Tenant.

Tenant, at its expense, shall promptly perform, subject to delays arising from the collection of insurance proceeds, from Force Majeure (as defined in Section 34) events or to obtain Hazardous Material Clearances, all repairs or restoration not required to be done by Landlord and shall promptly re-enter the Premises and commence doing business in accordance with this Lease. Notwithstanding the foregoing, either Landlord or Tenant may terminate this Lease upon written notice to the other if the Premises are damaged during the last year of the Term and Landlord reasonably estimates that it will take more than 2 months to repair such damage; provided, however, that such notice is delivered within 10 business days after the date that Landlord provides Tenant with written notice of the estimated Restoration Period. Notwithstanding anything to the contrary contained herein, Landlord shall also have the right to terminate this Lease if insurance proceeds are not available for such restoration. Rent shall be abated from the date all required Hazardous Material Clearances are obtained until the Premises are repaired and restored, in the proportion which the area of the Premises, if any, which is not usable by Tenant bears to the total area of the Premises, unless Landlord provides Tenant with other space during the period of repair that is suitable for the temporary conduct of Tenant's business. Such abatement shall be the sole remedy of Tenant, and except as provided in this Section 18, Tenant waives any right to terminate the Lease by reason of damage or casualty loss.

The provisions of this Lease, including this Section 18, constitute an express agreement between Landlord and Tenant with respect to any and all damage to, or destruction of, all or any part of the Premises, or any other portion of the Project, and any statute or regulation which is now or may hereafter be in effect shall have no application to this Lease or any damage or destruction to all or any part of the Premises or any other portion of the Project, the parties hereto expressly agreeing that this Section 18 sets forth their entire understanding and agreement with respect to such matters.

19. **Condemnation**. If the whole or any material part of the Premises or the Project is taken for any public or quasi-public use under governmental law, ordinance, or regulation, or by right of eminent domain, or by private purchase in lieu thereof (a "**Taking**" or "**Taken**"), and the Taking would in Landlord's reasonable judgment, either prevent or materially interfere with Tenant's use of the Premises or materially interfere with or impair Landlord's ownership or operation of the Project, then upon written notice by Landlord this Lease shall terminate and Rent shall be apportioned as of said date. If part of the Premises shall be Taken, and this Lease is not terminated as provided above, Landlord shall promptly restore the Premises and the Project as nearly as is commercially reasonable under the circumstances to their condition prior to such partial Taking and the rentable square footage of the Building, the rentable square footage of the Premises, Tenant's Share of Operating Expenses and the Rent payable hereunder during the unexpired Term shall be reduced to such extent as may be fair and reasonable under the circumstances. Upon any such Taking, Landlord shall be entitled to receive the entire price or award from any such Taking without any payment to Tenant, and Tenant hereby assigns to Landlord Tenant's interest, if any, in such award. Tenant shall have the right, to the extent that same shall not diminish Landlord's award, to make a separate claim against the condemning authority (but not Landlord) for such compensation as may be separately awarded or recoverable by Tenant for moving expenses and damage to Tenant's trade fixtures, if a separate award for such items is made to Tenant. Tenant hereby waives any and all rights it might otherwise have pursuant to any provision of state law to terminate this Lease upon a partial Taking of the Premises or the Project.

20. **Events of Default**. Each of the following events shall be a default ("**Default**") by Tenant under this Lease:

(a) **Payment Defaults**. Tenant shall fail to pay any installment of Rent or any other payment hereunder when due; provided, however, that Landlord will give Tenant notice and an opportunity to cure any failure to pay Rent within 3 days of any such notice not more than once in any 12 month period and Tenant agrees that such notice shall be in lieu of and not in addition to, or shall be deemed to be, any notice required by law.

(b) **Insurance**. Any insurance required to be maintained by Tenant pursuant to this Lease shall be canceled or terminated or shall expire or shall be reduced or materially changed, or Landlord shall receive a notice of nonrenewal of any such insurance and Tenant shall fail to obtain replacement insurance at least 10 days before the expiration of the current coverage.

(c) **Abandonment**. Tenant shall abandon the Premises. Tenant shall not be deemed to have abandoned the Premises if Tenant provides Landlord with reasonable advance notice prior to vacating and, at the time of vacating the Premises, (i) Tenant completes Tenant's obligations under the Surrender Plan in compliance with Section 28, (ii) Tenant has obtained the release of the Premises of all Hazardous Materials Clearances and the Premises are free from any residual impact from the Tenant HazMat Operations and provides reasonably detailed documentation to Landlord confirming such matters, (iii) Tenant has made reasonable arrangements with Landlord for the security of the Premises for the balance of the Term, and (iv) Tenant continues during the balance of the Term to satisfy and perform all of Tenant's obligations under this Lease as they come due.

(d) **Improper Transfer**. Tenant shall assign, sublease or otherwise transfer or attempt to transfer all or any portion of Tenant's interest in this Lease or the Premises except as expressly permitted herein, or Tenant's interest in this Lease shall be attached, executed upon, or otherwise judicially seized and such action is not released within 90 days of the action.

(e) **Liens**. Tenant shall fail to discharge or otherwise obtain the release of any lien placed upon the Premises in violation of this Lease within 15 days after Tenant's receipt of notice of any such lien being filed against the Premises.

(f) **Insolvency Events**. Tenant or any guarantor or surety of Tenant's obligations hereunder shall: (A) make a general assignment for the benefit of creditors; (B) commence any case, proceeding or other action seeking to have an order for relief entered on its behalf as a debtor or to adjudicate it a bankrupt or insolvent, or seeking reorganization, arrangement, adjustment, liquidation, dissolution or composition of it or its debts or seeking appointment of a receiver, trustee, custodian or other similar official for it or for all or of any substantial part of its property (collectively a "**Proceeding for Relief**"); (C) become the subject of any Proceeding for Relief which is not dismissed within 90 days of its filing or entry; or (D) die or suffer a legal disability (if Tenant, guarantor, or surety is an individual) or be dissolved or otherwise fail to maintain its legal existence (if Tenant, guarantor or surety is a corporation, partnership or other entity).

(g) **Estoppel Certificate or Subordination Agreement**. Tenant fails to execute any document required from Tenant under Sections 23 or 27 within 5 business days after a second notice requesting such document.

(h) **Other Defaults**. Tenant shall fail to comply with any provision of this Lease other than those specifically referred to in this Section 20, and, except as otherwise expressly provided herein, such failure shall continue for a period of 30 days after written notice thereof from Landlord to Tenant.

Any notice given under Section 20(h) hereof shall: (i) specify the alleged default, (ii) demand that Tenant cure such default, (iii) be in lieu of, and not in addition to, or shall be deemed to be, any notice required under any provision of applicable law, and (iv) not be deemed a forfeiture or a termination of this Lease unless Landlord elects otherwise in such notice; provided that if the nature of Tenant's default pursuant to Section 20(h) is such that it cannot be cured by the payment of money and reasonably requires more than 30 days to cure, then Tenant shall not be deemed to be in default if Tenant commences such cure within said 30 day period and thereafter diligently prosecutes the same to completion; provided, however, that such cure shall be completed no later than 60 days from the date of Landlord's notice.

21. **Landlord's Remedies**.

(a) **Payment By Landlord; Interest**. Upon a Default by Tenant hereunder, Landlord may, without waiving or releasing any obligation of Tenant hereunder, make such payment or perform such act. All sums so paid or incurred by Landlord, together with interest thereon, from the date such sums were paid or incurred, at the annual rate equal to 12% per annum or the highest rate permitted by law (the "**Default Rate**"), whichever is less, shall be payable to Landlord on demand as Additional Rent. Nothing herein shall be construed to create or impose a duty on Landlord to mitigate any damages resulting from Tenant's Default hereunder.

(b) **Late Payment Rent**. Late payment by Tenant to Landlord of Rent and other sums due will cause Landlord to incur costs not contemplated by this Lease, the exact amount of which will be extremely difficult and impracticable to ascertain. Such costs include, but are not limited to, processing and accounting charges and late charges which may be imposed on Landlord under any Mortgage covering the Premises. Therefore, if any installment of Rent due from Tenant is not received by Landlord within 5 days after the date such payment is due, Tenant shall pay to Landlord an additional sum equal to 6% of the overdue Rent as a late charge. Notwithstanding the foregoing, before assessing a late charge the first time in any calendar year, Landlord shall provide Tenant written notice of the delinquency and will waive the right if Tenant pays such delinquency within 5 days thereafter. The parties agree that this late charge represents a fair and reasonable estimate of the costs Landlord will incur by reason of late payment by Tenant. In addition to the late charge, Rent not paid when due shall bear interest at the Default Rate from the 5th day after the date due until paid.

(c) **Remedies**. Upon the occurrence of a Default, Landlord, at its option, without further notice or demand to Tenant, shall have in addition to all other rights and remedies provided in this Lease, at law or in equity, the option to pursue any one or more of the following remedies, each and all of which shall be cumulative and nonexclusive, without any notice or demand whatsoever.

(i) Terminate this Lease, or at Landlord's option, Tenant's right to possession only, in which event Tenant shall immediately surrender the Premises to Landlord, and if Tenant fails to do so, Landlord may, in accordance with Legal Requirements, without prejudice to any other remedy which it may have for possession or arrearages in rent, enter upon and take possession of the Premises and expel or remove Tenant and any other person who may be occupying the Premises or any part thereof, without being liable for prosecution or any claim or damages therefor;

(ii) Upon any termination of this Lease, whether pursuant to the foregoing Section 21(c)(i) or otherwise, Landlord may recover from Tenant the following:

(A) The worth at the time of the award of any unpaid rent which has been earned at the time of such termination; plus

(B) The worth at the time of award of the amount by which the unpaid rent which would have been earned after termination until the time of award exceeds the amount of such rental loss that Tenant proves could have been reasonably avoided; plus

(C) The worth at the time of award of the amount by which the unpaid rent for the balance of the Term after the time of award exceeds the amount of such rental loss that Tenant proves could have been reasonably avoided; plus

(D) Any other amount necessary to compensate Landlord for all the detriment proximately caused by Tenant's failure to perform its obligations under this Lease or which in the ordinary course of things would be likely to result therefrom, specifically including, but not limited to, customary brokerage commissions and advertising expenses incurred, expenses of remodeling the Premises or any portion thereof for a new tenant, whether for the same or a different use, and any special concessions made to obtain a new tenant; and

(E) At Landlord's election, such other amounts in addition to or in lieu of the foregoing as may be permitted from time to time by applicable law.

The term "**rent**" as used in this Section 21 shall be deemed to be and to mean all sums of every nature required to be paid by Tenant pursuant to the terms of this Lease, whether to Landlord or to others. As used in Sections 21(c)(ii)(A) and (B), above, the "**worth at the time of award**" shall be computed by allowing interest at the Default Rate. As used in Section 21(c)(ii)(C) above, the "**worth at the time of award**" shall be computed by discounting such amount at the discount rate of the Federal Reserve Bank of San Francisco at the time of award plus 1%.

(iii) Landlord may continue this Lease in effect after Tenant's Default and recover rent as it becomes due (Landlord and Tenant hereby agreeing that Tenant has the right to sublet or assign hereunder, subject only to reasonable limitations). Accordingly, if Landlord does not elect to terminate this Lease following a Default by Tenant, Landlord may, from time to time, without terminating this Lease, enforce all of its rights and remedies hereunder, including the right to recover all Rent as it becomes due.

(iv) Whether or not Landlord elects to terminate this Lease following a Default by Tenant, Landlord shall have the right to terminate any and all subleases, licenses, concessions or other consensual arrangements for possession entered into by Tenant and affecting the Premises or may, in Landlord's sole discretion, succeed to Tenant's interest in such subleases, licenses, concessions or arrangements. Upon Landlord's election to succeed to Tenant's interest in any such subleases, licenses, concessions or arrangements, Tenant shall, as of the date of notice by Landlord of such election, have no further right to or interest in the rent or other consideration receivable thereunder.

(v) Independent of the exercise of any other remedy of Landlord hereunder or under applicable law, Landlord may conduct an environmental test of the Premises as generally described in Section 30(d) hereof, at Tenant's expense.

(d) **Effect of Exercise**. Exercise by Landlord of any remedies hereunder or otherwise available shall not be deemed to be an acceptance of surrender of the Premises and/or a termination of this Lease by Landlord, it being understood that such surrender and/or termination can be effected only by the express written agreement of Landlord and Tenant. Any law, usage, or custom to the contrary notwithstanding, Landlord shall have the right at all times to enforce the provisions of this Lease in strict accordance with the terms hereof; and the failure of Landlord at any time to enforce its rights under this Lease strictly in accordance with same shall not be construed as having created a custom in any way or manner contrary to the specific terms, provisions, and covenants of this Lease or as having modified the same and shall not be deemed a waiver of Landlord's right to enforce one or more of its rights in connection with any subsequent default. A receipt by Landlord of Rent or other payment with knowledge of the breach of any covenant hereof shall not be deemed a waiver of such breach, and no waiver by Landlord of any provision of this Lease shall be deemed to have been made unless expressed in writing and signed by Landlord. To the greatest extent permitted by law, Tenant waives the service of notice of Landlord's intention to re-enter, re-take or otherwise obtain possession of the Premises as provided in any statute, or to institute legal proceedings to that end, and also waives all right of redemption in case Tenant shall be dispossessed by a judgment or by warrant of any court or judge. Any reletting of the Premises or any portion thereof shall be on such terms and conditions as Landlord in its sole discretion may determine. Landlord shall not be liable for, nor shall Tenant's obligations hereunder be diminished because of, Landlord's failure to relet the Premises or collect rent due in respect of such reletting or otherwise to mitigate any damages arising by reason of Tenant's Default.

22. **Assignment and Subletting**.

(a) **General Prohibition**. Without Landlord's prior written consent subject to and on the conditions described in this Section 22, Tenant shall not, directly or indirectly, voluntarily or by operation of law, assign this Lease or sublease the Premises or any part thereof or mortgage, pledge, or hypothecate its leasehold interest or grant any concession or license within the Premises, and any attempt to do any of the foregoing shall be void and of no effect. If Tenant is a corporation, partnership or limited liability company, the shares or other ownership interests thereof which are not actively traded upon a stock exchange or in the over-the-counter market, a transfer or series of transfers whereby 50% or more of the issued and outstanding shares or other ownership interests of such corporation are, or voting control is, transferred (but excepting transfers upon deaths of individual owners) from a person or persons or entity or entities which were owners thereof at time of execution of this Lease to persons or entities who were not owners of shares or other ownership interests of the corporation, partnership or limited liability company at time of execution of this Lease, shall be deemed an assignment of this Lease requiring the consent of Landlord as provided in this Section 22.

(b) **Permitted Transfers**. If Tenant desires to assign, sublease, hypothecate or otherwise transfer this Lease or sublet the Premises, other than pursuant to a Permitted Assignment (as defined below), then at least 10 business days, but not more than 60 business days, before the date Tenant desires the assignment or sublease to be effective (the "**Assignment Date**"), Tenant shall give Landlord a notice (the "**Assignment Notice**") containing such information about the proposed assignee or sublessee, including the proposed use of the Premises and any Hazardous Materials proposed to be used, stored handled, treated, generated in or released or disposed of from the Premises, the Assignment Date, any relationship between Tenant and the proposed assignee or sublessee, and all material terms and conditions of the proposed assignment or sublease, including a copy of any proposed assignment or sublease in its substantially final form, and such other information as Landlord may deem reasonably necessary or appropriate to its consideration whether to grant its consent. Landlord may, by giving written notice to Tenant within 10 business days after receipt of the Assignment Notice: (i) grant such consent (provided that Landlord shall further have the right to review and approve or disapprove the proposed form of sublease prior to the effective date of any such subletting), (ii) refuse such consent, in its reasonable discretion; or (iii) terminate this Lease with respect to the space described in the Assignment Notice as of the Assignment Date (an "**Assignment Termination**"). Among other reasons, it shall be reasonable for Landlord to withhold its consent in any of these instances: (1) the proposed assignee or subtenant is a governmental agency; (2) in Landlord's reasonable judgment, the use of the Premises by the proposed assignee or subtenant would entail any alterations that would lessen the value of the leasehold improvements in the Premises, or would require increased services by Landlord; (3) in Landlord's reasonable judgment, the proposed assignee or subtenant is engaged in areas of scientific research or other business concerns that are controversial such that they may (i) attract or cause negative publicity for or about the Building or the Project, (ii) negatively affect the reputation of the Building, the Project or Landlord, (iii) attract protestors to the Building or the Project, or (iv) lessen the attractiveness of the Building or the Project to any tenants or prospective tenants, purchasers or lenders; (4) in Landlord's reasonable judgment, the proposed assignee or subtenant lacks the creditworthiness to support the financial obligations it will incur under the proposed assignment or sublease; (5) in Landlord's reasonable judgment, the character, reputation, or business of the proposed assignee or subtenant is inconsistent with the desired tenant-mix or the quality of other tenancies in the Project or is inconsistent with the type and quality of the nature of the Building; (6) Landlord has received from any prior landlord to the proposed assignee or subtenant a negative report concerning such prior landlord's experience with the proposed assignee or subtenant; (7) Landlord has experienced previous defaults by or is in litigation with the proposed assignee or subtenant; (8) the use of the Premises by the proposed assignee or subtenant will violate any applicable Legal Requirement; (9) intentionally omitted; (10) the proposed assignee or subtenant is an entity with whom Landlord is actively negotiating to lease space in the Project; or (11) the assignment or sublease is prohibited by Landlord's lender. If Landlord delivers notice of its election to exercise an Assignment Termination, Tenant shall have the right to withdraw such Assignment Notice by written notice to Landlord of such election within 5 business days after Landlord's notice electing to exercise the Assignment Termination. If Tenant withdraws such Assignment Notice, this Lease shall continue in full force and effect. If Tenant does not withdraw such Assignment Notice,

this Lease, and the term and estate herein granted, shall terminate as of the Assignment Date with respect to the space described in such Assignment Notice. No failure of Landlord to exercise any such option to terminate this Lease, or to deliver a timely notice in response to the Assignment Notice, shall be deemed to be Landlord's consent to the proposed assignment, sublease or other transfer. Tenant shall pay to Landlord a fee equal to Two Thousand Five Hundred Dollars ($2,500) in connection with its consideration of any Assignment Notice and/or its preparation or review of any consent documents.

Notwithstanding the foregoing, Landlord's consent to an assignment of this Lease or a subletting of any portion of the Premises to any entity controlling, controlled by or under common control with Tenant (a "**Control Permitted Assignment**") shall not be required, provided that Landlord shall have the right to approve the form of any such sublease or assignment. In addition, Tenant shall have the right to assign this Lease, upon 30 days prior written notice to Landlord but without obtaining Landlord's prior written consent, to a corporation or other entity which is a successor-in-interest to Tenant, by way of merger, consolidation or corporate reorganization, or by the purchase of all or substantially all of the assets or the ownership interests of Tenant provided that (i) such merger or consolidation, or such acquisition or assumption, as the case may be, is for a good business purpose and not principally for the purpose of transferring the Lease, and (ii) the net worth (as determined in accordance with generally accepted accounting principles ("**GAAP**")) of the assignee is not less than the greater of the net worth (as determined in accordance with GAAP) of Tenant as of (A) the Commencement Date, or (B) as of the date of Tenant's most current quarterly or annual financial statements, and (iii) such assignee shall agree in writing to assume all of the terms, covenants and conditions of this Lease (a "**Corporate Permitted Assignment**"). Control Permitted Assignments and Corporate Permitted Assignments are hereinafter referred to as "**Permitted Assignments**."

(c) **Additional Conditions**. As a condition to any such assignment or subletting, whether or not Landlord's consent is required, Landlord may require:

(i) that any assignee or subtenant agree, in writing at the time of such assignment or subletting, that if Landlord gives such party written notice that Tenant is in default under this Lease, such party shall thereafter make all payments otherwise due Tenant directly to Landlord, which payments will be received by Landlord without any liability except to credit such payment against those due under the Lease, and any such third party shall agree to attorn to Landlord or its successors and assigns should this Lease be terminated for any reason; provided, however, in no event shall Landlord or its successors or assigns be obligated to accept such attornment; and

(ii) A list of Hazardous Materials, certified by the proposed assignee or sublessee to be true and correct, which the proposed assignee or sublessee intends to use, store, handle, treat, generate in or release or dispose of from the Premises, together with copies of all documents relating to such use, storage, handling, treatment, generation, release or disposal of Hazardous Materials by the proposed assignee or subtenant in the Premises or on the Project, prior to the proposed assignment or subletting, including, without limitation: permits; approvals; reports and correspondence; storage and management plans; plans relating to the installation of any storage tanks to be installed in or under the Project (provided, said installation of tanks shall only be permitted after Landlord has given its written consent to do so, which consent may be withheld in Landlord's sole and absolute discretion); and all closure plans or any other documents required by any and all federal, state and local Governmental Authorities for any storage tanks installed in, on or under the Project for the closure of any such tanks. Neither Tenant nor any such proposed assignee or subtenant is required, however, to provide Landlord with any portion(s) of the such documents containing information of a proprietary nature which, in and of themselves, do not contain a reference to any Hazardous Materials or hazardous activities.

(d) **No Release of Tenant, Sharing of Excess Rents**. Notwithstanding any assignment or subletting, Tenant and any guarantor or surety of Tenant's obligations under this Lease shall at all times remain fully and primarily responsible and liable for the payment of Rent and for compliance with all of Tenant's other obligations under this Lease. If the Rent due and payable by a sublessee or assignee (or a combination of the rental payable under such sublease or assignment plus any bonus or other

consideration therefor or incident thereto in any form) exceeds the sum of the rental payable under this Lease, (excluding however, any Rent payable under this Section) and actual and reasonable brokerage fees, legal costs and any design or construction fees directly related to and required pursuant to the terms of any such sublease) ("**Excess Rent**"), then Tenant shall be bound and obligated to pay Landlord as Additional Rent hereunder 50% of such Excess Rent within 30 days following receipt thereof by Tenant. If Tenant shall sublet the Premises or any part thereof, Tenant hereby immediately and irrevocably assigns to Landlord, as security for Tenant's obligations under this Lease, all rent from any such subletting, and Landlord as assignee, or a receiver for Tenant appointed on Landlord's application, may collect such rent and apply it toward Tenant's obligations under this Lease; except that, until the occurrence of a Default, Tenant shall have the right to collect such rent.

(e) **No Waiver**. The consent by Landlord to an assignment or subletting shall not relieve Tenant or any assignees of this Lease or any sublessees of the Premises from obtaining the consent of Landlord to any further assignment or subletting nor shall it release Tenant or any assignee or sublessee of Tenant from full and primary liability under the Lease. The acceptance of Rent hereunder, or the acceptance of performance of any other term, covenant, or condition thereof, from any other person or entity shall not be deemed to be a waiver of any of the provisions of this Lease or a consent to any subletting, assignment or other transfer of the Premises.

(f) **Prior Conduct of Proposed Transferee**. Notwithstanding any other provision of this Section 22, if (i) the proposed assignee or sublessee of Tenant has been required by any prior landlord, lender or Governmental Authority to take remedial action in connection with Hazardous Materials contaminating a property, where the contamination resulted from such party's action or use of the property in question, (ii) the proposed assignee or sublessee is subject to an enforcement order issued by any Governmental Authority in connection with the use, storage, handling, treatment, generation, release or disposal of Hazardous Materials (including, without limitation, any order related to the failure to make a required reporting to any Governmental Authority), or (iii) because of the existence of a pre-existing environmental condition in the vicinity of or underlying the Project, the risk that Landlord would be targeted as a responsible party in connection with the remediation of such pre-existing environmental condition would be materially increased or exacerbated by the proposed use of Hazardous Materials by such proposed assignee or sublessee, Landlord shall have the absolute right to refuse to consent to any assignment or subletting to any such party.

23. **Estoppel Certificate**. Tenant shall, within 10 business days after receipt of written notice from Landlord, execute, acknowledge and deliver a statement in writing in any form reasonably requested by a proposed lender or purchaser, (i) certifying that this Lease is unmodified and in full force and effect (or, if modified, stating the nature of such modification and certifying that this Lease as so modified is in full force and effect) and the dates to which the rental and other charges are paid in advance, if any, (ii) acknowledging that, to Tenant's knowledge, there are not any uncured defaults on the part of Landlord hereunder, or specifying such defaults if any are claimed, and (iii) setting forth such further information with respect to the status of this Lease or the Premises as may be reasonably requested thereon. Any such statement may be relied upon by any prospective purchaser or encumbrancer of all or any portion of the real property of which the Premises are a part. Tenant's failure to deliver such statement within such time shall, at the option of Landlord, constitute a Default under this Lease, and, in any event, shall be conclusive upon Tenant that the Lease is in full force and effect and without modification except as may be represented by Landlord in any certificate prepared by Landlord and delivered to Tenant for execution.

24. **Quiet Enjoyment**. So long as Tenant is not in Default under this Lease, Tenant shall, subject to the terms of this Lease, at all times during the Term, have peaceful and quiet enjoyment of the Premises against any person claiming by, through or under Landlord.

25. **Prorations**. All prorations required or permitted to be made hereunder shall be made on the basis of a 360 day year and 30 day months.

26. **Rules and Regulations**. Tenant shall, at all times during the Term and any extension thereof, comply with all reasonable rules and regulations at any time or from time to time established by Landlord covering use of the Premises and the Project; provided, however, that (a) such rules and regulations do not unreasonably and materially interfere with Tenant's use and enjoyment of the Premises for the Permitted Use, and (b) Landlord provides reasonable advance written notice thereof. The current rules and regulations are attached hereto as **Exhibit E**. If there is any conflict between said rules and regulations and other provisions of this Lease, the terms and provisions of this Lease shall control. Landlord shall not have any liability or obligation for the breach of any rules or regulations by other tenants in the Project and shall not enforce such rules and regulations in a discriminatory manner.

27. **Subordination**. This Lease and Tenant's interest and rights hereunder are hereby made and shall be subject and subordinate at all times to the lien of any Mortgage now existing or hereafter created on or against the Project or the Premises, and all amendments, restatements, renewals, modifications, consolidations, refinancing, assignments and extensions thereof, without the necessity of any further instrument or act on the part of Tenant; provided, however that so long as there is no Default hereunder, Tenant's right to possession of the Premises shall not be disturbed by the Holder of any such Mortgage. Tenant agrees, at the election of the Holder of any such Mortgage, to attorn to any such Holder. Tenant agrees upon demand to execute, acknowledge and deliver such instruments, confirming such subordination, and such instruments of attornment as shall be reasonably requested by any such Holder, provided any such instruments contain appropriate non-disturbance provisions assuring Tenant's quiet enjoyment of the Premises as set forth in Section 24 hereof. Notwithstanding the foregoing, any such Holder may at any time subordinate its Mortgage to this Lease, without Tenant's consent, by notice in writing to Tenant, and thereupon this Lease shall be deemed prior to such Mortgage without regard to their respective dates of execution, delivery or recording and in that event such Holder shall have the same rights with respect to this Lease as though this Lease had been executed prior to the execution, delivery and recording of such Mortgage and had been assigned to such Holder. The term "**Mortgage**" whenever used in this Lease shall be deemed to include deeds of trust, security assignments and any other encumbrances, and any reference to the "**Holder**" of a Mortgage shall be deemed to include the beneficiary under a deed of trust. As of the date of this Lease, there is no existing Mortgage encumbering the Project.

Upon written request from Tenant, Landlord agrees to use reasonable efforts to cause the future Holder of a Mortgage to enter into a subordination, non-disturbance and attornment agreement ("**SNDA**") with Tenant with respect to this Lease. The SNDA shall be on the form proscribed by the Holder and Tenant shall pay the Holder's fees and costs in connection with obtaining such SNDA; provided, however, that Landlord shall request that Holder make any reasonable changes to the SNDA requested by Tenant. Landlord's failure to cause the Holder to enter into the SNDA with Tenant (or make any of the changes requested by Tenant) shall not be a default by Landlord under this Lease.

28. **Surrender**. Upon the expiration of the Term or earlier termination of Tenant's right of possession, Tenant shall surrender the Premises to Landlord in the same condition as received (ordinary wear and tear and casualty loss and condemnation covered by Sections 18 and 19 excepted), subject to any Alterations or Installations permitted by Landlord to remain in the Premises, free of Hazardous Materials brought upon, kept, used, stored, handled, treated, generated in, or released or disposed of from, the Premises by any person other than a Landlord Party (collectively, "**Tenant HazMat Operations**") and released of all Hazardous Materials Clearances, broom clean. At least 3 months prior to the surrender of the Premises, Tenant shall deliver to Landlord a narrative description of the actions proposed (or required by any Governmental Authority) to be taken by Tenant in order to surrender the Premises (including any Installations permitted by Landlord to remain in the Premises) at the expiration or earlier termination of the Term, free from any residual impact from the Tenant HazMat Operations and otherwise released for unrestricted use and occupancy (the "**Surrender Plan**"). Such Surrender Plan shall be accompanied by a current listing of (i) all Hazardous Materials licenses and permits held by or on behalf of any Tenant Party with respect to the Premises, and (ii) all Hazardous Materials used, stored, handled, treated, generated, released or disposed of from the Premises, and shall be subject to the review and approval of Landlord's environmental consultant. In connection with the review and approval of the Surrender Plan, upon the request of Landlord, Tenant shall deliver to Landlord or its consultant

such additional non-proprietary information concerning Tenant HazMat Operations as Landlord shall reasonably request. On or before such surrender, Tenant shall deliver to Landlord reasonable evidence that the approved Surrender Plan shall have been satisfactorily completed and Landlord shall have the right, subject to reimbursement at Tenant's expense as set forth below, to cause Landlord's environmental consultant to inspect the Premises and perform such additional procedures as may be deemed reasonably necessary to confirm that the Premises are, as of the effective date of such surrender or early termination of the Lease, free from any residual impact from Tenant HazMat Operations. Tenant shall reimburse Landlord, as Additional Rent, for the actual out-of pocket expense incurred by Landlord for Landlord's environmental consultant to review and approve the Surrender Plan and to visit the Premises and verify satisfactory completion of the same, which cost shall not exceed $3,000. Landlord shall have the unrestricted right to deliver such Surrender Plan and any report by Landlord's environmental consultant with respect to the surrender of the Premises to third parties; provided, however, that Landlord shall instruct such parties to treat the same as confidential.

If Tenant shall fail to prepare or submit a Surrender Plan approved by Landlord, or if Tenant shall fail to complete the approved Surrender Plan, or if such Surrender Plan, whether or not approved by Landlord, shall fail to adequately address any residual effect of Tenant HazMat Operations in, on or about the Premises, Landlord shall have the right to take such actions as Landlord may deem reasonable or appropriate to assure that the Premises and the Project are surrendered free from any residual impact from Tenant HazMat Operations, the reasonable cost of which actions shall be reimbursed by Tenant as Additional Rent, without regard to the limitation set forth in the first paragraph of this Section 28.

Tenant shall immediately return to Landlord all keys and/or access cards to parking, the Project, restrooms or all or any portion of the Premises furnished to or otherwise procured by Tenant. If any such access card or key is lost, Tenant shall pay to Landlord, at Landlord's election, either the cost of replacing such lost access card or key or the cost of reprogramming the access security system in which such access card was used or changing the lock or locks opened by such lost key. Any Tenant's Property, Alterations and property not so removed by Tenant as permitted or required herein shall be deemed abandoned and may be stored, removed, and disposed of by Landlord at Tenant's expense, and Tenant waives all claims against Landlord for any damages resulting from Landlord's retention and/or disposition of such property. All obligations of Tenant hereunder not fully performed as of the termination of the Term, including the obligations of Tenant under Section 30 hereof, shall survive the expiration or earlier termination of the Term, including, without limitation, indemnity obligations, payment obligations with respect to Rent and obligations concerning the condition and repair of the Premises.

29. **Waiver of Jury Trial**. TO THE EXTENT PERMITTED BY LAW, TENANT AND LANDLORD WAIVE ANY RIGHT TO TRIAL BY JURY OR TO HAVE A JURY PARTICIPATE IN RESOLVING ANY DISPUTE, WHETHER SOUNDING IN CONTRACT, TORT, OR OTHERWISE, BETWEEN LANDLORD AND TENANT ARISING OUT OF THIS LEASE OR ANY OTHER INSTRUMENT, DOCUMENT, OR AGREEMENT EXECUTED OR DELIVERED IN CONNECTION HEREWITH OR THE TRANSACTIONS RELATED HERETO.

30. **Environmental Requirements**.

(a) **Prohibition/Compliance/Indemnity**. Tenant shall not cause or permit any Hazardous Materials (as hereinafter defined) to be brought upon, kept, used, stored, handled, treated, generated in or about, or released or disposed of from, the Premises or the Project in violation of applicable Environmental Requirements (as hereinafter defined) by Tenant or any Tenant Party. If Tenant breaches the obligation stated in the preceding sentence, or if the presence of Hazardous Materials in the Premises during the Term, any holding over or any other period of occupancy by Tenant results in contamination of the Premises, the Project or any adjacent property or if contamination of the Premises, the Project or any adjacent property by Hazardous Materials brought into, kept, used, stored, handled, treated, generated in or about, or released or disposed of from, the Premises by anyone other than Landlord and Landlord's employees, agents and contractors otherwise occurs during the Term, any holding over or any other period of occupancy by Tenant, Tenant hereby indemnifies and shall defend and hold Landlord, its officers, directors, employees, agents and contractors harmless from any and all actions (including,

without limitation, remedial or enforcement actions of any kind, administrative or judicial proceedings, and orders or judgments arising out of or resulting therefrom), costs, claims, damages (including, without limitation, punitive damages and damages based upon diminution in value of the Premises or the Project, or the loss of, or restriction on, use of the Premises or any portion of the Project), expenses (including, without limitation, attorneys', consultants' and experts' fees, court costs and amounts paid in settlement of any claims or actions), fines, forfeitures or other civil, administrative or criminal penalties, injunctive or other relief (whether or not based upon personal injury, property damage, or contamination of, or adverse effects upon, the environment, water tables or natural resources), liabilities or losses (collectively, "**Environmental Claims**") which arise during or after the Term as a result of such contamination. This indemnification of Landlord by Tenant includes, without limitation, costs incurred in connection with any investigation of site conditions or any cleanup, treatment, remedial, removal, or restoration work required by any federal, state or local Governmental Authority because of Hazardous Materials present in the air, soil or ground water above, on, or under the Premises. Without limiting the foregoing, if the presence of any Hazardous Materials on the Premises, the Building, the Project or any adjacent property caused or permitted by Tenant or any Tenant Party results in any contamination of the Premises, the Building, the Project or any adjacent property, Tenant shall promptly take all actions at its sole expense and in accordance with applicable Environmental Requirements as are necessary to return the Premises, the Building, the Project or any adjacent property to the condition existing prior to the time of such contamination, provided that Landlord's approval of such action shall first be obtained, which approval shall not unreasonably be withheld so long as such actions would not potentially have any material adverse long-term or short-term effect on the Premises, the Building or the Project. Notwithstanding anything to the contrary contained in this Section 30, Tenant shall not be responsible for, and the indemnification and hold harmless obligation set forth in this paragraph shall not apply to, the presence of any Hazardous Materials in the Premises which Tenant can prove to Landlord's reasonable satisfaction migrated from outside of the Premises into the Premises unless the presence of such Hazardous Materials (i) is the result of a breach by Tenant of any of its obligations under this Lease, or (ii) was caused, contributed to or exacerbated by Tenant or any Tenant Party.

(b) **Business**. Landlord acknowledges that it is not the intent of this Section 30 to prohibit Tenant from using the Premises for the Permitted Use. Tenant may operate its business according to prudent industry practices so long as the use or presence of Hazardous Materials is strictly and properly monitored according to all then applicable Environmental Requirements. As a material inducement to Landlord to allow Tenant to use Hazardous Materials in connection with its business, Tenant agrees to deliver to Landlord prior to the Commencement Date a list identifying each type of Hazardous Materials to be brought upon, kept, used, stored, handled, treated, generated on, or released or disposed of from, the Premises and setting forth any and all governmental approvals or permits required in connection with the presence, use, storage, handling, treatment, generation, release or disposal of such Hazardous Materials on or from the Premises ("**Hazardous Materials List**"). Upon Landlord's request, or any time that Tenant is required to deliver a Hazardous Materials List to any Governmental Authority (e.g., the fire department) in connection with Tenant's use or occupancy of the Premises, Tenant shall deliver to Landlord a copy of such Hazardous Materials List. Tenant shall deliver to Landlord true and correct copies of the following documents (the "**Haz Mat Documents**") relating to the use, storage, handling, treatment, generation, release or disposal of Hazardous Materials prior to the Commencement Date, or if unavailable at that time, concurrent with the receipt from or submission to a Governmental Authority: permits; approvals; reports and correspondence; storage and management plans, notice of violations of any Legal Requirements; plans relating to the installation of any storage tanks to be installed in or under the Project (provided, said installation of tanks shall only be permitted after Landlord has given Tenant its written consent to do so, which consent may be withheld in Landlord's sole and absolute discretion); all closure plans or any other documents required by any and all federal, state and local Governmental Authorities for any storage tanks installed in, on or under the Project for the closure of any such tanks; and a Surrender Plan (to the extent surrender in accordance with Section 28 cannot be accomplished in 3 months). Tenant is not required, however, to provide Landlord with any portion(s) of the Haz Mat Documents containing information of a proprietary nature which, in and of themselves, do not contain a reference to any Hazardous Materials or hazardous activities. It is not the intent of this Section to provide Landlord with information which could be detrimental to Tenant's business should such information become possessed by Tenant's competitors.

(c) **Tenant Representation and Warranty**. Tenant hereby represents and warrants to Landlord that, to the best of Tenant's knowledge after due inquiry and investigation, (i) neither Tenant nor any of its legal predecessors has been required by any prior landlord, lender or Governmental Authority at any time to take remedial action in connection with Hazardous Materials contaminating a property which contamination was permitted by Tenant of such predecessor or resulted from Tenant's or such predecessor's action or use of the property in question, and (ii) Tenant is not subject to any enforcement order issued by any Governmental Authority in connection with the use, storage, handling, treatment, generation, release or disposal of Hazardous Materials (including, without limitation, any order related to the failure to make a required reporting to any Governmental Authority). If Landlord determines that this representation and warranty was not true as of the date of this lease, Landlord shall have the right to terminate this Lease in Landlord's sole and absolute discretion.

(d) **Testing**. Landlord shall have the right, upon reasonable advance written notice to Tenant, to conduct annual tests of the Premises to determine whether any contamination of the Premises or the Project has occurred as a result of Tenant's use. Landlord shall use reasonable efforts to minimize interference with Tenant's operations in the Premises during the performance of testing pursuant to this Section 30(d). Tenant shall be required to pay the cost of such annual test of the Premises if there is violation of this Section 30 or if contamination for which Tenant is responsible under this Section 30 is identified; provided, however, that if Tenant conducts its own tests of the Premises using third party contractors and test procedures acceptable to Landlord which tests are certified to Landlord, Landlord shall accept such tests in lieu of the annual tests to be paid for by Tenant. In addition, at any time, and from time to time, prior to the expiration or earlier termination of the Term, Landlord shall have the right to conduct appropriate tests of the Premises and the Project to determine if contamination has occurred as a result of Tenant's use of the Premises. In connection with such testing, upon the request of Landlord, Tenant shall deliver to Landlord or its consultant such non-proprietary information concerning the use of Hazardous Materials in or about the Premises by Tenant or any Tenant Party. If contamination has occurred for which Tenant is liable under this Section 30, Tenant shall pay all costs to conduct such tests. If no such contamination is found, Landlord shall pay the costs of such tests (which shall not constitute an Operating Expense). Landlord shall provide Tenant with a copy of all third party, non-confidential reports and tests of the Premises made by or on behalf of Landlord during the Term without representation or warranty and subject to a confidentiality agreement. Tenant shall, at its sole cost and expense, promptly and satisfactorily remediate any environmental conditions identified by such testing for which Tenant is responsible under this Lease in accordance with all Environmental Requirements. Landlord's receipt of or satisfaction with any environmental assessment in no way waives any rights which Landlord may have against Tenant.

(e) **Control Areas**. Tenant shall be allowed to utilize up to its pro rata share of the Hazardous Materials inventory within any control area or zone (located within the Premises), as designated by the applicable building code, for chemical use or storage. As used in the preceding sentence, Tenant's pro rata share of any control areas or zones located within the Premises shall be determined based on the rentable square footage that Tenant leases within the applicable control area or zone. For purposes of example only, if a control area or zone contains 10,000 rentable square feet and 2,000 rentable square feet of a tenant's premises are located within such control area or zone (while such premises as a whole contains 5,000 rentable square feet), the applicable tenant's pro rata share of such control area would be 20%.

(f) **Underground Tanks**. Tenant shall have no right to use or install any underground or other storage tanks at the Project, except for above-ground tanks related to Tenant's use of bottled lab gases, as reasonable approved by Landlord.

(g) **Tenant's Obligations**. Tenant's obligations under this Section 30 shall survive the expiration or earlier termination of the Lease. During any period of time after the expiration or earlier termination of this Lease required by Tenant or Landlord to complete the removal from the Premises of any Hazardous Materials (including, without limitation, the release and termination of any licenses or permits restricting the use of the Premises and the completion of the approved Surrender Plan), Tenant shall continue to pay the full Rent in accordance with this Lease for any portion of the Premises not relet by Landlord in Landlord's sole discretion, which Rent shall be prorated daily.

(h) **Definitions**. As used herein, the term "**Environmental Requirements**" means all applicable present and future statutes, regulations, ordinances, rules, codes, judgments, orders or other similar enactments of any Governmental Authority regulating or relating to health, safety, or environmental conditions on, under, or about the Premises or the Project, or the environment, including without limitation, the following: the Comprehensive Environmental Response, Compensation and Liability Act; the Resource Conservation and Recovery Act; and all state and local counterparts thereto, and any regulations or policies promulgated or issued thereunder. As used herein, the term "**Hazardous Materials**" means and includes any substance, material, waste, pollutant, or contaminant listed or defined as hazardous or toxic, or regulated by reason of its impact or potential impact on humans, animals and/or the environment under any Environmental Requirements, asbestos and petroleum, including crude oil or any fraction thereof, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas). As defined in Environmental Requirements, Tenant is and shall be deemed to be the "**operator**" of Tenant's "**facility**" and the "**owner**" of all Hazardous Materials brought on the Premises by Tenant or any Tenant Party, and the wastes, by-products, or residues generated, resulting, or produced therefrom.

31. **Tenant's Remedies/Limitation of Liability**. Landlord shall not be in default hereunder unless Landlord fails to perform any of its obligations hereunder within 30 days after written notice from Tenant specifying such failure (unless such performance will, due to the nature of the obligation, require a period of time in excess of 30 days, then after such period of time as is reasonably necessary). Upon any default by Landlord, Tenant shall give notice by registered or certified mail to any Holder of a Mortgage covering the Premises and to any landlord of any lease of property in or on which the Premises are located and Tenant shall offer such Holder and/or landlord a reasonable opportunity to cure the default, including time to obtain possession of the Project by power of sale or a judicial action if such should prove necessary to effect a cure; provided Landlord shall have furnished to Tenant in writing the names and addresses of all such persons who are to receive such notices. All obligations of Landlord hereunder shall be construed as covenants, not conditions; and, except as may be otherwise expressly provided in this Lease, Tenant may not terminate this Lease for breach of Landlord's obligations hereunder.

All obligations of Landlord under this Lease will be binding upon Landlord only during the period of its ownership of the Premises and Landlord shall not be responsible for obligations arising from and after the date of the transfer of Landlord's interest in the Premises. The term "**Landlord**" in this Lease shall mean only the owner for the time being of the Premises. Upon the transfer by such owner of its interest in the Premises and a written assumption by new owner of the obligations of Landlord arising hereunder from and after the date of such transfer, such owner shall thereupon be released and discharged from all obligations of Landlord thereafter accruing, but such obligations shall be binding during the Term upon each new owner for the duration of such owner's ownership.

32. **Inspection and Access**. Landlord and its agents, representatives, and contractors may enter the Premises at any reasonable time to inspect the Premises and to make such repairs as may be required or permitted pursuant to this Lease and for any other business purpose. Landlord and Landlord's representatives may enter the Premises during business hours on not less than 48 hours advance written notice (except in the case of emergencies in which case no such notice shall be required and such entry may be at any time) for the purpose of effecting any such repairs, inspecting the Premises, showing the Premises to prospective purchasers and, during the last year of the Term, to prospective tenants or for any other business purpose. Landlord may erect a suitable sign on the Premises stating the Premises are available to let or that the Project is available for sale. Landlord may grant easements, make public dedications, designate Common Areas and create restrictions on or about the Premises, provided that no such easement, dedication, designation or restriction materially, adversely affects Tenant's use or occupancy of the Premises for the Permitted Use. At Landlord's request, Tenant shall execute such instruments as may be necessary for such easements, dedications or restrictions. Tenant shall at all times, except in the case of emergencies, have the right to escort Landlord or its agents, representatives, contractors or guests while the same are in the Premises, provided such escort does not materially and adversely affect Landlord's access rights hereunder. Landlord shall comply with Tenant's reasonable security requirements with respect to entering the Premises; provided, however, that Tenant has notified Landlord of such security requirements prior to Landlord's entry into the Premises.

33. **Security**. Tenant acknowledges and agrees that security devices and services, if any, while intended to deter crime may not in given instances prevent theft or other criminal acts and that Landlord is not providing any security services with respect to the Premises. Tenant agrees that Landlord shall not be liable to Tenant for, and Tenant waives any claim against Landlord with respect to, any loss by theft or any other damage suffered or incurred by Tenant in connection with any unauthorized entry into the Premises or any other breach of security with respect to the Premises. Tenant shall be solely responsible for the personal safety of Tenant's officers, employees, agents, contractors, guests and invitees while any such person is in, on or about the Premises and/or the Project. Tenant shall at Tenant's cost obtain insurance coverage to the extent Tenant desires protection against such criminal acts.

34. **Force Majeure**. Except for the payment of Rent, neither Landlord nor Tenant shall be held responsible or liable for delays in the performance of its obligations hereunder when caused by, related to, or arising out of acts of God, sinkholes or subsidence, strikes, lockouts, or other labor disputes, embargoes, quarantines, weather, national, regional, or local disasters, calamities, or catastrophes, inability to obtain labor or materials (or reasonable substitutes therefor) at reasonable costs or failure of, or inability to obtain, utilities necessary for performance, governmental restrictions, orders, limitations, regulations, or controls, national emergencies, delay in issuance or revocation of permits, enemy or hostile governmental action, terrorism, insurrection, riots, civil disturbance or commotion, fire or other casualty, and other causes or events beyond their reasonable control ("**Force Majeure**").

35. **Brokers**. Landlord and Tenant each represents and warrants that it has not dealt with any broker, agent or other person (collectively, "**Broker**") in connection with this transaction and that no Broker brought about this transaction, other than Cushman & Wakefield. Landlord and Tenant each hereby agree to indemnify and hold the other harmless from and against any claims by any Broker, other than Cushman & Wakefield claiming a commission or other form of compensation by virtue of having dealt with Tenant or Landlord, as applicable, with regard to this leasing transaction.

36. **Limitation on Landlord's Liability**. NOTWITHSTANDING ANYTHING SET FORTH HEREIN OR IN ANY OTHER AGREEMENT BETWEEN LANDLORD AND TENANT TO THE CONTRARY: (A) LANDLORD SHALL NOT BE LIABLE TO TENANT OR ANY OTHER PERSON FOR (AND TENANT AND EACH SUCH OTHER PERSON ASSUME ALL RISK OF) LOSS, DAMAGE OR INJURY, WHETHER ACTUAL OR CONSEQUENTIAL TO: TENANT'S PERSONAL PROPERTY OF EVERY KIND AND DESCRIPTION, INCLUDING, WITHOUT LIMITATION TRADE FIXTURES, EQUIPMENT, INVENTORY, SCIENTIFIC RESEARCH, SCIENTIFIC EXPERIMENTS, LABORATORY ANIMALS, PRODUCT, SPECIMENS, SAMPLES, AND/OR SCIENTIFIC, BUSINESS, ACCOUNTING AND OTHER RECORDS OF EVERY KIND AND DESCRIPTION KEPT AT THE PREMISES AND ANY AND ALL INCOME DERIVED OR DERIVABLE THEREFROM; (B) THERE SHALL BE NO PERSONAL RECOURSE TO LANDLORD FOR ANY ACT OR OCCURRENCE IN, ON OR ABOUT THE PREMISES OR ARISING IN ANY WAY UNDER THIS LEASE OR ANY OTHER AGREEMENT BETWEEN LANDLORD AND TENANT WITH RESPECT TO THE SUBJECT MATTER HEREOF AND ANY LIABILITY OF LANDLORD HEREUNDER SHALL BE STRICTLY LIMITED SOLELY TO LANDLORD'S INTEREST IN THE PROJECT OR ANY PROCEEDS FROM SALE OR CONDEMNATION THEREOF AND ANY INSURANCE PROCEEDS PAYABLE IN RESPECT OF LANDLORD'S INTEREST IN THE PROJECT OR IN CONNECTION WITH ANY SUCH LOSS; AND (C) IN NO EVENT SHALL ANY PERSONAL LIABILITY BE ASSERTED AGAINST LANDLORD IN CONNECTION WITH THIS LEASE NOR SHALL ANY RECOURSE BE HAD TO ANY OTHER PROPERTY OR ASSETS OF LANDLORD OR ANY OF LANDLORD'S OFFICERS, DIRECTORS, EMPLOYEES, AGENTS OR CONTRACTORS. UNDER NO CIRCUMSTANCES SHALL LANDLORD OR ANY OF LANDLORD'S OFFICERS, DIRECTORS, EMPLOYEES, AGENTS OR CONTRACTORS BE LIABLE FOR INJURY TO TENANT'S BUSINESS OR FOR ANY LOSS OF INCOME OR PROFIT THEREFROM.

37. **Severability**. If any clause or provision of this Lease is illegal, invalid or unenforceable under present or future laws, then and in that event, it is the intention of the parties hereto that the remainder of this Lease shall not be affected thereby. It is also the intention of the parties to this Lease that in lieu of each clause or provision of this Lease that is illegal, invalid or unenforceable, there be added, as a part of this Lease, a clause or provision as similar in effect to such illegal, invalid or unenforceable clause or provision as shall be legal, valid and enforceable.

38. **Signs; Exterior Appearance**. Tenant shall not, without the prior written consent of Landlord, which may be granted or withheld in Landlord's sole discretion: (i) attach any awnings, exterior lights, decorations, balloons, flags, pennants, banners, painting or other projection to any outside wall of the Project, (ii) use any curtains, blinds, shades or screens other than Landlord's standard window coverings, (iii) coat or otherwise sunscreen the interior or exterior of any windows, (iv) place any bottles, parcels, or other articles on the window sills, (v) place any equipment, furniture or other items of personal property on any exterior balcony, or (vi) paint, affix or exhibit on any part of the Premises or the Project any signs, notices, window or door lettering, placards, decorations, or advertising media of any type which can be viewed from the exterior of the Premises. Standard suite entry signage, interior wall signage bearing Tenant's or Guarantor's logo, and signage on the directory tablet shall be inscribed, painted or affixed for Tenant by Landlord at Landlord's cost, and shall be in locations and of a size, color and type acceptable to Landlord. Nothing may be placed on the exterior of corridor walls or corridor doors other than Landlord's standard lettering. The directory tablet shall be provided exclusively for the display of the name and location of tenants.

As of the date of this Lease, no signage is planned or approved for the exterior of the Building. If Landlord elects, in its sole and absolute discretion, during the Term, to allow tenants of the Building of similar size to Tenant to have signage on the exterior of the Building, then Tenant shall have the non-exclusive right to display, at Tenant's cost and expense, a sign bearing Tenant's name and/or logo ("**Building Sign**") at a location on Building selected by Landlord. Notwithstanding the foregoing, Tenant acknowledges and agrees that the Building Sign including, without limitation, the size, color and type, shall be subject to Landlord's prior written approval, which shall not be unreasonably withheld, shall be consistent with Landlord's signage program at the Project and shall be subject to any and all other required approvals and applicable Legal Requirements. Tenant shall be responsible, at Tenant's sole cost and expense, for the maintenance of each Building Sign, for the removal of each Building Sign at the expiration or earlier termination of this Lease and for the repair of all damage resulting from such removal. The rights granted pursuant to this paragraph shall be personal to ELO Life Systems, Inc. Landlord agrees that if Landlord elects pursuant to this paragraph to allow tenants of the Building or similar size to Tenant to have signage on the exterior of the Building, Landlord shall not grant signage rights superior to those of Tenant to any tenant of the Building leasing less square footage at the Building than Tenant. Landlord is under no obligation to allow tenants of the Building of similar size to Tenant to have signage on the exterior of the Building or to seek approval from any Governmental Authority for signage on the exterior of the Building at any time.

39. **Rights to Expand**.

(a) **Expansion in the Building**. Tenant shall have an on-going right during the Base Term, but not the obligation, subject to the terms of this Section 39(a), to expand the Premises (the "**Expansion Right**") to include the Expansion Space upon the terms and conditions in this Section 39(a). For purposes of this Section 39(a), "**Expansion Space**" shall mean the remaining space located on the second floor of the portion of the Building known as "Lab Building 2", which is not occupied by a tenant or which is occupied by a then-existing tenant whose lease is expiring within 6 months or less and such tenant does not wish to renew (whether or not such tenant has a right to renew) its occupancy of such space. Each time that there is any available Expansion Space, Landlord shall, at such time as Landlord shall elect so long as Tenant's rights hereunder are preserved, deliver to Tenant written notice (the "**Expansion Notice**") of such Expansion Space, together with the terms and conditions on which Landlord is prepared to lease Tenant such Expansion Space, provided that the base rent payable with respect to the Expansion Space shall be the Market Rate (as defined in Section 40). For the avoidance of doubt, Tenant shall be required to exercise its right under this Section 39(a) with respect to all of the

space described in the Expansion Notice ("**Identified Expansion Space**"). The term of the Lease with respect to the Identified Expansion Space may not be co-terminous with the Term of this Lease with respect to the then-existing Premises. Notwithstanding anything to the contrary contained herein, in no event shall the Work Letter apply to the Identified Expansion Space. Tenant shall have 10 business days following receipt of the Expansion Notice to deliver to Landlord written notification of Tenant's exercise of the Expansion Right ("**Exercise Notice**") with respect to the Identified Expansion Space. If Landlord and Tenant are unable to agree on the Market Rate for the Identified Expansion Space after negotiating in good faith within 5 days after Tenant's delivery of a Exercise Notice to Landlord, the Market Rate will be determined through arbitration in accordance with Section 40(b) below. If Tenant does not deliver a Exercise Notice to Landlord within such 10 business day period, then Tenant shall be deemed to have waived its rights under this Section 39(a) to lease the Identified Expansion Space, and Landlord shall have the right to lease the Identified Expansion Space to any third party on any terms and conditions acceptable to Landlord. Notwithstanding anything to the contrary contained herein, Tenant shall have no right to exercise the Expansion Right and the provisions of this Section 39(a) shall no longer apply after the date that is 9 months prior to the expiration of the Base Term if Tenant has not exercised its first Extension Right pursuant to Section 40.

(b) **Right of First Refusal**. Subject to the provisions of this Section 39(b), each time after the date of this Lease and prior to the expiration of the Base Term that Landlord intends to accept a written proposal (the "**Pending Deal**") to lease all or any portion the First Refusal Space (as hereinafter defined) to a third party, Landlord shall deliver to Tenant written notice (the "**Pending Deal Notice**") of the existence of such Pending Deal and the material terms of such Pending Deal. For purposes of this Section 39(b), "**First Refusal Space**" shall mean any space in the second floor of the building at the Project commonly known as "Lab Building 1" (which second floor contains approximately 23,045 rentable square feet of space), which is not occupied by a tenant or which is occupied by a then existing tenant whose lease is expiring within 6 months or less and such tenant does not wish to renew (whether or not such tenant has a right to renew) its occupancy of such space. For the avoidance of doubt, Tenant shall be required to exercise its right under this Section 39(b) with respect to all of the space described in the Pending Deal Notice, including any space in addition to the First Refusal Space that is described in the Pending Deal Notice, which additional space shall be deemed to be included as part of the First Refusal Space. Within 5 business days after Tenant's receipt of the Pending Deal Notice, Tenant shall deliver to Landlord written notice (the "**Space Acceptance Notice**") if Tenant elects to lease the First Refusal Space described in the Pending Deal Notice. Tenant's right to receive the Pending Deal Notice and election to lease or not lease the First Refusal Space pursuant to this Section 39(b) is hereinafter referred to as the "**Right of First Refusal**." If Tenant elects to lease the First Refusal Space described in the Pending Deal Notice by delivering the Space Acceptance Notice within the required 5 business day period, Tenant shall be deemed to agree to lease the First Refusal Space on the same general terms and conditions as this Lease except that the terms of this Lease shall be modified to reflect the terms of the Pending Deal Notice for the rental of the First Refusal Space. Tenant acknowledges that the term of the Lease with respect to the First Refusal Space and the Term of the Lease with respect to the original Premises may not be co-terminous. Notwithstanding anything to the contrary contained herein, in no event shall the Work Letter apply to the First Refusal Space. If Tenant fails to deliver a Space Acceptance Notice to Landlord within the required 5 business day period, Landlord shall have the right to lease the First Refusal Space to the third party subject to the Pending Deal (or an affiliate of such third party) on substantially the same business terms and conditions set forth in the Pending Deal Notice. Notwithstanding anything to the contrary contained in this Section 39(b), Tenant shall have no right to exercise the Right of First Refusal and the provisions of this Section 39(b) shall no longer apply after the date that is 9 months prior to the expiration of the Base Term if Tenant has not exercised its first Extension Right pursuant to Section 40.

(c) **Amended Lease**. If: (i) Tenant fails to timely deliver an Exercise Notice or a Space Acceptance Notice, as applicable, or (ii) after the expiration of a period of 30 days after Landlord's delivery to Tenant of a lease amendment for Tenant's lease of the Identified Expansion Space or First Refusal Space, as applicable, no lease amendment for the Identified Expansion Space or First Refusal Space, as applicable, acceptable to both parties, each in their sole and absolute discretion, has been executed, Tenant shall be deemed to have waived its right under this Section 39 to lease such Identified Expansion Space or First Refusal Space, as applicable. Landlord and Tenant agree to use good faith reasonable efforts with respect to the negotiation and execution of any such lease amendment.

(d) **Exceptions**. Notwithstanding the above, the Expansion Right and the Right of First Refusal shall, at Landlord's option, not be in effect and may not be exercised by Tenant:

(i) during any period of time that Tenant is in Default under any provision of the Lease; or

(ii) if Tenant has been in Default under any provision of the Lease 3 or more times, whether or not the Defaults are cured, during the 12 month period prior to the date on which Tenant seeks to exercise the Expansion Right or Right of First Refusal.

(e) **Termination**. The Expansion Right and the Right of First Refusal shall, at Landlord's option, terminate and be of no further force or effect even after Tenant's due and timely exercise of the Expansion Right or Right of First Refusal, as applicable, if, after such exercise, but prior to the commencement date of the lease of the Identified Expansion Space or the First Refusal Space, as applicable, (i) Tenant fails to timely cure any default by Tenant under the Lease; or (ii) Tenant has Defaulted 3 or more times during the period from the date of the exercise of the Expansion Right or the Right of First Refusal, as applicable, to the date of the commencement of the lease of the Identified Expansion Space or the First Refusal Space, as applicable, whether or not such Defaults are cured.

(f) **Rights Personal**. The Expansion Right and the Right of First Refusal are personal to Tenant and are not assignable without Landlord's consent, which may be granted or withheld in Landlord's sole discretion separate and apart from any consent by Landlord to an assignment of Tenant's interest in the Lease, except that they may be assigned in connection with any Permitted Assignment of this Lease.

(g) **No Extensions**. The period of time within which the Expansion Right or the Right of First Refusal may be exercised shall not be extended or enlarged by reason of Tenant's inability to exercise the Expansion Right or Right of First Refusal.

40. **Right to Extend Term**. Tenant shall have the right to extend the Term of the Lease upon the following terms and conditions:

(a) **Extension Rights**. Tenant shall have 2 consecutive rights (each, an "**Extension Right**") to extend the term of this Lease for 5 years each (each, an "**Extension Term**") on the same terms and conditions as this Lease (other than with respect to Base Rent and the Work Letter) by giving Landlord written notice of its election to exercise each Extension Right at least 9 months prior to the expiration of the Base Term of the Lease or the expiration of any prior Extension Term.

Upon the commencement of any Extension Term, Base Rent shall be payable at the Market Rate (as defined below). Base Rent shall thereafter be adjusted on each annual anniversary of the commencement of such Extension Term by a percentage as determined by Landlord and agreed to by Tenant at the time the Market Rate is determined. As used herein, "**Market Rate**" shall mean the rate that comparable landlords of comparable buildings have accepted in current transactions from non-equity (i.e., not being offered equity in the buildings) and nonaffiliated tenants of similar financial strength for space of comparable size, quality (including all Tenant Improvements, Alterations and other improvements) and floor height in Class A laboratory/office buildings in Research Triangle Park for a comparable term, with the determination of the Market Rate to take into account all relevant factors, including tenant inducements, available amenities, parking costs, leasing commissions, allowances or concessions, if any. Notwithstanding the foregoing, the Market Rate shall in no event be less than the Base Rent payable as of the date immediately preceding the commencement of such Extension Term increased by the Rent Adjustment Percentage multiplied by such Base Rent. In addition, Landlord may impose a market rent for the parking rights provided hereunder.

If, on or before the date which is 210 days prior to the expiration of the Base Term of this Lease, Tenant has not agreed with Landlord's determination of the Market Rate and the rent escalations during the Extension Term after negotiating in good faith, Tenant shall be deemed to have elected arbitration as described in Section 40(b). Tenant acknowledges and agrees that, if Tenant has elected to exercise the Extension Right by delivering notice to Landlord as required in this Section 40(a), Tenant shall have no right thereafter to rescind or elect not to extend the term of the Lease for the Extension Term.

(b) **Arbitration**.

(i) Within 10 days of Tenant's notice to Landlord of its election (or deemed election) to arbitrate Market Rate and escalations, each party shall deliver to the other a proposal containing the Market Rate and escalations that the submitting party believes to be correct ("**Extension Proposal**"). If either party fails to timely submit an Extension Proposal, the other party's submitted proposal shall determine the Base Rent and escalations for the Extension Term. If both parties submit Extension Proposals, then Landlord and Tenant shall meet within 7 days after delivery of the last Extension Proposal and make a good faith attempt to mutually appoint a single Arbitrator (and defined below) to determine the Market Rate and escalations. If Landlord and Tenant are unable to agree upon a single Arbitrator, then each shall, by written notice delivered to the other within 10 days after the meeting, select an Arbitrator. If either party fails to timely give notice of its selection for an Arbitrator, the other party's submitted proposal shall determine the Base Rent for the Extension Term. The 2 Arbitrators so appointed shall, within 5 business days after their appointment, appoint a third Arbitrator. If the 2 Arbitrators so selected cannot agree on the selection of the third Arbitrator within the time above specified, then either party, on behalf of both parties, may request such appointment of such third Arbitrator by application to any state court of general jurisdiction in the jurisdiction in which the Premises are located, upon 10 days prior written notice to the other party of such intent.

(ii) The decision of the Arbitrator(s) shall be made within 30 days after the appointment of a single Arbitrator or the third Arbitrator, as applicable. The decision of the single Arbitrator shall be final and binding upon the parties. The average of the two closest Arbitrators in a three Arbitrator panel shall be final and binding upon the parties. Each party shall pay the fees and expenses of the Arbitrator appointed by or on behalf of such party and the fees and expenses of the third Arbitrator shall be borne equally by both parties. If the Market Rate and escalations are not determined by the first day of the Extension Term, then Tenant shall pay Landlord Base Rent in an amount equal to the Base Rent in effect immediately prior to the Extension Term and increased by the Rent Adjustment Percentage until such determination is made. After the determination of the Market Rate and escalations, the parties shall make any necessary adjustments to such payments made by Tenant. Landlord and Tenant shall then execute an amendment recognizing the Market Rate and escalations for the Extension Term.

(iii) An "**Arbitrator**" shall be any person appointed by or on behalf of either party or appointed pursuant to the provisions hereof and: (i) shall be (A) a member of the American Institute of Real Estate Appraisers with not less than 10 years of experience in the appraisal of improved office and high tech industrial real estate in the greater Raleigh/Durham metropolitan area, or (B) a licensed commercial real estate broker with not less than 15 years experience representing landlords and/or tenants in the leasing of high tech or life sciences space in the greater Raleigh/Durham metropolitan area, (ii) devoting substantially all of their time to professional appraisal or brokerage work, as applicable, at the time of appointment and (iii) be in all respects impartial and disinterested.

(c) **Rights Personal**. Extension Rights are personal to Tenant and are not assignable without Landlord's consent, which may be granted or withheld in Landlord's sole discretion separate and apart from any consent by Landlord to an assignment of Tenant's interest in the Lease, except that they may be assigned in connection with any Permitted Assignment of this Lease.

(d) **Exceptions**. Notwithstanding anything set forth above to the contrary, Extension Rights shall, at Landlord's option, not be in effect and Tenant may not exercise any of the Extension Rights:

(i) during any period of time that Tenant is in Default under any provision of this Lease; or

(ii) if Tenant has been in Default under any provision of this Lease 3 or more times, whether or not the Defaults are cured, during the 12 month period immediately prior to the date that Tenant intends to exercise an Extension Right, whether or not the Defaults are cured.

(e) **No Extensions**. The period of time within which any Extension Rights may be exercised shall not be extended or enlarged by reason of Tenant's inability to exercise the Extension Rights.

(f) **Termination**. The Extension Rights shall, at Landlord's option, terminate and be of no further force or effect even after Tenant's due and timely exercise of an Extension Right, if, after such exercise, but prior to the commencement date of an Extension Term, (i) Tenant fails to timely cure any default by Tenant under this Lease; or (ii) Tenant has Defaulted 3 or more times during the period from the date of the exercise of an Extension Right to the date of the commencement of the Extension Term, whether or not such Defaults are cured.

41. **Relocation**. Landlord shall have no right to relocate the Premises during the Term.

42. **Right of First Negotiation for New Greenhouse**. Landlord is contemplating constructing an additional greenhouse at the Project (the "**Additional Greenhouse**"). For a period of 90 days following the Commencement Date, Landlord shall not negotiate with any third party regarding the lease of all or a portion of the Additional Greenhouse and Tenant shall not negotiate with any third party for the leasing of greenhouse space in the Research Triangle Park area. During such 90 day period, unless Tenant declines its right of first negotiation pursuant to this Section 42 by delivery of written notice to Landlord within 10 days after the Commencement Date, Landlord and Tenant shall negotiate in good faith the terms and conditions pursuant to which Tenant may lease the Additional Greenhouse from Landlord. In the event that, (a) Tenant delivers to Landlord written notice declining its right of first negotiation pursuant to the immediately preceding sentence, or (b) at the end of such 90 day period Landlord and Tenant have not executed an amendment to this Lease providing for the lease of the Additional Greenhouse by Tenant, then this Section 42 shall be null and void and of no further force or effect and Landlord shall be free to solicit offers and negotiate with third parties for the lease of all or a portion of the Additional Greenhouse.

43. **Shared Lab Area**.

(a) **License**. Commencing on the Lab/Premises Commencement Date, Landlord hereby grants to Tenant, and Tenant hereby accepts, a non-exclusive license ("**Shared Lab License**") to use that certain area of the Building described as the "**Shared Lab Area**" on **Exhibit I** attached hereto, subject to the terms and provisions of this Section 43.

(b) **Use**. Tenant shall exercise its rights under this Section 43 and use the Shared Lab Area in a manner that complies with all applicable Legal Requirements and any and all rules and regulations which may be adopted by Landlord from time to time including, without limitation, any schedule(s) which may be implemented by Landlord for the use of the Shared Lab Area by all parties entitled to use the same. Tenant agrees to cause its employees who will be using the Shared Lab Area to complete all training programs, if any, mandated by Landlord relating to the use of the Shared Lab Area.

Tenant shall use the Shared Lab Area in a manner that will not interfere with the rights of any other tenants, other licensees or Landlord's service providers. Landlord assumes no responsibility for enforcing Tenant's rights or for protecting the Shared Lab Area from interference or use from any person including, without limitation, other tenants or licensees of the Project. Landlord may terminate the Shared

Lab License granted to Tenant hereunder at any time during the Term for Tenant's failure to comply with the terms of this Section 43 or any reasonable rules and regulations adopted by Landlord and delivered to Tenant in writing with respect to the Shared Lab Area. The expiration or earlier termination of this Lease shall automatically terminate the license hereby granted to Tenant to so use the Shared Lab Area.

(c) **Relocation and Modification of Shared Lab Area**. Tenant acknowledges and agrees that Landlord shall have the right at any time and from time to time, upon no less than 30 days' notice to Tenant, to reconfigure, relocate, modify or remove the Shared Lab Area and/or to revise, expand or discontinue any of the services (if any) provided therein, and to add, change, reconfigure, remove or relocate any of the Equipment (as hereinafter defined) located therein. If Landlord ceases to maintain the existence of the Shared Lab Area, the rights granted to Tenant pursuant to this Section 42 shall terminate.

(d) **Waiver**.

(i) Landlord's sole obligation for providing any equipment, systems, furnishings or personal property to the Shared Lab Area whether or not affixed to the Premises (collectively, "**Equipment**") shall be (i) to provide such Equipment as is determined by Landlord in its sole and absolute discretion, and (ii) to contract with a third party to maintain the Equipment that is deemed by Landlord (in its sole and absolute discretion) to need periodic maintenance per the manufacturer's standard maintenance guidelines. Landlord shall have no obligation to provide Tenant with operational Equipment, back-up Equipment or back-up utilities or to supervise, oversee or confirm that the third party maintaining the Equipment is maintaining the Equipment as per the manufacturer's standard guidelines or otherwise. During any period of replacement, repair or maintenance of the Equipment when such Equipment is not operational, including any delays thereto due to the inability to obtain parts or replacements, Landlord shall have no obligation to provide Tenant with alternative or back-up Equipment. Tenant expressly acknowledges and agrees that Landlord does not guaranty that the Equipment will be operational at all times, will function or perform adequately and Landlord shall not be liable for any damages resulting from the failure of such Equipment.

(ii) Landlord makes no warranties of any kind, express or implied, with respect to the Shared Lab Area or the Equipment, and Landlord disclaims any such warranties. Without limiting the foregoing, Tenant expressly acknowledges and agrees that Landlord does not guaranty or warrant that that the Shared Lab Area of any Equipment will be operational at all times, will be of sufficient capacity to accommodate Tenant's use thereof, will be free of Hazardous Materials, or will function or perform adequately, and Landlord shall not be liable for any damages resulting from the failure of the Shared Lab Area and/or any Equipment.

(e) Tenant acknowledges and agrees that Landlord is under no obligation to provide any type of instruction or implement any training programs relating to the use of the Shared Lab Area for Tenant or any other parties entitled to use the Shared Lab Area.

44. **Miscellaneous**.

(a) **Notices**. All notices or other communications between the parties shall be in writing and shall be deemed duly given upon delivery or refusal to accept delivery by the addressee thereof if delivered in person, or upon actual receipt if delivered by reputable overnight guaranty courier, addressed and sent to the parties at their addresses set forth above. Landlord and Tenant may from time to time by written notice to the other designate another address for receipt of future notices.

(b) **Joint and Several Liability**. If and when included within the term "**Tenant**," as used in this instrument, there is more than one person or entity, each shall be jointly and severally liable for the obligations of Tenant.

(c) **Financial Information**. Tenant shall furnish Landlord with true and complete copies of (i) Tenant's most recent audited annual financial statements within 90 days of the end of each of Tenant's fiscal years during the Term, and (ii) Tenant's most recent unaudited quarterly financial statements within 45 days of the end of each of Tenant's first three fiscal quarters of each of Tenant's fiscal years during the Term.

(d) **Recordation**. This Lease shall not be filed by or on behalf of Tenant in any public record. Notwithstanding the foregoing, upon Tenant's request and at Tenant's sole cost and expense, Landlord shall execute and notarize a memorandum of lease prepared by Tenant which memorandum shall contain only the following information and any other additional information that may be required by applicable law: (i) the names of the parties to this Lease, (ii) description of the Premises and the Project, and (iii) the Term. Tenant shall file such memorandum of lease, at Tenant's sole cost. If Tenant fails, after written request from Landlord, to record a termination of the memorandum on the expiration or earlier termination of this Lease, Tenant shall be responsible for any damages suffered by Landlord (from any cause including, without limitation, resulting from any indemnities or certifications which may be made by Landlord in favor of third parties). The provisions of this Section 44(d) shall survive the expiration or earlier termination of this Lease.

(e) **Interpretation**. The normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Lease or any exhibits or amendments hereto. Words of any gender used in this Lease shall be held and construed to include any other gender, and words in the singular number shall be held to include the plural, unless the context otherwise requires. The captions inserted in this Lease are for convenience only and in no way define, limit or otherwise describe the scope or intent of this Lease, or any provision hereof, or in any way affect the interpretation of this Lease.

(f) **Not Binding Until Executed**. The submission by Landlord to Tenant of this Lease shall have no binding force or effect, shall not constitute an option for the leasing of the Premises, nor confer any right or impose any obligations upon either party until execution of this Lease by both parties.

(g) **Limitations on Interest**. It is expressly the intent of Landlord and Tenant at all times to comply with applicable law governing the maximum rate or amount of any interest payable on or in connection with this Lease. If applicable law is ever judicially interpreted so as to render usurious any interest called for under this Lease, or contracted for, charged, taken, reserved, or received with respect to this Lease, then it is Landlord's and Tenant's express intent that all excess amounts theretofore collected by Landlord be credited on the applicable obligation (or, if the obligation has been or would thereby be paid in full, refunded to Tenant), and the provisions of this Lease immediately shall be deemed reformed and the amounts thereafter collectible hereunder reduced, without the necessity of the execution of any new document, so as to comply with the applicable law, but so as to permit the recovery of the fullest amount otherwise called for hereunder.

(h) **Choice of Law**. Construction and interpretation of this Lease shall be governed by the internal laws of the state in which the Premises are located, excluding any principles of conflicts of laws.

(i) **Time**. Time is of the essence as to the performance of Tenant's obligations under this Lease.

(j) **OFAC**. Tenant and all beneficial owners of Tenant are currently (a) in compliance with and shall at all times during the Term of this Lease remain in compliance with the regulations of the Office of Foreign Assets Control ("**OFAC**") of the U.S. Department of Treasury and any statute, executive order, or regulation relating thereto (collectively, the "**OFAC Rules**"), (b) not listed on, and shall not during the term of this Lease be listed on, the Specially Designated Nationals and Blocked Persons List, Foreign Sanctions Evaders List, or the Sectoral Sanctions Identification List, which are all maintained by OFAC and/or on any other similar list maintained by OFAC or other governmental authority pursuant to any authorizing statute, executive order, or regulation, and (c) not a person or entity with whom a U.S. person is prohibited from conducting business under the OFAC Rules.

(k) **Incorporation by Reference**. All exhibits and addenda attached hereto are hereby incorporated into this Lease and made a part hereof. If there is any conflict between such exhibits or addenda and the terms of this Lease, such exhibits or addenda shall control.

(l) **Entire Agreement**. This Lease, including the exhibits attached hereto, constitutes the entire agreement between Landlord and Tenant pertaining to the subject matter hereof and supersedes all prior and contemporaneous agreements, understandings, letters of intent, negotiations and discussions, whether oral or written, of the parties, and there are no warranties, representations or other agreements, express or implied, made to either party by the other party in connection with the subject matter hereof except as specifically set forth herein.

(m) **No Accord and Satisfaction**. No payment by Tenant or receipt by Landlord of a lesser amount than the monthly installment of Base Rent or any Additional Rent will be other than on account of the earliest stipulated Base Rent and Additional Rent, nor will any endorsement or statement on any check or letter accompanying a check for payment of any Base Rent or Additional Rent be an accord and satisfaction. Landlord may accept such check or payment without prejudice to Landlord's right to recover the balance of such Rent or to pursue any other remedy provided in this Lease.

(n) **Hazardous Activities**. Notwithstanding any other provision of this Lease, Landlord, for itself and its employees, agents and contractors, reserves the right to refuse to perform any repairs or services in any portion of the Premises which, pursuant to Tenant's routine safety guidelines, practices or custom or prudent industry practices, require any form of protective clothing or equipment other than safety glasses. In any such case, Tenant shall contract with parties who are acceptable to Landlord, in Landlord's reasonable discretion, for all such repairs and services, and Landlord shall, to the extent required, equitably adjust Tenant's Share of Operating Expenses in respect of such repairs or services to reflect that Landlord is not providing such repairs or services to Tenant.

(o) **Redevelopment of Project**. Tenant acknowledges that Landlord, in its sole discretion, may from time to time expand, renovate and/or reconfigure the Project as the same may exist from time to time and, in connection therewith or in addition thereto, as the case may be, from time to time without limitation: (a) change the shape, size, location, number and/or extent of any improvements, buildings, structures, lobbies, hallways, entrances, exits, parking and/or parking areas relative to any portion of the Project; (b) modify, eliminate and/or add any buildings, improvements, and parking structure(s) either above or below grade, to the Project, the Common Areas and/or any other portion of the Project and/or make any other changes thereto affecting the same; and (c) make any other changes, additions and/or deletions in any way affecting the Project and/or any portion thereof as Landlord may elect from time to time, including without limitation, additions to and/or deletions from the land comprising the Project, the Common Areas and/or any other portion of the Project. Notwithstanding anything to the contrary contained in this Lease, Tenant shall have no right to seek damages (including abatement of Rent) or to cancel or terminate this Lease because of any proposed changes, expansion, renovation or reconfiguration of the Project nor shall Tenant have the right to restrict, inhibit or prohibit any such changes, expansion, renovation or reconfiguration; provided, however, Landlord shall not change the size, dimensions, location or Tenant's Permitted Use of the Premises.

(p) **Guaranty**. In order to induce Landlord to enter into this Lease and in consideration of Landlord's entering into this Lease, on or prior to the date hereof Tenant shall cause Precision Biosciences, Inc., a Delaware corporation ("**Guarantor**"), to execute and deliver to Landlord a guaranty in the form attached hereto as **Exhibit I** (the "**Guaranty**").

(q) **Landlord Lien Waiver**. Subject to the provisions of this paragraph, during the Term, Landlord waives any statutory landlord's lien and any attachment for Rent on Tenant's Property and on any Alteration of Tenant that is not required to be surrendered to Landlord at the expiration or sooner termination of the Term of this Lease (collectively, "**Personalty**") that Landlord may have or may hereafter acquire. Landlord acknowledges and agrees that Tenant's Personalty may be leased from an equipment lessor or encumbered by Tenant's lender (collectively, "**Equipment Lessor**") and that Tenant may execute and enter into an equipment lease or security agreement with respect to such Personalty

("**Equipment Lease**"). If and to the extent required by any Equipment Lease or Equipment Lessor, Landlord shall execute and deliver to the Equipment Lessor a written consent, waiver and/or acknowledgment which is in form and content reasonably acceptable to Landlord ("**Lien Waiver**") in which Landlord (i) acknowledges and agrees that, during the Term, the Personalty which is the subject of the Equipment Lease and described with specificity on an exhibit to the Lien Waiver constitutes the personal property of Tenant (unless contrary to the provisions of this Lease), and shall not be considered to be part of the Premises, regardless of whether or by what means they become attached thereto, (ii) agrees that, during the Term, it shall not claim any interest in such Personalty, and (iii) agrees that Equipment Lessor may enter the Premises for the purpose of removing such Personalty, but only if, in such consent such Equipment Lessor agrees to repair any damage resulting from such removal and to indemnify and hold harmless Landlord from and against any claim or other loss that results from such entry and, agrees, within 3 business days after the expiration or termination of the Term to pay all Rent that would accrue under the Lease if it had not terminated or expired for the period from the expiration or termination of such Lease until 5 business days after such Equipment Lessor relinquishes its right rights to enter into the Premises; provided, further, such Equipment Lessor's right to enter the Premises shall in any event expire 30 days after the expiration or termination of the Lease in which case the Equipment Lessor and Tenant shall agree that the Personalty shall be deemed abandoned. Such Lien Waiver documents also may contain such other reasonable and customary provisions that are reasonably acceptable to Landlord. Landlord shall be entitled to be paid as administrative rent a fee of $1,000 per occurrence for its time and effort in preparing and negotiating each Lien Waiver.

(r) **Materials Transport Equipment**. Landlord hereby grants to Tenant a non-exclusive license to use that certain forklift and Gem vehicle available for use by tenants and licensees of the Project, including Tenant, for the transport of materials at the Project (collectively, the "**Materials Transport Equipment**"). Tenant agrees to cause its employees who will be using the Materials Transport Equipment to complete all training programs, if any, mandated by Landlord relating to the use of the Materials Transport Equipment. Tenant shall exercise its rights under this Section 44(r) and use the Materials Transport Equipment in a manner that complies with all applicable Legal Requirements and any and all rules and regulations which may be adopted by Landlord from time to time including, without limitation, any schedule(s) which may be implemented by Landlord for the use of the Materials Transport Equipment by all parties entitled to use the same. Tenant shall use the Materials Transport Equipment in a manner that will not interfere with the rights of any other tenants, other licensees or Landlord's service providers. Landlord assumes no responsibility for enforcing Tenant's rights or for protecting the Materials Transport Equipment from interference or use from any person including, without limitation, other tenants or licensees of the Project. Landlord may terminate the license granted to Tenant pursuant to this Section 44(r) at any time during the Term, upon 10 days' notice to Tenant, for Tenant's failure to comply with the terms of this Section 44(r) or any rules and regulations adopted by Landlord with respect to the Materials Transport Equipment. Tenant acknowledges and agrees that Landlord shall have the right at any time and from time to time, upon no less than 30 days' notice to Tenant, to add, change, reconfigure, remove or relocate any of the Materials Transport Equipment.

Landlord's sole obligation for providing any Materials Transport Equipment shall be (x) to provide such Materials Transport Equipment as is determined by Landlord in its sole and absolute discretion, and (y) to contract with a third party to maintain the Materials Transport Equipment per the manufacturer's standard maintenance guidelines. Landlord shall have no obligation to provide Tenant with operational Materials Transport Equipment or back-up Materials Transport Equipment or to supervise, oversee or confirm that the third party maintaining the Materials Transport Equipment is maintaining the Materials Transport Equipment as per the manufacturer's standard guidelines or otherwise. During any period of replacement, repair or maintenance of the Materials Transport Equipment when such Materials Transport Equipment is not operational, including any delays thereto due to the inability to obtain parts or replacements, Landlord shall have no obligation to provide Tenant with alternative or back-up Materials Transport Equipment.

Landlord makes no warranties of any kind, express or implied, with respect to the Materials Transport Equipment, and Landlord disclaims any such warranties. Without limiting the foregoing, Tenant expressly acknowledges and agrees that Landlord does not guaranty or warrant that that the Materials Transport Equipment will be operational at all times, will be of sufficient capacity to accommodate Tenant's use thereof, will be free of Hazardous Materials, or will function or perform adequately, and Landlord Indemnified Parties shall not be liable for any Claims arising out of or in connection with the Materials Transport Equipment or the failure of the Materials Transport Equipment to function or perform adequately or to be available at any time. Tenant further waives any and all Claims relating to the Materials Transport Equipment or the failure of the Materials Transport Equipment to function or perform adequately or to be available at any time. Landlord Indemnified Parties shall not be liable for any damages arising from any act, omission or neglect of any tenant in the Project or of any other third party or Tenant Parties in connection with the Materials Transport Equipment.

Tenant acknowledges and agrees that Landlord is under no obligation to provide any type of instruction or implement any training programs relating to the use of the Materials Transport Equipment for Tenant or any other parties entitled to use the Materials Transport Equipment.

[Signatures on next page]

IN WITNESS WHEREOF, Landlord and Tenant have executed this Lease as of the day and year first above written.

TENANT:

ELO LIFE SYSTEMS, INC.,
a Delaware corporation

By: /s/ Matt Kane
Its: CEO

LANDLORD:

ARE-NC REGION NO. 17, LLC,
a Delaware limited liability company

By: ALEXANDRIA REAL ESTATE EQUITIES, L.P.,
a Delaware limited partnership

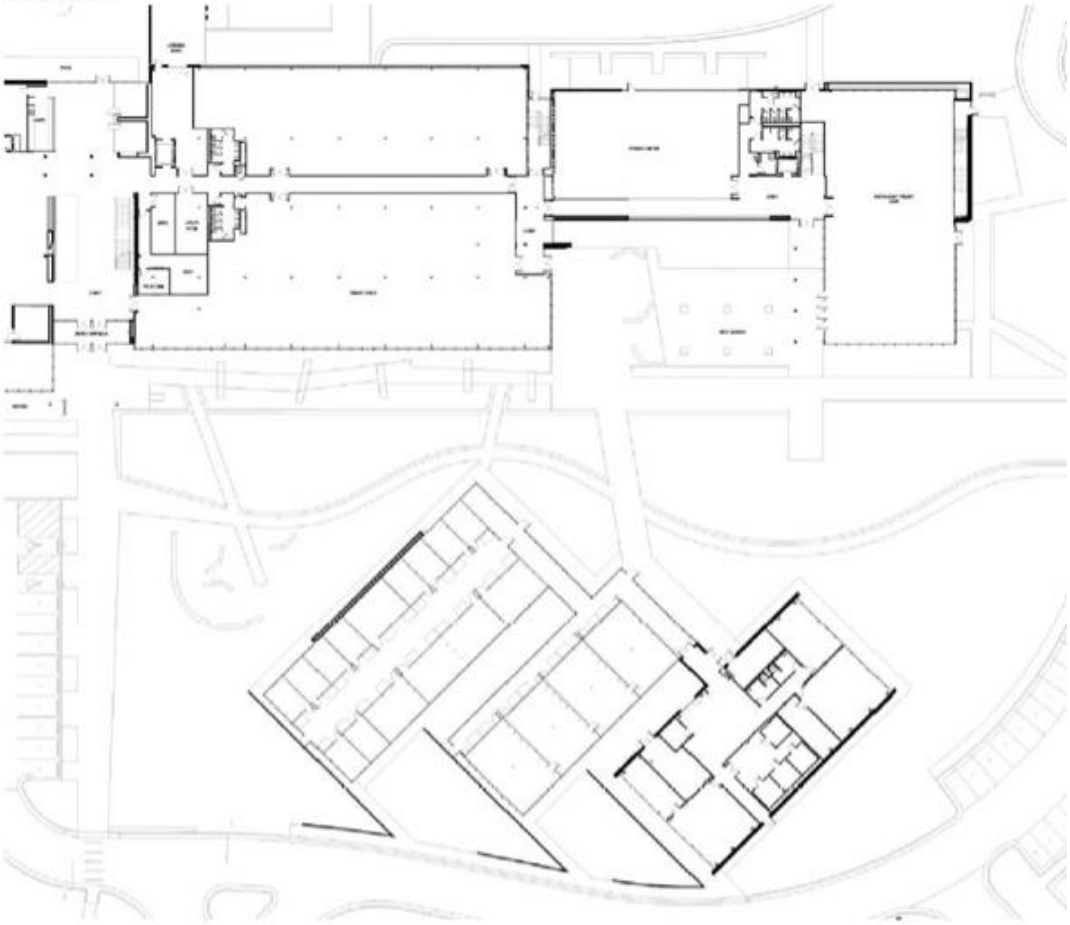
By: ARE-QRS CORP.,
a Maryland corporation, general partner

By: /s/ Gary Dean
Its: Senior Vice President RE
Legal Affairs

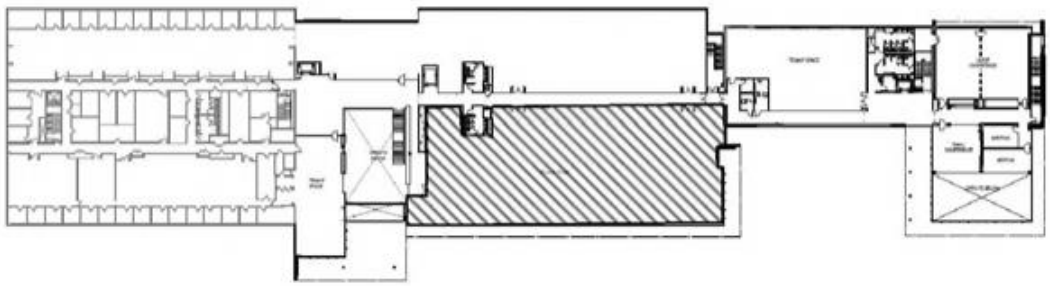
EXHIBIT A TO LEASE

DESCRIPTION OF PREMISES

First Floor



Second Floor



= Lab/Office Premises

EXHIBIT B TO LEASE

DESCRIPTION OF PROJECT

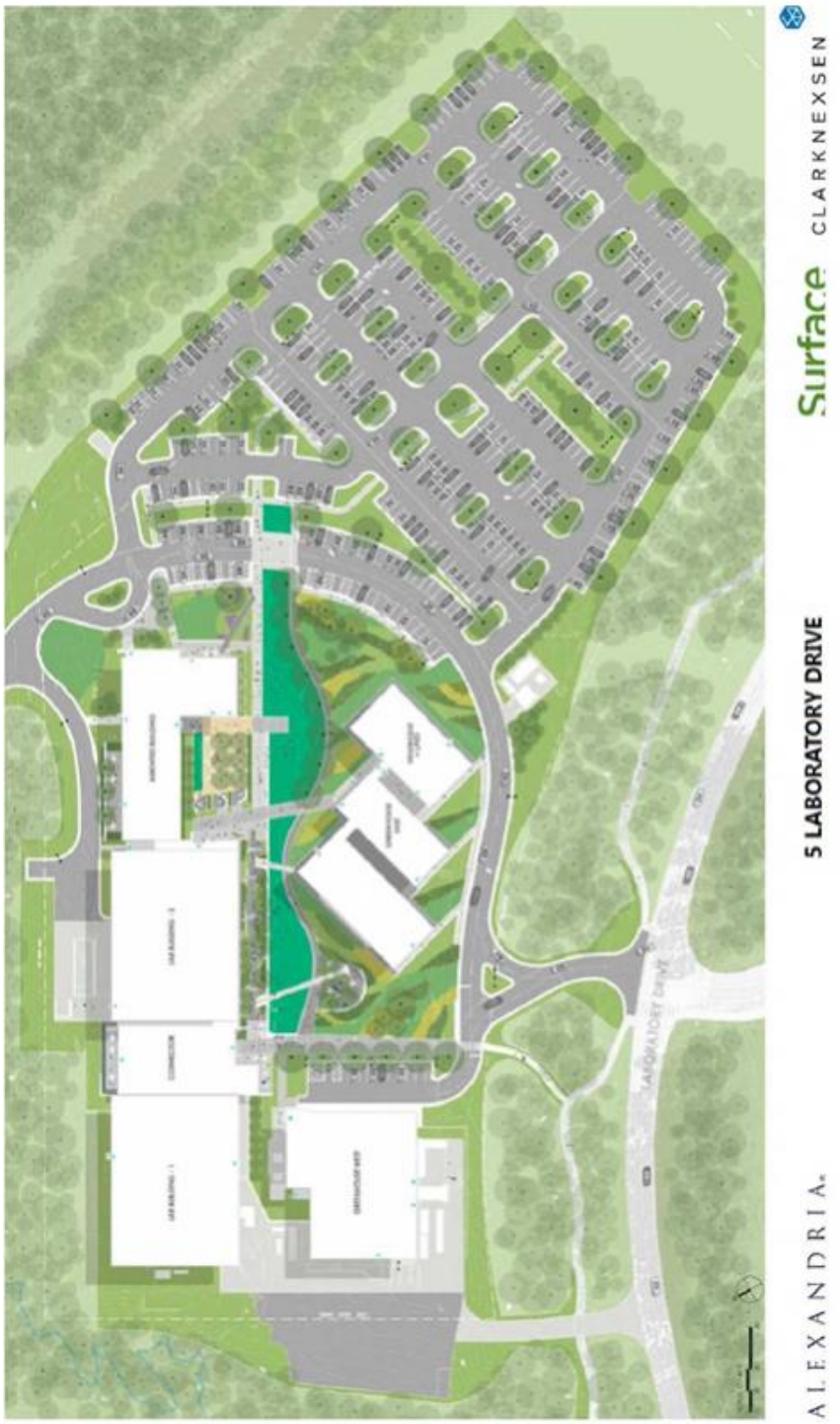


EXHIBIT C TO LEASE

WORK LETTER

THIS WORK LETTER (this "**Work Letter**") is incorporated into that certain Lease Agreement (the "**Lease**") dated as of March , 2018 by and between **ARE-NC REGION NO. 17, LLC**, a Delaware limited liability company ("**Landlord**"), and **ELO LIFE SYSTEMS, INC.**, a Delaware corporation ("**Tenant**"). Any initially capitalized terms used but not defined herein shall have the meanings given them in the Lease.

1. **General Requirements**.

(a) **Tenant's Authorized Representative**. Tenant designates Sinu Bhandaru and Fayaz Khazi (either such individual acting alone, "**Tenant's Representative**") as the only persons authorized to act for Tenant pursuant to this Work Letter. Landlord shall not be obligated to respond to or act upon any request, approval, inquiry or other communication ("**Communication**") from or on behalf of Tenant in connection with this Work Letter unless such Communication is in writing (which writing may be in e-mail form) from Tenant's Representative. Tenant may change either Tenant's Representative at any time upon not less than five (5) business days advance written notice to Landlord. Neither Tenant nor Tenant's Representative shall be authorized to direct Landlord's contractors in the performance of Landlord's Work (as hereinafter defined).

(b) **Landlord's Authorized Representative**. Landlord designates Oliver Sherrill and Andy Reinach (either such individual acting alone, "**Landlord's Representative**") as the only persons authorized to act for Landlord pursuant to this Work Letter. Tenant shall not be obligated to respond to or act upon any request, approval, inquiry or other Communication from or on behalf of Landlord in connection with this Work Letter unless such Communication is in writing (which writing may be in e-mail form) from Landlord's Representative. Landlord may change either Landlord's Representative at any time upon not less than five (5) business days advance written notice to Tenant. Landlord's Representative shall be the sole persons authorized to direct Landlord's contractors in the performance of Landlord's Work.

(c) **Architects, Consultants and Contractors**. Landlord and Tenant hereby acknowledge and agree that the architect (the "**TI Architect**") for the Tenant Improvements (as defined in Section 3(a) below), the general contractor and any subcontractors for the Tenant Improvements shall be selected by Tenant, subject to Landlord's approval, which approval shall not be unreasonably withheld, conditioned or delayed. Landlord shall be named a third party beneficiary of any contract entered into by Tenant with the TI Architect, any consultant, any contractor or any subcontractor, and of any warranty made by any contractor or any subcontractor.

Clark Nexson shall be the architect for Landlord's Work (the "**Core and Shell Architect**") and Whiting Turner shall be the general contractor for Landlord's Work ("**Core and Shell Contractor**"). Landlord shall select any subcontractors for Landlord's Work in Landlord's sole and absolute discretion.

(d) **Coordination Obligations**. Landlord and Tenant desire the construction of the Tenant Improvements in the Premises to commence upon the Building Core & Shell Improvements being in Tenant Improvement Work Readiness Condition (as hereinafter defined). "**Tenant Improvement Work Readiness Condition**" shall be deemed to have occurred at the point when the Core and Shell contractor reasonably determines that Tenant may commence construction of the Tenant Improvements in the Premises without material disruption to Landlord's construction of the Building Core and Shell Improvements. Landlord and Tenant shall work together in a cooperative manner, and shall likewise require each of their respective architects and engineers and contractors to work together in a cooperative manner, to coordinate the construction of the Building Core & Shell Improvements and the Tenant Improvements and to achieve the substantial completion of all such work in as prompt and efficient manner as reasonably practicable.

2. **Building Core and Shell Improvements**.

(a) **Definition of Landlord's Work**. As used herein, "**Landlord's Work**" shall mean the work of designing, permitting and constructing the Building Core and Shell Improvements. Other than (x) completing Landlord's Work, and (y) funding the TI Allowance (as defined in Section 6 below), Landlord shall not have any obligation whatsoever with respect to the finishing of the Premises for Tenant's use and occupancy.

(b) **Building Core & Shell**. As used herein, the term, "**Building Core and Shell Improvements**" shall mean the improvements to the Building reflected on Schedule 1 attached to this Work Letter ("**Building Core and Shell Plans**"), which Building Core and Shell Improvements shall be performed by Landlord at Landlord's sole cost and expense using materials selected by Landlord in its sole and absolute discretion. The design of the Building Core and Shell Improvements shall be determined by Landlord in Landlord's sole and absolute discretion and Tenant acknowledges that Landlord may make changes to the Building Core and Shell Plans, as determined by Landlord in its sole and absolute discretion. Landlord agrees to provide to Tenant with copies of any material changes made by Landlord to the Building Core and Shell Plans (including, but not limited to changes to the Building Core and Shell Improvements which would result in a change of the rentable square footage of the Premises of more than 2%) within ten (10) days after Landlord's determination of such material changes and, if requested in writing by Tenant, to meet with Tenant regarding any such material changes to the Building Core and Shell Improvements. Notwithstanding anything to the contrary contained herein, Landlord is under no obligation to make any changes that may be requested by Tenant to the Building Core and Shell Improvements.

(c) **Completion of Building Core and Shell Improvements**. Landlord shall cause the Core and Shell Contractor to construct the Building Core and Shell Improvements in a good and workmanlike manner, in accordance with applicable Legal Requirements and the building permit authorizing the construction of the Building Core and Shell Improvements (the "**Building Core and Shell Permit**"), subject to Minor Core and Shell Variations ("**Building Core and Shell Substantial Completion**"). Upon Building Core and Shell Substantial Completion, Landlord shall require the Core and Shell Architect and the Core and Shell Contractor to execute and deliver a Certificate of Substantial Completion in the form of the American Institute of Architects ("**AIA**") document G704. For purposes of this Work Letter, "**Minor Core and Shell Variations**" shall mean any modifications reasonably required: (i) to comply with any applicable Legal Requirements; (ii) to obtain or to comply with any required permit for Building Core and Shell Improvements; (iii) to comply with any request by Tenant for modifications to the Building Core and Shell Improvements if Landlord has agreed to make such change; or (iv) to make reasonable adjustments for field deviations or conditions encountered during the construction of the Building Core and Shell Improvements.

(d) **Defects in Building Core & Shell Improvements**. When the Building Core and Shell Improvements have reached Building Core and Shell Substantial Completion, Tenant shall accept the Building Core and Shell Improvements. Tenant's acceptance of the Building Core and Shell Improvements shall not constitute a waiver of: (i) any warranty with respect to workmanship (including installation of equipment) or material (exclusive of equipment provided directly by manufacturers), (ii) any non-compliance of the Building Core and Shell Improvements with applicable Legal Requirements, or (iii) any claim that Building Core and Shell Improvements were not completed substantially in accordance with the construction drawings for the Building Core and Shell Improvements (collectively, a "**Building Core and Shell Construction Defect**"). Tenant shall have one year after Building Core and Shell Substantial Completion within which to notify Landlord of any such Building Core and Shell Construction Defect discovered by Tenant, and Landlord shall use reasonable efforts to remedy or cause the responsible contractor to remedy any such Building Core and Shell Construction Defect within thirty (30) days thereafter. Notwithstanding the foregoing, Landlord shall not be in default under the Lease if the applicable contractor, despite Landlord's reasonable efforts, fails to remedy such Building Core and Shell Construction Defect within such thirty (30) day period. If the contractor fails to remedy such Building Core and Shell Construction Defect within a reasonable time, Landlord shall use reasonable efforts to remedy the Building Core and Shell Construction Defect within a reasonable period.

Tenant shall be entitled to receive the benefit of all construction warranties and manufacturer's equipment warranties relating to equipment installed in the Premises. If requested by Tenant, Landlord shall attempt to obtain extended warranties from manufacturers and suppliers of such equipment, but the cost of any such extended warranties shall be borne solely out of the TI Fund (as defined in Section 6(c) below). Landlord shall promptly undertake and shall use reasonable efforts to complete, or cause to be completed, all punch list items arising from the Core and Shell Improvements and affecting the Premises.

3. **Tenant Improvements**.

(a) **Tenant Improvements Defined**. As used herein, "**Tenant Improvements**" shall mean all improvements to the Premises of a fixed and permanent nature as shown on the TI Construction Drawings, as defined in Section 3(c) below. Tenant shall be solely responsible for ensuring that the design and specifications for Tenant Improvements are consistent with Tenant's requirements.

(b) **Tenant's Space Plans**. Tenant shall deliver to Landlord schematic drawings and outline specifications (the "**Space Plans**") detailing Tenant's requirements for the Tenant Improvements. Not more than ten (10) days thereafter, Landlord shall deliver to Tenant the written objections, questions or comments of Landlord and the TI Architect with regard to the Space Plans. Tenant shall cause the Space Plans to be revised to reasonably address such written comments and shall resubmit said drawings to Landlord for approval within ten (10) days thereafter. Such process shall continue until Landlord has approved the Space Plans, which approval shall not be unreasonably withheld, conditioned or delayed.

(c) **Working Drawings**. Not later than fifteen (15) business days following the approval of the Space Plans by Landlord, Tenant shall cause the TI Architect to prepare and deliver to Landlord for review and comment construction plans, specifications and drawings for the Tenant Improvements ("**TI Construction Drawings**"), which TI Construction Drawings shall be prepared substantially in accordance with the Space Plans. Tenant shall be solely responsible for ensuring that the TI Construction Drawings reflect Tenant's requirements for the Tenant Improvements. Landlord shall deliver its written comments on the TI Construction Drawings to Tenant not later than ten (10) business days after Landlord's receipt of the same; provided, however, that Landlord may not disapprove any matter that is consistent with the Space Plans. Tenant and the TI Architect shall consider all such comments in good faith and shall, within ten (10) business days after receipt, notify Landlord how Tenant proposes to respond to such comments. Any disputes in connection with such comments shall be resolved in accordance with Section 3(d) hereof. Provided that the design reflected in the TI Construction Drawings is consistent with the Space Plans, Landlord shall approve the TI Construction Drawings submitted by Tenant, which approval shall not be unreasonably withheld, conditioned or delayed. Once approved by Landlord, subject to the provisions of Section 7 below, Tenant shall not materially modify the TI Construction Drawings except as may be reasonably required in connection with the issuance of the TI Permit (as defined in Section 4(a) below).

(d) **Approval and Completion**. If any dispute regarding the design of the Tenant Improvements is not settled within ten (10) business days after notice of such dispute is delivered by one party to the other, Tenant may make the final decision regarding the design of the Tenant Improvements, provided (i) Tenant acts reasonably and such final decision is either consistent with or a compromise between Landlord's and Tenant's positions with respect to such dispute, (ii) that all costs and expenses resulting from any such decision by Tenant shall be payable out of the TI Fund, and (iii) Tenant's decision will not affect the base Building, structural components of the Building or any Building systems (in which case Landlord shall make the final decision). Any changes to the TI Construction Drawings following Landlord's and Tenant's approval of same requested by Tenant shall be processed as provided in Section 5 hereof.

4. **Performance of Tenant Improvements**.

(a) **Commencement and Permitting of the Tenant Improvements**. Subject to the provisions of this Work Letter, following the Tenant Improvement Work Readiness Condition occurring, Tenant shall commence construction of the Tenant Improvements in the Premises upon obtaining and delivering to Landlord a building permit (the "**TI Permit**") authorizing the construction of the Tenant

Improvements consistent with the TI Construction Drawings approved by Landlord. The cost of obtaining the TI Permit shall be payable from the TI Fund. Landlord shall assist Tenant in obtaining the TI Permit. Prior to the commencement of the Tenant Improvements, Tenant shall deliver to Landlord a copy of any contract with Tenant's contractors (including the TI Architect), and certificates of insurance from any contractor performing any part of the Tenant Improvements evidencing industry standard commercial general liability, automotive liability, "builder's risk", and workers' compensation insurance. Tenant shall cause the General Contractor to provide a certificate of insurance naming Landlord, Alexandria Real Estate Equities, Inc., and Landlord's lender (if any) as additional insureds for the general contractor's liability coverages required above.

(b) **Selection of Materials, Etc**. Where more than one type of material or structure is indicated on the TI Construction Drawings approved by Tenant and Landlord, the option will be within Tenant's reasonable discretion if the matter concerns the Tenant Improvements, and within Landlord's reasonable discretion if the matter concerns the structural components of the Building or any Building system.

(c) **Tenant Liability**. Tenant shall be responsible for correcting any deficiencies or defects in the Tenant Improvements.

(d) **Substantial Completion**. Tenant shall substantially complete or cause to be substantially completed the Tenant Improvements in a good and workmanlike manner, in accordance with the TI Permit subject, in each case, to Minor Variations and normal "punch list" items of a non-material nature which do not interfere with the use of the Premises ("**Substantial Completion**" or "**Substantially Complete**"). Upon Substantial Completion of the Tenant Improvements, Tenant shall require the TI Architect and the Tenant's general contractor to execute and deliver, for the benefit of Tenant and Landlord, a Certificate of Substantial Completion in the form of the AIA document G704. For purposes of this Work Letter, "**Minor Variations**" shall mean any modifications reasonably required: (i) to comply with all applicable Legal Requirements and/or to obtain or to comply with any required permit (including the TI Permit); (ii) to comport with good design, engineering, and construction practices which are not material; or (iii) to make reasonable adjustments for field deviations or conditions encountered during the construction of the Tenant Improvements.

5. **Changes**. Any changes requested by Tenant to the Tenant Improvements after the approval of the Space Plan by Landlord and Tenant shall be requested and instituted in accordance with the provisions of this Section 5 and shall be subject to the written approval of Landlord and the Core and Shell Architect, such approval not to be unreasonably withheld, conditioned or delayed.

(a) **Tenant's Request For Changes**. If Tenant shall request changes to the Tenant Improvements (collectively, "**Changes**"), Tenant shall request such Changes by notifying Landlord in writing in substantially the same form as the AIA standard change order form (a "**Change Request**"), which Change Request shall detail the nature and extent of any such Change. Such Change Request must be signed by Tenant's Representative. Landlord shall review and approve or disapprove such Change Request within 10 business days thereafter, provided that Landlord's approval shall not be unreasonably withheld, conditioned or delayed.

(b) **Implementation of Changes**. If Landlord approves such Change, Tenant may cause the approved Change to be instituted. If any TI Permit modification or change is required as a result of such Change, Tenant shall promptly provide Landlord with a copy of such TI Permit modification or change.

6. **Costs**.

(a) **Budget For Tenant Improvements**. Before the commencement of construction of the Tenant Improvements, Tenant shall obtain a detailed breakdown, by trade, of the costs incurred or that will be incurred, in connection with the design and construction of the Tenant Improvements (the "**Budget**"), and deliver a copy of the Budget to Landlord for Landlord's approval, which shall not be

unreasonably withheld, conditioned or delayed. The Budget shall be based upon the TI Construction Drawings approved by Landlord. The Budget shall include a payment to Landlord of administrative rent ("**Administrative Rent**") equal to 2% of all hard TI Costs (as hereinafter defined) for monitoring and inspecting the construction of the Tenant Improvements, which sum shall be payable from the TI Fund. For purposes of this Work Letter, Administrative Rent shall include, without limitation, all reasonable and verifiable out-of-pocket costs, expenses and fees incurred by or on behalf of Landlord arising from, out of, or in connection with, such monitoring of the construction of the Tenant Improvements.

(b) **TI Allowance**. Landlord shall provide to Tenant a tenant improvement allowance (collectively, the "**TI Allowance**") in the maximum amount of $70.00 per rentable square foot of the Premises. TI Rent shall be payable pursuant to Section 4(b) of the Lease with respect to any TI Allowance in excess of $55.00 per rentable square foot of the Premises.

Tenant shall have no right to the use or benefit (including any reduction to Base Rent) of any portion of the TI Allowance not required for the design and construction of (i) the Tenant Improvements described in the TI Construction Drawings approved pursuant to Section 3(c), or (ii) any Changes pursuant to Section 5. Tenant shall have no right to any portion of the TI Allowance that is not disbursed before the last day of the month that is twelve (12) months after the Commencement Date.

(c) **Costs Includable in the TI Fund**. Subject to the terms of this Section 6, the TI Fund shall be used solely for the payment of design, permits and construction costs in connection with the construction of the Tenant Improvements, including, without limitation, the cost of electrical power and other utilities used in connection with the construction of the Tenant Improvements, the cost of preparing the Space Plans, the TI Construction Drawings, all costs set forth in the Budget, including Landlord's Administrative Rent payable in connection with the Tenant Improvements, and the cost of Changes in connection with the Tenant Improvements (collectively, "**TI Costs**"). Notwithstanding anything to the contrary contained herein, except as provided below, the TI Fund shall not be used to purchase any furniture, personal property or other non-Building system materials or equipment, including, but not be limited to, non-ducted biological safety cabinets and other scientific equipment not incorporated into the Tenant Improvements.

(d) **Excess TI Costs**. Landlord shall have no obligation to bear any portion of the cost of any of the Tenant Improvements except to the extent of the TI Allowance. If at any time and from time-to-time, the remaining TI Costs under the Budget exceed the remaining unexpended TI Allowance ("**Excess TI Costs**"), monthly disbursements of the TI Allowance shall be made in the proportion that the remaining TI Allowance bears to the outstanding TI Costs under the Budget, and Tenant shall fund the balance of each such monthly draw. For purposes of any litigation instituted with regard to any amount due under this Section 6(d), those amounts will be deemed Rent under the Lease. The TI Allowance and Excess TI Costs are collectively herein referred to as the "**TI Fund**." Notwithstanding anything to the contrary set forth in this Section 6(d), Tenant shall be fully and solely liable for TI Costs and the cost of Minor Variations in excess of the TI Allowance.

(e) **Payment for TI Costs**. During the course of design and construction of the Tenant Improvements, following the payment by Tenant of any Excess TI Costs required to be paid by Tenant pursuant to Section 6(d) above, Landlord shall reimburse Tenant for TI Costs once a month against a draw request in Landlord's standard form, containing evidence of payment of such TI Costs by Tenant and such certifications, lien waivers (including a conditional lien release for each progress payment and unconditional lien releases for the prior month's progress payments), inspection reports (if any) and other matters as Landlord reasonably requires, to the extent of Landlord's approval thereof for payment, no later than thirty (30) days following receipt of such draw request. Upon completion of the Tenant Improvements (and prior to any final disbursement of the TI Fund), Tenant shall deliver to Landlord: (i) sworn statements setting forth the names of all contractors and first tier subcontractors who did the work and final, unconditional lien waivers from all such contractors and first tier subcontractors; (ii) as-built plans (one copy in print format and two copies in electronic CAD format) for such Tenant Improvements; (iii) a certification of substantial completion in Form AIA G704, (iv) a certificate of occupancy for the Premises; and (v) copies of all operation and maintenance manuals and warranties affecting the Premises.

7. **Miscellaneous**.

(a) **Consents**. Whenever consent or approval of either party is required under this Work Letter, that party shall not unreasonably withhold, condition or delay such consent or approval, except as may be expressly set forth herein to the contrary.

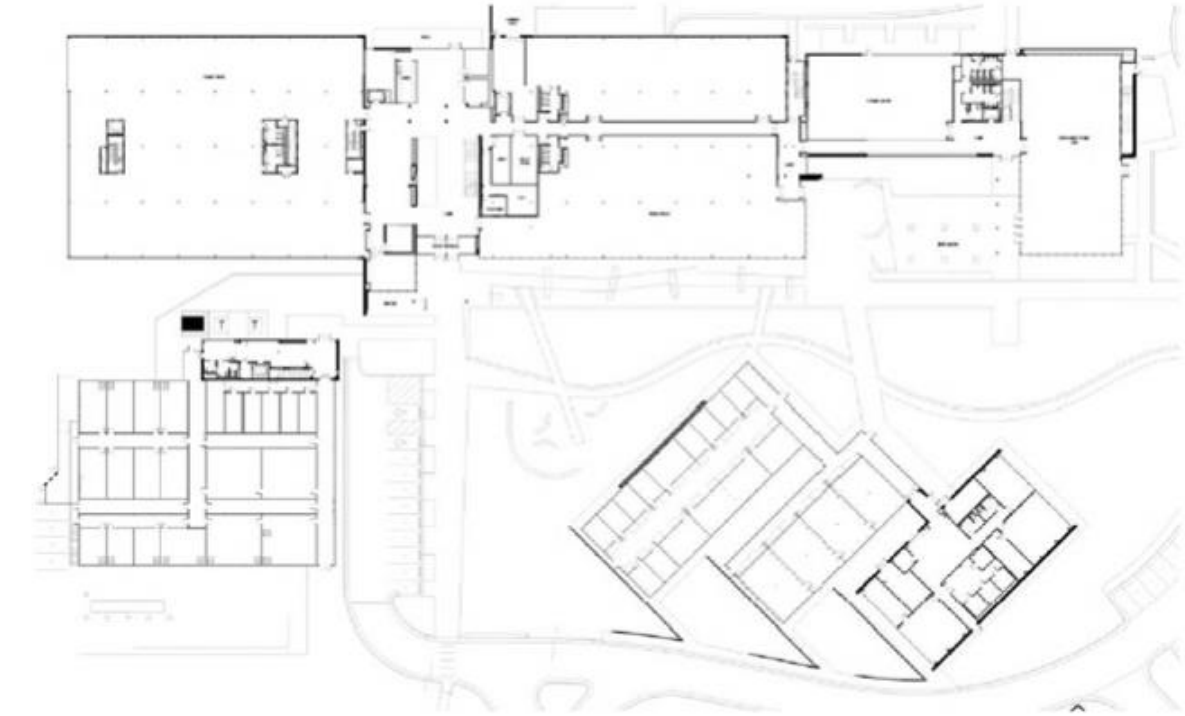
(b) **Modification**. No modification, waiver or amendment of this Work Letter or of any of its conditions or provisions shall be binding upon Landlord or Tenant unless in writing signed by Landlord and Tenant.

(c) **No Default Funding**. In no event shall Landlord have any obligation to fund any portion of the TI Allowance or to perform any Landlord's Work during any period that Tenant is in Default under the Lease.

Schedule 1

Building Core & Shell Improvements

First Floor



Second Floor

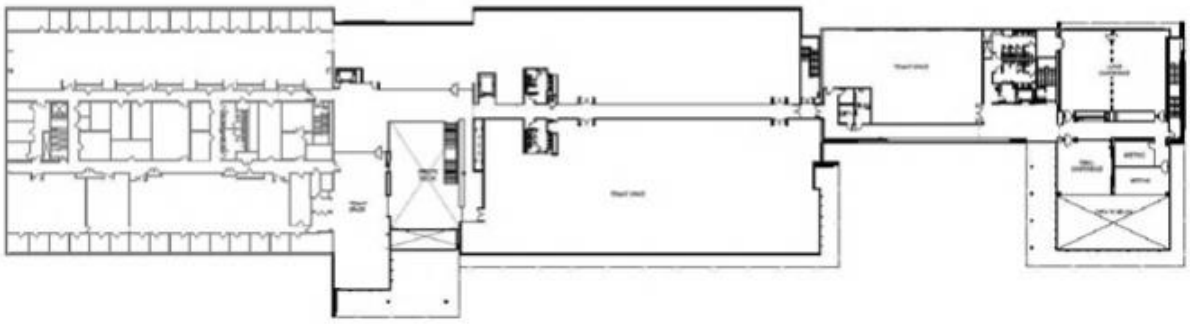


EXHIBIT D TO LEASE

ACKNOWLEDGMENT OF COMMENCEMENT DATE

This **ACKNOWLEDGMENT OF COMMENCEMENT DATE** is made this day of , , between **ARE-NC REGION NO. 17, LLC**, a Delaware limited liability company ("**Landlord**"), and **ELO LIFE SYSTEMS, INC.**, a Delaware corporation ("**Tenant**"), and is attached to and made a part of the Lease dated , (the "**Lease**"), by and between Landlord and Tenant. Any initially capitalized terms used but not defined herein shall have the meanings given them in the Lease.

Landlord and Tenant hereby acknowledge and agree, for all purposes of the Lease, that the Commencement Date is , , the Rent Commencement Date is , , and the termination date of the Base Term of the Lease shall be midnight on , . In case of a conflict between the terms of the Lease and the terms of this Acknowledgment of Commencement Date, this Acknowledgment of Commencement Date shall control for all purposes.

IN WITNESS WHEREOF, Landlord and Tenant have executed this ACKNOWLEDGMENT OF COMMENCEMENT DATE to be effective on the date first above written.

TENANT:

ELO LIFE SYSTEMS, INC.,
a Delaware corporation

By: _____
Its: _____

LANDLORD:

ARE-NC REGION NO. 17, LLC,
a Delaware limited liability company

By: ALEXANDRIA REAL ESTATE EQUITIES, L.P.,
a Delaware limited partnership

By: ARE-QRS CORP.,
a Maryland corporation,
general partner

By: _____
Its: _____

EXHIBIT E TO LEASE

Rules and Regulations

1. The sidewalk, entries, and driveways of the Project shall not be obstructed by Tenant, or any Tenant Party, or used by them for any purpose other than ingress and egress to and from the Premises.

2. Tenant shall not place any objects, including antennas, outdoor furniture, etc., in the parking areas, landscaped areas or other areas outside of its Premises, or on the roof of the Project.

3. Except for animals assisting the disabled, no animals shall be allowed in the offices, halls, or corridors in the Project.

4. Tenant shall not disturb the occupants of the Project or adjoining buildings by the use of any radio or musical instrument or by the making of loud or improper noises.

5. If Tenant desires telegraphic, telephonic or other electric connections in the Premises, Landlord or its agent will direct the electrician as to where and how the wires may be introduced; and, without such direction, no boring or cutting of wires will be permitted. Any such installation or connection shall be made at Tenant’s expense.

6. Tenant shall not install or operate any steam or gas engine or boiler, or other mechanical apparatus in the Premises, except as specifically approved in the Lease. The use of oil, gas or inflammable liquids for heating, lighting or any other purpose is expressly prohibited. Explosives or other articles deemed extra hazardous shall not be brought into the Project.

7. Parking any type of recreational vehicles is specifically prohibited on or about the Project. Except for the overnight parking of operative vehicles, no vehicle of any type shall be stored in the parking areas at any time. In the event that a vehicle is disabled, it shall be removed within 48 hours. There shall be no “For Sale” or other advertising signs on or about any parked vehicle. All vehicles shall be parked in the designated parking areas in conformity with all signs and other markings. All parking will be open parking, and no reserved parking, numbering or lettering of individual spaces will be permitted except as specified by Landlord.

8. Tenant shall maintain the Premises free from rodents, insects and other pests.

9. Landlord reserves the right to exclude or expel from the Project any person who, in the reasonable judgment of Landlord, is intoxicated or under the influence of liquor or drugs or who shall in any manner do any act in violation of the Rules and Regulations of the Project.

10. Tenant shall not cause any unnecessary labor by reason of Tenant’s carelessness or indifference in the preservation of good order and cleanliness. Landlord shall not be responsible to Tenant for any loss of property on the Premises, however occurring, or for any damage done to the effects of Tenant by the janitors or any other employee or person.

11. Tenant shall give Landlord prompt notice of any known defects in the water, lawn sprinkler, sewage, gas pipes, electrical lights and fixtures, heating apparatus, or any other service equipment affecting the Premises.

12. Tenant shall not permit storage outside the Premises, including without limitation, outside storage of trucks and other vehicles, or dumping of waste or refuse or permit any harmful materials to be placed in any drainage system or sanitary system in or about the Premises.

13. All moveable trash receptacles provided by the trash disposal firm for the Premises must be kept in the trash enclosure areas, if any, provided for that purpose.

14. No auction, public or private, will be permitted on the Premises or the Project.

15. No awnings shall be placed over the windows in the Premises except with the prior written consent of Landlord.

16. The Premises shall not be used for lodging, sleeping or cooking (except that Tenant may use microwave ovens, toasters and coffee makers in the Premises for the benefit of Tenant's employees and contractors in an areas designated for such items, but only if the use thereof is at all times supervised by the individual using the same) or for any immoral or illegal purposes or for any purpose other than that specified in the Lease. No gaming devices shall be operated in the Premises.

17. Tenant shall ascertain from Landlord the maximum amount of electrical current which can safely be used in the Premises, taking into account the capacity of the electrical wiring in the Project and the Premises and the needs of other tenants, and shall not use more than such safe capacity. Landlord's consent to the installation of electric equipment shall not relieve Tenant from the obligation not to use more electricity than such safe capacity.

18. Tenant assumes full responsibility for protecting the Premises from theft, robbery and pilferage.

19. Tenant shall not install or operate on the Premises any machinery or mechanical devices of a nature not directly related to Tenant's ordinary use of the Premises for the Permitted Use and shall keep all such machinery free of vibration, noise and air waves which may be transmitted beyond the Premises.

EXHIBIT F TO LEASE

TENANT'S PERSONAL PROPERTY

None

EXHIBIT G TO LEASE

FORM OF GUARANTY

THIS GUARANTY OF LEASE ("**Guaranty"**) is made as of March , 2018, by **PRECISION BIOSCIENCES, INC.**, a North Delaware corporation ("**Guarantor"**), in favor of **ARE-NC REGION NO. 17, LLC**, a Delaware limited liability company ("**Landlord"**), in connection with that certain Lease Agreement dated of even date herewith (the "**Lease"**) pursuant to which Landlord leases to **ELO LIFE SYSTEMS, INC.**, a Delaware corporation ("**Tenant"**), the premises located at 3054 E. Cornwallis Road, Research Triangle Park, North Carolina (the "**Premises"**). As a material inducement to and in consideration of Landlord's entering into the Lease, Landlord having indicated that it would not enter into the Lease without the execution of this Guaranty, Guarantor does hereby agree with Landlord as follows:

1. **Guarantor does hereby unconditionally guarantee, without deduction by reason of set off, defense or counterclaim, as a primary obligor and not as a surety, and promises to perform and be liable for any and all obligations and liabilities of Tenant under the terms of the Lease, including without implied limitation the Tenant's obligation to pay such rents, charges, costs and impositions as are set forth in the Lease.** Guarantor further agrees to defend with counsel acceptable to Landlord, and to indemnify and save Landlord harmless from and against any and all loss, cost, damage or liability arising out of any Default by Tenant of any of the terms, conditions and covenants of the Lease, or out of any breach of warranty or misrepresentation made by Tenant under the Lease or heretofore or hereafter made to Landlord, including reasonable attorneys' fees and any other costs incurred by Landlord in connection therewith.

2. The undertakings contained in this Guaranty shall be the personal liability of Guarantor. Guarantor acknowledges that after any event of default by Tenant in the performance of any term, condition or covenant of the Lease, the liability of Guarantor under this Guaranty shall be primary and that, in the enforcement of its rights, Landlord shall be entitled to look to Guarantor for the performance of the obligations of Tenant which Guarantor has guaranteed, without first commencing any action or proceedings against Tenant, and likewise, enforcement of Landlord's rights against Tenant shall not impair the right of Landlord to enforce this Guaranty, and any such action by Landlord shall not operate as a release of the liability of Guarantor under this Guaranty. The guaranteed obligations include both payment and performance. **The obligations of the Guarantor shall be absolute and unconditional and shall remain in full force and effect until all amounts due pursuant to the Lease have been paid in full and all of Tenant's obligations thereunder have been performed in full.**

3. If Tenant shall at any time default in the performance or observance of any of the terms, covenants or conditions in the Lease on Tenant's part to be kept performed or observed, Guarantor will keep, perform and observe same, as the case may be, in the place and stead of Tenant.

4. The obligations of Guarantor hereunder shall not be released by Landlord's receipt, application or release of any security given for the performance and observance of any covenant or condition in the Lease on Tenant's part to be performed or observed, regardless of whether Guarantor consents thereto or receives notice thereof.

5. The liability of Guarantor hereunder shall in no way be affected by (a) the release or discharge of Tenant in any creditor's receivership, bankruptcy or other proceeding; (b) the impairment, limitation or modification of the liability of Tenant or the estate of Tenant in bankruptcy, or of any remedy for the enforcement of Tenant's liability under the Lease resulting from the operation of any present or future provision of the Bankruptcy Act or other statute or from the decision in any court; (c) the rejection of the Lease in any such proceedings; (d) the assignment or transfer of the Lease by Tenant; (e) any disability or other defense of Tenant; (f) the cessation from any cause other than as provided under the Lease whatsoever of the liability of Tenant; (g) the exercise by Landlord of any of its rights or remedies reserved under the Lease or by law; or (h) any termination of the Lease, other than as provided under the Lease.

6. Guarantor agrees that none of its obligations and no right against Guarantor hereunder shall in any way be discharged, impaired, or otherwise affected by any extension of time for, or by any partial or complete waiver of the performance of any of Tenant's obligations under the Lease, or by any other alteration, amendment, assignment, expansion, extension or modification in or to the Lease, or by any release or waiver of any term, covenant or condition of the Lease, or by any delay in the enforcement of any rights against Tenant, Guarantor or any other person or entity under the Lease. Without limitation, Guarantor agrees that the Lease may be altered, amended, assigned, expanded, extended or modified from time to time on such terms and provisions as may be satisfactory to Landlord without notice to or further assent by Guarantor, and Guarantor hereby waives notice of acceptance of this Guaranty, notice of any obligations guaranteed hereby or of any action taken or omitted in reliance hereon, and notice of any defaults of Tenant under the Lease and waives presentment, demand for payment or performance, protest, notice of dishonor, nonpayment or nonperformance of any such obligations, suit or taking of other action by Landlord against, and any other notice to, any party liable thereon and waives suretyship defenses generally, other than full and timely payment and performance of all obligations hereby guaranteed, and Guarantor agrees to cause Tenant to preserve the enforceability of all instruments hereby guaranteed, as modified with Landlord's consent, and to cause Tenant to refrain from any act or omission which might be the basis for a claim that Guarantor has any defense to Guarantor's obligations hereunder, exclusive only of the defense that Tenant has fully and timely paid and performed all obligations hereby guaranteed. No invalidity, irregularity or unenforceability of all or any part of such obligations or of any security therefor and no insolvency, bankruptcy, liquidation proceeding or dissolution affecting Tenant or Guarantor shall affect, impair or be a defense to this Guaranty. The liability of the Guarantor hereunder is primary and unconditional and shall not be subject to any offset, defense (other than the defense of full and timely payment and performance) or counterclaim of Guarantor. This is a continuing guaranty.

7. Guarantor represents that this Guaranty, and the Lease hereby guaranteed, as originally delivered and as modified, amended or supplemented, have been duly authorized and are the legal, valid and binding obligations of Guarantor and Tenant, enforceable in accordance with their respective terms, and Guarantor further agrees that no invalidity of any term shall affect or impair Guarantor's liability under this Guaranty.

8. This instrument is intended to be fully effective in accordance with its terms notwithstanding any exculpatory provisions inconsistent herewith contained in the Lease.

9. Guarantor further agrees that it may be joined in any action against Tenant in connection with the obligations of Tenant under the Lease and recovery may be had against Guarantor in any such action. Landlord may enforce the obligations of Guarantor hereunder without first taking any action whatsoever against Tenant or its successors and assigns, or pursue any other remedy or apply any security it may hold.

10. Until all of Tenant's obligations under the Lease are fully performed, Guarantor: (a) shall have no right of subrogation against Tenant by reason of any payments or actions of performance by Guarantor under this Guaranty; and (b) subordinates any liability or indebtedness of Tenant now or hereafter held by Guarantor to the obligations of Tenant under, arising out of or related to the Lease or Tenant's use of the Premises. Furthermore, from and after the occurrence of any default by Tenant in the performance of any term, condition, covenant or obligation under the Lease, Guarantor agrees that it will not accept or receive any dividend, payment or reimbursement from Tenant, including any payment on account of any indebtedness from Tenant to Guarantor, and that if Guarantor does then receive any such dividend, payment or reimbursement the same shall be held in trust for Landlord and forthwith will be turned over to Landlord in the form received.

11. The liability of Guarantor and all rights, powers and remedies of Landlord hereunder and under any other agreement now or at any time hereafter in force between Landlord and Guarantor relating to the Lease shall be cumulative and not alternative and such rights, powers and remedies shall be in addition to all rights, powers and remedies given to Landlord by law.

12. This Guaranty applies to, inures to the benefit of and binds all parties hereto, and their successors and assigns. This Guaranty may be assigned by Landlord voluntarily or by operation of law.

13. If not publicly available to Landlord, Guarantor shall deliver to Landlord Guarantor's most recent financial statements within 10 business days after written request from Landlord (but in no event more than 1 time per calendar year). If such financial statements have been audited, Guarantor shall deliver audited financial statements. The financial statements shall be prepared in accordance with generally accepted accounting principles and shall be true and correct in all material respects.

14. If Landlord desires to sell, finance or refinance the Premises, or any part thereof, Guarantor hereby agrees to deliver to any lender or buyer designated by Landlord such financial statements of Guarantor as may be reasonably required by such lender or buyer. Such statements shall include the past three (3) years' financial statements of Guarantor. All such financial statements shall be received by Landlord in confidence and shall be used only for the foregoing purposes.

15. If claim is ever made upon Landlord for repayment of any amount or amounts received by Landlord in payment of the obligations under the Lease and Landlord repays all or any part of said amount, then, notwithstanding any revocation or termination of this Guaranty or the termination of the Lease, Guarantor shall be and remain liable to Landlord for the amount so repaid.

16. This Guaranty shall constitute the entire agreement between Guarantor and the Landlord with respect to the subject matter hereof. No provision of this Guaranty or right of Landlord hereunder may be waived nor may Guarantor be released from any obligation hereunder except by a writing duly executed by an authorized officer of Landlord.

17. When the context and construction so requires, all words used in the singular herein shall be deemed to have been used in the plural. The word "person" as used herein shall include an individual, company, firm, association, partnership, corporation, trust or other legal entity of any kind whatsoever.

18. Should any one or more provisions of this Guaranty be determined to be illegal or unenforceable, all other provisions shall nevertheless be effective.

19. Guarantor represents that the person signing below is duly authorized to execute this Guaranty on behalf of Guarantor and to bind Guarantor hereby.

20. The waiver or failure to enforce any provision of this Guaranty shall not operate as a waiver of any other breach of such provision or any other provisions hereof.

21. If either party hereto participates in an action against the other party arising out of or in connection with this Guaranty, the prevailing party shall be entitled to have and recover from the other party reasonable attorneys' fees, collection costs and other costs incurred in and in preparation for the action.

22. Guarantor agrees that this Guaranty shall be governed by and construed in accordance with the laws of the State of North Carolina.

23. The term "Landlord" whenever used herein refers to and means the Landlord in the foregoing Lease specifically named and also any assignee of said Landlord, whether by outright assignment or by assignment for security, and also any successor to the interest of said Landlord or of any assignee of such Lease or any part thereof whether by assignment or otherwise. The term "Tenant" whenever used herein refers to and means the Tenant in the foregoing Lease specifically named and also any assignee of said Tenant, assignee or sublessee of such Lease or any part thereof, whether by assignment, sublease or otherwise.

24. Any notice or other communication to be given under this Agreement by either party to the other will be in writing and delivered personally or mailed by certified mail, postage prepaid and return receipt requested, or delivered by an express overnight delivery service, charges prepaid, or transmitted by facsimile, as follows:

If to Landlord:

ARE-NC REGION NO. 17, LLC
c/o Alexandria Real Estate Equities, Inc.
385 E. Colorado Boulevard, Suite 299
Pasadena, CA 91101
Re: 3054 Cornwallis
Attention: Corporate Secretary

If to Guarantor: Precision Biosciences, Inc.
302 E. Pettigrew St.
Durham, NC 27701
Attention: Abid Ansari, VP Finance

Any address or name specified above may be changed by a notice given by the addressee to the other party in accordance with this numbered paragraph. Any notice will be deemed given and effective (i) if given by personal delivery, as of the date of delivery in person; or (ii) if given by mail, upon receipt as set forth on the return receipt; or (iii) if given by overnight courier, one (1) business day after timely deposit with the courier; or (iv) if given by facsimile, upon receipt of the appropriate confirmation of transmission by facsimile. The inability to deliver because of a changed address of which no notice was given of the rejection or other refusal to accept any notice will be deemed to be the receipt of the notice as of the date of such inability to deliver or the rejection or refusal to accept.

25. Waiver of Jury Trial. THE PARTIES HERETO WAIVE TRIAL BY JURY IN ANY ACTION, PROCEEDING OR COUNTERCLAIM BROUGHT BY ANY PARTY(IES) AGAINST ANY OTHER PARTY(IES) ON ANY MATTER ARISING OUT OF OR IN ANY WAY CONNECTED WITH THIS GUARANTY OR THE RELATIONSHIP OF THE PARTIES CREATED HEREUNDER.

26. Guarantor hereby consents to the jurisdiction of any state or federal court located within the State of North Carolina in any suit, action or proceeding brought under or arising out of this Guaranty (and further agrees not to assert or claim that such venue is inconvenient or otherwise inappropriate or unsuitable), and waives personal service of any and all process upon it and consents that all service of process be made by certified mail directed to Guarantor at the address set forth in this Guaranty.

27. Guarantor and all beneficial owners of Guarantor are currently (a) in compliance with and shall at all times while this Guaranty remains in effect remain in compliance with the regulations of the Office of Foreign Assets Control ("**OFAC**") of the U.S. Department of Treasury and any statute, executive order, or regulation relating thereto (collectively, the "**OFAC Rules**"), (b) not listed on, and shall not while this Guaranty remains in effect be listed on, the Specially Designated Nationals and Blocked Persons List, Foreign Sanctions Evaders List, or the Sectoral Sanctions Identification List, which are all maintained by OFAC and/or on any other similar list maintained by OFAC or other governmental authority pursuant to any authorizing statute, executive order, or regulation, and (c) not a person or entity with whom a U.S. person is prohibited from conducting business under the OFAC Rules.

IN WITNESS WHEREOF, Guarantor has executed this Guaranty as of the date first above written.

"Guarantor"

PRECISION BIOSCIENCES, INC.,
a Delaware corporation

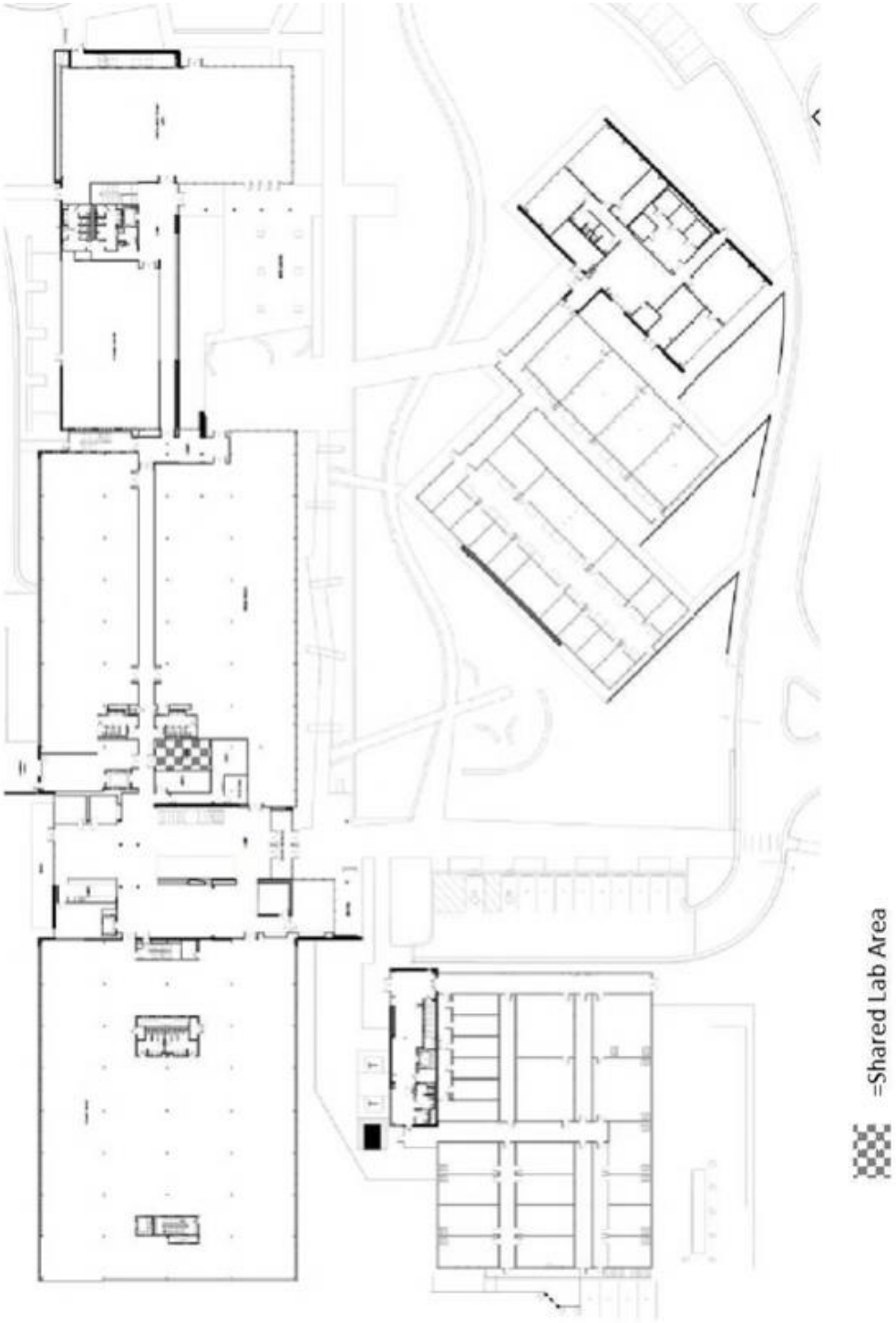
By: _____
Name: _____
Title: _____

EXHIBIT H TO LEASE

INTENTIONALLY OMITTED

EXHIBIT I TO LEASE

SHARED LAB AREA



FIRST AMENDMENT TO LEASE

THIS FIRST AMENDMENT TO LEASE (this "**First Amendment**") is made as of December 21, 2018, by and between **ARE-NC REGION NO. 17, LLC**, a Delaware limited liability company ("**Landlord**"), and **ELO LIFE SYSTEMS, INC.**, a Delaware corporation ("**Tenant**").

RECITALS

A. Landlord and Tenant entered into that certain Lease Agreement dated as of March 29, 2018, as amended by that certain letter agreement dated as of October 28, 2018 (as amended, the "**Lease**"). Pursuant to the Lease, Tenant leases certain premises consisting of approximately 15,558 rentable square feet ("**Premises**") located at 5 Laboratory Drive (formerly known as 3054 E. Cornwallis Road), Research Triangle Park, North Carolina. The Premises are more particularly described in the Lease. Capitalized terms used herein without definition shall have the meanings defined for such terms in the Lease.

B. Pursuant to the Acknowledgment of Commencement Date executed by the parties dated May 30, 2018 (the "**Acknowledgment**"), the Rent Commencement Date was scheduled to occur on November 15, 2018, and the Base Term of the Lease is scheduled to expire on November 30, 2025

C. Landlord and Tenant desire, subject to the terms and conditions set forth below, to amend the terms of the Lease to extend the Rent Commencement Date and the expiration date of the Base Term of the Lease.

NOW, THEREFORE, in consideration of the foregoing Recitals, which are incorporated herein by this reference, the mutual promises and conditions contained herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Landlord and Tenant hereby agree as follows:

1. **Rent Commencement Date**. Notwithstanding anything to the contrary contained in the Lease or in the Acknowledgment, the "**Rent Commencement Date**" shall be January 15, 2019.

2. **Base Term**. Notwithstanding anything to the contrary contained in the Lease or in the Acknowledgment, the expiration date of the Base Term of the Lease is hereby extended from November 30, 2025, to April 30, 2026.

3. **OFAC**. Tenant and all beneficial owners of Tenant are currently (a) in compliance with and shall at all times during the Term of this Lease remain in compliance with the regulations of the Office of Foreign Assets Control ("**OFAC**") of the U.S. Department of Treasury and any statute, executive order, or regulation relating thereto (collectively, the "**OFAC Rules**"), (b) not listed on, and shall not during the term of this Lease be listed on, the Specially Designated Nationals and Blocked Persons List, Foreign Sanctions Evaders List, or the Sectoral Sanctions Identification List, which are all maintained by OFAC and/or on any other similar list maintained by OFAC or other governmental authority pursuant to any authorizing statute, executive order, or regulation, and (c) not a person or entity with whom a U.S. person is prohibited from conducting business under the OFAC Rules.

4. **Miscellaneous**.

a. This First Amendment is the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior and contemporaneous oral and written agreements and discussions. This First Amendment may be amended only by an agreement in writing, signed by the parties hereto.

b. This First Amendment is binding upon and shall inure to the benefit of the parties hereto, their respective agents, employees, representatives, officers, directors, divisions, subsidiaries, affiliates, assigns, heirs, successors in interest and shareholders.

c. This First Amendment may be executed in 2 or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature process complying with the U.S. federal ESIGN Act of 2000) or other transmission method and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes. Electronic signatures shall be deemed original signatures for purposes of this First Amendment and all matters related thereto, with such electronic signatures having the same legal effect as original signatures.

d. Except as amended and/or modified by this First Amendment, the Lease is hereby ratified and confirmed and all other terms of the Lease shall remain in full force and effect, unaltered and unchanged by this First Amendment. In the event of any conflict between the provisions of this First Amendment and the provisions of the Lease, the provisions of this First Amendment shall prevail. Whether or not specifically amended by this First Amendment, all of the terms and provisions of the Lease are hereby amended to the extent necessary to give effect to the purpose and intent of this First Amendment.

[Signatures are on the next page.]

IN WITNESS WHEREOF, the parties hereto have executed this First Amendment as of the day and year first above written.

TENANT:

ELO LIFE SYSTEMS, INC.,
a Delaware corporation

By: /s/ Matthew Kane
Its: Matt Kane / CEO

LANDLORD:

ARE-NC REGION NO. 17, LLC,
a Delaware limited liability company

By: ALEXANDRIA REAL ESTATE EQUITIES, L.P.,
a Delaware limited partnership, managing member

By: /s/ Allison Grochola
Its: Allison Grochola
Vice President
RE Legal Affairs

CONSENT OF GUARANTOR:

The undersigned, being the Guarantor under that certain Guaranty of Lease dated as of March 28, 2018 (the "**Guaranty**") made by the undersigned in favor of Landlord, hereby consents to all of the terms, provisions, covenants and conditions set forth in this First Amendment, and to the execution and delivery of this First Amendment by Tenant. Guarantor hereby agrees that all of the guarantees, terms, covenants, conditions, representations and warranties set forth in the Guaranty are in full force and effect for the benefit of Landlord, as amended by the terms of this First Amendment, and Guarantor hereby expressly affirms and confirms its obligations, guarantees and liabilities under the Guaranty, as amended by this First Amendment.

Witness the execution and delivery hereof as an instrument under seal as of the 21st day of December, 2018.

PRECISION BIOSCEINCES, INC.,
a Delaware corporation

By: /s/ Matthew Kane
Its: Matt Kane / CEO

Exhibit 10.7

LEASE

BIOPOINT INNOVATION LABS

DURHAM TW ALEXANDER, LLC,

a Delaware limited liability company

as Landlord,

and

PRECISION BIOSCIENCES, INC.,

a Delaware corporation,

as Tenant.

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BIOPOINT INNOVATION LABS

LEASE

This Lease (the "**Lease**"), dated as of the date set forth in Section 1 of the Summary of Basic Lease Information (the "**Summary**"), below, is made by and between **DURHAM TW ALEXANDER, LLC,** a Delaware limited liability company ("**Landlord**"), and **PRECISION BIOSCIENCES, INC.**, a Delaware corporation ("**Tenant**").

SUMMARY OF BASIC LEASE INFORMATION

TERMS OF LEASE		DESCRIPTION
1.	Date:	October 2nd, 2018
2.	Premises (Article 1).	
2.1	Building:	That certain office building containing approximately 148,989 rentable square feet of space located at 20 TW Alexander Drive, Research Triangle Park, NC 27709.
2.2	Premises:	Approximately 17,296 rentable square feet of space on the first (1st) floor of the Building and commonly known as Suite 130, as further set forth in **Exhibit C** to the Lease.
3.	Lease Term (Article 2).	
3.1	Length of Term:	Eighty-six (86) months.
3.2	Lease Commencement Date:	The date of Lease execution.
3.3	Rent Commencement Date:	Nine (9) months after the Lease Commencement Date.
3.4	Lease Expiration Date:	Eighty-six (86) months after the Rent Commencement Date.

4. Base Rent (Article 3):

Time Period	Annual Base Rent	Monthly Installment of Base Rent	Annual Base Rent per Rentable Square Foot
Year 1**	$449,696.04	$37,474.67	$ 26.00
Year 2	$463,186.92	$38,598.91	$ 26.78
Year 3	$477,023.64	$39,751.97	$ 27.58
Year 4	$491,379.36	$40,948.28	$ 28.41
Year 5	$506,080.92	$42,173.41	$ 29.26
Year 6	$521,301.48	$43,441.79	$ 30.14
Year 7	$537,040.80	$44,753.40	$ 31.05
Year 8	$553,126.08	$46,093.84	$ 31.98

* Note: Provided Tenant is not in default of the terms of this Lease, after expiration of any applicable notice and cure period, Tenant shall have no obligation to pay any Base Rent attributable to the first two (2) months of the Lease Term following the Rent Commencement Date (the "**Abatement Period**"). Tenant shall be obligated to pay Tenant's Share of Direct Expenses attributable to the Abatement Period.

5. Tenant Improvements Allowance: The improvements in the Premises shall be constructed in accordance with the terms of the Tenant Work Letter attached hereto as **Exhibit D** up to a cost of $70.58 per rentable square foot.

6. NNN Lease. In addition to the Base Rent, Tenant shall be responsible to pay Tenant's Share of Direct Expenses in accordance with the terms of Article 4 of the Lease.

7. Tenant's Share (Article 4): Approximately 11.61%.

8. Permitted Use (Article 5): The Premises may only be used for any or all of the following uses: general office, research and development, engineering, GMP manufacturing, laboratory, storage and/or warehouse uses, including, but not limited to, administrative offices and other lawful uses reasonably related to or incidental to such specified uses, all (i) consistent with substantially similar life sciences and/or office projects in the Durham, North Carolina area ("**First Class Life Sciences Projects**"), and (ii) in compliance with, and subject to, all Applicable Laws (as defined herein), and the terms of this Lease.

9. Security Deposit (Article 21):	$149,898.68 So long as Tenant is not in default under this Lease beyond applicable notice and cure periods at any time during the first three (3) years of the Lease Term then thereafter the Security Deposit shall be reduced to $112,424.01. So long as Tenant is not in default under this Lease beyond applicable notice and cure periods at any time during the first five (5) years of the Lease Term then thereafter the Security Deposit shall be reduced to $74,949.34 for the remainder of the Lease Term. In such event, if the Security Deposit has been posted in the form of a cash deposit Landlord shall refund the additional amount to Tenant within thirty (30) days and if the Security Deposit is in the form of a letter of credit then Landlord shall return the existing letter of credit to Tenant upon Tenant's posting of a new letter of credit in the correct amount or the posting of a cash deposit by Tenant.
10. Parking Pass Ratio (Article 28):	2.5 unreserved parking spaces for every 1,000 rentable square feet of the Premises, subject to the terms of Article 28 of the Lease.
11. Address of Tenant (Section 29.18):	PRECISION BIOSCIENCES, INC. 302 E. Pettigrew ST. Durham, NC 27701 Attention: Sinu Bhandaru, Director, Head of Operations & IT With a Copy of any default notices to: Smith, Anderson, Blount, Dorsett, Mitchell & Jernigan, L.L.P. Post Office Box 2611 Raleigh, North Carolina 27602-2611 Attention: Michael P. Saber, Esq. overnight delivery address: Smith, Anderson, Blount, Dorsett, Mitchell & Jernigan, L.L.P. 2300 Wells Fargo Capitol Center 150 Fayetteville Street Raleigh, North Carolina 27601
12. Address of Landlord (Section 29.18):	See Section 29.18 of the Lease.
13. Broker(s) (Section 29.24):	Cushman & Wakefield
14. Guarantor(s) (Section 29.33):	None ("**Guarantors**")

1. PREMISES, BUILDING, PROJECT, AND COMMON AREAS

1.1 **Premises, Building, Project and Common Areas**.

1.1.1 **The Premises**. Landlord hereby leases to Tenant and Tenant hereby leases from Landlord the premises set forth in Section 2.2 of the Summary (the "**Premises**"). The outline of the Premises is set forth in **Exhibit C** attached hereto and has the number of rentable square feet as set forth in Section 2.2 of the Summary. The parties hereto agree that the lease of the Premises is upon and subject to the terms, covenants and conditions herein set forth, and Tenant covenants as a material part of the consideration for this Lease to keep and perform each and all of such terms, covenants and conditions by it to be kept and performed and that this Lease is made upon the condition of such performance. The parties hereto hereby acknowledge that the purpose of **Exhibit C** is to show the approximate location of the Premises in the "Building," as that term is defined in Section 1.1.2, below, only, and such Exhibit is not meant to constitute an agreement, representation or warranty as to the construction of the Premises, the precise area thereof or the specific location of the "Common Areas," as that term is defined in Section 1.1.3, below, or the elements thereof or of the accessways to the Premises or the "Project," as that term is defined in Section 1.1.2, below. Tenant shall accept the Premises in its presently existing "as-is" condition and Landlord shall not be obligated to provide or pay for any improvement work or services related to the improvement of the Premises except Landlord shall deliver the Premises in broom clean condition, with all currently existing Premises systems in good working order (provided that (i) Tenant acknowledges and agrees that demolition work has been performed to a portion of the space, separating same from the remaining, functioning standard office portion; and (ii) Tenant shall promptly notify Landlord of any known/discovered defects or needed repairs to same so that Landlord may fulfill any repair obligations under Section 7.3 of this Lease), and except as otherwise expressly set forth in this Lease or in the Tenant Work Letter attached hereto as **Exhibit D**.

The Premises shall exclude Common Areas, including without limitation exterior faces of exterior walls, the entry, vestibules and main lobby of the Building, lobbies and common lavatories, the common stairways and stairwells, boiler room, sprinkler rooms, mechanical rooms, loading and receiving areas, electric and telephone closets, janitor closets, and pipes, ducts, conduits, wires and appurtenant fixtures and equipment serving exclusively or in common with other parts of the Building..

1.1.2 **The Building and The Project**. The Premises are a part of the building set forth in Section 2.1 of the Summary (the "**Building**"). The term "**Project**," as used in this Lease, shall mean (i) the Building and the Common Areas, (ii) the land (which is improved with landscaping, parking facilities and other improvements) upon which the Building and the Common Areas are located, (iii) the other buildings located in the project known as "BioPoint Innovation Labs", and the land upon which such adjacent buildings are located, and (iv) at Landlord's discretion, any additional real property, areas, land, buildings or other improvements added thereto outside of the Project. Landlord may only own portions of the Project and any rights granted within portions of the Project not owned by Landlord shall be pursuant to recorded declarations and easements to the extent such documents exist.

1.1.3 **Common Areas**. Tenant shall have the non-exclusive right to use in common with other tenants in the Project, and subject to the Rules and Regulations referred to in Article 5 of this Lease, those portions of the Project which are provided, from time to time, for use in common by Landlord, Tenant and any other tenants of the Project (such areas, together with such other portions of the Project designated by Landlord, in its discretion, including certain areas designated for the exclusive use of certain tenants, or to be shared by Landlord and certain tenants, are collectively referred to herein as the "**Common Areas**"). The Common Areas shall consist of the "**Project Common Areas**" and the "**Building Common Areas**." The term "**Project Common Areas**," as used in this Lease, shall mean the portion of the Project designated as such by Landlord or areas within the Project that the occupants of the Building are permitted to utilize pursuant to a recorded declaration and which areas shall be maintained in accordance with the declaration. The term "**Building Common Areas**," as used in this Lease, shall mean the portions of the Common Areas located within the Building reasonably designated as such by Landlord. The manner in which the Common Areas are maintained and operated shall be at the reasonable discretion of Landlord and the use thereof shall be subject to the Rules and Regulations as Landlord may make from time to time. Landlord reserves the right to close temporarily, make alterations or additions to, or change the location of elements of the Project and the Common Areas, provided that, in connection therewith, Landlord shall perform such closures, alterations, additions or changes in a commercially reasonable manner and, in connection therewith, shall use commercially reasonable efforts to minimize any material interference with Tenant's use of and access to the Premises.

1.2 **Stipulation of Rentable Square Feet of Premises**. For purposes of this Lease, "rentable square feet" of the Premises shall be deemed as set forth in Section 2.2 of the Summary. Notwithstanding the foregoing, the useable area of the Premises shall be determined in accordance with a standard promulgated by the Building Owners and Managers Association which standard is selected by Landlord. The rentable area of the Premises shall be determined by multiplying the useable area of the Premises by a "core factor". Landlord may, at any time, have its architect or engineer measure the actual total usable and rentable square footage of the Premises. In the event the Premises shall contain an amount of rentable square footage different than the amount of rentable square feet referenced in Section 2.2 of the Summary, the Premises shall be redefined to reflect the actual rentable square footage but the Base Rent and Additional Rent shall not change from/based what is listed in Section 4 of the Summary.

1.3 **Right of First Offer**. Beginning on the date which is six (6) months after the Rent Commencement Date Landlord hereby grants to the Tenant named in the Summary (the "**Original Tenant**") and its "Permitted Assignees", as defined in Section 14.8, below, a continuing right of first offer with respect to **Suite 012 containing approximately 12,128 rentable square feet** located in the Building as set forth in **Exhibit A** attached hereto, (the "**First Offer Space**"). Notwithstanding the foregoing, such first offer right of Tenant shall commence only following the expiration or earlier termination of the initial lease (including renewals) of the First Offer Space, and such right of first offer shall be subordinate to all rights of which are set forth in leases of space in the Project as of the date hereof, including any renewal rights set forth in such leases, regardless of whether such renewal rights are executed strictly in accordance with their terms, or pursuant to a lease amendment or a new lease (collectively, the "**Superior Right Holders**") with respect to such First Offer Space. Tenant's right of first offer shall not be applicable during any Option Term. Tenant's right of first offer shall be on the terms and conditions set forth in this Section 1.3.

1.3.1 **Procedure for Offer**. If Landlord receives a bona fide offer from a third party for the First Offer Space, any portion of the First Offer Space or such larger space that includes the First Offer Space, Landlord shall notify Tenant (the "**First Offer Notice**"), provided that no Superior Right Holder wishes to lease such space. Pursuant to such First Offer Notice, Landlord shall offer to lease to Tenant the then available First Offer Space and any additional space noted within the First Offer Notice. The First Offer Notice shall describe the space so offered to Tenant (which the parties acknowledge may include a portion of the First Offer Space, only the First Offer Space, or the First Offer Space plus additional contiguous space the Landlord is offering for lease) and shall set forth the "First Offer Rent," as that term is defined in Section 1.3.3 below, and the other economic terms upon which Landlord is willing to lease such space to Tenant.

1.3.2 **Procedure for Acceptance**. If Tenant wishes to exercise Tenant's right of first offer with respect to the space described in the First Offer Notice, then within ten (10) business days of delivery of the First Offer Notice to Tenant, Tenant shall deliver notice to Landlord of Tenant's election to exercise its right of first offer with respect to the entire space described in the First Offer Notice on the terms contained in such notice. If Tenant does not so notify Landlord within the ten (10) business day period, then Landlord shall be free to lease the space described in the First Offer Notice to anyone to whom Landlord desires on any terms Landlord desires. Notwithstanding anything to the contrary contained herein, Tenant must elect to exercise its right of first offer, if at all, with respect to all of the space offered by Landlord to Tenant at any particular time, and Tenant may not elect to lease only a portion thereof.

1.3.3 **First Offer Space Rent**. The "Rent," as that term is defined in Section 4.1, below, payable by Tenant for the First Offer Space (the "**First Offer Rent**") shall be equal to the "Fair Rental Value", as defined in Section 2.2.2, below, as of the "First Offer Commencement Date," as that term is defined in Section 1.3.5, below.

1.3.4 **Construction In First Offer Space**. Tenant shall take the First Offer Space in its "as is" condition, subject to any improvement allowance granted as a component of the Fair Rental Value, and the construction of improvements in the First Offer Space shall comply with the terms of Article 8 of this Lease.

1.3.5 **Amendment to Lease**. If Tenant timely exercises Tenant's right to lease the First Offer Space as set forth herein, Landlord and Tenant shall promptly thereafter execute an amendment to this Lease for such First Offer Space upon the terms and conditions as set forth in the First Offer Notice and this Section 1.3. Tenant shall commence payment of Rent for the First Offer Space, and the term of the First Offer Space shall commence upon the date of delivery of the First Offer Space to Tenant (the "**First Offer Commencement Date**") and terminate on the date set forth in the First Offer Notice.

1.3.6 **Termination of Right of First Offer**. The rights contained in this Section 1.3 shall be personal to the Original Tenant and its Permitted Assignees, and may only be exercised by the Original Tenant or a Permitted Assignee (and not any other assignee, sublessee or other transferee of the Original Tenant's interest in this Lease) if the Original Tenant occupies the majority of the Premises. Tenant shall not have the right to lease First Offer Space, as provided in this Section 1.3, if, as of the date of the attempted exercise of any right of first offer by Tenant, or as of the scheduled date of delivery of such First Offer Space to Tenant, Tenant is in default under this Lease, after the expiration of any applicable notice and cure period, or Tenant has previously been in default, after the expiration of any applicable notice and cure period, under this Lease more than twice.

2. LEASE TERM; OPTION TERM

2.1 **Lease Term**. The terms and provisions of this Lease shall be effective as of the date of this Lease. The term of this Lease (the "**Lease Term**") shall be as set forth in Section 3.1 of the Summary, shall commence on the date set forth in Section 3.2 of the Summary (the "**Lease Commencement Date**"), and shall terminate on the date set forth in Section 3.4 of the Summary (the "**Lease Expiration Date**") unless this Lease is sooner terminated as hereinafter provided. For purposes of this Lease, the term "**Lease Year**" shall mean each consecutive twelve (12) month period during the Lease Term. At any time during the Lease Term, Landlord may deliver to Tenant a notice in the form as set forth in **Exhibit B**, attached hereto, as a confirmation only of the information set forth therein, which Tenant shall execute and return to Landlord within ten (10) business days of receipt thereof.

2.2 **Option Term**.

2.2.1 **Option Right**. Landlord hereby grants to the originally named Tenant herein ("**Original Tenant**"), and its "Permitted Assignees", as that term is defined in Section 14.8, below, one (1) option to extend the Lease Term for a period of five (5) years (the "**Option Term**"), which option shall be irrevocably exercised only by written notice delivered by Tenant to Landlord not more than eighteen (18) months nor less than nine (9) months prior to the expiration of the initial Lease Term, provided that the following conditions **(**the "**Option Conditions**") are satisfied: (i) as of the date of delivery of such notice, Tenant is not in default under this Lease, after the expiration of any applicable notice and cure period; (ii) as of the end of the Lease Term, Tenant is not in default under this Lease, after the expiration of any applicable notice and cure period; (iii) Tenant has not previously been in default under this Lease, after the expiration of any applicable notice and cure period, more than twice; and (iv) the Lease then remains in full force and effect and Original Tenant or a Permitted Assignee occupies the majority of the Premises at the time the option to extend is exercised and as of the commencement of the Option Term. Landlord may, at Landlord's option, exercised in Landlord's sole and absolute discretion, waive any of the Option Conditions in which case the option, if otherwise properly exercised by Tenant, shall remain in full force and effect. Upon the proper exercise of such option to extend, and provided that Tenant satisfies all of the Option Conditions (except those, if any, which are waived by Landlord), the Lease Term, as it applies to the Premises, shall be extended for a period of five (5) years. The rights contained in this Section 2.2 shall be personal to Original Tenant and any Permitted Assignees, and may be exercised by Original Tenant or such Permitted Assignees (and not by any assignee, sublessee or other "Transferee," as that term is defined in Section 14.1 of this Lease, of Tenant's interest in this Lease).

2.2.2 **Option Rent**. The annual Rent payable by Tenant during the Option Term (the "**Option Rent**") shall be equal to the "Fair Rental Value," as that term is defined below, for the Premises as of the commencement date of the Option Term. The "**Fair Rental Value**," as used in this Lease, shall be equal to the annual rent per rentable square foot (including additional rent and considering any "base year" or "expense stop" applicable thereto), including all escalations, at which tenants (pursuant to leases consummated within the twelve (12) month period preceding the first day of the Option Term), are leasing non-sublease, non-encumbered, non-equity space which is not significantly greater or smaller in size than the subject space, for a comparable lease term, in an arm's length transaction, which comparable space is located in the "Comparable Buildings," as that term is defined in this Section 2.2.2, below (transactions satisfying the foregoing criteria shall be known as the "**Comparable**

Transactions"), taking into consideration the following concessions (the "**Concessions**"): (a) rental abatement concessions, if any, being granted such tenants in connection with such comparable space; (b) tenant improvements or allowances provided or to be provided for such comparable space, and taking into account the value, if any, of the existing improvements in the subject space, such value to be based upon the age, condition, design, quality of finishes and layout of the improvements and the extent to which the same can be utilized by a general office user other than Tenant; and (c) other reasonable monetary concessions being granted such tenants in connection with such comparable space; provided, however, that in calculating the Fair Rental Value, no consideration shall be given to (i) the fact that Landlord is or is not required to pay a real estate brokerage commission in connection with Tenant's exercise of its right to extend the Lease Term, or the fact that landlords are or are not paying real estate brokerage commissions in connection with such comparable space, and (ii) any period of rental abatement, if any, granted to tenants in comparable transactions in connection with the design, permitting and construction of tenant improvements in such comparable spaces. The Fair Rental Value shall additionally include a determination as to whether, and if so to what extent, Tenant must provide Landlord with financial security, such as a letter of credit or guaranty, for Tenant's Rent obligations in connection with Tenant's lease of the Premises during the Option Term. Such determination shall be made by reviewing the extent of financial security then generally being imposed in Comparable Transactions from tenants of comparable financial condition and credit history to the then existing financial condition and credit history of Tenant (with appropriate adjustments to account for differences in the then-existing financial condition of Tenant and such other tenants). The Concessions (A) shall be reflected in the effective rental rate (which effective rental rate shall take into consideration the total dollar value of such Concessions as amortized on a straight-line basis over the applicable term of the Comparable Transaction (in which case such Concessions evidenced in the effective rental rate shall not be granted to Tenant)) payable by Tenant, or (B) at Landlord's election, all such Concessions shall be granted to Tenant in kind. The term "**Comparable Buildings**" shall mean the Building and those other class A life sciences or class A office buildings which are comparable to the Building in terms of age (based upon the date of completion of construction or major renovation of to the building), quality of construction, level of services and amenities, size and appearance, and are located in Durham, North Carolina and the surrounding commercial area.

2.2.3 **Determination of Option Rent**. In the event Tenant timely and appropriately exercises an option to extend the Lease Term, Landlord shall notify Tenant of Landlord's determination of the Option Rent at least sixty (60) days before the Lease Expiration Date. If Tenant, on or before the date which is ten (10) business days following the date upon which Tenant receives Landlord's determination of the Option Rent, in good faith objects to Landlord's determination of the Option Rent, then Landlord and Tenant shall attempt to agree upon the Option Rent using their best good-faith efforts. If Landlord and Tenant fail to reach agreement within ten (10) business days following Tenant's objection to the Option Rent (the "**Outside Agreement Date**"), then each party shall make a separate determination of the Option Rent, as the case may be, within five (5) business days, and such determinations shall be submitted to arbitration in accordance with Sections 2.2.3.1 through 2.2.3.7, below. If Tenant fails to object to Landlord's determination of the Option Rent within the time period set forth herein, then Tenant shall be deemed to have objected to Landlord's determination of Option Rent.

2.2.3.1 Landlord and Tenant shall each appoint one arbitrator who shall be, at the option of the appointing party, a real estate broker or appraiser who shall have been active over the five (5) year period ending on the date of such appointment in the leasing or appraisal (not currently or formerly in the employ of Landlord or Tenant), as the case may be, of other class A life sciences buildings located in the Durham, North Carolina market area. The determination of the arbitrators shall be limited solely to the issue of whether Landlord's or Tenant's submitted Option Rent is the closest to the actual Option Rent, taking into account the requirements of Section 2.2.2 of this Lease, as determined by the arbitrators. Each such arbitrator shall be appointed within fifteen (15) days after the Outside Agreement Date. Landlord and Tenant may consult with their selected arbitrators prior to appointment and may select an arbitrator who is favorable to their respective positions. The arbitrators so selected by Landlord and Tenant shall be deemed "**Advocate Arbitrators**."

2.2.3.2 The two (2) Advocate Arbitrators so appointed shall be specifically required pursuant to an engagement letter within ten (10) business days of the date of the appointment of the last appointed Advocate Arbitrator to agree upon and appoint a third arbitrator ("**Neutral Arbitrator**") who shall be qualified under the same criteria set forth hereinabove for qualification of the two Advocate Arbitrators, except that neither the Landlord or Tenant or either parties' Advocate Arbitrator may, directly or indirectly, consult with the Neutral Arbitrator prior or subsequent to his or her appearance. The Neutral Arbitrator shall be retained via an engagement letter jointly prepared by Landlord's counsel and Tenant's counsel.

2.2.3.3 The three arbitrators shall, within thirty (30) days of the appointment of the Neutral Arbitrator, reach a decision as to whether the parties shall use Landlord's or Tenant's submitted Option Rent, and shall notify Landlord and Tenant thereof.

2.2.3.4 The decision of the majority of the three arbitrators shall be binding upon Landlord and Tenant.

2.2.3.5 If either Landlord or Tenant fails to appoint an Advocate Arbitrator within fifteen (15) days after the Outside Agreement Date, then either party may petition the presiding judge of the Superior Court of Durham County to appoint such Advocate Arbitrator subject to the criteria in Section 2.2.3.1 of this Lease, or if he or she refuses to act, either party may petition any judge having jurisdiction over the parties to appoint such Advocate Arbitrator.

2.2.3.6 If the two (2) Advocate Arbitrators fail to agree upon and appoint the Neutral Arbitrator, then either party may petition the presiding judge of the Superior Court of Durham County to appoint the Neutral Arbitrator, subject to criteria in Section 2.2.3.1 2 of this Lease, or if he or she refuses to act, either party may petition any judge having jurisdiction over the parties to appoint such arbitrator.

2.2.3.7 The cost of the arbitration shall be paid by Landlord and Tenant equally.

2.2.3.8 In the event that the Option Rent shall not have been determined pursuant to the terms hereof prior to the commencement of the Option Term, Tenant shall be required to pay the Option Rent initially provided by Landlord to Tenant, and upon the final determination of the Option Rent, the payments made by Tenant shall be reconciled with the actual amounts of Option Rent due, and the appropriate party shall make any corresponding payment to the other party.

3. BASE RENT

3.1 Beginning on the Rent Commencement Date, Tenant shall pay, without prior notice or demand, to Landlord or Landlord's agent at the management office of the Project, or, at Landlord's option, at such other place as Landlord may from time to time designate in advance and in writing, (i) by a check for currency which, at the time of payment, is legal tender for private or public debts in the United States of America, or (ii) if so elected by Tenant, by electronic funds transfer to the account of Landlord as provided to Tenant, base rent ("**Base Rent**") as set forth in Section 4 of the Summary, payable in equal monthly installments as set forth in Section 4 of the Summary in advance on or before the first day of each and every calendar month during the Lease Term, without any setoff or deduction whatsoever. The Base Rent for the first full month of the Lease Term shall be paid at the time of Tenant's execution of this Lease. If any Rent payment date (including the Rent Commencement Date) falls on a day of the month other than the first day of such month or if any payment of Rent is for a period which is shorter than one month, the Rent for any fractional month shall accrue on a daily basis for the period from the date such payment is due to the end of such calendar month or to the end of the Lease Term at a rate per day which is equal to 1/365 of the applicable annual Rent. All other payments or adjustments required to be made under the terms of this Lease that require proration on a time basis shall be prorated on the same basis. Base Rent and Additional Rent, as defined below, shall together be denominated "Rent." Without limiting the foregoing, Tenant's obligation to pay Rent shall not be discharged or otherwise affected by any law or regulation now or hereafter applicable to the Premises, or any other restriction on Tenant's use, or (except as expressly provided herein) any casualty or taking, or any failure by Landlord to perform any covenant contained herein, or any other occurrence.

4. ADDITIONAL RENT

4.1 **General Terms**. In addition to paying the Base Rent specified in Article 3 of this Lease, Tenant shall pay "**Tenant's Share**" of the annual "**Direct Expenses**," as those terms are defined in Sections 4.2.6 and 4.2.2 of this Lease, respectively. Such payments by Tenant, together with any and all other amounts payable by Tenant to Landlord pursuant to the terms of this Lease, are hereinafter collectively referred to as the "**Additional Rent**". All amounts due under this Article 4 as Additional Rent shall be payable for the same periods and in the same manner as the Base Rent. Without limitation on other obligations of Tenant which survive the expiration of the Lease Term, the obligations of Tenant to pay the Additional Rent provided for in this Article 4 shall survive the expiration of the Lease Term.

4.2 **Definitions of Key Terms Relating to Additional Rent**. As used in this Article 4, the following terms shall have the meanings hereinafter set forth:

4.2.1 Intentionally Omitted.

4.2.2 "**Direct Expenses**" shall mean "**Operating Expenses**" and "**Tax Expenses**."

4.2.3 "**Expense Year**" shall mean each calendar year in which any portion of the Lease Term falls, through and including the calendar year in which the Lease Term expires, provided that Landlord, upon advance written notice to Tenant, may change the Expense Year from time to time to any other twelve (12) consecutive month period, and, in the event of any such change, Tenant's Share of Direct Expenses shall be equitably adjusted for any Expense Year involved in any such change.

4.2.4 "**Operating Expenses**" shall mean all reasonable expenses, costs and amounts of every kind and nature which Landlord actually pays or accrues during any Expense Year because of or in connection with the ownership, management, maintenance, security, repair, replacement, restoration or operation of the Project, or any portion thereof. Without limiting the generality of the foregoing, Operating Expenses shall specifically include any and all of the following: (i) the cost of supplying all utilities, the cost of operating, repairing, maintaining, and renovating the utility, telephone, mechanical, sanitary, storm drainage, and elevator systems (if applicable), and the cost of maintenance and service contracts in connection therewith; (ii) the cost of licenses, certificates, permits and inspections and the cost of contesting any governmental enactments which affect Operating Expenses, and the costs incurred in connection with a governmentally mandated transportation system management program or similar program; (iii) the cost of all insurance carried by Landlord in connection with the Project as reasonably determined by Landlord; (iv) the cost of landscaping, re-lamping, and all supplies, tools, equipment and materials used in the operation, repair and maintenance of the Project, or any portion thereof; (v) the cost of parking area operation, repair, restoration, and maintenance; (vi) fees and other costs, including market management and/or incentive fees, consulting fees, legal fees and accounting fees, of all contractors and consultants in connection with the management, operation, maintenance and repair of the Project; (vii) payments under any equipment rental agreements and the fair rental value of any management office space; (viii) subject to item (f), below, wages, salaries and other compensation and benefits, including taxes levied thereon, of all persons engaged in the operation, maintenance and security of the Project (at or below the level of property manager); (ix) costs under any instrument pertaining to the sharing of costs by the Project; (x) operation, repair, maintenance and replacement of all systems and equipment and components thereof of the Project; (xi) the cost of janitorial, alarm, security and other services, replacement of wall and floor coverings, ceiling tiles and fixtures in Common Areas, maintenance and replacement of curbs and walkways, repair to roofs and re-roofing; (xii) amortization (including reasonable interest on the unamortized cost) over such period of time as Landlord shall reasonably determine, of the cost of acquiring or the rental expense of personal property used in the maintenance, operation and repair of the Project, or any portion thereof; (xiii) the cost of capital improvements or other costs incurred in connection with the Project (A) which are intended to reduce expenses in the operation or maintenance of the Project, or any portion thereof, or to reduce current or future Operating Expenses or to enhance the safety or security of the Project or its occupants, (B) that are required to comply with present or anticipated mandatory conservation programs, (C) which are replacements or modifications of nonstructural items located in the Common Areas required to keep the Common Areas in the same good order or condition as on the Commencement Date, or (D) that are required under any governmental law or regulation that was not in force or effect as of the Commencement Date; provided, however, that any capital expenditure shall be amortized (including reasonable interest on the amortized cost as reasonably determined by Landlord) in accordance with IRS regulations; and (xiv) costs, fees, charges or assessments imposed by, or resulting from any mandate imposed on Landlord by, any federal, state or local government for fire and police protection, trash removal, community services, or other services which do not constitute "Tax Expenses" as that term is defined in Section 4.2.5, below, (xv) cost of tenant relation programs reasonably established by

Landlord, and (xvi) payments under any easement, license, operating agreement, declaration, restrictive covenant, or instrument pertaining to the sharing of costs by the Building, including, without limitation, any covenants, conditions and restrictions affecting the property, and reciprocal easement agreements affecting the property, any parking licenses, and any agreements with transit agencies affecting the Property (collectively, "**Underlying Documents**"). In the event that Landlord or Landlord's managers or agents perform services for the benefit of the Building off-site which would otherwise be performed on-site (e.g. accounting), the cost of such services shall be reasonably allocated among the properties benefitting from such service and shall be included in Operating Expenses. Notwithstanding the foregoing, for purposes of this Lease, Operating Expenses shall not, however, include:

(a) costs, including legal fees, space planners' fees, advertising and promotional expenses, and brokerage fees incurred in connection with the original construction or development, or original or future leasing of the Project, and costs, including permit, license and inspection costs, incurred with respect to the installation of tenant improvements made for new tenants initially occupying space in the Project after the Lease Commencement Date or incurred in renovating or otherwise improving, decorating, painting or redecorating vacant space for tenants or other occupants of the Project (excluding, however, such costs relating to any common areas of the Project);

(b) except as set forth in items (xii), (xiii), and (xiv) above, depreciation, interest and principal payments on mortgages and other debt costs, if any, penalties and interest, and costs of capital improvements (as distinguished from repairs or replacements);

(c) costs for which the Landlord is reimbursed by any tenant or occupant of the Project or by insurance by its carrier or any tenant's carrier or by anyone else, and electric power costs for which any tenant directly contracts with the local public service company;

(d) any bad debt loss, rent loss, or reserves for bad debts or rent loss;

(e) costs associated with the operation of the business of the partnership or entity which constitutes the Landlord, as the same are distinguished from the costs of operation of the Project (which shall specifically include, but not be limited to, accounting costs associated with the operation of the Project). Costs associated with the operation of the business of the partnership or entity which constitutes the Landlord include costs of partnership accounting and legal matters, costs of defending any lawsuits with any mortgagee (except as the actions of the Tenant may be in issue), costs of selling, syndicating, financing, mortgaging or hypothecating any of the Landlord's interest in the Project, and costs incurred in connection with any disputes between Landlord and its employees, between Landlord and Project management, or between Landlord and other tenants or occupants;

(f) the wages and benefits of any employee who does not devote substantially all of his or her employed time to the Project unless such wages and benefits are prorated to reflect time spent on operating and managing the Project vis-a-vis time spent on matters unrelated to operating and managing the Project; provided, that in no event shall Operating Expenses for purposes of this Lease include wages and/or benefits attributable to personnel above the level of Project manager;

(g) amount paid as ground rental for the Project by the Landlord;

(h) except for a property management fee to the extent expressly allowed above, overhead and profit increment paid to the Landlord or to subsidiaries or affiliates of the Landlord for services in the Project to the extent the same exceeds the costs of such services rendered by qualified, first-class unaffiliated third parties on a competitive basis;

(i) any compensation paid to clerks, attendants or other persons in commercial concessions operated by the Landlord, provided that any compensation paid to any concierge at the Project shall be includable as an Operating Expense;

(j) rentals and other related expenses incurred in leasing air conditioning systems, elevators (if applicable) or other equipment which if purchased the cost of which would be excluded from Operating Expenses as a capital improvement, except equipment not affixed to the Project which is used in providing janitorial or similar services and, further excepting from this exclusion such equipment rented or leased to remedy or ameliorate an emergency condition in the Project ;

(k) all items and services for which Tenant or any other tenant in the Project reimburses Landlord or which Landlord provides selectively to one or more tenants (other than Tenant) without reimbursement;

(l) any costs expressly excluded from Operating Expenses elsewhere in this Lease;

(m) rent for any office space occupied by Project management personnel to the extent the size or rental rate of such office space exceeds the size or fair market rental value of office space occupied by management personnel of the comparable buildings in the vicinity of the Building, with adjustment where appropriate for the size of the applicable project;

(n) costs arising from the gross negligence or willful misconduct of Landlord or its agents, employees, vendors, contractors, or providers of materials or services;

(o) costs incurred to comply with laws relating to the removal of hazardous material (as defined under Applicable Law) which was in existence in the Building or on the Project prior to the Lease Commencement Date, and was of such a nature that a federal, State or municipal governmental authority, if it had then had knowledge of the presence of such hazardous material, in the state, and under the conditions that it then existed in the Building or on the Project, would have then required the removal of such hazardous material or other remedial or containment action with respect thereto; and costs incurred to remove, remedy, contain, or treat hazardous material, which hazardous material is brought into the Building or onto the Project after the date hereof by Landlord or any other tenant of the Project and is of such a nature, at that time, that a federal, State or municipal governmental authority, if it had then had knowledge of the presence of such hazardous material, in the state, and under the conditions, that it then exists in the Building or on the Project, would have then required the removal of such hazardous material or other remedial or containment action with respect thereto;

(p) costs incurred to comply with laws relating to the removal of Hazardous Materials (other than Hazardous Materials typically found in first class office buildings, such as recyclable materials and typical construction materials, and costs to comply with the Operation and Maintenance Plan described on **Exhibit G**);

(q) the cost of special services, goods or materials provided to any other tenant of the Project free of charge, and not provided to Tenant;

(r) Landlord’s general overhead expenses not related to the Project;

(s) legal fees, accountants’ fees (other than normal bookkeeping expenses) and other expenses incurred in connection with disputes of tenants or other occupants of the Project or associated with the enforcement of the terms of any leases with tenants or the defense of Landlord’s title to or interest in the Project or any part thereof;

(t) costs incurred due to a violation by Landlord or any other tenant of the Project of the terms and conditions of a lease; and

(u) any reserve funds.

If Landlord is not furnishing any particular work or service (the cost of which, if performed by Landlord, would be included in Operating Expenses) to a tenant who has undertaken to perform such work or service in lieu of the performance thereof by Landlord, Operating Expenses shall be deemed to be increased by an amount equal to the additional Operating Expenses which would reasonably have been incurred during such period by Landlord if it had at its own expense furnished such work or service to such tenant. If the Project is not at least one hundred percent (100%) occupied during all or a portion of any Expense Year, Landlord shall make an appropriate adjustment to the components of Operating Expenses for such year to determine the amount of Operating Expenses that would have been incurred had the Project been one hundred percent (100%) occupied; and the amount so determined shall be deemed to have been the amount of Operating Expenses for such year.

4.2.5 **Taxes**.

4.2.5.1 "**Tax Expenses**" shall mean all federal, state, county, or local governmental or municipal taxes, fees, charges or other impositions of every kind and nature, whether general, special, ordinary or extraordinary (including, without limitation, real estate taxes, general and special assessments, transit taxes, leasehold taxes or taxes based upon the receipt of rent, including gross receipts or sales taxes applicable to the receipt of rent, unless required to be paid by Tenant, personal property taxes imposed upon the fixtures, machinery, equipment, apparatus, systems and equipment, appurtenances, furniture and other personal property used in connection with the Project, or any portion thereof), which shall be paid or accrued during any Expense Year (without regard to any different fiscal year used by such governmental or municipal authority) because of or in connection with the ownership, leasing and operation of the Project, or any portion thereof.

4.2.5.2 Tax Expenses shall include, without limitation: (i) Any tax on the rent, right to rent or other income from the Project, or any portion thereof, or as against the business of leasing the Project, or any portion thereof; (ii) Any assessment, tax, fee, levy or charge in addition to, or in substitution, partially or totally, of any assessment, tax, fee, levy or charge previously included within the definition of real property tax; (iii) Any assessment, tax, fee, levy, or charge allocable to or measured by the area of the Premises or the Rent payable hereunder, including, without limitation, any business or gross income tax or excise tax with respect to the receipt of such rent, or upon or with respect to the possession, leasing, operating, management, maintenance, alteration, repair, use or occupancy by Tenant of the Premises, or any portion thereof; and (iv) Any assessment, tax, fee, levy or charge, upon this transaction or any document to which Tenant is a party, creating or transferring an interest or an estate in the Premises or the improvements thereon.

4.2.5.3 Any reasonable costs and expenses (including, without limitation, reasonable attorneys' and consultants' fees) incurred in attempting to protest, reduce or minimize Tax Expenses shall be included in Tax Expenses in the Expense Year such expenses are incurred. Tax refunds shall be credited against Tax Expenses and refunded to Tenant regardless of when received, based on the Expense Year to which the refund is applicable, provided that in no event shall the amount to be refunded to Tenant for any such Expense Year exceed the total amount paid by Tenant as Additional Rent under this Article 4 for such Expense Year. The foregoing sentence shall survive the expiration or earlier termination of this Lease. If Tax Expenses for any period during the Lease Term or any extension thereof are increased after payment thereof for any reason, including, without limitation, error or reassessment by applicable governmental or municipal authorities, Tenant shall pay Landlord upon demand Tenant's Share of any such increased Tax Expenses. Notwithstanding anything to the contrary contained in this Section 4.2.5, there shall be excluded from Tax Expenses (i) all excess profits taxes, franchise taxes, gift taxes, capital stock taxes, inheritance and succession taxes, estate taxes, transfer tax or fee, federal and state income taxes, and other taxes to the extent applicable to Landlord's general or net income (as opposed to rents, receipts or income attributable to operations at the Project), (ii) any items included as Operating Expenses, and (iii) any items paid by Tenant under Section 4.5 of this Lease.

4.2.6 "**Tenant's Share**" is based upon the ratio that the rentable square feet of the Premises bears to the rentable square feet of the Building and, subject to adjustment pursuant to Section 1.2 above, is the percentage set forth in Section 7 of the Summary.

4.3 **Intentionally omitted**. .

4.4 **Calculation and Payment of Additional Rent**. Tenant shall pay to Landlord, in the manner set forth in Section 4.4.1, below, and as Additional Rent, Tenant's Share of Direct Expenses for each Expense Year. If the Rent Commencement Date is a day other than the first day of an Expense Year, or if this Lease terminates or expires on a day other than the last day of an Expense Year, then Additional Rent shall be prorated in the manner provided in Section 3.1 above.

4.4.1 **Statement of Actual Direct Expenses and Payment by Tenant**. Landlord shall use good faith efforts to give to Tenant within six (6) months following the end of each Expense Year, a statement (the "**Statement**") which shall state the Direct Expenses incurred or accrued for such preceding Expense Year, and which shall indicate the amount of Tenant's Share of Direct Expenses. Upon receipt of the Statement for each Expense Year commencing or ending during the Lease Term, Tenant shall pay, with its next installment of Base Rent due, the full amount of Tenant's Share of Direct Expenses for such Expense Year, less the amounts, if any, paid during such Expense Year as "**Estimated Direct Expenses**," as that term is defined in Section 4.4.2, below, and if Tenant paid more as Estimated Direct Expenses than the actual Tenant's Share of Direct Expenses, Tenant shall receive a credit in the amount of Tenant's overpayment against Rent next due under this Lease. The failure of Landlord to timely furnish the Statement for any Expense Year shall not prejudice Landlord or Tenant from enforcing its rights under this Article 4. Even though the Lease Term has expired and Tenant has vacated the Premises, when the final determination is made of Tenant's Share of Direct Expenses for the Expense Year in which this Lease terminates, Tenant shall pay to Landlord such amount within thirty (30) days, and if Tenant paid more as Estimated Direct Expenses than the actual Tenant's Share of Direct Expenses, Landlord shall, within thirty (30) days, deliver a check payable to Tenant in the amount of the overpayment. The provisions of this Section 4.4.1 shall survive the expiration or earlier termination of the Lease Term. Notwithstanding the immediately preceding sentence, Tenant shall not be responsible for Tenant's Share of any Direct Expenses attributable to any Expense Year which are first billed to Tenant more than two (2) calendar years after the earlier of the expiration of the applicable Expense Year or the Lease Expiration Date, provided that in any event Tenant shall be responsible for Tenant's Share of Direct Expenses levied by any governmental authority or by any public utility companies at any time following the Lease Expiration Date which are attributable to any Expense Year (provided that Landlord delivers Tenant a bill for such amounts within two (2) years following Landlord's receipt of the bill therefor).

4.4.2 **Statement of Estimated Direct Expenses**. In addition, Landlord shall give Tenant a yearly expense estimate statement (the "**Estimate Statement**") which shall set forth Landlord's reasonable estimate (the "**Estimate**") of what the total amount of Direct Expenses for the then-current Expense Year shall be and the estimated Tenant's Share of Direct Expenses (the "**Estimated Direct Expenses**"). The failure of Landlord to timely furnish the Estimate Statement for any Expense Year shall not preclude Landlord from enforcing its rights to collect any Estimated Direct Expenses under this Article 4, nor shall Landlord be prohibited from revising any Estimate Statement or Estimated Direct Expenses theretofore delivered to the extent necessary. Thereafter, Tenant shall pay, with its next installment of Base Rent due, a fraction of the Estimated Direct Expenses for the then-current Expense Year (reduced by any amounts paid pursuant to the last sentence of this Section 4.4.2). Such fraction shall have as its numerator the number of months which have elapsed in such current Expense Year, including the month of such payment, and twelve (12) as its denominator. Until a new Estimate Statement is furnished (which Landlord shall have the right to deliver to Tenant at any time), Tenant shall pay monthly, with the monthly Base Rent installments, an amount equal to one-twelfth (1/12) of the total Estimated Direct Expenses set forth in the previous Estimate Statement delivered by Landlord to Tenant.

4.4.3 **Audit Right**. In the event the Controllable Operating Expenses (as defined below) increase by more than three percent (3%) in any given Lease Year (as measured against the Controllable Operating Expenses for the immediately preceding Lease Year), or as otherwise reasonably requested by Tenant (or required by Tenant's business partners and/or applicable law), then Tenant may audit Landlord's records and all information pertaining to Operating Expenses in order to verify the accuracy of Landlord's determination of the Tenant's Share subject to the procedure noted below. Controllable Operating Expenses shall include all Operating Expenses other than utilities (e.g., electricity, gas, water and sewer), management fees, security expenses, insurance, taxes, assessments, snow and ice removal and other weather related charges, association fees and charges under any declaration, storm water fees and similar governmental or quasi-governmentally imposed fees, and any other expenses which are set or determined by a governmental entity or other third party and non-negotiable, or are otherwise beyond Landlord's reasonable control including minimum wage increases, hereafter, "**Controllable Operating Expenses**". Tenant must comply with the following in order to audit Landlord's records and information pertaining to Operating Expenses:

(i) Tenant must give notice to Landlord of its election to undertake said audit within one hundred twenty (120) days after receipt of the statement of the actual amount of Tenant's Share for the preceding calendar year from Landlord, and with respect to such audit, Tenant may audit the two preceding calendar years;

(ii) Such audit will be conducted only during regular business hours at the office where Landlord maintains records of Operating Expenses and only after Tenant gives Landlord fourteen (14) days' advance written notice;

(iii) Tenant shall deliver to Landlord a copy of the results of such audit within fifteen (15) days of its receipt by Tenant and no such audit shall be conducted if any other tenant of the Building has conducted an independent audit for the time period Tenant intends to audit and Landlord furnishes to Tenant a copy of such audit;

(iv) No audit shall be conducted at any time that Tenant is in default (after the expiration of any applicable grace and/or cure period) of any of the terms of this Lease;

(v) No subtenant shall have any right to conduct an audit and no assignee shall conduct an audit for any period during which such assignee was not in possession of the Premises;

(vi) Such audit review by Tenant shall not postpone or alter the liability and obligation of Tenant to pay any amounts due under the terms of this Lease; and

(vii) Such audit shall be conducted by an independent, reputable accounting firm which is not being compensated by Tenant on a contingency fee basis.

Within thirty (30) days after Tenant's receipt of such audit, Tenant must give notice to Landlord of any disputed amounts and identify all items being contested in Landlord's statement of the Tenant Share. If Landlord and Tenant cannot agree upon any such item as to which Tenant shall have given such notice, the dispute shall be resolved by an audit by a major accounting firm mutually and reasonably acceptable to Landlord and Tenant and the cost of said joint audit shall be paid by the non-prevailing party.

Any adjustment required as a result of any audit shall be paid within 30 days, or adjusted in the next installment(s) of Tenant's Share.

4.5 **Taxes and Other Charges for Which Tenant Is Directly Responsible**. Tenant shall be liable for and shall pay before delinquency, taxes levied against Tenant's equipment, furniture, fixtures and any other personal property located in or about the Premises. If any such taxes on Tenant's equipment, furniture, fixtures and any other personal property are levied against Landlord or Landlord's property or if the assessed value of Landlord's property is noticeably increased by the inclusion therein of a value placed upon such equipment, furniture, fixtures or any other personal property (as reasonably documented by Landlord) and if Landlord pays the taxes based upon such increased assessment, which Landlord shall have the right to do regardless of the validity thereof but only under proper protest if requested by Tenant, Tenant shall upon demand repay to Landlord the taxes so levied against Landlord or the proportion of such taxes resulting from such increase in the assessment, as the case may be.

4.6 **Limit of Increases in Tenant's Share of Operating Expenses.** The Controllable Operating Expenses (as hereinafter defined) which may be passed through to Tenant under this Section 4 shall not increase in any year by an amount which exceeds five percent (5%) of such Controllable Operating Expenses for the immediately preceding year (as measured on a cumulative and compounded basis). For purposes hereof, "**Controllable Operating Expenses**" shall be deemed to include all Operating Expenses other than utilities (e.g., electricity, gas, water and sewer), management fees, security expenses, insurance, taxes, assessments, snow and ice removal and other weather related charges, association fees and charges under any declaration, storm water fees and similar governmental or quasi-governmentally imposed fees, and any other expenses which are set or determined by a governmental entity or other third party or are otherwise beyond Landlord's reasonable control including minimum wage increases.

5. USE OF PREMISES

5.1 **Permitted Use**. Tenant shall use the Premises solely for the Permitted Use set forth in Section 8 of the Summary and Tenant shall not use the Premises or the Project for any other purpose or purposes whatsoever without the prior written consent of Landlord, which may be withheld in Landlord's sole discretion.

5.2 **Prohibited Uses**. Tenant further covenants and agrees that Tenant shall not use, or suffer or permit any person or persons to use, the Premises or any part thereof for any use or purpose contrary to the provisions of the Rules and Regulations set forth in **Exhibit E**, attached hereto (the "**Rules and Regulations**"), or in violation of the laws of the United States of America, the State of North Carolina, or the ordinances, regulations or requirements of the local municipal or county governing body or other lawful authorities having jurisdiction over the Project, including, without limitation, any such laws, ordinances, regulations or requirements relating to hazardous materials or substances, as those terms are defined by Applicable Laws now or hereafter in effect, or any Underlying Documents. Tenant shall not do or permit anything to be done in or about the Premises which will damage the reputation of the Project or obstruct or unreasonably interfere with the rights of other tenants or occupants of the Building, or injure or annoy them or use or allow the Premises to be used for any improper, unlawful or objectionable purpose, nor shall Tenant cause or maintain any nuisance in, on or about the Premises. Tenant shall comply with, and Tenant's rights and obligations under the Lease and Tenant's use of the Premises shall be subject and subordinate to, all recorded easements, covenants, conditions, and restrictions now or hereafter affecting the Project. Provided, however, that (a) in the event of any conflict between any Rules and Regulations and the express terms of this Lease, the Lease terms shall control; (b) such Rules and Regulations do not require payment of additional material sum of money; (c) such Rules and Regulations do not unreasonably and materially interfere with Tenant's conduct of its business or Tenant's use and enjoyment of the Premises; (d) Landlord provides reasonable advance written notice thereof; and (e) such Rules and Regulations are uniformly enforced in a non-discriminatory manner.

5.3 **Intentionally Omitted**.

5.4 **Hazardous Materials**.

5.4.1 **Tenant's Obligations**.

5.4.1.1 **Prohibitions**. As a material inducement to Landlord to enter into this Lease with Tenant, Tenant has, to the best of its knowledge, completed Landlord's Pre-Leasing Environmental Exposure Questionnaire (the "**Environmental Questionnaire**"), which is attached as **Exhibit G**. Tenant hereby represents, warrants and covenants that except for those chemicals or materials, and their respective quantities, specifically listed on the Environmental Questionnaire, neither Tenant nor Tenant's employees, contractors and subcontractors of any tier, entities with a contractual relationship with Tenant (other than Landlord), or any entity acting as an agent or sub-agent of Tenant (collectively, "**Tenant's Agents**") will produce, use, store or generate any "Hazardous Materials," as that term is defined below, on, under or about the Premises, nor cause or permit any Hazardous Material to be brought upon, placed, stored, manufactured, generated, blended, handled, recycled, used or "Released," as that term is defined below, on, in, under or about the Premises. If any information provided to Landlord by Tenant on the Environmental Questionnaire, or otherwise relating to information concerning Hazardous Materials is knowingly false, incomplete, or misleading in any material respect, the same shall be deemed a default by Tenant under this Lease. Tenant shall deliver to Landlord an updated Environmental Questionnaire at least once a year, upon Landlord's request, and in the event of any material change in Tenant's use of Hazardous Materials at the Premises. Landlord's prior written consent shall be required to any Hazardous Materials use for the Premises not described on the initial Environmental Questionnaire, such consent not to be unreasonably withheld, conditioned, or delayed. Tenant shall not install or permit any underground storage tank on the Premises. In addition, Tenant agrees that it: (i) shall not cause or suffer to occur, the Release of any Hazardous Materials at, upon, under or within the Premises or any contiguous or adjacent premises; and (ii) shall not engage in activities at the Premises that result in, give rise to, or lead to the imposition of liability upon Tenant or Landlord or the creation of an environmental lien or use restriction upon the Premises. For purposes of this Lease, "**Hazardous Materials**" means all flammable explosives, petroleum and petroleum products,

waste oil, radon, radioactive materials, toxic pollutants, asbestos, polychlorinated biphenyls ("**PCBs**"), medical waste, chemicals known to cause cancer or reproductive toxicity, pollutants, contaminants, hazardous wastes, toxic substances or related materials, including without limitation any chemical, element, compound, mixture, solution, substance, object, waste or any combination thereof, which is or may be hazardous to human health, safety or to the environment due to its radioactivity, ignitability, corrosiveness, reactivity, explosiveness, toxicity, carcinogenicity, infectiousness or other harmful or potentially harmful properties or effects, or defined as, regulated as or included in, the definition of "hazardous substances," "hazardous wastes," "hazardous materials," or "toxic substances" under any Environmental Laws. The term "Hazardous Materials" for purposes of this Lease shall also include any mold, fungus or spores, whether or not the same is defined, listed, or otherwise classified as a "hazardous material" under any Environmental Laws, if such mold, fungus or spores may pose a risk to human health or the environment or negatively impact the value of the Premises. For purposes of this Lease, "**Release**" or "**Released**" or "**Releases**" shall mean any release, deposit, discharge, emission, leaking, spilling, seeping, migrating, injecting, pumping, pouring, emptying, escaping, dumping, disposing, or other movement of Hazardous Materials into the environment.

Any use or storage of Hazardous Materials by Tenant permitted pursuant to this Article 5 shall not exceed Tenant's proportionate share (measured on a per floor basis), based on the standards of the BMBL (as defined below), of similarly classed Hazardous Materials. Notwithstanding the foregoing to the contrary, in no event shall Tenant or anyone claiming by through or under Tenant perform work at or above the risk category Biosafety Level 2 as established by the Department of Health and Human Services ("**DHHS**") and as further described in the DHHS publication Biosafety in Microbiological and Biomedical Laboratories (5th Edition) (as it may be or may have been further revised, the "**BMBL**") or such nationally recognized new or replacement standards as Landlord may reasonable designate). Tenant shall comply with all applicable provisions of the standards of the BMBL to the extent applicable to Tenant's operations in the Premises.

5.4.1.2 **Intentionally Omitted.**

5.4.1.3 **Notices to Landlord**. Unless Tenant is required by Applicable Laws to give earlier notice to Landlord, Tenant shall notify Landlord in writing as soon as reasonably possible but in no event later than five (5) days after knowledge of (i) the occurrence of any actual, alleged or threatened Release of any Hazardous Material in, on, under, from, about or in the vicinity of the Premises (whether past or present), regardless of the source or quantity of any such Release, or (ii) Tenant becomes aware of any regulatory actions, inquiries, inspections, investigations, directives, or any cleanup, compliance, enforcement or abatement proceedings (including any threatened or contemplated investigations or proceedings) relating to or potentially affecting the Premises, or (iii) Tenant becomes aware of any claims by any person or entity relating to any Hazardous Materials in, on, under, from, about or in the vicinity of the Premises, whether relating to damage, contribution, cost recovery, compensation, loss or injury. Collectively, the matters set forth in clauses (i), (ii) and (iii) above are hereinafter referred to as "Hazardous Materials Claims". Tenant shall promptly forward to Landlord copies of all orders, notices, permits, applications and other communications and reports in connection with any Hazardous Materials Claims. Additionally, Tenant shall promptly advise Landlord in writing of Tenant's discovery of any occurrence or condition on, in, under or about the Premises that could subject Tenant or Landlord to any liability, or restrictions on ownership, occupancy, transferability or use of the Premises under any "Environmental Laws," as that term is defined below. Tenant shall not enter into any legal proceeding or other action, settlement, consent decree or other compromise with respect to any Hazardous Materials Claims without first notifying Landlord of Tenant's intention to do so and affording Landlord the opportunity to join and participate, as a party if Landlord so elects, in such proceedings and in no event shall Tenant enter into any agreements which are binding on Landlord or the Premises without Landlord's prior written consent. Landlord shall have the right to appear at and participate in, any and all legal or other administrative proceedings concerning any Hazardous Materials Claim. For purposes of this Lease, "Environmental Laws" means all applicable present and future laws, including principles of common law, relating to the protection of human health, safety, wildlife or the environment, including, without limitation, (i) all requirements pertaining to reporting, licensing, permitting, investigation and/or remediation of emissions, discharges, Releases, or threatened Releases of Hazardous Materials, whether solid, liquid, or gaseous in nature, into the air, surface water, groundwater, or land, or relating to the manufacture, processing, distribution, use, treatment, storage, disposal, transport, or handling of Hazardous Materials; and (ii) all requirements pertaining to the health and safety of employees or the public. Environmental Laws include, but are not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 USC § 9601, et seq., the Hazardous Materials Transportation Authorization Act of 1994, 49 USC § 5101,

et seq., the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, and Hazardous and Solid Waste Amendments of 1984, 42 USC § 6901, et seq., the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, 33 USC § 1251, et seq., the Clean Air Act of 1966, 42 USC § 7401, et seq., the Toxic Substances Control Act of 1976, 15 USC § 2601, et seq., the Safe Drinking Water Act of 1974, 42 USC §§ 300f through 300j, the Occupational Safety and Health Act of 1970, as amended, 29 USC § 651 et seq., the Oil Pollution Act of 1990, 33 USC § 2701 et seq., the Emergency Planning and Community Right-To-Know Act of 1986, 42 USC § 11001 et seq., the National Environmental Policy Act of 1969, 42 USC § 4321 et seq., the Federal Insecticide, Fungicide and Rodenticide Act of 1947, 7 USC § 136 et seq., North Carolina Oil Pollution and Hazardous Substances Control Act, N.C. Gen. Stat. § 143-215.75 et seq., North Carolina Inactive Hazardous Sites Act, N.C. Gen. Stat. § 130A-310, North Carolina Water and Air Resources Act, N.C. Gen. Stat. § 143-211 et seq., 15A N.C. Admin. Code Subchapter 2L, , and any other state or local law counterparts, as amended, as such Applicable Laws, are in effect as of the Lease Commencement Date, or thereafter adopted, published, or promulgated.

5.4.1.4 **Releases of Hazardous Materials**. If any Release of any Hazardous Material in, on, under, from or about the Premises shall occur at any time during the Lease and/or if any other Hazardous Material condition exists at the Premises proximately due to the breach of Tenant's obligations under this Section 5.4 that requires response actions under Environmental Laws, in addition to notifying Landlord as specified above, Tenant, at its own sole cost and expense, shall (i) immediately comply with any and all reporting requirements imposed pursuant to any and all Environmental Laws, (ii) provide a written certification to Landlord indicating that Tenant has complied with all applicable reporting requirements, (iii) take any and all necessary investigation, corrective and remedial action in accordance with any and all applicable Environmental Laws, utilizing an environmental consultant reasonably approved by Landlord, all in accordance with the provisions and requirements of this Section 5.4, including, without limitation, Section 5.4.4, and (iv) take any such additional investigative, remedial and corrective actions as Landlord shall in its reasonable discretion deem necessary such that the Premises are remediated to a condition allowing unrestricted use of the Premises (i.e. to a level that will allow any future use of the Premises, including residential, without any engineering controls or deed restrictions), all in accordance with the provisions and requirements of this Section 5.4. Landlord may, as required by any and all Environmental Laws, report the Release of any Hazardous Material to the appropriate governmental authority, identifying Tenant as the responsible party. Tenant shall deliver to Landlord copies of all administrative orders, notices, demands, directives or other communications directed to Tenant from any governmental authority with respect to any Release of Hazardous Materials in, on, under, from, or about the Premises, together with copies of all investigation, assessment, and remediation plans and reports prepared by or on behalf of Tenant in response to any such regulatory order or directive. Notwithstanding the foregoing, if Tenant provides Landlord with substantial proof that a Release in the Premises was caused by another tenant or occupant in the Project then Landlord shall use good faith efforts to assist Tenant in pursuing such party to cause it to remediate the Release or pay for such remediation, but ultimately Tenant's obligations under this Section 5.4 shall remain as stated herein.

5.4.1.5 **Indemnification**.

5.4.1.5.1 **In General**. Without limiting in any way Tenant's obligations under any other provision of this Lease, Tenant shall be solely responsible for and shall protect, defend, indemnify and hold the Landlord Parties harmless from and against any and all claims, judgments, losses, damages, costs, expenses, penalties, enforcement actions, taxes, fines, remedial actions, liabilities (including, without limitation, actual attorneys' fees, litigation, arbitration and administrative proceeding costs, expert and consultant fees and laboratory costs) including, without limitation, consequential damages and sums paid in settlement of claims, which arise during or after the Lease Term, whether foreseeable or unforeseeable, directly or indirectly arising out of or attributable to the presence, use, generation, manufacture, treatment, handling, refining, production, processing, storage, Release or presence of Hazardous Materials in, on, under or about the Premises by Tenant, except to the extent such liabilities result from the gross negligence or willful misconduct of Landlord following the Lease Commencement Date. The foregoing obligations of Tenant shall include, including without limitation: (i) the costs of any required or necessary removal, repair, cleanup or remediation of the Premises, and the preparation and implementation of any closure, removal, remedial or other required plans; (ii) judgments for personal injury or property damages; and (iii) all costs and expenses incurred by Landlord in connection therewith. It is the express intention of the parties to this Lease that Tenant assumes all such liabilities, and holds Landlord harmless from all such liabilities, associated with the environmental condition of the Premises, arising on or after the date Tenant takes possession of the Premises.

5.4.1.5.2 **Limitations**. Landlord warrants and represents that Landlord has not engaged in the Release of any Hazardous Materials subsequent to the date of the "Phase I Environmental Site Assessment Report" bearing ECS Project No. 49-1782, prepared on behalf of Longfellow Real Estate Ventures, LLC as of April 18, 2016 ("ECS Phase I") Landlord further warrants and represents that, to Landlord's knowledge, on or after the effective date of the ECS Phase I report, Landlord has not received a summons, citation, directive, letter or other communication, written or oral, from any state agency or the U.S. Government concerning the Project or any intentional or unintentional action on Landlord or any occupant's part as a result of a Release of any Hazardous Materials.

5.4.1.6 **Compliance with Environmental Laws**. Without limiting the generality of Tenant's obligation to comply with Applicable Laws as otherwise provided in this Lease, Tenant shall, at its sole cost and expense, comply with all Environmental Laws. Tenant shall obtain and maintain any and all necessary permits, licenses, certifications and approvals appropriate or required for the use, handling, storage, and disposal of any Hazardous Materials used, stored, generated, transported, handled, blended, or recycled by Tenant on the Premises. Landlord shall have a continuing right, without obligation, to require Tenant to obtain, and to review and inspect any and all such permits, licenses, certifications and approvals, together with copies of any and all Hazardous Materials management plans and programs, any and all Hazardous Materials risk management and pollution prevention programs, and any and all Hazardous Materials emergency response and employee training programs respecting Tenant's use of Hazardous Materials. Upon request of Landlord, Tenant shall deliver to Landlord a narrative description explaining the nature and scope of Tenant's activities involving Hazardous Materials and showing to Landlord's satisfaction compliance with all Environmental Laws and the terms of this Lease.

5.4.2 **Assurance of Performance**.

5.4.2.1 **Environmental Assessments In General**. Landlord may, but shall not be required to, engage from time to time such contractors as Landlord determines to be appropriate (and with reasonable advance notice to Tenant, not less than 5 business days) to perform "Environmental Assessments," as that term is defined below, to ensure Tenant's compliance with the requirements of this Lease with respect to Hazardous Materials. For purposes of this Lease, "**Environmental Assessment**" means an assessment including, without limitation: (i) an environmental site assessment conducted in accordance with the then-current standards of the American Society for Testing and Materials and meeting the requirements for satisfying the "all appropriate inquiries" requirements; and (ii) sampling and testing of the Premises based upon potential recognized environmental conditions or areas of concern or inquiry identified by the environmental site assessment.

5.4.2.2 **Costs of Environmental Assessments**. All costs and expenses incurred by Landlord in connection with any such Environmental Assessment initially shall be paid by Landlord; provided that if any such Environmental Assessment shows that Tenant has failed to comply with the provisions of this Section 5.4, then all of the costs and expenses of such Environmental Assessment shall be reimbursed by Tenant as Additional Rent within thirty (30) days after receipt of written demand therefor (and reasonable documentation of Tenant's material breach of its environmental obligations).

5.4.3 **Tenant's Obligations upon Surrender**. At the expiration or earlier termination of the Lease Term, Tenant, at Tenant's sole cost and expense, shall: (i) cause an Environmental Assessment of the Premises to be conducted in accordance with Section 15.3; (ii) cause all Hazardous Materials to be removed from the Premises and disposed of in accordance with all Environmental Laws and as necessary to allow the Premises to be used for any purpose; and (iii) cause to be removed all containers installed or used by Tenant or Tenant's Agents to store any Hazardous Materials on the Premises, and cause to be repaired any damage to the Premises caused by such removal.

5.4.4 **Clean-up**.

5.4.4.1 **Environmental Reports; Clean-Up**. If any written report, including any report containing results of any Environmental Assessment (an "**Environmental Report**") shall indicate (i) the presence of any Hazardous Materials as to which Tenant has a removal or remediation obligation under this Section 5.4, and (ii) that as a result of same, the investigation, characterization, monitoring, assessment, repair, closure, remediation, removal, or other clean-up (the "**Clean-up**") of any Hazardous Materials is required, Tenant shall promptly prepare

and submit to Landlord within thirty (30) days after receipt of the Environmental Report a comprehensive plan, subject to Landlord's written approval, specifying the actions to be taken by Tenant to perform the Clean-up so that the Premises are restored to the conditions required by this Lease. Upon Landlord's approval of the Clean-up plan, Tenant shall, at Tenant's sole cost and expense, without limitation on any rights and remedies of Landlord under this Lease, immediately implement such plan with a consultant reasonably acceptable to Landlord and proceed to Clean-Up Hazardous Materials in accordance with all Applicable Laws and as required by such plan and this Lease. If, within thirty (30) days after receiving a copy of such Environmental Report, Tenant fails either (a) to complete such Clean-up, or (b) with respect to any Clean-up that cannot be completed within such thirty-day period, fails to proceed with diligence to prepare the Clean-up plan and complete the Clean-up as promptly as practicable, then Landlord shall have the right, but not the obligation, and without waiving any other rights under this Lease, to carry out any Clean-up recommended by the Environmental Report or required by any governmental authority having jurisdiction over the Premises, and recover all of the costs and expenses thereof from Tenant as Additional Rent, payable within ten (10) business days after receipt of written demand therefor.

5.4.4.2 **No Rent Abatement**. Tenant shall continue to pay all Rent due or accruing under this Lease during any Clean-up, and shall not be entitled to any reduction, offset or deferral of any Base Rent or Additional Rent due or accruing under this Lease during any such Clean-up.

5.4.4.3 **Surrender of Premises**. Tenant shall complete any Clean-up prior to surrender of the Premises upon the expiration or earlier termination of this Lease, and shall fully comply with all Environmental Laws and requirements of any governmental authority with respect to such completion, including, without limitation, fully comply with any requirement to file a risk assessment, mitigation plan or other information with any such governmental authority in conjunction with the Clean-up prior to such surrender. Tenant shall obtain and deliver to Landlord a letter or other written determination from the overseeing governmental authority confirming that the Clean-up has been completed in accordance with all requirements of such governmental authority and that no further response action is required for the unrestricted use of the Premises from an Environmental Law standpoint ("**Closure Letter**"). Upon the expiration or earlier termination of this Lease, Tenant shall also be obligated to close all permits obtained in connection with Hazardous Materials in accordance with applicable laws.

5.4.4.4 **Failure to Timely Clean-Up**. Should any Clean-up for which Tenant is responsible not be completed, or should Tenant not receive the Closure Letter and any governmental approvals required under Environmental Laws in conjunction with such Clean-up prior to the expiration or earlier termination of this Lease, and Tenant's failure to receive the Closure Letter is prohibiting Landlord from leasing the Premises or any part thereof to a third party, or prevents the occupancy or use of the Premises or any part thereof by a third party, then Tenant shall be liable to Landlord as a holdover tenant (as more particularly provided in Article 16) until Tenant has fully complied with its obligations under this Section 5.4.

5.4.5 **Confidentiality**. Unless compelled to do so by Applicable Law, Tenant agrees that Tenant shall not disclose, discuss, disseminate or copy any information, data, findings, communications, conclusions and reports regarding the environmental condition of the Premises to any Person (other than Tenant's consultants, attorneys, property managers and employees that have a need to know such information), including any governmental authority, without the prior written consent of Landlord, not to be unreasonably withheld, conditioned, or delayed. In the event Tenant reasonably believes that disclosure is compelled by Applicable Law, it shall provide Landlord ten (10) days' advance notice of disclosure of confidential information so that Landlord may attempt to obtain a protective order. Tenant may additionally release such information to bona fide prospective purchasers or lenders, subject to any such parties' written agreement to be bound by the terms of this Section 5.4.

5.4.6 **Copies of Environmental Reports**. Within thirty (30) days of receipt thereof, Tenant shall provide Landlord with a copy of any and all environmental assessments, audits, studies and reports regarding Tenant's activities with respect to the Premises, or ground water beneath the Land, or the environmental condition or Clean-up thereof. Tenant shall be obligated to provide Landlord with a copy of such materials without regard to whether such materials are generated by Tenant or prepared for Tenant, or how Tenant comes into possession of such materials.

5.4.7 **Intentionally Omitted**.

5.4.8 **Signs, Response Plans, Etc**. Tenant shall be responsible for posting on the Premises any signs required under applicable Environmental Laws. Tenant shall also complete and file any business response plans or inventories required by any Applicable Laws. Tenant shall concurrently file a copy of any such business response plan or inventory with Landlord.

5.4.9 **Survival**. Each covenant, agreement, representation, warranty and indemnification made by Tenant set forth in this Section 5.4 shall survive the expiration or earlier termination of this Lease and shall remain effective until all of Tenant's obligations under this Section 5.4 have been completely performed and satisfied.

6. SERVICES AND UTILITIES

6.1 **Landlord Provided Services**. Landlord shall provide the following services on all days (unless otherwise stated below) during the Lease Term.

6.1.1 Subject to limitations imposed by all governmental rules, regulations and guidelines applicable thereto, Landlord shall provide adequate electrical wiring and facilities for connection to Tenant's lighting fixtures and incidental use equipment, provided that the connected electrical load of the incidental use equipment and the connected electrical load of Tenant's lighting fixtures does not exceed Tenant's Share of the system capacity (as reasonably documented by Landlord). Tenant shall bear the cost of replacement of lamps, starters and ballasts for lighting fixtures within the Premises.

6.1.2 Landlord shall provide city water from the regular Building outlets for drinking, lavatory and toilet purposes in the Building Common Areas and service to the Premises.

6.1.3 Landlord shall provide a dumpster and/or trash compactor at the Building for use by Tenant and other tenants for ordinary office waste (and not for Hazardous Materials).

6.1.4 Landlord shall provide landscaping, snow and ice removal in the Common Areas.

6.1.5 Landlord shall provide access to the rooftop as stated in Section 7.2.

6.1.6 Landlord shall provide Building standard heating, ventilation (including exhaust) and air conditioning ("**HVAC**").

6.2 **Tenant Provided Services and Utilities**. Except as otherwise expressly set forth in Section 6.1, above, Tenant will be responsible, at its sole cost and expense, for the furnishing of all services and utilities to the Premises including internet, telephone, janitorial and interior Building security services.

6.2.1 Landlord shall not provide janitorial or trash services for the Premises except as expressly provided in Section 6.1.3, above. Tenant shall be solely responsible for performing all janitorial and trash services and other cleaning of the Premises, all in compliance with Applicable Laws. In the event such service is provided by a third party janitorial service, and not by employees of Tenant, such service shall be a janitorial service approved in advance by Landlord, (Landlord shall provide Tenant with a list of approved vendors upon Tenant's request). The janitorial and cleaning of the Premises shall be adequate to maintain the Premises in a manner consistent with Comparable Buildings.

6.2.2 Subject to Applicable Laws and the other provisions of this Lease (including, without limitation, the Rules and Regulations, and except in the event of an emergency), Tenant shall have access to the Building, the Premises and the Common Areas of the Building, other than Common Areas requiring access with a Building engineer, twenty-four (24) hours per day, seven (7) days per week, every day of the year; provided, however, that Tenant shall only be permitted to have access to and use of the limited-access areas of the Building during the normal operating hours of such portions of the Building.

Tenant shall reasonably cooperate with Landlord at all times and abide by all regulations and requirements that Landlord may reasonably prescribe for the proper functioning and protection of the HVAC, electrical, mechanical and plumbing systems.

6.2.3 Tenant shall pay for all water, gas, heat, light, power, telephone, internet service, cable television, other telecommunications and other utilities supplied to the Premises, together with any fees, surcharges and taxes thereon, whether part of Operating Expenses or as provided under this Article 6. Tenant shall pay all costs and expenses for any separately metered utilities provided exclusively to the Premises directly to the applicable service provider. Tenant shall pay all actual out-of-pocket costs and expenses, without mark-up, for utility charges that are based on a check- or sub-metering metering installation based on Landlord's reading of such meters and directly to Landlord, including without limitation for utility charges for power, gas and water serving the HVAC system of the Building (which are measured by the control management system of the Building based on air volume provided to each tenant space). Additional Rent for such utilities may be reasonably estimated monthly by Landlord, based on actual readings of sub- and "check" meters where applicable, and shall be paid monthly by Tenant within thirty (30) days after being billed with a final accounting based upon actual bills received from the utility providers following the conclusion of each fiscal year of the Building.

6.3 **Metering**. If necessary, Landlord may install devices to separately meter any utility use (or use other reasonable industry standard methods to reasonably estimate such use) and in such event Tenant shall pay the cost directly to Landlord, within thirty (30) days after Tenant's receipt of an invoice therefor, at the rates charged by the public utility company furnishing the same, including the cost of installing, testing and maintaining of such metering devices. Tenant's use of electricity and any other utility shall never exceed the capacity of the feeders to the Project or the risers or wiring installation or Tenant's Share of the per floor limits as reasonably determined and documented by Landlord.

6.4 **Interruption of Use**. Tenant agrees that, to the extent permitted pursuant to Applicable Laws, Landlord shall not be liable for damages, by abatement of Rent or otherwise, for failure to furnish or delay in furnishing any service (including telephone and telecommunication services), or for any diminution in the quality or quantity thereof, when such failure or delay or diminution is occasioned, in whole or in part, by breakage, repairs, replacements, or improvements, by any strike, lockout or other labor trouble, by inability to secure electricity, gas, water, or other fuel at the Building or Project after reasonable effort to do so, by any riot or other dangerous condition, emergency, accident or casualty whatsoever, by act or default of Tenant or other parties, or by any other cause not under Landlord's reasonable control; and such failures or delays or diminution shall never be deemed to constitute an eviction or disturbance of Tenant's use and possession of the Premises or relieve Tenant from paying Rent or performing any of its obligations under this Lease. Furthermore, Landlord shall not be liable under any circumstances for a loss of, or injury to, property or for injury to, or interference with, Tenant's business, including, without limitation, loss of profits, however occurring, through or in connection with or incidental to a failure to furnish any of the services or utilities as set forth in this Article 6.

Notwithstanding the foregoing to the contrary, in the event that there shall be an interruption, curtailment or suspension of any service required to be provided by Landlord pursuant to Section 6.1 (and no reasonably equivalent alternative service or supply is provided by Landlord) that shall materially interfere with Tenant's use and enjoyment of a material portion of the Premises, and Tenant actually ceases to use affected portion of the Premises (any such event, a "**Service Interruption**"), and if (i) such Service Interruption shall continue for seventy-two (72) consecutive hours following receipt by Landlord of written notice from Tenant describing such Service Interruption (the "**Service Interruption Notice**"), (ii) such Service Interruption shall not have been caused, in whole or in part, by reasons beyond Landlord's reasonable control or by an act or omission in violation of this Lease by Tenant or by any negligence of Tenant, or Tenant's agents, employees, contractors or invitees, and (iii) either (A) Landlord does not diligently commence and pursue to completion the remedy of such Service Interruption or (B) Landlord receives proceeds from its rental interruption insurance that covers such Service Interruption (a Service Interruption that satisfies the foregoing conditions being referred to hereinafter as a "**Material Service Interruption**") then, as liquidated damages and Tenant's sole remedy at law or equity, Tenant shall be entitled to an equitable abatement of Base Rent and Tenant's Share of Direct Expenses, based on the nature and duration of the Material Service Interruption, the area of the Premises affected, and the then current Rent amounts, for the period that shall begin on the commencement of such Material Service Interruption and that shall end on the day such Material Service Interruption shall cease. To the extent a Material Service Interruption is caused by an event covered by Articles 11 or 13 of this Lease, then Tenant's right to abate rent shall be governed by the terms of such Article 11 or 13, as applicable, and the provisions of this paragraph shall not apply

6.5 **Responsibility Matrix**. The matrix attached hereto as **Exhibit H** and incorporated by reference provides the maintenance, repair, services, and utilities responsibilities for Landlord and Tenant at the Premises and Building ("**Responsibility Matrix**"). Landlord reserves the right at any time to make reasonable changes to the Responsibility Matrix based on current conditions at the Building as in Landlord's reasonable judgment may from time to time be necessary for the management, safety, care and cleanliness of the Premises and Building. The parties shall perform the obligations as noted in the Responsibility Matrix and to the extent of any discrepancies between this Article 6 and the Responsibility Matrix the details in the Responsibility Matrix shall control.

7. REPAIRS

7.1 **Tenant Repairs**. Tenant shall, at Tenant's own expense, keep the Premises, including all improvements, fixtures, furnishings, supplemental/non-Building heating, ventilation (including exhaust) and air conditioning (which Tenant installs as part of the Tenant Improvements) ("**Supplemental HVAC**"), and systems and equipment therein (including, without limitation, plumbing fixtures and equipment such as dishwashers, garbage disposals, and insta-hot dispensers), and the floor of the Building on which the Premises are located, in good order, repair and condition as received (ordinary wear and tear and casualty damage excepted) at all times during the Lease Term. In addition, Tenant shall, at Tenant's own expense, but under the supervision and subject to the prior reasonable approval of Landlord, and within any reasonable period of time specified by Landlord, promptly and adequately repair all damage to the Premises and replace or repair all damaged, broken, or worn fixtures and appurtenances, except for damage caused by ordinary wear and tear or beyond the reasonable control of Tenant; provided however, that, at Landlord's option, or if Tenant fails to make such repairs (after notice from Landlord a reasonable opportunity to do so), Landlord may, but need not, make such repairs and replacements, and Tenant shall pay Landlord the cost thereof, including a percentage of the cost thereof (to be uniformly established for the Building and/or the Project) sufficient to reimburse Landlord for all overhead, general conditions, fees and other costs or expenses arising from Landlord's involvement with such repairs and replacements forthwith upon being billed for same. Without limitation, Tenant shall be responsible for the Supplemental HVAC and Tenant shall secure, pay for, and keep in force contracts with appropriate and reputable service companies reasonably approved by Landlord providing for the regular maintenance of such systems.

7.2 **Riser Room and Rooftop Rights**. Landlord grants Tenant the right, subject to the terms and conditions of this Lease, to access the riser room and the roof of the Building in order to maintain, repair and replace the Supplemental HVAC equipment and any other mechanical equipment located in the riser room or on the roof for which Tenant is responsible to repair, maintain and replace. Tenant may not install additional locks on any access doors or any equipment in such areas. In the event the Tenant desires to move any rooftop equipment or install any new rooftop equipment the exact location and layout of such items must be approved in advance in writing by Landlord, such approval not to be unreasonably withheld, conditioned, or delayed. Tenant's access to the riser room for the purposes of exercising its rights and obligations under this Section 7.2 shall be limited to Building Hours by prior appointment with the property manager, except in the case of emergencies. In the event of an emergency Tenant shall utilize Landlord's after-hours contact information. Tenant shall be provided access to the rooftop at all times except during an emergency through card access with Tenant's personnel who are approved in advance by Landlord. Tenant shall engage Landlord's roofer before beginning any rooftop installations or repairs which affect the roof whether under this Section 7.2 or otherwise, and shall always comply with the roof warranty governing the protection of the roof and modifications to the roof. Tenant shall obtain a letter from Landlord's roofer following completion of such work stating that the roof warranty remains in effect. Tenant agrees that Tenant's access to the riser room or roof and any work on the roof shall be at Tenant's sole risk. Tenant shall indemnify, defend and hold Landlord harmless against any liability, claim or cost, including reasonable attorneys' fees, incurred in connection with the loss of life, personal injury, damage to property or business or any other loss or injury (except to the extent due to the grossly negligent act or willful misconduct of Landlord or its employees, agents or contractors) arising out of the access to the riser room or rooftop or any work on the rooftop by Tenant or its employees, agents, or contractors, including any liability arising out of Tenant's violation of this Section 7.2. Tenant shall specifically be responsible for Landlord's costs to repair any damage or remedy any infraction caused by Tenant or Tenant's vendor in the riser

room or on the roof of the Building. Landlord shall not be responsible for any damage or harm that result from Tenant's inability or delay to access the riser room or rooftop and Tenant hereby waives any claims against Landlord arising from such delays in access. The provisions of this paragraph shall survive the expiration or earlier termination of this Lease.

7.3 **Landlord Repairs**. Notwithstanding the foregoing, Landlord shall be responsible for repairs to the exterior walls, windows, foundation and roof (including roof membrane) of the Building, the structural portions of the floors of the Building, and the base building systems and equipment of the Building and Common Areas (to the extent not serving Tenant exclusively (but Landlord acknowledges and agrees that the air handler currently serving the Premises constitutes part of the base Building)), except to the extent that such repairs are required due to the gross negligence or willful misconduct of Tenant; provided, however, that if such repairs are due to the gross negligence or willful misconduct of Tenant, Landlord shall nevertheless make such repairs at Tenant's expense, or, if covered by Landlord's insurance, Tenant shall only be obligated to pay any deductible in connection therewith. Subject to the terms of Article 27, below, Landlord may, but shall not be required to, enter the Premises at all reasonable times and upon reasonable prior notice to make such repairs, alterations, improvements or additions to the Premises or to the Project or to any equipment located in the Project as Landlord shall reasonably desire or deem necessary or as Landlord may be required to do by governmental or quasi-governmental authority or court order or decree.

8. ADDITIONS AND ALTERATIONS

8.1 **Landlord's Consent to Alterations**. Tenant may not make any improvements, alterations, additions or changes to the Premises or any mechanical, plumbing or HVAC facilities or systems pertaining to the Premises (collectively, the "**Alterations**") without first procuring the prior written consent of Landlord to such Alterations, which consent shall be requested by Tenant not less than ten (10) business days prior to the commencement thereof, and which consent shall not be unreasonably withheld, conditioned or delayed by Landlord, provided it shall be deemed reasonable for Landlord to withhold its consent to any Alteration which adversely affects the structural portions or the systems or equipment of the Building or is visible from the exterior of the Building. Notwithstanding the foregoing, Tenant shall be permitted to make non-structural Alterations following ten (10) business days' notice to Landlord, but without Landlord's prior consent, to the extent that such Alterations (i) do not materially affect the Building roof, systems or equipment, (ii) are not visible from the exterior of the Building, and (iii) cost less than fifty thousand and 00/100 ($50,000.00) per year.

8.2 Prior to commencing any Alterations affecting air distribution or disbursement from ventilation systems serving Tenant or the Building, including without limitation the installation of Tenant's exhaust systems, Tenant shall provide Landlord with a third party report from a consultant, and in a form reasonably acceptable to Landlord, showing that such work will not materially and adversely affect the ventilation systems or air quality of the Building (or of any other tenant in the Building) and shall, upon completion of such work, provide Landlord with a certification reasonably satisfactory to Landlord from such consultant confirming that no such adverse effects have resulted from such work.

8.3 **Manner of Construction**. Landlord may impose, as an express condition of its consent (at the time said consent is given) to any and all Alterations (other than the Tenant Improvements) or repairs of the Premises or about the Premises, such requirements as Landlord in its reasonable discretion may deem desirable, including, but not limited to, the requirement that Tenant utilize for such purposes only contractors, subcontractors, materials, mechanics and materialmen selected by Tenant and approved by Landlord (which approval shall not be unreasonably withheld, conditioned or delayed), the requirement that upon Landlord's request at the time Landlord approves said Alterations (subject to the terms of Section 8.5, below), Tenant shall, at Tenant's expense, remove such Alterations upon the expiration or any early termination of the Lease Term. Tenant shall construct such Alterations and perform such repairs in a good and workmanlike manner, in conformance with any and all applicable federal, state, county or municipal laws, rules and regulations and pursuant to a valid building permit, issued by the city in which the Building is located (or other applicable governmental authority). Tenant shall not use (and upon notice from Landlord shall cease using) contractors, services, workmen, labor, materials or equipment that, in Landlord's reasonable judgment, would disturb labor harmony with the workforce or trades engaged in performing other work, labor or services in or about the Building or the Common Areas. Upon completion of any Alterations (or repairs), Tenant shall deliver to Landlord final lien waivers from all contractors, subcontractors and materialmen who performed such work. In

addition to Tenant's obligations under Article 9 of this Lease, upon completion of any Alterations, Tenant shall deliver to the Project construction manager a reproducible copy of the "**as built**" drawings of the Alterations as well as all permits, approvals and other documents issued by any governmental agency in connection with the Alterations. Landlord shall make its construction rules and a pre-approved vendor list available to Tenant upon request.

8.4 **Payment for Improvements**. If Tenant orders any work directly from Landlord, Tenant shall pay to Landlord an amount equal to four percent (4%) of the cost of such work to compensate Landlord for all overhead, general conditions, fees and other costs and expenses arising from Landlord's involvement with such work. If Tenant does not order any work directly from Landlord, Tenant shall reimburse Landlord for Landlord's reasonable, actual, out-of-pocket costs and expenses actually incurred in connection with Landlord's review of such work including a construction management fee in the amount of two and one-half percent (2.5%) of the total costs of such work, up to but not to exceed a total payment by Tenant to Landlord of Forty Thousand and 00/100 Dollars ($40,000.000).

8.5 **Construction Insurance**. In addition to the requirements of Article 10 of this Lease, in the event that Tenant makes any Alterations, prior to the commencement of such Alterations, Tenant shall provide Landlord with evidence that Tenant carries "**Builder's All Risk**" insurance (to the extent that the cost of the work shall exceed $100,000.00) in an amount approved by Landlord covering the construction of such Alterations, and such other standard and reasonable insurance as Landlord may reasonably require, it being understood and agreed that all of such Alterations shall be insured by Tenant pursuant to Article 10 of this Lease immediately upon completion thereof. In addition, Tenant's contractors and subcontractors shall be required to carry Commercial General Liability Insurance in an amount approved by Landlord and otherwise in accordance with the requirements of Article 10 of this Lease and such general liability insurance shall name the Landlord Parties as additional insureds. In addition, Tenant's contractors and subcontractors shall be required to carry workers compensation insurance with a waiver of subrogation in favor of Landlord Parties.

9. COVENANT AGAINST LIENS

Tenant shall keep the Project and Premises free from any liens or encumbrances arising out of the work performed, materials or services furnished or obligations incurred by or on behalf of Tenant, and shall protect, defend, indemnify and hold Landlord harmless from and against any claims, liabilities, judgments or costs (including, without limitation, reasonable attorneys' fees and costs) arising out of same or in connection therewith. Tenant shall give Landlord notice at least twenty (20) days prior to the commencement of any work, services or obligations related to the Premises giving rise to any such liens or encumbrances (or such additional time as may be necessary under Applicable Laws) to afford Landlord the opportunity of posting and recording appropriate notices of non-responsibility (to the extent applicable pursuant to then Applicable Laws). Tenant shall remove any such lien or encumbrance by statutory lien bond or otherwise within ten (10) business days after notice by Landlord, and if Tenant shall fail to do so, Landlord may pay the amount necessary to remove such lien or encumbrance, without being responsible for investigating the validity thereof.

10. INSURANCE

10.1 **Indemnification and Waiver**. Tenant hereby assumes all risk of damage to property or injury to persons in, upon or about the Premises from any cause whatsoever (including, but not limited to, any personal injuries resulting from a slip and fall in, upon or about the Premises) and agrees that Landlord, its lenders, partners, subpartners and their respective officers, agents, servants, employees, and independent contractors (collectively, "**Landlord Parties**") shall not be liable for, and are hereby released from any responsibility for, any damage either to person or property or resulting from the loss of use thereof, which damage is sustained by Tenant or by other persons claiming through Tenant. Tenant shall indemnify, defend, protect, and hold harmless the Landlord Parties from any and all loss, cost, damage, injury, expense and liability (including without limitation court costs and reasonable attorneys' fees) during the Lease Term, or any period of Tenant's occupancy of the Premises prior to the commencement or after the expiration of the Lease Term, incurred in connection with or arising from any cause in, on or about the Premises (including, but not limited to, a slip and fall), any acts, omissions or negligence of Tenant or of any person claiming by, through or under Tenant, or of the contractors, agents, servants, employees, invitees, guests or licensees of Tenant or any such person, in, on or about the Project or any breach of the terms of this Lease, either prior to, during, or after the expiration of the Lease Term, provided that the terms of the foregoing indemnity shall not apply to the gross

negligence or willful misconduct of Landlord. Should Landlord be named as a defendant in any suit brought against Tenant in connection with or arising out of Tenant's occupancy of the Premises, Tenant shall pay to Landlord its reasonable costs and expenses incurred in such suit, including without limitation, its actual professional fees such as reasonable appraisers', accountants' and attorneys' fees. The provisions of this Section 10.1 shall survive the expiration or sooner termination of this Lease with respect to any claims or liability arising in connection with any event occurring prior to such expiration or termination.

10.2 **Tenant's Compliance With Landlord's Property Insurance**. Tenant shall, at Tenant's expense, comply with all reasonable insurance company requirements pertaining to the use of the Premises. If Tenant's conduct or use of the Premises for any purpose other than customary, general office use causes any increase in the premium for such insurance policies (as reasonably documented by Landlord) then Tenant shall reimburse Landlord for any such increase. Tenant, at Tenant's expense, shall comply with all rules, orders, regulations or requirements of the American Insurance Association (formerly the National Board of Fire Underwriters) and with any similar body.

10.3 **Tenant's Insurance**. Tenant shall maintain the following coverages in the following amounts.

10.3.1 Commercial General Liability Insurance on an occurrence form covering the insured against claims of bodily injury, personal and advertising injury and property damage (including loss of use thereof) arising out of Tenant's operations, products/completed operations, and contractual liability including a Broad Form endorsement covering the insuring provisions of this Lease and the performance by Tenant of the indemnity agreements set forth in Section 10.1 of this Lease, and including, solely on a claims-made basis, products and completed operations coverage, for limits of liability of not less than:

Bodily Injury and Property Damage Liability	$5,000,000 each occurrence $5,000,000 annual aggregate
Personal and Advertising Injury Liability	$5,000,000 each occurrence $5,000,000 annual aggregate 0% Insured's participation

10.3.2 Property Insurance covering (i) all office furniture, business and trade fixtures, office equipment, free-standing cabinet work, movable partitions, merchandise and all other items of Tenant's property on the Premises installed by, for, or at the expense of Tenant, and (ii) any other improvements which exist in the Premises as of the Lease Commencement Date (excluding the Base Building) (the "**New Improvements**"). Such insurance shall be written on an "**all risks**" of physical loss or damage basis, for the full replacement cost value (subject to reasonable deductible amounts) new without deduction for depreciation of the covered items and in amounts that meet any co-insurance clauses of the policies of insurance and shall include coverage for damage or other loss caused by fire or other peril including, but not limited to, vandalism and malicious mischief, theft, water damage of any type, including sprinkler leakage, bursting or stoppage of pipes, and explosion.

10.3.3 Business Income Interruption for one (1) year plus Extra Expense insurance in such amounts as will reimburse Tenant for actual direct or indirect loss of earnings attributable to the risks outlined in Section 10.3.2 above.

10.3.4 Worker's Compensation and Employer's Liability or other similar insurance pursuant to all applicable state and local statutes and regulations. The policy will include a waiver of subrogation in favor of the Landlord Parties.

10.4 **Form of Policies**. The minimum limits of policies of insurance required of Tenant under this Lease shall in no event limit the liability of Tenant under this Lease. Such insurance shall (i) name Landlord, its subsidiaries and affiliates and any other party the Landlord so specifies, as an additional insured, as applicable, including Landlord's managing agent, if any; (ii) cover the liability assumed by Tenant under this Lease; (iii) be issued by an insurance company having a rating of not less than A:VIII in Best's Insurance Guide or which is otherwise acceptable to Landlord and licensed to do business in the State of North Carolina; (iv) be primary insurance as to all claims

thereunder and provide that any insurance carried by Landlord is excess and is non-contributing with any insurance required of Tenant; (v) be in form and content reasonably acceptable to Landlord; and (vi) provide that said insurer shall endeavor to provide written notice to Landlord and any mortgagee of Landlord, to the extent such names are furnished to Tenant prior to the cancellation of such policy. Tenant shall deliver said policy or policies or certificates thereof to Landlord on or before the earlier to occur of (A) the Lease Commencement Date, and (B) the date upon which Tenant is first provided access to the Premises, and at least ten (10) days before the expiration dates thereof. In the event Tenant shall fail to procure such insurance, or to deliver such policies or certificate within ten (10) days after written notice from Landlord, Landlord may, at its option (upon notice to Tenant), procure such policies for the account of Tenant, and the cost thereof shall be paid to Landlord within five (5) days after delivery to Tenant of bills therefor.

10.5 **Subrogation**. Landlord and Tenant intend that their respective property loss risks shall be borne by reasonable insurance carriers to the extent above provided, and Landlord and Tenant hereby agree to look solely to, and seek recovery only from, their respective insurance carriers in the event of a property loss to the extent that such coverage is agreed to be provided hereunder. The parties each hereby waive all rights and claims against each other for such losses, and waive all rights of subrogation of their respective insurers, provided such waiver of subrogation shall not affect the right to the insured to recover thereunder. The parties agree that their respective insurance policies are now, or shall specify that the waiver of subrogation shall not affect the right of the insured to recover thereunder.

10.6 **Additional Insurance Obligations**. Tenant shall carry and maintain during the entire Lease Term, at Tenant's sole cost and expense, increased amounts of insurance to the extent required by any lender or mortgagee on the Building.

10.7 **Landlord Insurance Obligations**. Landlord shall keep in force during the term of this Lease at least the following coverage: (i) commercial general liability insurance against any and all claims for bodily injury and property damage occurring in or about the Building or the Common Areas having a combined single limit of not less than One Million Dollars ($1,000,000) per occurrence and Two Million Dollars ($2,000,000) in the aggregate, and (ii) property insurance for fire, casualty and special causes of loss in such amounts and coverages as Landlord deems appropriate or is otherwise required of Landlord by its lender or Applicable Law, but in no event less than the lesser of (a) at least one hundred percent (100%) percent of the replacement cost of the Building or (b) the maximum insurable value of the Building.

11. DAMAGE AND DESTRUCTION

11.1 **Repair of Damage to Premises by Landlord**. Tenant shall promptly notify Landlord of any damage to the Premises resulting from fire or any other casualty. If the Premises or any Common Areas serving or providing access to the Premises shall be damaged by fire or other casualty, Landlord shall promptly and diligently, subject to reasonable delays for insurance adjustment or other matters beyond Landlord's reasonable control, and subject to all other terms of this Article 11, restore such Common Areas and the Premises to substantially the same condition as existed prior to the casualty, except for modifications required by zoning and building codes and other laws or by the holder of a mortgage on the Building or Project or any other modifications to the Common Areas deemed desirable by Landlord, which are consistent with the character of the Project, provided that access to the or the use of Premises shall not be materially impaired. Upon the occurrence of any damage to the Premises, upon notice (the "**Landlord Repair Notice**") to Tenant from Landlord, Tenant shall assign to Landlord (or to any party designated by Landlord) all insurance proceeds payable to Tenant under Tenant's insurance required under Section 10.3.2(ii) of this Lease and Landlord's obligation to restore any Alterations or Tenant Improvements shall be limited to the extent of such proceeds received by Landlord. To the extent permitted pursuant to Applicable Laws, Landlord shall not be liable for any inconvenience or annoyance to Tenant or its visitors, or injury to Tenant's business resulting in any way from such damage or the repair thereof; provided however, that if such fire or other casualty shall have damaged the Premises or Common Areas necessary to Tenant's occupancy, and the Premises, or a material portion of the Premises, are not occupied by Tenant as a result thereof, then during the time and to the extent the Premises are unfit for occupancy, the Rent shall be abated in proportion to the ratio that the amount of rentable square feet of the Premises which is unfit for occupancy for the purposes permitted under this Lease bears to the total rentable square feet of the Premises.

11.2 **Landlord's Option to Repair**. Notwithstanding the terms of Section 11.1 of this Lease, Landlord may elect not to rebuild and/or restore the Premises, Building and/or Project, and instead terminate this Lease, by notifying Tenant in writing of such termination within forty-five (45) days after the date of discovery of the damage, such notice to include a termination date giving Tenant sixty (60) days to vacate the Premises, but Landlord may so elect only if the Building or Project shall be damaged by fire or other casualty or cause, whether or not the Premises are affected, and one or more of the following conditions is present: (i) in Landlord's reasonable judgment, repairs cannot reasonably be completed within one hundred eighty (180) days after the date of discovery of the damage (when such repairs are made without the payment of overtime or other premiums); (ii) the holder of any mortgage on the Building or Project or ground lessor with respect to the Building or Project shall require that the insurance proceeds or any portion thereof be used to retire the mortgage debt, or shall terminate the ground lease, as the case may be; (iii) at least Ten Thousand and 00/100 Dollars ($10,000.00) of damage is not fully covered by Landlord's insurance policies; (iv) intentionally omitted; (v) the damage occurs during the last twelve (12) months of the Lease Term; or (vi) any owner of any other portion of the Project, other than Landlord, does not intend to repair the damage to such portion of the Project; provided, however, that if Landlord does not elect to terminate this Lease pursuant to Landlord's termination right as provided above, and the repairs cannot, in the reasonable opinion of Landlord, be completed within one hundred eighty (180) days after the date of the damage, Tenant may elect, no earlier than thirty (30) days after the date of the damage and not later than ninety (90) days after the date of such damage, to terminate this Lease by written notice to Landlord effective as of the date specified in the notice, which date shall not be less than thirty (30) days nor more than sixty (60) days after the date such notice is given by Tenant. Notwithstanding the provisions of this Section 11.2, Tenant shall have the right to terminate this Lease under this Section 11.2 only if each of the following conditions is satisfied: (a) the damage to the Project by fire or other casualty was not caused by the gross negligence or intentional act of Tenant or its partners or subpartners and their respective officers, agents, servants, employees, and independent contractors; and (b) as a result of the damage, Tenant cannot reasonably conduct business from the Premises. In addition, Tenant may terminate this Lease if the damage to the Premises occurs during the last twelve (12) months of the Lease Term and such repair will take more than 10% of the remaining Term to repair.

12. NONWAIVER

No provision of this Lease shall be deemed waived by either party hereto unless expressly waived in a writing signed thereby. The waiver by either party hereto of any breach of any term, covenant or condition herein contained shall not be deemed to be a waiver of any subsequent breach of same or any other term, covenant or condition herein contained. The subsequent acceptance of Rent hereunder by Landlord shall not be deemed to be a waiver of any preceding breach by Tenant of any term, covenant or condition of this Lease, other than the failure of Tenant to pay the particular Rent so accepted, regardless of Landlord's knowledge of such preceding breach at the time of acceptance of such Rent. No acceptance of a lesser amount than the Rent herein stipulated shall be deemed a waiver of Landlord's right to receive the full amount due, nor shall any endorsement or statement on any check or payment or any letter accompanying such check or payment be deemed an accord and satisfaction, and Landlord may accept such check or payment without prejudice to Landlord's right to recover the full amount due. No receipt of monies by Landlord from Tenant after the termination of this Lease shall in any way alter the length of the Lease Term or of Tenant's right of possession hereunder, or after the giving of any notice shall reinstate, continue or extend the Lease Term or affect any notice given Tenant prior to the receipt of such monies, it being agreed that after the service of notice or the commencement of a suit, or after final judgment for possession of the Premises, Landlord may receive and collect any Rent due, and the payment of said Rent shall not waive or affect said notice, suit or judgment.

13. CONDEMNATION

If the whole or any part of the Premises, Building or Project shall be taken by power of eminent domain or condemned by any competent authority for any public or quasi-public use or purpose, or if any adjacent property or street shall be so taken or condemned, or reconfigured or vacated by such authority in such manner as to require the use, reconstruction or remodeling of any part of the Premises, Building or Project, or if Landlord shall grant a deed or other instrument in lieu of such taking by eminent domain or condemnation, Landlord shall have the option to terminate this Lease effective as of the date possession is required to be surrendered to the authority. Tenant shall not because of such taking assert any claim against Landlord or the authority for any compensation because of such taking and Landlord shall be entitled to the entire award or payment in connection therewith, except that Tenant shall have the right to file any separate claim available to Tenant for any taking of Tenant's personal property and fixtures

belonging to Tenant and removable by Tenant upon expiration of the Lease Term pursuant to the terms of this Lease, and for moving expenses, so long as such claims do not diminish the award available to Landlord, its ground lessor with respect to the Building or Project or its mortgagee, and such claim is payable separately to Tenant. All Rent shall be apportioned as of the date of such termination. If any part of the Premises shall be taken, and this Lease shall not be so terminated, the Rent shall be proportionately abated. Notwithstanding anything to the contrary contained in this Article 13, in the event of a temporary taking of all or any portion of the Premises for a period of one hundred and eighty (180) days or less, and provided that such temporary taking does not materially preclude or unreasonably diminish Tenant's ability to conduct business from the Premises, then this Lease shall not terminate but the Base Rent and the Additional Rent shall be abated for the period of such taking in proportion to the ratio that the amount of rentable square feet of the Premises taken bears to the total rentable square feet of the Premises. Landlord shall be entitled to receive the entire award made in connection with any such temporary taking, provided, however, that Tenant shall be entitled to a share of the award for any loss of fixtures and improvements and for moving and other reasonable expenses that do not otherwise reduce Landlord's recovery.

14. ASSIGNMENT AND SUBLETTING

14.1 **Transfers**. Tenant shall not, without the prior written consent of Landlord, assign, mortgage, pledge, hypothecate, encumber, or permit any lien to attach to, or otherwise transfer, this Lease or any interest hereunder, permit any assignment, or other transfer of this Lease or any interest hereunder by operation of law, sublet the Premises or any part thereof, or enter into any license or concession agreements or otherwise permit the occupancy or use of the Premises or any part thereof by any persons other than Tenant and its employees and contractors (all of the foregoing are hereinafter sometimes referred to collectively as "**Transfers**" and any person to whom any Transfer is made or sought to be made is hereinafter sometimes referred to as a "**Transferee**"). If Tenant desires Landlord's consent to any Transfer, Tenant shall notify Landlord in writing, which notice (the "**Transfer Notice**") shall include (i) the proposed effective date of the Transfer, which shall not be less than twenty (20) days nor more than one hundred eighty (180) days after the date of delivery of the Transfer Notice, (ii) a description of the portion of the Premises to be transferred (the "**Subject Space**"), (iii) all of the terms of the proposed Transfer and the consideration therefor, including calculation of the "**Transfer Premium**", as that term is defined in Section 14.3 below, in connection with such Transfer, the name and address of the proposed Transferee, and a copy of all existing executed and/or proposed documentation pertaining to the proposed Transfer, and (iv) current financial statements of the proposed Transferee certified by an officer, partner or owner thereof, business credit and personal references and history of the proposed Transferee and any other information reasonably required by Landlord which will enable Landlord to determine the financial responsibility, character, and reputation of the proposed Transferee, nature of such Transferee's business and proposed use of the Subject Space. Any Transfer made without Landlord's prior written consent shall, at Landlord's option, be null, void and of no effect, and shall, at Landlord's option, constitute a default by Tenant under this Lease. Whether or not Landlord consents to any proposed Transfer, Tenant shall pay Landlord's reasonable review and processing fees(not to exceed $1,500.00 for Landlord's internal costs) plus any reasonable professional fees (including, without limitation, attorneys', accountants', architects', engineers' and consultants' fees) incurred by Landlord, within thirty (30) days after written request by Landlord.

14.2 **Landlord's Consent**. Landlord shall not unreasonably withhold, condition or delay its consent to any proposed Transfer of the Subject Space to the Transferee on the terms specified in the Transfer Notice. Without limitation as to other reasonable grounds for withholding consent, the parties hereby agree that it shall be reasonable under this Lease and under any applicable law for Landlord to withhold consent to any proposed Transfer where one or more of the following apply:

14.2.1 The Transferee is of a character or reputation or engaged in a business which is not consistent with the quality of the Building or the Project;

14.2.2 The Transferee is either a governmental agency or instrumentality thereof;

14.2.3 The Transferee is not a party of reasonable financial worth and/or financial stability in light of the responsibilities to be undertaken in connection with the Transfer on the date consent is requested;

14.2.4 The proposed Transfer would cause a violation of another lease for space in the Project, or would give an occupant of the Project a right to cancel its lease; or

14.2.5 Either the proposed Transferee, or any person or entity which directly or indirectly, controls, is controlled by, or is under common control with, the proposed Transferee, is actively negotiating with Landlord or has negotiated with Landlord during the four (4) month period immediately preceding the date Landlord receives the Transfer Notice, to lease space in the Project (and Landlord has suitable space available in the Project to meet Transferee's needs).

14.2.6 In Landlord's reasonable determination, the sub-rent, additional rent or other amounts received or accrued by Tenant from subleasing, assigning or otherwise Transferring all or any portion of the Premises is based on the income or profits of any person, or the assignment of sublease could cause any portion of the amounts received by Landlord pursuant to this Lease to fail to qualify as "rents from real property" within the meaning of section 856(d) of the Internal Revenue Code of 1986, as amended (the "Code"), or any similar or successor provision thereto or which would cause any other income of Landlord to fail to qualify as income described in section 856(c)(2) of the Code.

If Landlord consents to any Transfer pursuant to the terms of this Section 14.2 (and does not exercise any recapture rights Landlord may have under Section 14.4 of this Lease), Tenant may within six (6) months after Landlord's consent, but not later than the expiration of said six-month period, enter into such Transfer of the Premises or portion thereof, upon substantially the same terms and conditions as are set forth in the Transfer Notice furnished by Tenant to Landlord pursuant to Section 14.1 of this Lease, provided that if there are any material changes in the terms and conditions from those specified in the Transfer Notice such that Landlord would initially have been entitled to refuse its consent to such Transfer under this Section 14.2, Tenant shall again submit the Transfer to Landlord for its approval and other action under this Article 14 (including Landlord's right of recapture, if any, under Section 14.4 of this Lease). Notwithstanding anything to the contrary in this Lease, if Tenant or any proposed Transferee claims that Landlord has unreasonably withheld or delayed its consent under Section 14.2 or otherwise has breached or acted unreasonably under this Article 14, their sole remedies shall be a suit for contract damages (other than damages for injury to, or interference with, Tenant's business including, without limitation, loss of profits, however occurring) or declaratory judgment and an injunction for the relief sought, and Tenant hereby waives all other remedies, including, without limitation, any right at law or equity to terminate this Lease, on its own behalf and, to the extent permitted under all Applicable Laws, on behalf of the proposed Transferee.

14.3 **Transfer Premium**. If Landlord consents to a Transfer, as a condition thereto which the parties hereby agree is reasonable, Tenant shall pay to Landlord fifty percent (50%) of any "**Transfer Premium**," as that term is defined in this Section 14.3, received by Tenant from such Transferee (other than any Permitted Transferee). "**Transfer Premium**" shall mean all rent, additional rent or other consideration payable by such Transferee in connection with the Transfer in excess of the Rent and Additional Rent payable by Tenant under this Lease during the term of the Transfer on a per rentable square foot basis if less than all of the Premises is transferred, after deducting the reasonable third party expenses incurred by Tenant for (i) any design and construction costs incurred on account of changes, alterations and improvements to the Premises in connection with the Transfer, (ii) any free base rent and tenant improvement allowances reasonably provided to the Transferee in connection with the Transfer (provided that such free rent and tenant improvement allowances shall be deducted only to the extent the same is included in the calculation of total consideration payable by such Transferee), (iii) any brokerage commissions in connection with the Transfer, (iv) legal fees and disbursements reasonably incurred in connection with the Transfer, and (v) any unamortized Excess Costs, as defined in Exhibit D (as determined on a straight line basis over the initial term of this Lease, without interest) paid by Tenant for the Tenant Improvements (collectively, "**Tenant's Subleasing Costs**"). "**Transfer Premium**" shall also include, but not be limited to, key money, bonus money or other cash consideration paid by Transferee to Tenant in connection with such Transfer, and any payment in excess of fair market value for services rendered by Tenant to Transferee or for assets, fixtures, inventory, equipment, or furniture transferred by Tenant to Transferee in connection with such Transfer. The determination of the amount of Landlord's applicable share of the Transfer Premium shall be made on a monthly basis as rent or other consideration is received by Tenant under the Transfer.

14.4 **Landlord's Option as to Subject Space**. Notwithstanding anything to the contrary contained in this Article 14, in the event Tenant contemplates a Transfer which, together with all prior Transfers then remaining in effect, would cause seventy-five percent (75%) or more of the Premises to be Transferred for more than fifty percent (50%) of the then remaining Lease Term (assuming all sublease renewal or extension rights are exercised), Tenant shall give Landlord notice (the "**Intention to Transfer Notice**") of such contemplated Transfer (whether or not the contemplated Transferee or the terms of such contemplated Transfer have been determined). The Intention to Transfer Notice shall specify the portion of and amount of rentable square feet of the Premises which Tenant intends to Transfer (the "**Contemplated Transfer Space**"), the contemplated date of commencement of the Contemplated Transfer (the "**Contemplated Effective Date**"), and the contemplated length of the term of such contemplated Transfer, and shall specify that such Intention to Transfer Notice is delivered to Landlord pursuant to this Section 14.4 in order to allow Landlord to elect to recapture the Contemplated Transfer Space. Thereafter, Landlord shall have the option, by giving written notice to Tenant within fifteen (15) days after receipt of any Intention to Transfer Notice, to recapture the Contemplated Transfer Space. Such recapture shall cancel and terminate this Lease with respect to such Contemplated Transfer Space as of the Contemplated Effective Date. In the event of a recapture by Landlord, if this Lease shall be canceled with respect to less than the entire Premises, the Rent reserved herein shall be prorated on the basis of the number of rentable square feet retained by Tenant in proportion to the number of rentable square feet contained in the Premises, and this Lease as so amended shall continue thereafter in full force and effect, and upon request of either party, the parties shall execute written confirmation of the same.

14.5 **Effect of Transfer**. If Landlord consents to a Transfer, (i) the terms and conditions of this Lease shall in no way be deemed to have been waived or modified, (ii) such consent shall not be deemed consent to any further Transfer by either Tenant or a Transferee, (iii) Tenant shall deliver to Landlord, promptly after execution, an original executed copy of all documentation pertaining to the Transfer in form reasonably acceptable to Landlord, (iv) intentionally omitted, and (v) no Transfer relating to this Lease or agreement entered into with respect thereto, whether with or without Landlord's consent, shall relieve Tenant or any guarantor of the Lease from any liability under this Lease, including, without limitation, in connection with the Subject Space.

14.6 **Sublease/Transfer Restrictions**. Notwithstanding anything contained herein to the contrary and without limiting the generality of Section 14.1 above, Tenant shall not: (a) sublet all or part of the Premises or assign or otherwise Transfer this Lease on any basis such that the rental or other amounts to be paid by the subtenant or assignee thereunder would be based, in whole or in part, on the income or profits derived by the business activities of the subtenant or assignee; (b) sublet all or part of the Premises or assign this Lease to any person or entity in which, under Section 856(d)(2)(B) of the Code, Longfellow Atlantic REIT, Inc., a Delaware corporation (the "Company"), or any affiliate of the Company owns, directly or indirectly (by applying constructive ownership rules set forth in Section 856(d)(5) of the Code), a ten percent (10%) or greater interest; or (c) sublet all or part of the Premises or assign this Lease in any other manner or otherwise derive any income which could cause any portion of the amounts received by Landlord pursuant hereto or any sublease to fail to qualify as "rents from real property" within the meaning of Section 856(d) of the Code, or which could cause any other income received by Landlord to fail to qualify as income described in Section 856(c)(2) of the Code. The requirements of this Section 14.4 shall likewise apply to any further subleasing, assignment or other Transfer by any subtenant or assignee. All references herein to Section 856 of the Code also shall refer to any amendments thereof or successor provisions thereto.

14.7 **Occurrence of Default**. Any Transfer hereunder shall be subordinate and subject to the provisions of this Lease, and if this Lease shall be terminated during the term of any Transfer, Landlord shall have the right to: (i) treat such Transfer as cancelled and repossess the Subject Space by any lawful means, or (ii) require that such Transferee attorn to and recognize Landlord as its landlord under any such Transfer. If Tenant shall be in default under this Lease (beyond applicable notice and cure period), Landlord is hereby irrevocably authorized to direct any Transferee to make all payments under or in connection with the Transfer directly to Landlord (which Landlord shall apply towards Tenant's obligations under this Lease) until such default is cured. Such Transferee shall rely on any representation by Landlord that Tenant is in default hereunder, without any need for confirmation thereof by Tenant. Upon any assignment, the assignee shall assume in writing all obligations and covenants of Tenant thereafter to be performed or observed under this Lease. No collection or acceptance of rent by Landlord from any Transferee shall be deemed a waiver of any provision of this Article 14 or the approval of any Transferee or a release of Tenant from any obligation under this Lease, whether theretofore or thereafter accruing. In no event shall Landlord's enforcement of any provision of this Lease against any Transferee be deemed a waiver of Landlord's right to enforce any term of this Lease against Tenant or any other person. If Tenant's obligations hereunder have been guaranteed, Landlord's consent to any Transfer shall not be effective unless the guarantor also consents to such Transfer.

14.8 **Non-Transfers**. Notwithstanding anything to the contrary contained in this Article 14, (i) an assignment or subletting of all or a portion of the Premises to an affiliate of Tenant (an entity which is controlled by, controls, or is under common control with, Tenant), (ii) an assignment of the Premises to an entity which acquires all or substantially all of the assets or interests (partnership, stock or other) of Tenant, (iii) an assignment of the Premises to an entity which is the resulting entity of a merger or consolidation of Tenant, or (iv) a sale of corporate shares of capital stock in Tenant in connection with an initial public offering of Tenant's stock on a nationally-recognized stock exchange (collectively, a "**Permitted Transferee**"), shall not be deemed a Transfer under this Article 14, provided that (A) Tenant notifies Landlord of any such assignment or sublease and promptly supplies Landlord with any documents or information reasonably requested by Landlord regarding such assignment or sublease or such affiliate, (B) such assignment or sublease is not a subterfuge by Tenant to avoid its obligations under this Lease, (C) such Permitted Transferee shall be of a character and reputation consistent with the quality of the Building, and (D) such Permitted Transferee shall have a tangible net worth (not including goodwill as an asset) computed in accordance with generally accepted accounting principles ("**Net Worth**") at least equal to the Net Worth of Tenant on the day immediately preceding the effective date of such assignment or sublease. An assignee of Tenant's entire interest that is also a Permitted Transferee may also be known as a "**Permitted Assignee**". "**Control**," as used in this Section 14.8, shall mean the ownership, directly or indirectly, of at least fifty-one percent (51%) of the voting securities of, or possession of the right to vote, in the ordinary direction of its affairs, of at least fifty-one percent (51%) of the voting interest in, any person or entity. No such permitted assignment or subletting shall serve to release Tenant from any of its obligations under this Lease.

15. SURRENDER OF PREMISES; OWNERSHIP AND REMOVAL OF TRADE FIXTURES

15.1 **Surrender of Premises**. No act or thing done by Landlord or any agent or employee of Landlord during the Lease Term shall be deemed to constitute an acceptance by Landlord of a surrender of the Premises unless such intent is specifically acknowledged in writing by Landlord. The delivery of keys to the Premises to Landlord or any agent or employee of Landlord shall not constitute a surrender of the Premises or effect a termination of this Lease, whether or not the keys are thereafter retained by Landlord, and notwithstanding such delivery Tenant shall be entitled to the return of such keys at any reasonable time upon request until this Lease shall have been properly terminated. The voluntary or other surrender of this Lease by Tenant, whether accepted by Landlord or not, or a mutual termination hereof, shall not work a merger, and at the option of Landlord shall operate as an assignment to Landlord of all subleases or subtenancies affecting the Premises or terminate any or all such sublessees or subtenancies.

15.2 **Removal of Tenant Property by Tenant**. Upon the expiration of the Lease Term, or upon any earlier termination of this Lease, Tenant shall, subject to the provisions of this Article 15, quit and surrender possession of the Premises to Landlord in as good order and condition as when Tenant took possession and as thereafter improved by Landlord and/or Tenant, reasonable wear and tear and repairs which are specifically made the responsibility of Landlord hereunder excepted. Upon such expiration or termination, Tenant shall, without expense to Landlord, remove or cause to be removed from the Premises all debris and rubbish, and such items of furniture, equipment, free-standing cabinet work, movable partitions (not including modular "clean rooms" built into the Premises as part of the Tenant Improvements) and other articles of personal property owned by Tenant or installed or placed by Tenant at its expense in the Premises, and such similar articles of any other persons claiming under Tenant, as Landlord may, in its sole discretion, require to be removed, and Tenant shall repair at its own expense all damage to the Premises and Building resulting from such removal. In no event shall any Landlord's Work be deemed to be Tenant's personal property, it being the intent that Tenant's personal property includes only those items that are not built into the Premises and that have not been constructed or installed by Landlord pursuant to the Work Letter.

15.3 **Environmental Assessment**. Prior to the expiration of the Lease (or within thirty (30) days after any earlier termination), Tenant shall clean and otherwise decommission all interior surfaces (including floors, walls, ceilings, and counters), piping, supply lines, waste lines and plumbing in or serving the Premises, and all exhaust or other ductwork in or serving the Premises, in each case that has carried, released or otherwise been exposed to any Hazardous Materials due to Tenant's use or occupancy of the Premises, and shall otherwise clean the Premises so as

to permit the Environmental Assessment called for by this Section 15.3 to be issued. Prior to the expiration of this Lease (or within thirty (30) days after any earlier termination), Tenant, at Tenant's expense, shall obtain for Landlord a report (an "**Environmental Assessment**") addressed to Landlord (and, at Tenant's election, Tenant) by a reputable licensed environmental consultant or industrial hygienist that is designated by Tenant and acceptable to Landlord in Landlord's reasonable discretion, which report shall be based on the environmental consultant's inspection of the Premises and shall state, to the Landlord's reasonable satisfaction, that (a) the Hazardous Materials described in the first sentence of this paragraph, to the extent, if any, existing prior to such decommissioning, have been removed in accordance with Applicable Laws; (b) all Hazardous Materials described in the first sentence of this paragraph, if any, have been removed in accordance with Applicable Laws from the interior surfaces of the Premises (including floors, walls, ceilings, and counters), piping, supply lines, waste lines and plumbing, and all such exhaust or other ductwork in the Premises, may be reused by a subsequent tenant or disposed of in compliance with Applicable Laws without incurring special costs or undertaking special procedures for demolition, disposal, investigation, assessment, cleaning or removal of such Hazardous Materials and without giving notice in connection with such Hazardous Materials; and (c) the Premises may be reoccupied for office, research and development, or laboratory use, demolished or renovated without incurring special costs or undertaking special procedures for disposal, investigation, assessment, cleaning or removal of Hazardous Materials described in the first sentence of this paragraph and without giving notice in connection with Hazardous Materials. Further, for purposes of clauses (b) and (c), "special costs" or "special procedures" shall mean costs or procedures, as the case may be, that would not be incurred but for the nature of the Hazardous Materials as Hazardous Materials instead of non-hazardous materials. The report shall also include reasonable detail concerning the clean-up measures taken, the clean-up locations, the tests run and the analytic results. Tenant shall submit to Landlord the scope of the proposed Environmental Assessment for Landlord's reasonable review and approval at least 30 days prior to commencing the work described therein or at least 60 days prior to the expiration of the Lease Term, whichever is earlier.

If Tenant fails to perform its obligations under this Section 15.3 without limiting any other right or remedy, Landlord may, on five (5) business days' prior written notice to Tenant perform such obligations at Tenant's expense if Tenant has not commenced to do so within said five day period, and Tenant shall within 10 days of written demand reimburse Landlord for all reasonable out-of-pocket costs and expenses incurred by Landlord in connection with such work. Tenant's obligations under this Section 15.3 shall survive the expiration or earlier termination of this Lease. In addition, at Landlord's election, Landlord may inspect the Premises and/or the Project for Hazardous Materials at Landlord's cost and expense within sixty (60) days of Tenant's surrender of the Premises at the expiration or earlier termination of this Lease. Tenant shall pay for all such costs and expenses incurred by Landlord in connection with such inspection if such inspection reveals that a release of Hazardous Materials exists at the Project or Premises as a proximate result of the acts or omissions of Tenant, its officers, employees, contractors, and agents (except to the extent resulting from (i) Hazardous Materials existing in the Premises as at the delivery of possession to Tenant (in which event Landlord shall be responsible for any Clean-up, as provided in this Lease), or (ii) the acts or omissions of Landlord or Landlord's agents, employees or contractors).

16. HOLDING OVER

If Tenant holds over after the expiration of the Lease Term or earlier termination thereof, with the express or implied consent of Landlord, such tenancy shall be from month-to-month only, and shall not constitute a renewal hereof or an extension for any further term. If Tenant holds over after the expiration of the Lease Term of earlier termination thereof, without the express or implied consent of Landlord, such tenancy shall be deemed to be a tenancy by sufferance only, and shall not constitute a renewal hereof or an extension for any further term. In either case, Base Rent shall be payable at a monthly rate equal to one hundred twenty-five percent (125%) of the Base Rent applicable during the last rental period of the Lease Term under this Lease for the first two (2) months of such holdover with such rate increasing to one hundred fifty percent (150%) of the Base Rent if Tenant holdsover longer than two (2) months. Such month-to-month tenancy or tenancy by sufferance, as the case may be, shall be subject to every other applicable term, covenant and agreement contained herein. Nothing contained in this Article 16 shall be construed as consent by Landlord to any holding over by Tenant, and Landlord expressly reserves the right to require Tenant to surrender possession of the Premises to Landlord as provided in this Lease upon the expiration or other termination of this Lease. The provisions of this Article 16 shall not be deemed to limit or constitute a waiver of any other rights or remedies of Landlord provided herein or at law. If Tenant fails to surrender the Premises upon the termination or expiration of this Lease, in addition to any other liabilities to Landlord accruing therefrom, Tenant shall protect, defend, indemnify and hold Landlord harmless from all loss, costs (including reasonable attorneys' fees) and liability resulting from such failure, including, without limiting the generality of the foregoing, any claims made by any succeeding tenant founded upon such failure to surrender and any lost profits to Landlord resulting therefrom.

17. ESTOPPEL CERTIFICATES

Within ten (10) business days following a request in writing by Landlord, Tenant shall execute, acknowledge and deliver to Landlord an estoppel certificate, which, as submitted by Landlord, shall be substantially in the form of **Exhibit F**, attached hereto (or such other commercially reasonable form as may be required by any prospective mortgagee or purchaser of the Project, or any portion thereof), indicating therein any exceptions thereto that may exist at that time, and shall also contain any other information reasonably requested by Landlord or Landlord's mortgagee or prospective mortgagee. Any such certificate may be relied upon by any prospective mortgagee or purchaser of all or any portion of the Project. Tenant shall execute and deliver whatever other instruments may be reasonably required for such purposes. At any time during the Lease Term, but not more often than twice per year, Landlord may require Tenant to provide Landlord with a current financial statement and financial statements of the two (2) years prior to the current financial statement year. Such statements shall be prepared in accordance with generally accepted accounting principles and, if such is the normal practice of Tenant, shall be audited by an independent certified public accountant. Failure of Tenant to timely execute, acknowledge and deliver such estoppel certificate or other instruments shall constitute an acceptance of the Premises and an acknowledgment by Tenant that statements included in the estoppel certificate are true and correct, without exception.

18. SUBORDINATION

This Lease shall be subject and subordinate to all present and future ground or underlying leases of the Building or Project and to the lien of any mortgage, trust deed or other encumbrances now or hereafter in force against the Building or Project or any part thereof, if any, and to all renewals, extensions, modifications, consolidations and replacements thereof, and to all advances made or hereafter to be made upon the security of such mortgages or trust deeds, unless the holders of such mortgages, trust deeds or other encumbrances, or the lessors under such ground lease or underlying leases, require in writing that this Lease be superior thereto. Tenant covenants and agrees in the event any proceedings are brought for the foreclosure of any such mortgage or deed in lieu thereof (or if any ground lease is terminated), to attorn, without any deductions or set-offs whatsoever, to the lienholder or purchaser or any successors thereto upon any such foreclosure sale or deed in lieu thereof (or to the ground lessor), if so requested to do so by such purchaser or lienholder or ground lessor, and to recognize such purchaser or lienholder or ground lessor as the lessor under this Lease, provided such lienholder or purchaser or ground lessor shall agree to accept this Lease and not disturb Tenant's occupancy, so long as Tenant timely pays the rent and observes and performs the terms, covenants and conditions of this Lease to be observed and performed by Tenant. Landlord's delivery to Tenant of commercially reasonable non-disturbance agreement(s) in favor of Tenant from any ground lessors, mortgage holders or lien holders of Landlord who come into existence following the date hereof but prior to the expiration of the Lease Term shall be in consideration of, and a condition precedent to, Tenant's agreement to subordinate this Lease to any such ground lease, mortgage or lien. Landlord's interest herein may be assigned as security at any time to any lienholder. Tenant shall, within ten (10) business days of request by Landlord, execute such further commercially reasonable instruments or assurances as Landlord may reasonably deem necessary to evidence or confirm the subordination or superiority of this Lease to any such mortgages, trust deeds, ground leases or underlying leases. Tenant waives the provisions of any current or future statute, rule or law which may give or purport to give Tenant any right or election to terminate or otherwise adversely affect this Lease and the obligations of the Tenant hereunder in the event of any foreclosure proceeding or sale.

19. DEFAULTS; REMEDIES

19.1 **Events of Default**. The occurrence of any of the following shall constitute a default of this Lease by Tenant:

19.1.1 Any failure by Tenant to pay any Rent or any other charge required to be paid under this Lease, or any part thereof, when due (provided, however, that it shall not be a default if Tenant makes full payment within five (5) business days after receipt of written notice of any delinquency; provided that Landlord shall not be required to provide more than one (1) such notices in any twelve (12) month period during the Lease Term); or

19.1.2 Except where a specific time period is otherwise set forth for Tenant's performance in this Lease, in which event the failure to perform by Tenant within such time period shall be a default by Tenant under this Section 19.1.2, any failure by Tenant to observe or perform any other provision, covenant or condition of this Lease to be observed or performed by Tenant where such failure continues for thirty (30) days after written notice thereof from Landlord to Tenant; provided that if the nature of such default is such that the same cannot reasonably be cured within a thirty (30) day period, Tenant shall not be deemed to be in default if it diligently commences such cure within such period and thereafter diligently proceeds to rectify and cure such default; or

19.1.3 Abandonment of the Premises by Tenant and failure to perform any obligation under this Lease regarding the maintenance, cleanliness or operation of the Premises within five (5) business days after notice from Landlord; or

19.1.4 The failure by Tenant to observe or perform according to the provisions of Articles 5, 14, 17 or 18 of this Lease where such failure continues for more than two (2) business days after notice from Landlord.

The notice periods provided herein are in lieu of, and not in addition to, any notice periods provided by law.

19.2 **Remedies Upon Default**. Upon the occurrence of any event of default by Tenant, Landlord shall have, in addition to any other remedies available to Landlord at law or in equity (all of which remedies shall be distinct, separate and cumulative), the option to pursue any one or more of the following remedies, each and all of which shall be cumulative and nonexclusive, without any separate notice or demand whatsoever.

19.2.1 Landlord may, immediately or at any time thereafter, elect to terminate this Lease by notice of termination, by entry, or by any other means available under law and may recover possession of the Premises as provided herein. Upon termination by notice, by entry, or by any other means available under law, Landlord shall be entitled immediately, in the case of termination by notice or entry, and otherwise in accordance with the provisions of law to recover possession of the Premises from Tenant and those claiming through or under the Tenant. Such termination of this Lease and repossession of the Premises shall be without prejudice to any remedies which Landlord might otherwise have for arrears of rent or for a prior breach of the provisions of this Lease. Tenant waives any statutory notice to quit and equitable rights in the nature of further cure or redemption, and Tenant agrees that upon Landlord's termination of this Lease Landlord shall be entitled to re-entry and possession in accordance with the terms hereof. Landlord may, without notice, store Tenant's personal property (and those of any person claiming under Tenant) at the expense and risk of Tenant or, if Landlord so elects, Landlord may sell such personal property at public auction or auctions or at private sale or sales after seven days' notice to Tenant and apply the net proceeds to the earliest of installments of rent or other charges owing Landlord. Tenant agrees that a notice by Landlord alleging any default shall, at Landlord's option (the exercise of such option shall be indicated by the inclusion of the words "notice to quit" in such notice), constitute a statutory notice to quit. If Landlord exercises its option to designate a notice of default hereunder as a statutory notice to quit, any grace periods provided for herein shall run concurrently with any statutory notice periods.

19.2.2 In the case of termination of this Lease pursuant to Section 19.2.1, Tenant shall reimburse Landlord for all expenses arising out of such termination, including without limitation, all reasonable costs incurred in collecting amounts due from Tenant under this Lease (including reasonable attorneys' fees, costs of litigation and the like); all expenses incurred by Landlord in attempting to relet the Premises or parts thereof (including advertisements, brokerage commissions, Tenant's allowances, costs of preparing space, and the like); and all Landlord's other reasonable expenditures necessitated by the termination. The reimbursement from Tenant shall be due and payable immediately from time to time upon notice from Landlord that an expense has been incurred, without regard to whether the expense was incurred before or after the termination.

19.2.3 Landlord may elect by written notice to Tenant within one year following such termination to be indemnified for loss of rent by a lump sum payment representing the then present value of the amount of Rent that would have been paid in accordance with this Lease for the remainder of the Lease Term minus the then present value of the aggregate fair market rent and additional charges payable for the Premises for the remainder of the Lease Term (if less than the Rent payable hereunder), estimated as of the date of the termination, and taking into account reasonable projections of vacancy and time required to re-lease the Premises. (For the purposes of calculating the Rent that would have been paid hereunder for the lump sum payment calculation described herein, the last full year's Additional Rent under Article 4 is to be deemed constant for each year thereafter. The Federal Reserve discount rate (or equivalent) shall be used in calculating present values.) Should the parties be unable to agree on a fair market rent, the matter shall be submitted, upon the demand of either party, to the Charlotte, North Carolina office of the American Arbitration Association, with a request for arbitration in accordance with the rules of the Association by a single arbitrator who shall be an MAI appraiser with at least ten years' experience as an appraiser of life sciences buildings in the Research Triangle Park and Durham markets. The parties agree that a decision of the arbitrator shall be conclusive and binding upon them. If, at the end of the Lease Term, the rent that Landlord has actually received from the Premises is less than the aggregate fair market rent estimated as aforesaid, Tenant shall thereupon pay Landlord the amount of such difference. If and for so long as Landlord does not make the election provided for in this Section 19.2.3, Tenant shall indemnify Landlord for the loss of Rent by a payment at the end of each month which would have been included in the Lease Term, representing the excess of the Rent that would have been paid in accordance with this Lease (Base Rent together with any Additional Rent that would have been payable under Article 4, to be ascertained monthly) over the rent actually derived from the Premises by Landlord for such month (the amount of rent deemed derived shall be the actual amount less any portion thereof attributable to Landlord's reletting expenses described in Section 19.2.2 that have not been reimbursed by Tenant thereunder).

19.2.4 Intentionally Omitted.

19.2.5 In lieu of any other damages or indemnity and in lieu of full recovery by Landlord of all sums payable under all the foregoing provisions of this Section 19.2, Landlord may by written notice to Tenant within six (6) months after termination under any of the provisions contained in Section 19.1 and before such full recovery, elect to recover, and Tenant shall thereupon pay, as minimum liquidated damages under this Section 19.2, an amount equal to the lesser of (i) the aggregate of the Base Rent and Additional Rent for the balance of the Lease Term had it not been terminated or (ii) the aggregate thereof for the 12 months ending one year after the termination date, plus in either case (iii) the amount of Base Rent and Additional Rent of any kind accrued and unpaid at the time of termination and minus (iv) the amount of any recovery by Landlord under the foregoing provisions of this Section 19.2 up to the time of payment of such liquidated damages (but reduced by any amounts of reimbursement under Section 19.2.2). Liquidated damages hereunder shall not be in lieu of any claims for reimbursement under Section 19.2.2.

19.2.6 If Landlord does not elect to terminate this Lease on account of any default by Tenant, Landlord may, from time to time, without terminating this Lease, enforce all of its rights and remedies under this Lease, including the right to recover all rent as it becomes due.

19.2.7 Landlord shall at all times have the rights and remedies (which shall be cumulative with each other and cumulative and in addition to those rights and remedies available under Sections 19.2.1 and 19.2.2, above, or any law or other provision of this Lease), without prior demand or notice except as required by Applicable Law, to seek any declaratory, injunctive or other equitable relief, and specifically enforce this Lease, or restrain or enjoin a violation or breach of any provision hereof. The provisions of this Section 19.2.7 are not dependent upon the occurrence of a default.

19.2.8 Any obligation imposed by law upon Landlord to relet the Premises after any termination of the Lease shall be subject to the reasonable requirements of Landlord to lease to high quality tenants on such terms as Landlord may from time to time deem reasonably appropriate and to develop the Building in a harmonious manner with an appropriate mix of uses, tenants, floor areas and terms of tenancies, and the like, and Landlord shall not be obligated to relet the Premises to any party to whom Landlord or its affiliate may desire to lease other available space in the Building.

19.2.9 Nothing herein shall limit or prejudice the right of Landlord to prove and obtain in a proceeding for bankruptcy, insolvency, arrangement or reorganization, by reason of the termination, an amount equal to the maximum allowed by a statute of law in effect at the time when, and governing the proceedings in which, the damages are to be proved, whether or not the amount is greater to, equal to, or less than the amount of the loss or damage which Landlord has suffered.

19.3 **Subleases of Tenant**. Whether or not Landlord elects to terminate this Lease on account of any default by Tenant, as set forth in this Article 19, Landlord shall have the right to terminate any and all subleases, licenses, concessions or other consensual arrangements for possession entered into by Tenant and affecting the Premises or may, in Landlord's sole discretion, succeed to Tenant's interest in such subleases, licenses, concessions or arrangements. In the event of Landlord's election to succeed to Tenant's interest in any such subleases, licenses, concessions or arrangements, Tenant shall, as of the date of notice by Landlord of such election, have no further right to or interest in the rent or other consideration receivable thereunder.

19.4 **Efforts to Relet**. No re-entry or repossession, repairs, maintenance, changes, alterations and additions, reletting, appointment of a receiver to protect Landlord's interests hereunder, or any other action or omission by Landlord shall be construed as an election by Landlord to terminate this Lease or Tenant's right to possession, or to accept a surrender of the Premises, nor shall same operate to release Tenant in whole or in part from any of Tenant's obligations hereunder, unless express written notice of such intention is sent by Landlord to Tenant. Tenant hereby irrevocably waives any right otherwise available under any law to redeem or reinstate this Lease.

19.5 **Landlord Default**.

19.5.1 **General**. Notwithstanding anything to the contrary set forth in this Lease, Landlord shall not be in default in the performance of any obligation required to be performed by Landlord pursuant to this Lease unless Landlord fails to perform such obligation within thirty (30) days after the receipt of notice from Tenant specifying in detail Landlord's failure to perform; provided, however, if the nature of Landlord's obligation is such that more than thirty (30) days are required for its performance, then Landlord shall not be in default under this Lease if it shall commence such performance within such thirty (30) day period and thereafter diligently pursue the same to completion. Upon any such default by Landlord under this Lease, Tenant may, except as otherwise specifically provided in this Lease to the contrary, exercise any of its rights provided at law or in equity.

19.5.2 **Intentionally Omitted**.

20. COVENANT OF QUIET ENJOYMENT

Landlord covenants that Tenant, on paying the Rent, charges for services and other payments herein reserved and on keeping, observing and performing all the other terms, covenants, conditions, provisions and agreements herein contained on the part of Tenant to be kept, observed and performed, shall, during the Lease Term, peaceably and quietly have, hold and enjoy the Premises subject to the terms, covenants, conditions, provisions and agreements hereof without interference by any persons lawfully claiming by or through Landlord. The foregoing covenant is in lieu of any other covenant express or implied.

21. SECURITY DEPOSIT

Concurrently with Tenant's execution and delivery of this Lease, Tenant shall deposit with Landlord cash in the amount set forth in Section 9 of the Summary as security for the faithful performance by Tenant of all of its obligations under this Lease. The Security Deposit shall be held by Landlord as security for the faithful performance by Tenant of all of the terms, covenants and conditions of this Lease to be kept and performed by Tenant during the period commencing on the Execution Date and ending upon the expiration or termination of Tenant's obligations under this Lease. After an Event of Default Landlord may (but shall not be required to) use, apply or retain all or any part of the Security Deposit for the payment of any Rent or any other sum in default, or to compensate Landlord for any other loss or damage that Landlord may suffer by reason of Tenant's default as provided in this Lease. The provisions of this Article shall survive the expiration or earlier termination of this Lease. In the event of bankruptcy or other debtor-creditor proceedings against Tenant, the Security Deposit then being held by Landlord shall be deemed to be applied first to the payment of Rent and other charges due Landlord for all periods prior to the filing of such proceedings. Landlord shall deliver or credit to any purchaser of Landlord's interest in the Premises the funds then

held hereunder by Landlord, and thereupon (and upon confirmation by the transferee of such funds, whether expressly or by written assumption of this Lease, generally) Landlord shall be discharged from any further liability with respect to such funds. This provision shall also apply to any subsequent transfers. If Tenant shall fully and faithfully perform every provision of this Lease to be performed by it, then the Security Deposit, if any, or any balance thereof, shall be returned to Tenant (or, at Landlord's option, to the last assignee of Tenant's interest hereunder) within 90 days after the expiration or earlier termination of this Lease. Landlord shall hold the Security Deposit in an account at a banking organization selected by Landlord; provided, however, that Landlord shall not be required to maintain a separate account for the Security Deposit, but may intermingle it with other funds of Landlord. Landlord shall be entitled to all interest and/or dividends, if any, accruing on such Security Deposit.

22. SUBSTITUTION OF OTHER PREMISES

Intentionally omitted.

23. SIGNS

23.1 **Interior Signage**. All letters and numerals on doors or other signs on the Premises shall be in the standard form of graphics for the Building, and no others shall be used or permitted without Landlord's prior written consent, not to be unreasonably withheld, conditioned, or delayed. Furthermore, Tenant shall not place signs on or in the Premises which are visible from outside the Premises. Tenant's name and suite number shall be included by Landlord on the lobby directory for the Building, at Landlord's cost.

23.2 **Intentionally omitted**.

23.3 **Prohibited Signage and Other Items**. Any signs, notices, logos, pictures, names or advertisements which are installed and that have not been separately approved by Landlord may be removed without notice by Landlord at the sole expense of Tenant. Tenant may not install any signs on the exterior or roof of the Project or the Common Areas. Any signs, window coverings, or blinds (even if the same are located behind the Landlord-approved window coverings for the Building), or other items visible from the exterior of the Premises or Building, shall be subject to the prior approval of Landlord, in its sole discretion. Tenant shall not place or install any projections, antennae, aerials, or similar devices inside or outside of the Building, without the prior written approval of Landlord (not to be unreasonably withheld, conditioned, or delayed), subject to Tenant's rights pursuant to Section 23.1, above.

24. COMPLIANCE WITH LAW

Tenant shall not do anything or suffer anything to be done in or about the Premises or the Project which will conflict with any law, statute, ordinance or other governmental rule, regulation or requirement now in force or which may hereafter be enacted or promulgated (collectively, "**Applicable Laws**"). At its sole cost and expense, Tenant shall promptly comply with all such Applicable Laws which relate to (i) Tenant's use of the Premises, (ii) any Alterations or Tenant Improvements, or (iii) the Building, but as to the Building (and as to any improvements to exterior walls, structural floors and the portions of the electrical, heating, ventilation and air conditioning and other systems of the Building that serve other tenants and that are located within the Premises), only to the extent such obligations are triggered by Alterations or Tenant Improvements, or Tenant's use of the Premises for non-general office and laboratory use. Tenant shall be responsible, at its sole cost and expense, to make all alterations to the Premises as are required to comply with the Applicable Laws to the extent required in this Article 24. Notwithstanding the foregoing terms of this Article 24 to the contrary, Tenant may defer such compliance with Applicable Laws while Tenant contests, in a court of proper jurisdiction, in good faith, the applicability of such Applicable Laws to the Premises or Tenant's specific use or occupancy of the Premises; provided, however, Tenant may only defer such compliance if such deferral shall not (a) prohibit Tenant from obtaining or maintaining a certificate of occupancy for the Premises, (b) prohibit Landlord from obtaining or maintaining a certificate of occupancy for the Building or any portion thereof, (c) unreasonably and materially affect the safety of the employees and/or invitees of Landlord or of any tenant in the Building (including Tenant), (d) create a significant health hazard for the employees and/or invitees of Landlord or of any tenant in the Building (including Tenant), (e) otherwise materially and adversely affect Tenant's use of or access to the Buildings or the Premises, or (f) impose material obligations, liability, fines, or penalties upon Landlord or any other tenant of the Building, or would materially and adversely affect the use of or access to the

Building by Landlord or other tenants or invitees of the Building. The judgment of any court of competent jurisdiction or the admission of Tenant in any judicial action, regardless of whether Landlord is a party thereto, that Tenant has violated any of said governmental measures, shall be conclusive of that fact as between Landlord and Tenant. Landlord shall comply with all Applicable Laws relating to the Base Building and the Common Areas, provided that compliance with such Applicable Laws is not the responsibility of Tenant under this Lease, and provided further that Landlord's failure to comply therewith would prohibit Tenant from obtaining or maintaining a certificate of occupancy for the Premises, or would unreasonably and materially affect the safety of Tenant's employees or create a significant health hazard for Tenant's employees, or would otherwise materially and adversely affect Tenant's use of or access to the Premises. Landlord shall be permitted to include in Operating Expenses any costs or expenses incurred by Landlord under this Article 24 to the extent not prohibited by the terms of Section 4.2.7 above.

25. LATE CHARGES

If any installment of Rent or any other sum due from Tenant shall not be received by Landlord or Landlord's designee within five (5) business days after Tenant's receipt of written notice from Landlord that said amount is due, then Tenant shall pay to Landlord a late charge equal to five percent (5%) of the overdue amount plus any reasonable attorneys' fees incurred by Landlord by reason of Tenant's failure to pay Rent and/or other charges when due hereunder. Notwithstanding the foregoing, Landlord shall not charge Tenant a late charge for the first (1st) late payment in any twelve (12) month period (but in no event with respect to any subsequent late payment in any twelve (12) month period) during the Lease Term that Tenant fails to timely pay Rent or another sum due under this Lease, provided that such late payment is made within three (3) days following the expiration of the five (5) business day period set forth in the first sentence of this Article 25. The late charge shall be deemed Additional Rent and the right to require it shall be in addition to all of Landlord's other rights and remedies hereunder or at law and shall not be construed as liquidated damages or as limiting Landlord's remedies in any manner. In addition to the late charge described above, any Rent or other amounts owing hereunder which are not paid when due shall bear interest from the date when due until paid at a rate per annum equal to the lesser of (i) the annual "**Bank Prime Loan**" rate cited in the Federal Reserve Statistical Release Publication G.13(415), published on the first Tuesday of each calendar month (or such other comparable index as Landlord and Tenant shall reasonably agree upon if such rate ceases to be published) plus four (4) percentage points, and (ii) the highest rate permitted by Applicable Law.

26. LANDLORD'S RIGHT TO CURE DEFAULT; PAYMENTS BY TENANT

26.1 **Landlord's Cure**. All covenants and agreements to be kept or performed by Tenant under this Lease shall be performed by Tenant at Tenant's sole cost and expense and without any reduction of Rent, except to the extent, if any, otherwise expressly provided herein. If Tenant shall fail to perform any obligation under this Lease, and such failure shall continue after notice in excess of the time allowed under Section 19.1.2, above, unless a specific time period is otherwise stated in this Lease, Landlord may, but shall not be obligated to, make any such payment or perform any such act on Tenant's part without waiving its rights based upon any default of Tenant and without releasing Tenant from any obligations hereunder.

26.2 **Tenant's Reimbursement**. Except as may be specifically provided to the contrary in this Lease, Tenant shall pay to Landlord, upon delivery by Landlord to Tenant of statements therefor: (i) sums equal to expenditures reasonably made and obligations incurred by Landlord in connection with the remedying by Landlord of Tenant's defaults pursuant to the provisions of Section 26.1; (ii) sums equal to all losses, costs, liabilities, damages and expenses referred to in Article 10 of this Lease; and (iii) sums equal to all expenditures made and obligations incurred by Landlord in collecting or attempting to collect the Rent or in enforcing or attempting to enforce any rights of Landlord under this Lease or pursuant to law, including, without limitation, all reasonable legal fees and other amounts so expended. Tenant's obligations under this Section 26.2 shall survive the expiration or sooner termination of the Lease Term.

27. ENTRY BY LANDLORD

Provided, however, that any such entry by Landlord shall (i) remain subject to Tenant's reasonable security and privacy measures; and (ii) not unreasonably interfere with Tenant's use and occupancy of the Premises, or the conduct of its business therein, then Landlord reserves the right at all reasonable times and upon not less than one (1)

day's prior written (e-mail is acceptable) notice to Tenant (except in the case of an emergency) to enter the Premises to (i) inspect them; (ii) show the Premises to prospective purchasers, or to current or prospective mortgagees, ground or underlying lessors or insurers or, during the last nine (9) months of the Lease Term, to prospective tenants; (iii) post notices of nonresponsibility (to the extent applicable pursuant to then Applicable Law); or (iv) alter, improve or repair the Premises or the Building, or for structural alterations, repairs or improvements to the Building or the Building's systems and equipment. Provided that Landlord employs commercially reasonable efforts to minimize interference with the conduct of Tenant's business in connection with entries into the Premises, Landlord may make any such entries without the abatement of Rent, except as otherwise provided in this Lease, and shall take such reasonable steps as required to accomplish the stated purposes. In an emergency, Landlord shall have the right to use any means that Landlord may deem proper to open the doors in and to the Premises. Any entry into the Premises by Landlord in the manner hereinbefore described shall not be deemed to be a forcible or unlawful entry into, or a detainer of, the Premises, or an actual or constructive eviction of Tenant from any portion of the Premises.

28. TENANT PARKING

Tenant shall have the right, without the payment of any parking charge or fee (other than as a reimbursement of operating expenses to the extent allowed pursuant to the terms of Article 4 of this Lease, above), commencing on the Lease Commencement Date, to use the amount of unreserved parking spaces set forth in Section 10 of the Summary, on a monthly basis throughout the Lease Term, which parking spaces shall pertain to the on-site and/or off-site, as the case may be, parking facility (or facilities) which serve the Project. Notwithstanding the foregoing, Tenant shall be responsible for the full amount of any taxes imposed by any governmental authority in connection with the renting of such parking spaces by Tenant or the use of the parking facility by Tenant. Tenant's continued right to use the parking spaces is conditioned upon Tenant abiding by all rules and regulations which are prescribed from time to time for the orderly operation and use of the parking facility where the parking spaces are located (including any sticker or other identification system established by Landlord and the prohibition of vehicle repair and maintenance activities in the parking facilities), and shall reasonably cooperate in seeing that Tenant's employees and visitors also comply with such rules and regulations. Tenant's use of the Project parking facility shall be at Tenant's sole risk and Tenant acknowledges and agrees that Landlord shall have no liability whatsoever for damage to the vehicles of Tenant, its employees and/or visitors, or for other personal injury or property damage or theft relating to or connected with the parking rights granted herein or any of Tenant's, its employees' and/or visitors' use of the parking facilities.

29. MISCELLANEOUS PROVISIONS

29.1 **Terms; Captions**. The words "**Landlord**" and "**Tenant**" as used herein shall include the plural as well as the singular. The necessary grammatical changes required to make the provisions hereof apply either to corporations or partnerships or individuals, men or women, as the case may require, shall in all cases be assumed as though in each case fully expressed. The captions of Articles and Sections are for convenience only and shall not be deemed to limit, construe, affect or alter the meaning of such Articles and Sections.

29.2 **Binding Effect**. Subject to all other provisions of this Lease, each of the covenants, conditions and provisions of this Lease shall extend to and shall, as the case may require, bind or inure to the benefit not only of Landlord and of Tenant, but also of their respective heirs, personal representatives, successors or assigns, provided this clause shall not permit any assignment by Tenant contrary to the provisions of Article 14 of this Lease.

29.3 **No Air Rights**. No rights to any view or to light or air over any property, whether belonging to Landlord or any other person, are granted to Tenant by this Lease. If at any time any windows of the Premises are temporarily darkened or the light or view therefrom is obstructed by reason of any repairs, improvements, maintenance or cleaning in or about the Project, the same shall be without liability to Landlord and without any reduction or diminution of Tenant's obligations under this Lease.

29.4 **Modification of Lease**. Should any current or prospective mortgagee or ground lessor for the Building or Project require a modification of this Lease, which modification will not cause an increased cost or expense to Tenant or in any other way materially and adversely change the rights and obligations of Tenant hereunder, then and in such event, Tenant agrees that this Lease may be so modified and agrees to execute whatever documents are reasonably required therefor and to deliver the same to Landlord within ten (10) business days following a request therefor. At the request of Landlord or any mortgagee or ground lessor, Tenant agrees to execute a short form of Lease and deliver the same to Landlord within ten (10) business days following the request therefor.

29.5 **Transfer of Landlord's Interest**. Tenant acknowledges that Landlord has the right to transfer all or any portion of its interest in the Project or Building and in this Lease, and Tenant agrees that in the event of any such transfer, Landlord shall automatically be released from all liability under this Lease and Tenant agrees to look solely to such transferee for the performance of Landlord's obligations hereunder after the date of transfer and such transferee shall be deemed to have fully assumed and be liable for all obligations of this Lease to be performed by Landlord, including the return of any Security Deposit, and Tenant shall attorn to such transferee.

29.6 **Prohibition Against Recording**. In the event this Lease, a copy or any notice or memorandum thereof shall be recorded by Tenant without Landlord's consent, then such recording shall constitute a default by Tenant under Article 19 hereof entitling Landlord to immediately terminate this Lease. At the request of either Landlord or Tenant, the parties shall execute a memorandum of lease in recordable form containing such information as is necessary to constitute a notice of lease under North Carolina law. All costs of preparation and recording such notice shall be borne by the party requesting the memorandum. At the expiration or earlier termination of this Lease, Tenant shall provide Landlord with an executed termination of the memorandum in recordable form, which obligation shall survive such expiration or earlier termination.

29.7 **Landlord's Title**. Landlord's title is and always shall be paramount to the title of Tenant. Nothing herein contained shall empower Tenant to do any act which can, shall or may encumber the title of Landlord.

29.8 **Relationship of Parties**. Nothing contained in this Lease shall be deemed or construed by the parties hereto or by any third party to create the relationship of principal and agent, partnership, joint venturer or any association between Landlord and Tenant.

29.9 **Application of Payments**. Landlord shall have the right to apply payments received from Tenant pursuant to this Lease, regardless of Tenant's designation of such payments, to satisfy any obligations of Tenant hereunder, in such order and amounts as Landlord, in its sole discretion, may elect.

29.10 **Time of Essence**. Time is of the essence with respect to the performance of every provision of this Lease in which time of performance is a factor.

29.11 **Partial Invalidity**. If any term, provision or condition contained in this Lease shall, to any extent, be invalid or unenforceable, the remainder of this Lease, or the application of such term, provision or condition to persons or circumstances other than those with respect to which it is invalid or unenforceable, shall not be affected thereby, and each and every other term, provision and condition of this Lease shall be valid and enforceable to the fullest extent possible permitted by law.

29.12 **No Warranty**. In executing and delivering this Lease, Tenant has not relied on any representations, including, but not limited to, any representation as to the amount of any item comprising Additional Rent or the amount of the Additional Rent in the aggregate or that Landlord is furnishing the same services to other tenants, at all, on the same level or on the same basis, or any warranty or any statement of Landlord which is not set forth herein or in one or more of the exhibits attached hereto.

29.13 **Landlord Exculpation**. The liability of Landlord or the Landlord Parties to Tenant for any default by Landlord under this Lease or arising in connection herewith or with Landlord's operation, management, leasing, repair, renovation, alteration or any other matter relating to the Project or the Premises shall be limited solely and exclusively to an amount which is equal to the interest of Landlord in the Building (including rental income and insurance/condemnation proceeds). Neither Landlord, nor any of the Landlord Parties shall have any personal liability therefor, and Tenant hereby expressly waives and releases such personal liability on behalf of itself and all persons claiming by, through or under Tenant. The limitations of liability contained in this Section 29.13 shall inure to the benefit of Landlord's and the Landlord Parties' present and future partners, beneficiaries, officers, directors, trustees, shareholders, agents and employees, and their respective partners, heirs, successors and assigns. Under no

circumstances shall any present or future partner of Landlord (if Landlord is a partnership), or trustee or beneficiary (if Landlord or any partner of Landlord is a trust), have any liability for the performance of Landlord's obligations under this Lease. Notwithstanding any contrary provision herein, neither Landlord nor the Landlord Parties, not Tenant (except with respect to any holdover tenancy) shall be liable under any circumstances for consequential or indirect damages, including without limitation injury or damage to, or interference with, Tenant's business, including but not limited to, loss of profits, loss of rents or other revenues, loss of business opportunity, loss of goodwill or loss of use, in each case, however occurring.

29.14 **Entire Agreement**. It is understood and acknowledged that there are no oral agreements between the parties hereto affecting this Lease and this Lease constitutes the parties' entire agreement with respect to the leasing of the Premises and supersedes and cancels any and all previous negotiations, arrangements, brochures, agreements and understandings, if any, between the parties hereto or displayed by Landlord to Tenant with respect to the subject matter thereof, and none thereof shall be used to interpret or construe this Lease. None of the terms, covenants, conditions or provisions of this Lease can be modified, deleted or added to except in writing signed by the parties hereto.

29.15 **Right to Lease**. Landlord reserves the absolute right to effect such other tenancies in the Project as Landlord in the exercise of its sole business judgment shall determine to best promote the interests of the Building or Project. Tenant does not rely on the fact, nor does Landlord represent, that any specific tenant or type or number of tenants shall, during the Lease Term, occupy any space in the Building or Project.

29.16 **Force Majeure**. Any prevention, delay or stoppage due to strikes, lockouts, labor disputes, acts of God, acts of war, terrorist acts, governmental action or inaction, inability to obtain services, labor, or materials or reasonable substitutes therefor, governmental actions, civil commotions, fire or other casualty, and other causes beyond the reasonable control of the party obligated to perform, except with respect to the obligations imposed with regard to Rent and other charges to be paid by Tenant pursuant to this Lease (collectively, a "**Force Majeure**"), notwithstanding anything to the contrary contained in this Lease, shall excuse the performance of such party for a period equal to any such prevention, delay or stoppage and, therefore, if this Lease specifies a time period for performance of an obligation of either party, that time period shall be extended by the period of any delay in such party's performance caused by a Force Majeure.

29.17 **Waiver of Redemption by Tenant**. Tenant hereby waives, for Tenant and for all those claiming under Tenant, any and all rights now or hereafter existing to redeem by order or judgment of any court or by any legal process or writ, Tenant's right of occupancy of the Premises after any termination of this Lease.

29.18 **Notices**. All notices, demands, statements, designations, approvals or other communications (collectively, "**Notices**") given or required to be given by either party to the other hereunder or by law shall be in writing, shall be (A) sent by United States certified or registered mail, postage prepaid, return receipt requested ("**Mail**"), (B) delivered by a nationally recognized overnight courier, or (D) delivered personally. Any Notice shall be sent, transmitted, or delivered, as the case may be, to Tenant at the appropriate address set forth in Section 11 of the Summary, or to such other place as Tenant may from time to time designate in a Notice to Landlord, or to Landlord at the addresses set forth below, or to such other places as Landlord may from time to time designate in a Notice to Tenant. Any Notice will be deemed given (i) upon receipt or refusal, (ii) the date the overnight courier delivery is made, or (iii) the date personal delivery is made. As of the date of this Lease, any Notices to Landlord must be sent, transmitted, or delivered, as the case may be, to the following addresses:

DURHAM TW ALEXANDER, LLC
c/o Longfellow Real Estate Partners
260 Franklin Street, Suite 1920
Boston, MA 02110
Attention: Asset Management

And

David E. Wagner
K&L Gates LLP

4350 Lassiter at North Hills Avenue
Suite 300 (27609)
Post Office Box 17047
Raleigh, North Carolina 27619-7047

29.19 **Joint and Several**. If there is more than one Tenant, the obligations imposed upon Tenant under this Lease shall be joint and several.

29.20 **Authority**. Landlord and Tenant each hereby represents and warrants that it is a duly formed and existing entity qualified to do business in the State of North Carolina and that said party has full right and authority to execute and deliver this Lease and that each person signing on behalf of said party is authorized to do so.

29.21 **Attorneys' Fees**. In the event that either Landlord or Tenant should bring suit for the possession of the Premises, for the recovery of any sum due under this Lease, or because of the breach of any provision of this Lease or for any other relief against the other, then all costs and expenses, including reasonable attorneys' fees, incurred by the prevailing party therein shall be paid by the other party, which obligation on the part of the other party shall be deemed to have accrued on the date of the commencement of such action and shall be enforceable whether or not the action is prosecuted to judgment.

29.22 **Governing Law; WAIVER OF TRIAL BY JURY**. This Lease shall be construed and enforced in accordance with the laws of the State of North Carolina. Landlord and Tenant waive trial by jury in any action to which they are parties, and further agree that any action arising out of this Lease (except an action for possession by Landlord, which may be brought in whatever manner or place provided by law) shall be brought in the Trial Court, Superior Court Department, in the county where the Premises are located.

29.23 **Submission of Lease**. Submission of this instrument for examination or signature by Tenant does not constitute a reservation of, option for or option to lease, and it is not effective as a lease or otherwise until execution and delivery by both Landlord and Tenant.

29.24 **Brokers**. Landlord and Tenant hereby warrant to each other that it has had no dealings with any real estate broker or agent in connection with the negotiation of this Lease, excepting only the real estate brokers or agents specified in Section 13 of the Summary (the "**Brokers**"), and that it knows of no other real estate broker or agent which represented said party who is entitled to a commission in connection with this Lease. Landlord and Tenant each agree to indemnify and defend each other against and hold the indemnified party harmless from any and all claims, demands, losses, liabilities, lawsuits, judgments, costs and expenses (including without limitation reasonable attorneys' fees) with respect to any leasing commission or equivalent compensation alleged to be owing on account of any dealings with any real estate broker or agent, other than the Brokers, occurring by, through, or under the indemnifying party. The terms of this Section 29.24 shall survive the expiration or earlier termination of the Lease Term.

29.25 **Independent Covenants**. This Lease shall be construed as though the covenants herein between Landlord and Tenant are independent and not dependent and Tenant hereby expressly waives the benefit of any statute to the contrary and agrees that if Landlord fails to perform its obligations set forth herein, Tenant shall not be entitled to make any repairs or perform any acts hereunder at Landlord's expense or to any setoff of the Rent or other amounts owing hereunder against Landlord.

29.26 **Project or Building Name, Address and Signage**. Landlord shall have the right at any time to change the name and/or address of the Project or Building and to install, affix and maintain any and all signs on the exterior and on the interior of the Project or Building as Landlord may, in Landlord's sole discretion, desire. Tenant shall not use the name of the Project or Building or use pictures or illustrations of the Project or Building in advertising or other publicity or for any purpose other than as the address of the business to be conducted by Tenant in the Premises, without the prior written consent of Landlord.

29.27 **Counterparts**. This Lease may be executed in counterparts with the same effect as if both parties hereto had executed the same document. Both counterparts shall be construed together and shall constitute a single lease.

29.28 **Confidentiality**. Tenant acknowledges that the content of this Lease and any related documents are confidential information. Tenant shall keep such confidential information confidential and shall not disclose such confidential information to any person or entity other than Tenant's lawyers, accountants, auditors, agents, lenders, and prospective purchasers/investors for reasonable business purposes.

29.29 **Development of the Project**.

29.29.1 **Subdivision**. Landlord reserves the right to subdivide all or a portion of the buildings and Common Areas. Tenant agrees to execute and deliver, upon demand by Landlord and in the form requested by Landlord, any additional documents needed to conform this Lease to the circumstances resulting from a subdivision and any all maps in connection therewith. Notwithstanding anything to the contrary set forth in this Lease, the separate ownership of any buildings and/or Common Areas by an entity other than Landlord shall not affect the calculation of Direct Expenses or Tenant's payment of Tenant's Share of Direct Expenses.

29.29.2 **Construction of Property and Other Improvements**. Tenant acknowledges that portions of the Project and/or the Other Improvements may be under construction following Tenant's occupancy of the Premises, and that such construction may result in levels of noise, dust, obstruction of access, etc. which are in excess of that present in a fully constructed project. Tenant hereby waives any and all rent offsets or claims of constructive eviction which may arise in connection with such construction. Provided, however, that Landlord shall use good faith efforts to provide Tenant with fourteen (14) days' notice, which may be verbal, in advance of commencing any construction activities that Landlord anticipates could disrupt Tenant's use of the Premises, including a reasonable description of the scope of work to be performed and the anticipated duration of such activity. At all times Landlord shall use commercially reasonable efforts to minimize any disruption with the conduct of Tenant's business within the Premises. Upon request from Tenant Landlord will inform Tenant of the general construction schedule for any work adjacent to the Premises or which adversely affects access to the Premises.

29.30 **No Violation**. Landlord and Tenant each hereby warrant and represent that neither its execution of nor performance under this Lease shall cause said party to be in violation of any agreement, instrument, contract, law, rule or regulation by which said party is bound, and said party shall protect, defend, indemnify and hold the indemnified party harmless against any claims, demands, losses, damages, liabilities, costs and expenses, including, without limitation, reasonable attorneys' fees and costs, arising from the indemnifying party's breach of this warranty and representation.

29.31 **Communications and Computer Lines**. Tenant may install, maintain, replace, remove or use any communications or computer wires and cables serving the Premises (collectively, the "**Lines**"), provided that (i) Tenant shall obtain Landlord's prior written consent (which consent shall not be unreasonably withheld, conditioned or delayed), use an experienced and qualified contractor reasonably approved in writing by Landlord, and comply with all of the other provisions of Articles 7 and 8 of this Lease. Tenant shall pay all costs in connection therewith. Landlord reserves the right, upon notice to Tenant prior to the expiration or earlier termination of this Lease, to require that Tenant, at Tenant's sole cost and expense, remove any Lines located in or serving the Premises prior to the expiration or earlier termination of this Lease.

29.32 **Transportation Management**. Tenant shall reasonably comply with all present or future programs intended to manage parking, transportation or traffic in and around the Project and/or the Building, and in connection therewith, Tenant shall take responsible action for the transportation planning and management of all employees located at the Premises by working directly with Landlord, any governmental transportation management organization or any other transportation-related committees or entities. Such programs may include, without limitation: (i) restrictions on the number of peak-hour vehicle trips generated by Tenant; (ii) increased vehicle occupancy; (iii) implementation of an in-house ridesharing program and an employee transportation coordinator; (iv) working with employees and any Project, Building or area-wide ridesharing program manager; (v) instituting employer-sponsored incentives (financial or in-kind) to encourage employees to rideshare; and (vi) utilizing flexible work shifts for employees.

29.33 **Guarantor**. Intentionally omitted.

29.34 **REIT**. Tenant acknowledges that the Company, an affiliate of Landlord, elects to be taxed as a real estate investment trust (a "REIT") under the Code. Tenant hereby agrees to modifications of this Lease required to retain or clarify the Company's status as a REIT, provided such modifications: (a) are reasonable, (b) do not adversely affect in a material manner Tenant's use of the Premises as herein permitted, and (c) do not increase the Base Rent, Additional Rent and other sums to be paid by Tenant or Tenant's other obligations pursuant to this Lease, or reduce any rights of Tenant under this Lease, then Landlord may submit to Tenant an amendment to this Lease incorporating such required modifications, and Tenant shall execute, acknowledge and deliver such amendment to Landlord within ten (10) business days after Tenant's receipt thereof.

29.35 **Additional Storage**. Landlord shall provide Tenant with access to and use an exterior storage area as shown on **Exhibit I** ("**Storage Area**"). Tenant shall use the Storage Area in compliance with all Environmental Laws and in compliance with Section 5.4 of this Lease. Other tenants may utilize other portions of the structure or area in which the Storage Area is located, provided that Tenant shall always have access to no less than one-half of the capacity of the larger structure (as shown on **Exhibit I**). Tenant shall not exceed its share of any storage allocation applicable to the Storage Area, as reasonably determined by Landlord.

29.36 **Generator**. Subject to the provisions of this Section 29.36, Tenant shall be entitled to install, operate and maintain a generator and any other equipment related thereto, including, without limitation, a fuel system, wiring and shaft space ("**Generator**") next to the Building at Tenant's sole cost and expense (without paying any additional fee or rental to Landlord for the use thereof). Prior to the installation of the Generator, Tenant shall inspect the proposed location to determine a suitable location for the Generator, and Tenant shall submit written plans and specifications relative to the type, size and proposed location (including any proposed screening) of the Generator to Landlord for its review and written approval. Tenant shall be solely responsible for the cost of acquisition, installation, operation, and maintenance of the Generator; and Tenant shall install, maintain and operate the Generator in accordance with all federal, state, and local laws, statutes, ordinances, rules and regulations, including without limitation, obtaining and maintaining any and all permits, approvals and licenses required to install and operate the Generator by any governmental authority having jurisdiction. Landlord and Tenant agree that, upon the expiration of earlier termination of the Lease Term, Tenant shall not be required to remove the Generator, any associated cabling, wiring and screening or other improvements. Tenant shall not be entitled to grant or assign to any third party (other than a permitted assignee of Tenant's rights under the Lease or a permitted subtenant relative to the Premises (or a portion thereof)) the right to use the Generator without Landlord's prior written consent (which consent may be granted or withheld in Landlord's discretion). Upon reasonable advance notice to Tenant (and provided Landlord reasonably coordinates with Tenant and provides an alternate source of backup generator capacity during said transition), Landlord shall be entitled to cause the Generator to be moved to another location near the Building, at Landlord's cost and expense. Tenant shall pay all personal property taxes on the Generator. Tenant shall also pay any increases in the real property taxes of the Building due to the installation of the Generator within thirty (30) days of receipt of notice from Landlord which includes proof of such increase in taxes. Tenant's indemnity obligations under Section 5.4.1.5 of the Lease, relating to the use of Hazardous Materials, shall apply to the use and operation of the Generator. Finally, Tenant's insurance obligations under Section 10.3 of the Lease shall apply to the Generator.

IN WITNESS WHEREOF, Landlord and Tenant have caused this Lease to be executed the day and date first above written.

LANDLORD:

DURHAM TW ALEXANDER, LLC,
a Delaware limited liability company

By: /s/ Jamison N. Peschel
Name: Jamison N. Peschel
Its: Authorized Signatory

By: _____
Name: _____
Its: _____

TENANT:

PRECISION BIOSCIENCES, INC.,
a Delaware corporation

By: /s/ Matt Kane
Name: Matt Kane
Its: CEO

By: _____
Name: _____
Its: _____

EXHIBIT A

BIOPOINT INNOVATION LABS

FIRST OFFER SPACE

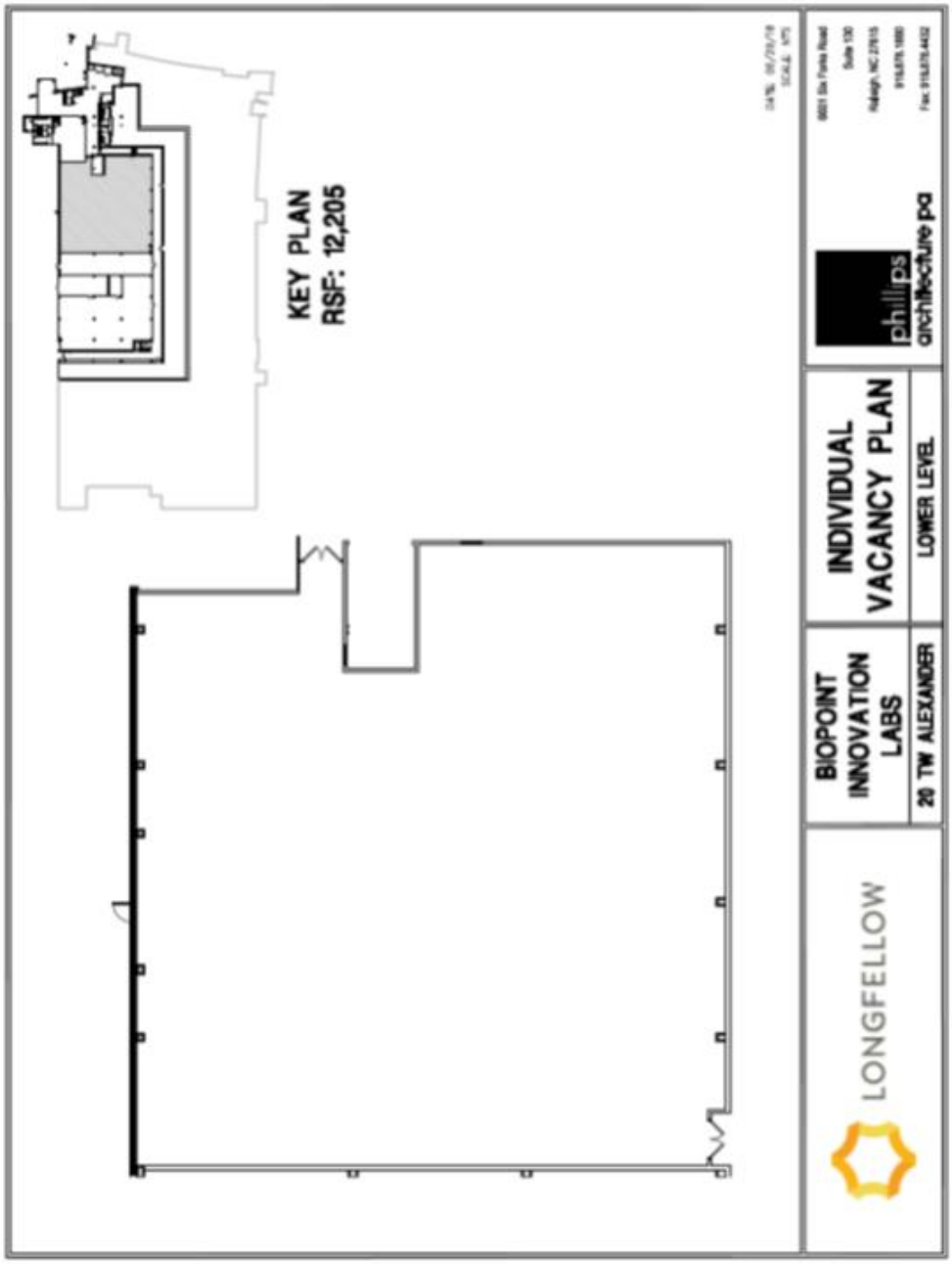


EXHIBIT B

NOTICE OF LEASE TERM DATES

To: _____
_____
_____
_____

Re: Lease dated , 20 between , a ("**Landlord**"), and , a ("**Tenant**") concerning Suite on floor(s) of the office building located at **[INSERT BUILDING ADDRESS]**.

Gentlemen:

In accordance with the Lease (the "**Lease**"), we wish to advise you and/or confirm as follows:

1. The Lease Term shall commence on or has commenced on for a term of ending on .
2. Rent commenced to accrue on , in the amount of .
3. If the Lease Commencement Date is other than the first day of the month, the first billing will contain a pro rata adjustment. Each billing thereafter, with the exception of the final billing, shall be for the full amount of the monthly installment as provided for in the Lease.
4. Your rent checks should be made payable to at .
5. The exact number of rentable/usable square feet within the Premises is square feet.
6. Tenant's Share as adjusted based upon the exact number of usable square feet within the Premises is %.

"Landlord":

_____,
a _____

By: _____
Its: _____

Agreed to and Accepted as
of , 20 .

"Tenant":

_____
a _____

By: _____
Its: _____

EXHIBIT C

PREMISES

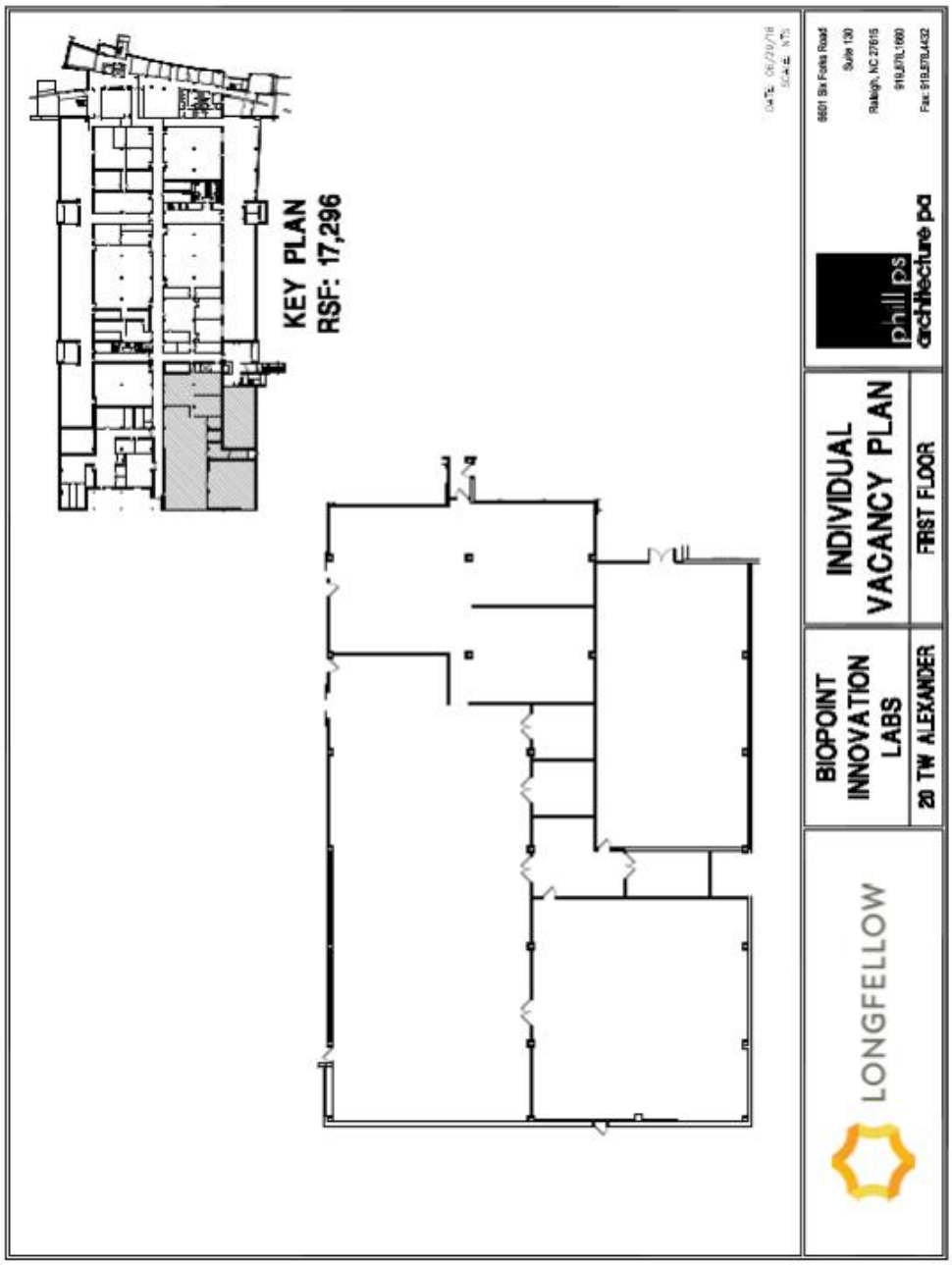


EXHIBIT D

TENANT WORK LETTER

This Tenant Work Letter sets forth the terms and conditions relating to the construction of the initial tenant improvements in the Premises. This Tenant Work Letter is essentially organized chronologically and addresses the issues of the construction of the Premises, in sequence, as such issues will arise during the actual construction of the Premises. All references in this Tenant Work Letter to Articles or Sections of "this Lease" shall mean the relevant portion of the Lease to which this Tenant Work Letter is attached as Exhibit D and of which this Tenant Work Letter forms a part, and all references in this Tenant Work Letter to Sections of "this Tenant Work Letter" shall mean the relevant portion of this Tenant Work Letter.

1. LANDLORD'S INITIAL CONSTRUCTION IN THE PREMISES

1.1 Landlord Work. Landlord shall, at Landlord's sole cost and expense, complete the work described on the attached Attachment 1 (collectively, the "Landlord Work"). The Landlord Work shall be performed in a first-class, workmanlike manner.

2. TENANT IMPROVEMENTS

2.1 Tenant Improvements Allowance. Tenant shall be entitled to a tenant improvement allowance (the "Tenant Improvements Allowance") in the maximum aggregate amount of **$1,220,720.00** (in a total amount equivolent to $70.58 per rentable square foot of the entire Premises initially leased hereunder) and adjusted based on the actual square footage) (the "Maximum Allowance Amount") for the hard costs and customary soft costs, as noted below, incurred by Tenant, including, without limitation, architectural and engineering fees, construction contractor fees, Tenant's project management fees, a 2% fee payable to Landlord or its affiliates for oversight and administrative costs related to the Tenant Improvements ("Landlord's Project Oversight Fee"), permits, and such other costs arising from or relating to the design and construction of Tenant's improvements which are to be permanently affixed to the Premises in accordance with this Work Letter (the "Tenant Improvements"). Landlord's Project Oversight Fee shall be equivolent to, but not exceed, a total of 2% of the Tenant Improvement Allowance paid to Tenant. For the avoidance of any doubt, the purchase and installation of data and telecommunications cabling shall not be included in the definition of Tenant Improvements and there shall not be any Landlord's Project Oversight Fee payable with respect to costs and expenses related thereto. Tenant agrees to keep the Landlord advised as to the progress of the work by providing copies of the Contractor's applications for payment. In no event shall Landlord be obligated to make disbursements pursuant to this Tenant Work Letter in a total amount which exceeds the Maximum Allowance Amount. All Tenant Improvements for which the Tenant Improvements Allowance has been used to pay shall be deemed Landlord's property under the terms of the Lease.

2.2 Disbursement of the Tenant Improvements Allowance. Except as otherwise set forth in this Tenant Work Letter, the Tenant Improvements Allowance shall be disbursed by Landlord (each of which disbursements shall be made pursuant to Landlord's reasonable disbursement process) for costs incurred by Tenant related to the design and construction of the Tenant Improvements and for the following items and costs (collectively, the "Tenant Improvements Allowance Items"): (i) payment of the fees of the "Architect" as that term is defined in Section 3.1 of this Tenant Work Letter in connection with the preparation and review of the "Construction Documents," as that term is defined in Section 3.1 of this Tenant Work Letter; (ii) payment of the Landlord's Project Oversight Fee, (iii) the cost of any changes to the Construction Documents or Tenant Improvements required by all applicable building codes (the "Code") enacted after approval of the Construction Documents, (iv) costs payable to the Contractor and any subcontractors, and (v) other costs incurred in connection with the Tenant Improvements to the extent the same can be paid using the Tenant Improvements Allowance pursuant to the specific provisions of this Tenant Work Letter.

Once Landlord is required to disburse any portion of the Tenant Improvement Allowance as noted herein, Landlord shall disburse the applicable portion of the Tenant Improvements Allowance within thirty (30) calendar days of receiving from Tenant a Payment Request (as hereinafter defined), an amount equal to the portion of the actual costs and expenses Tenant has incurred and paid in connection with the design and construction of the Tenant Improvements to date, over the amount Tenant is required to pay as noted in Section 4.3.1, which are to be paid for from the Tenant Improvement Allowance provided the following conditions have been satisfied:

(1) Tenant has delivered to Landlord a payment request ("Payment Request") in a form reasonably satisfactory to Landlord specifying the work which has been completed; and

(2) Tenant's general contractor and/or architect shall have submitted an application for payment and sworn statement substantially in the form of AIA Document G702 and AIA Document G703; and

(3) Tenant has submitted to Landlord lien waivers or partial lien waivers from all contractors, first tier subcontractors, artchitects, and first tier materialmen who performed such work to cover the work included under the Payment Request and all prior work Tenant was required to pay for before utilizing the Tenant Improvements Allowance.

Notwithstanding anything herein to the contrary, the Tenant Improvements Allowance must be requested by Tenant, if at all, in accordance with this paragraph on or before the date that is one year following the Rent Commencement Date, and any portion not requested by such date may no longer be utilized by Tenant and shall be deemed forfeited to Landlord.

3. CONSTRUCTION DOCUMENTS

3.1 Selection of Architect/Construction Documents. Landlord consents to Tenant retaining Integrated Design, PA (the "Architect") to prepare the "Construction Documents," as that term is defined in this Section 3.1 for the Tenant Improvements, together with the consulting engineers selected by the Architect and reasonably approved by Landlord. Tenant is not obligated to retain Integrated Design, PA and may retain another Architect or Architects from time to time, provided, however, that any such other Architects shall be subject to Landlord's reasonable approval. The plans and drawings to be prepared by Architect hereunder shall be known collectively as the "Construction Documents." All Construction Documents shall reasonably comply with the drawing format and specifications as reasonably determined by Landlord, and shall be subject to Landlord's and Tenant's approval. Landlord may hire an architectural firm to conduct a peer review, and the fees associated with this peer review shall be paid from the Landlord's Project Oversight Fee and shall not result in an additional charge to Tenant.

Landlord has no obligation to approve any Tenant Change or any Tenant Improvements not shown on the plans previously approved by Landlord and Tenant or reasonably inferable therefrom if, in Landlord's reasonable judgment, such Tenant Improvements (i) would materially increase the cost of performing any other work in the Building, not including the Tenant Improvements, unless in each case Tenant agrees to pay such costs based on Landlord's Change Estimate Notice (as defined below), (ii) are incompatible with the design, quality, equipment or systems of the Building or otherwise require a change to the existing Building systems or structure, each in a manner that would not otherwise be required in connection with the improvements contemplated by the Fit Plan (as defined below), (iii) is not consistent with the existing quality and nature of the Building, or (iv) otherwise do not comply with the provisions of the Lease.

3.2 Final Space Plan. Landlord and Tenant have reviewed and approved the preliminary space plan prepared by the Architect attached as Attachment 3 hereto (the "Fit Plan"). Tenant shall use commercially reasonable efforts to cause the Architect to prepare a space plan for the Premises which space plan shall be reasonably consistent with the Fit Plan and shall include a layout and designation of all labs, offices, rooms and other partitioning, their intended use, and equipment to be contained therein, and shall deliver the space plan to Landlord and Tenant for their approval. Landlord and Tenant shall review and provide any changes to the space plan within five Business Days of receipt thereof. Once Landlord and Tenant approve the final space plan, the space plan shall be considered final (the "Final Space Plan").

3.3 Construction Documents. Tenant shall cause the Architect to complete final Construction Documents consistent with the Final Space Plan and shall submit the same to Landlord and Tenant for their approval. Landlord and Tenant shall review and provide any changes to the construction documents within five (5) Business Days of receipt thereof, and the Tenant shall use reasonable efforts to cause the Architect to prepare and circulate

modified documents within ten (10) Business Days of its receipt of any requested changes from Tenant or Landlord. Such process of submittal and response within the time frame specified in the preceding sentence shall continue until each of Landlord and Tenant gives written approval to such documents, and the Construction Documents shall be considered final once approved by the Landlord and the Tenant. In no event may either Tenant or Landlord require any changes that are inconsistent with the Final Space Plan. The Construction Documents shall comply with Applicable Laws existing on the date of this Tenant Work Letter and which may be enacted prior to approval of completed Construction Documents. Subject to the provisions of Sections 3.1 and 5.4 of this Work Letter, Tenant may, from time to time, by written request to Landlord on a form reasonably specified by Landlord ("Tenant Change"), request a change in the Tenant Improvements shown on the Construction Documents, which Landlord approval shall not be unreasonably withheld or conditioned, and shall be granted or denied within five (5) business days after delivery of such Tenant Change to Landlord.

3.4 Permits. The Construction Documents as approved (or deemed approved) pursuant to Section 3.3 shall be the "Approved Working Drawings". Following approval or deemed approval of the Cost Proposal, as described below, Tenant shall promptly thereafter submit or cause to be submitted, the Approved Working Drawings to the appropriate municipal authorities for all applicable building permits necessary to allow "Contractor," as that term is defined in Section 4.1, below, to commence and fully complete the construction of the applicable Tenant Improvements (the "Permits").

3.5 Time Deadlines. Intentionally omitted.

4. CONSTRUCTION OF THE TENANT IMPROVEMENTS

4.1 Contractor. A contractor designated by Tenant and reasonably approved by Landlord ("Contractor") shall construct the Tenant Improvements.

4.2 Cost Proposal. After the Approved Working Drawings are approved by Landlord and Tenant, Tenant shall provide Landlord with a cost proposal (or cost proposals) in accordance with the Approved Working Drawings for Landlord's approval, which approval shall not be unreasonably withheld, which cost proposal(s) shall include, as nearly as possible, the cost of all Tenant Improvements Allowance Items to be incurred by Tenant in connection with the design and construction of the Tenant Improvements (the "Cost Proposal"). Tenant will consult with Landlord prior to approving the contractors to whom it will be bid and Landlord may review bid packages at Landlord's written request. The date on which Landlord approves the Cost Proposal shall be known hereafter as the "Cost Proposal Delivery Date".

4.3 Construction of Tenant Improvements by Contractor.

4.3.1 Payment of Tenant Improvements Allowance. Tenant shall be responsible to fund the entire cost of the Tenant Improvements less the amount of the Tenant Improvements Allowance prior to Landlord being required to fund any portion of the Tenant Improvements Allowance. Once Tenant has funded the required portion of the Tenant Improvements, as verified with paid invoices, then Tenant may submit a Payment Request to Landlord seeking disbursement of the Tenant Improvements Allowance to fund Tenant Improvements costs incurred by Tenant up to but not to exceed the full value of the Tenant Improvements Allowance. Unless otherwise agreed by the parties, all Tenant Improvements paid for by the Tenant Improvements Allowance shall be deemed Landlord's property under the terms of the Lease. Tenant hereby acknowledges and agrees that Tenant shall be responsible for all costs associated with the Tenant Improvements to the extent the same exceed the Tenant Improvements Allowance.

4.3.2 Tenant's Retention of Contractor. Tenant shall independently retain Contractor to construct the Tenant Improvements in accordance with the applicable Approved Working Drawings and the applicable Cost Proposal. Landlord shall be entitled to review the Tenant's construction contract with the Contractor upon Landlord's written request. Tenant shall be responsible to ensure the Contractor performs the construction work in a good and workmanlike manner and shall endeavor to oversee the Contractor's performance of its work to protect Landlord from construction defects.

5. COMPLETION OF THE TENANT IMPROVEMENTS; LEASE COMMENCEMENT DATE

5.1 Substantial Completion. Tenant shall give Landlord at least twenty (20) days prior written notice of the date that Tenant reasonably anticipates that the Tenant Improvements will be Substantially Complete (as defined below). For purposes of this Lease, "Substantial Completion" shall occur upon the completion of the last of the following to occur: (i) the completion of construction of the Tenant Improvements substantially pursuant to the Approved Working Drawings for such Tenant Improvements (each as reasonably determined by the Architect and Tenant), with the exception of any punch list items which do not impair Tenant's ability to occupy the Premises for their contemplated use, (ii) the acquisition of a certificate of occupancy or its legal equivalent allowing occupancy of the Premises (a "Sign Off"), and (iii) delivery of a certificate of substantial completion from the Architect confirming the matters set forth in the foregoing clause (i). In the event that the Sign Off is not a final certificate of occupancy, Tenant shall diligently prosecute the work necessary to achieve a full certificate of occupancy and use commercially reasonable efforts to obtain such full certificate of occupancy as soon as reasonably practicable following Substantial Completion.

5.2 Intentionally omitted.

5.3 Walk-through and Punchlist. After the Tenant Improvements are Substantially Completed and prior to Tenant's move-in into the Premises, following two (2) days' advance written notice from Tenant to Landlord, Tenant shall cause the Contractor to inspect the Premises with a representative of Landlord and complete a punch list of unfinished items of the Tenant Improvements. After Landlord and Tenant have mutually agreed upon the punch list, authorized representatives for Landlord and Tenant shall execute said punch list. The items listed on such punch list shall be completed by the Contractor within thirty (30) days after the approval of such punch list or as soon thereafter as reasonably practicable, provided that in the event a punch list item reasonably requires longer than thirty (30) days to complete, then Tenant shall cause Contractor to commence the completion of such particular item within thirty (30) days and diligently pursue the same to completion. The terms of this Section 5.3 will not affect the occurrence of the Substantial Completion of the Premises or the occurrence of the Rent Commencement Date.

5.4 Intentionally omitted.

5.5 Delay Not Caused by Parties. Neither the Landlord nor Tenant shall be considered to be in default of the provisions of this Tenant Work Letter for delays in performance due to Force Majeure.

5.6 Intentionally omitted.

5.7 Intentionally omitted.

6. MISCELLANEOUS

6.1 Tenant's Entry Into the Premises. As a condition to Tenant's entry into the Premises, Tenant shall comply with and perform, and shall cause its employees, agents, contractors, subcontractors, material suppliers and laborers to comply with and perform, all of Tenant's insurance and indemnity obligations and other obligations governing the conduct of Tenant at the Property under this Lease.

Any independent contractor of Tenant (or any employee or agent of Tenant) performing any work or invasive inspections in the Premises shall be reasonably subject to all of the terms, conditions and requirements contained in the Lease (including without limitation the provisions of Article 10) and, prior to such entry, Tenant shall provide Landlord with evidence of the insurance coverages required pursuant to Article 10. Tenant and any Tenant contractor performing any work or invasive inspections in the Premises shall use reasonable efforts not to interfere in any way with construction of, and shall not damage the Landlord Work or the common areas or other parts of the Building.

6.2 Tenant's Representative. Tenant has designated Sinu Bhandaru and Sam Stubbs as its sole representatives with respect to the matters set forth in this Tenant Work Letter, who, until further notice to Landlord, shall have full authority and responsibility to act on behalf of the Tenant as required in this Tenant Work Letter.

6.3 Landlord's Representative. Landlord has designated J. Randal Long as its sole representative with respect to the matters set forth in this Tenant Work Letter, who, until further notice to Tenant, shall have full authority and responsibility to act on behalf of the Landlord as required in this Tenant Work Letter.

6.4 Intentionally omitted.

6.5 General. This Work Letter shall not be deemed applicable to any additional space added to the Premises at any time or from time to time, whether by any options under the Lease or otherwise, or to any portion of the Premises or any additions to the Premises in the event of a renewal or extension of the original Lease Term, whether by any options under the Lease or otherwise, unless and to the extent expressly provided in the Lease or any amendment or supplement to the Lease that such additional space is to be delivered to Tenant in the same condition the initial Premises is to be delivered.

6.6 Insurance. In addition to the requirements of Article 8.5 and Article 10 of this Lease, prior to the commencement of the Tenant Improvements, Tenant shall provide Landlord with evidence that Tenant carries Builder's All Risk insurance in an amount reasonably approved by Landlord covering the construction of such Tenant Improvements, and such other insurance as Landlord may reasonably require, it being understood and agreed that all of such Tenant Improvements shall be insured by Tenant pursuant to Article 10 of this Lease immediately upon completion thereof. In addition, Tenant's contractors, subcontractors, and architects shall be required to carry Commercial General Liability Insurance in an amount approved by Landlord and otherwise in accordance with the requirements of Article 10 of this Lease and such general liability insurance shall name the Landlord Parties as additional insureds. In addition, Tenant's contractors and subcontractors shall be required to carry workers compensation insurance with a waiver of subrogation in favor of Landlord Parties.

ATTACHMENT 1

LANDLORD'S WORK

-Add one (1) 7' x 22' window to the Building which is similar to existing windows.
-Add one (1) 6' x 8' insulated electronically controlled roll-up door exiting onto the loading dock.

ATTACHMENT 2

Intentionally omitted

ATTACHMENT 3

PRELIMINARY PLANS

[to be attached]

EXHIBIT E

RULES AND REGULATIONS

Tenant shall faithfully observe and comply with the following Rules and Regulations. Landlord shall not be responsible to Tenant for the nonperformance of any of said Rules and Regulations by or otherwise with respect to the acts or omissions of any other tenants or occupants of the Project. In the event of any conflict between the Rules and Regulations and the other provisions of this Lease, the latter shall control.

1. Tenant shall not alter any lock or install any new or additional locks or bolts on any doors or windows of the Premises without obtaining Landlord's prior written consent, which shall not be unreasonably withheld, conditioned or delayed. If Tenant shall affix additional locks on doors then Tenant shall furnish Landlord with copies of keys or pass cards or similar devices for said locks. Tenant shall bear the cost of any lock changes or repairs required by Tenant. Two initial keys will be furnished by Landlord for the Premises, and any additional keys required by Tenant must be obtained from Landlord at a reasonable cost to be established by Landlord. Upon the termination of this Lease, Tenant shall restore to Landlord all keys of stores, offices, and toilet rooms, either furnished to, or otherwise procured by, Tenant and in the event of the loss of keys so furnished, Tenant shall pay to Landlord the cost of replacing same or of changing the lock or locks opened by such lost key if Landlord shall deem it necessary to make such changes.

2. All doors opening to public corridors shall be kept closed at all times except for normal ingress and egress to the Premises.

3. Landlord reserves the right to close and keep locked all entrance and exit doors of the Building during such hours as are customary for comparable buildings in the vicinity of the Building. Tenant, its employees and agents must be sure that the doors to the Building are securely closed and locked when leaving the Premises if it is after the normal hours of business for the Building. Any tenant, its employees, agents or any other persons entering or leaving the Building at any time when it is so locked, or any time when it is considered to be after normal business hours for the Building, may be required to sign the Building register. Access to the Building may be refused unless the person seeking access has proper identification or has a previously arranged pass for access to the Building. Landlord will furnish passes to persons for whom Tenant requests same in writing. Tenant shall be responsible for all persons for whom Tenant requests passes and shall be liable to Landlord for all acts of such persons. The Landlord and his agents shall in no case be liable for damages for any error with regard to the admission to or exclusion from the Building of any person. In case of invasion, mob, riot, public excitement, or other commotion, Landlord reserves the right to prevent access to the Building or the Project during the continuance thereof by any means it deems appropriate for the safety and protection of life and property.

4. Except for shipments by Tenant of its product or receipt by Tenant of goods in the ordinary course of the operation of its business, no furniture, freight or equipment of any kind shall be brought into the Building without prior notice to Landlord. All moving activity into or out of the Building shall be scheduled with Landlord and done only at such time and in such manner as Landlord reasonably designates. Landlord shall have the right to prescribe the weight, size and position of all safes and other heavy property brought into the Building and also the times and manner of moving the same in and out of the Building. Safes and other heavy objects shall, if considered necessary by Landlord, stand on supports of such thickness as is necessary to properly distribute the weight. Landlord will not be responsible for loss of or damage to any such safe or property in any case. Any damage to any part of the Building, its contents, occupants or visitors by moving or maintaining any such safe or other property shall be the sole responsibility and expense of Tenant.

5. Intentionally omitted.

6. The requirements of Tenant will be attended to only upon application at the management office for the Project or at such office location designated by Landlord. Employees of Landlord shall not perform any work or do anything outside their regular duties unless under special instructions from Landlord.

7. No sign, advertisement, notice or handbill shall be exhibited, distributed, painted or affixed by Tenant on any part of the Premises or the Building without the prior written consent of the Landlord. Tenant shall not disturb, solicit, peddle, or canvass any occupant of the Project and shall cooperate with Landlord and its agents of Landlord to prevent same.

8. The toilet rooms, urinals, wash bowls and other apparatus shall not be used for any purpose other than that for which they were constructed, and no foreign substance of any kind whatsoever shall be thrown therein. The expense of any breakage, stoppage or damage resulting from the violation of this rule shall be borne by the tenant who, or whose servants, employees, agents, visitors or licensees shall have caused same.

9. Discharge of industrial sewage to the Building plumbing system shall only be permitted if Tenant, at its sole expense, shall have obtained all necessary permits and licenses therefor, including without limitation permits from state and local authorities having jurisdiction thereof.

10. Tenant shall not overload the floor of the Premises, nor mark, drive nails or screws, or drill into the partitions, woodwork or drywall or in any way deface the Premises or any part thereof without Landlord's prior written consent; provided, however, that Landlord's prior written consent shall not be required for the hanging of normal and customary office artwork and personal items. Tenant shall not purchase spring water, ice, towel, linen, maintenance or other like services from any person or persons not included on an approved list that Landlord shall provide to Tenant upon request. Landlord reserves the right to have Landlord's structural engineer review Tenant's floor loads on the Building at Landlord's expense, unless such study reveals that Tenant has exceeded the floor loads, in which case Tenant shall pay the cost of such survey.

11. Except for vending machines intended for the sole use of Tenant's employees and invitees, no vending machine or machines other than fractional horsepower office machines shall be installed, maintained or operated upon the Premises without the written consent of Landlord.

12. Tenant shall not use or keep in or on the Premises, the Building, or the Project any kerosene, gasoline or other inflammable or combustible fluid, chemical, substance or material.

13. Tenant shall not without the prior written consent of Landlord (not to be unreasonably withheld, conditioned, or delayed) use any method of heating or air conditioning other than that supplied by Landlord (other than as part of the Tenant Improvements).

14. Tenant shall not use, keep or permit to be used or kept, any foul or noxious gas or substance in or on the Premises, or permit or allow the Premises to be occupied or used in a manner offensive or objectionable to Landlord or other occupants of the Project by reason of noise, odors, or vibrations, or interfere with other tenants or those having business therein, whether by the use of any musical instrument, radio, phonograph, or in any other way. Tenant shall not throw anything out of doors, windows or skylights or down passageways.

15. Tenant shall not bring into or keep within the Project, the Building or the Premises any animals (other than service animals), birds, aquariums, or, except in areas designated by Landlord, bicycles or other vehicles.

16. No cooking shall be done or permitted on the Premises, nor shall the Premises be used for the storage of merchandise, for lodging or for any improper, objectionable or immoral purposes. Notwithstanding the foregoing, Underwriters' laboratory-approved equipment and microwave ovens may be used in the Premises for heating food and brewing coffee, tea, hot chocolate and similar beverages for employees and visitors, provided that such use is in accordance with all applicable federal, state, county and city laws, codes, ordinances, rules and regulations.

17. The Premises shall not be used for manufacturing or for the storage of merchandise except as such storage may be incidental to the use of the Premises provided for in the Summary. Tenant shall not occupy or permit any portion of the Premises to be occupied as an office for a messenger-type operation or dispatch office, public stenographer or typist, or for the manufacture or sale of liquor, narcotics, or tobacco in any form, or as a medical office, or as a barber or manicure shop, or as an employment bureau without the express prior written consent of Landlord. Tenant shall not engage or pay any employees on the Premises except those actually working for such tenant on the Premises nor advertise for laborers giving an address at the Premises.

18. Landlord reserves the right to exclude or expel from the Project any person who, in the judgment of Landlord, is intoxicated or under the influence of liquor or drugs, or who shall in any manner do any act in violation of any of these Rules and Regulations.

19. Tenant, its employees and agents shall not loiter in or on the entrances, corridors, sidewalks, lobbies, courts, halls, stairways, vestibules or any Common Areas for the purpose of smoking tobacco products or for any other purpose, nor in any way obstruct such areas, and shall use them only as a means of ingress and egress for the Premises.

20. Tenant shall not waste electricity, water or air conditioning and agrees to reasonably cooperate with Landlord to ensure the most effective operation of the Building's heating and air conditioning system, and shall refrain from attempting to adjust any controls.

21. Tenant shall store all its trash and garbage within the interior of the Premises. No material shall be placed in the trash boxes or receptacles if such material is of such nature that it may not be disposed of in the ordinary and customary manner of removing and disposing of trash and garbage in the city in which the Building is located without violation of any law or ordinance governing such disposal. All trash, garbage and refuse disposal shall be made only through entry-ways provided for such purposes at such times as Landlord shall designate.

22. Tenant shall comply with all safety, fire protection and evacuation procedures and regulations established by Landlord or any governmental agency.

23. Any persons employed by Tenant to do janitorial work shall be subject to the prior written approval of Landlord (not to be unreasonably withheld, conditioned, or delayed), and while in the Building and outside of the Premises, shall be subject to and under the control and direction of the Building manager (but not as an agent or servant of such manager or of Landlord), and Tenant shall be responsible for all acts of such persons.

24. No awnings or other projection shall be attached to the outside walls of the Building without the prior written consent of Landlord (not to be unreasonably withheld, conditioned, or delayed), and no curtains, blinds, shades or screens shall be attached to or hung in, or used in connection with, any window or door of the Premises other than Landlord standard drapes. All electrical ceiling fixtures hung in the Premises or spaces along the perimeter of the Building must be fluorescent and/or of a quality, type, design and a warm white bulb color approved in advance in writing by Landlord. Neither the interior nor exterior of any windows shall be coated or otherwise sunscreened without the prior written consent of Landlord. Tenant shall abide by Landlord's regulations concerning the opening and closing of window coverings which are attached to the windows in the Premises, if any, which have a view of any interior portion of the Building or Building Common Areas.

25. The sashes, sash doors, skylights, windows, and doors that reflect or admit light and air into the halls, passageways or other public places in the Building shall not be covered or obstructed by Tenant, nor shall any bottles, parcels or other articles be placed on the windowsills.

26. Tenant must comply with requests by the Landlord concerning the informing of their employees of items of importance to the Landlord.

27. No smoking is permitted in the Building or on the Project.

28. Tenant hereby acknowledges that Landlord shall have no obligation to provide guard service or other security measures for the benefit of the Premises, the Building or the Project. Tenant hereby assumes all responsibility for the protection of Tenant and its agents, employees, contractors, invitees and guests, and the property thereof, from acts of third parties, including keeping doors locked and other means of entry to the Premises closed, whether or not Landlord, at its option, elects to provide security protection for the Project or any portion thereof. Tenant further assumes the risk that any safety and security devices, services and programs which Landlord elects, in its sole discretion, to provide may not be effective, or may malfunction or be circumvented by an unauthorized third party, and Tenant shall, in addition to its other insurance obligations under this Lease, obtain its own insurance coverage to the extent Tenant desires protection against losses related to such occurrences. Tenant shall cooperate in any reasonable safety or security program developed by Landlord or required by law.

29. All non-standard office equipment of any electrical or mechanical nature shall be placed by Tenant in the Premises in settings approved by Landlord, to absorb or prevent any vibration, noise and annoyance.

30. Tenant shall not use in any space or in the public halls of the Building, any hand trucks except those equipped with rubber tires and rubber side guards.

31. No auction, liquidation, fire sale, going-out-of-business or bankruptcy sale shall be conducted in the Premises without the prior written consent of Landlord.

32. No tenant shall use or permit the use of any portion of the Premises for living quarters, sleeping apartments or lodging rooms.

Landlord reserves the right at any time to change or rescind any one or more of these Rules and Regulations, or to make such other and further reasonable Rules and Regulations as in Landlord's judgment may from time to time be necessary for the management, safety, care and cleanliness of the Premises, Building, the Common Areas and the Project, and for the preservation of good order therein, as well as for the convenience of other occupants and tenants therein. Landlord may waive any one or more of these Rules and Regulations for the benefit of any particular tenants, but no such waiver by Landlord shall be construed as a waiver of such Rules and Regulations in favor of any other tenant, nor prevent Landlord from thereafter enforcing any such Rules or Regulations against any or all tenants of the Project. Tenant shall be deemed to have read these Rules and Regulations and to have agreed to abide by them as a condition of its occupancy of the Premises.

EXHIBIT F

[*Property Center Name*]

FORM OF TENANT'S ESTOPPEL CERTIFICATE

The undersigned as Tenant under that certain Lease (the "**Lease**") made and entered into as of , 201_ by and between as Landlord, and the undersigned as Tenant, for Premises on the floor(s) of the office building located at **[INSERT BUILDING ADDRESS]**, certifies as follows:

1. Attached hereto as **Exhibit F** is a true and correct copy of the Lease and all amendments and modifications thereto. The documents contained in **Exhibit F** represent the entire agreement between the parties as to the Premises.

2. The undersigned currently occupies the Premises described in the Lease, the Lease Term commenced on , and the Lease Term expires on , and the undersigned has no option to terminate or cancel the Lease or to purchase all or any part of the Premises, the Building and/or the Project.

3. Base Rent became payable on .

4. The Lease is in full force and effect and has not been modified, supplemented or amended in any way except as provided in **Exhibit F**.

5. Tenant has not transferred, assigned, or sublet any portion of the Premises nor entered into any license or concession agreements with respect thereto except as follows:

6. Intentionally Omitted.

7. All monthly installments of Base Rent, all Additional Rent and all monthly installments of estimated Additional Rent have been paid when due through . The current monthly installment of Base Rent is $.

8. All conditions of the Lease to be performed by Landlord necessary to the enforceability of the Lease have been satisfied and, to Tenant's actual knowledge, Landlord is not in default thereunder. In addition, the undersigned has not delivered any notice to Landlord regarding a default by Landlord thereunder.

9. No rental has been paid more than thirty (30) days in advance and no security has been deposited with Landlord except as provided in the Lease.

10. As of the date hereof, there are no existing defenses or offsets, or, to the undersigned's knowledge, claims or any basis for a claim, that the undersigned has against Landlord.

11. If Tenant is a corporation or partnership, each individual executing this Estoppel Certificate on behalf of Tenant hereby represents and warrants that Tenant is a duly formed and existing entity qualified to do business in North Carolina and that Tenant has full right and authority to execute and deliver this Estoppel Certificate and that each person signing on behalf of Tenant is authorized to do so.

12. There are no actions pending against the undersigned under the bankruptcy or similar laws of the United States or any state.

13. To Tenant's actual knowledge, Tenant is in full compliance with all federal, state and local laws, ordinances, rules and regulations affecting its use of the Premises, including, but not limited to, those laws, ordinances, rules or regulations relating to hazardous or toxic materials. Tenant has never permitted or suffered, nor does Tenant have any knowledge of, the generation, manufacture, treatment, use, storage, disposal or discharge of any hazardous, toxic or dangerous waste, substance or material in, on, under or about the Project or the Premises or any adjacent premises or property in violation of any federal, state or local law, ordinance, rule or regulation.

14. To the undersigned's knowledge, all tenant improvement work to be performed by Landlord under the Lease has been completed in accordance with the Lease and has been accepted by the undersigned and all reimbursements and allowances due to the undersigned under the Lease in connection with any tenant improvement work have been paid in full. All work (if any) in the common areas required by the Lease to be completed by Landlord has been completed and all parking spaces required by the Lease have been furnished and/or all parking ratios required by the Lease have been met.

The undersigned acknowledges that this Estoppel Certificate may be delivered to Landlord or to a prospective mortgagee or prospective purchaser, and acknowledges that said prospective mortgagee or prospective purchaser will be relying upon the statements contained herein in making the loan or acquiring the property of which the Premises are a part and that receipt by it of this certificate is a condition of making such loan or acquiring such property.

Executed at on the day of , 201 .

"Tenant":

_____,
a _____

By: _____
Its: _____

By: _____
Its: _____

EXHIBIT G

[*Property Center Name*]

ENVIRONMENTAL QUESTIONNAIRE

ENVIRONMENTAL QUESTIONNAIRE
FOR COMMERCIAL AND INDUSTRIAL PROPERTIES

Property Name: _____

Property Address: _____

Instructions: The following questionnaire is to be completed by the Lessee representative with knowledge of the planned operations for the specified building/location. Please print clearly and attach additional sheets as necessary.

1.0 PROCESS INFORMATION

Describe planned use, and include brief description of manufacturing processes employed.

_____

_____

_____

2.0 HAZARDOUS MATERIALS

Are hazardous materials used or stored? If so, continue with the next question. If not, go to Section 3.0.

2.1 Are any of the following materials handled on the Property?

Yes ☐ No ☐

(A material is handled if it is used, generated, processed, produced, packaged, treated, stored, emitted, discharged, or disposed.) If so, complete this section. If this question is not applicable, skip this section and go on to Section 5.0.

☐ Explosives	☐ Fuels	☐ Oils
☐ Solvents	☐ Oxidizers	☐ Organics/Inorganics
☐ Acids	☐ Bases	☐ Pesticides
☐ Gases	☐ PCBs	☐ Radioactive Materials
☐ Other (please specify)		

2-2. If any of the groups of materials checked in Section 2.1, please list the specific material(s), use(s), and quantity of each chemical used or stored on the site in the Table below. If convenient, you may substitute a chemical inventory and list the uses of each of the chemicals in each category separately.

Material	Physical State (Solid, Liquid, or Gas)	Usage	Container Size	Number of Containers	Total Quantity

2-3. Describe the planned storage area location(s) for these materials. Please include site maps and drawings as appropriate.

3.0 HAZARDOUS WASTES

Are hazardous wastes generated? Yes ☐ No ☐

If yes, continue with the next question. If not, skip this section and go to section 4.0.

3.1 Are any of the following wastes generated, handled, or disposed of (where applicable) on the Property?

☐ Hazardous wastes ☐ Industrial Wastewater
☐ Waste oils ☐ PCBs
☐ Air emissions ☐ Sludges
☐ Regulated Wastes ☐ Other (please specify)

3-2. List and quantify the materials identified in Question 3-1 of this section.

WASTE GENERATED	RCRA listed Waste?	SOURCE	APPROXIMATE MONTHLY QUANTITY	WASTE CHARACTERIZATION	DISPOSITION

3-3. Please include name, location, and permit number (e.g. EPA ID No.) for transporter and disposal facility, if applicable). Attach separate pages as necessary.

Transporter/Disposal Facility Name	Facility Location	Transporter (T) or Disposal (D) Facility	Permit Number

3-4. Are pollution controls or monitoring employed in the process to prevent or minimize the release of wastes into the environment? Yes ☐ No ☐

3-5. If so, please describe.

4.0 USTS/ASTS

4.1 Are underground storage tanks (USTs), aboveground storage tanks (ASTs), or associated pipelines used for the storage of petroleum products, chemicals, or liquid wastes present on site (lease renewals) or required for planned operations (new tenants)? Yes___ No___

If not, continue with section 5.0. If yes, please describe capacity, contents, age, type of the USTs or ASTs, as well any associated leak detection/spill prevention measures. Please attach additional pages if necessary.

Capacity	Contents	Year Installed	Type (Steel, Fiberglass, etc)	Associated Leak Detection / Spill Prevention Measures*

*Note: The following are examples of leak detection / spill prevention measures:

Integrity testing	Inventory reconciliation	Leak detection system
Overfill spill protection	Secondary containment	Cathodic protection

4-2. Please provide copies of written tank integrity test results and/or monitoring documentation, if available.

4-3. Is the UST/AST registered and permitted with the appropriate regulatory agencies? Yes ☐ No ☐

If so, please attach a copy of the required permits.

4-4. If this Questionnaire is being completed for a lease renewal, and if any of the USTs/ASTs have leaked, please state the substance released, the media(s) impacted (e.g., soil, water, asphalt, etc.), the actions taken, and all remedial responses to the incident.

4-5. If this Questionnaire is being completed for a lease renewal, have USTs/ASTs been removed from the Property?
Yes ☐ No ☐

If yes, please provide any official closure letters or reports and supporting documentation (e.g., analytical test results, remediation report results, etc.).

4-6. For Lease renewals, are there any above or below ground pipelines on site used to transfer chemicals or wastes?
Yes ☐ No ☐

For new tenants, are installations of this type required for the planned operations?
Yes ☐ No ☐

If yes to either question, please describe.

5.0 ASBESTOS CONTAINING BUILDING MATERIALS

Please be advised that an asbestos survey may have been performed at the Property. If provided, please review the information that identifies the locations of known asbestos containing material or presumed asbestos containing material. All personnel and appropriate subcontractors should be notified of the presence of these materials, and informed not to disturb these materials. Any activity that involves the disturbance or removal of these materials must be done by an appropriately trained individual/contractor.

6.0 REGULATORY

6-1. Does the operation have or require a National Pollutant Discharge Elimination System (NPDES) or equivalent permit?
Yes ☐ No ☐

If so, please attach a copy of this permit.

6-2. Has a Hazardous Materials Business Plan been developed for the site? Yes ☐ No ☐
If so, please attach a copy.

CERTIFICATION

I am familiar with the real property described in this questionnaire. By signing below, I represent and warrant that the answers to the above questions are complete and accurate to the best of my knowledge. I also understand that Lessor will rely on the completeness and accuracy of my answers in assessing any environmental liability risks associated with the property.

Signature: _____

Name: _____

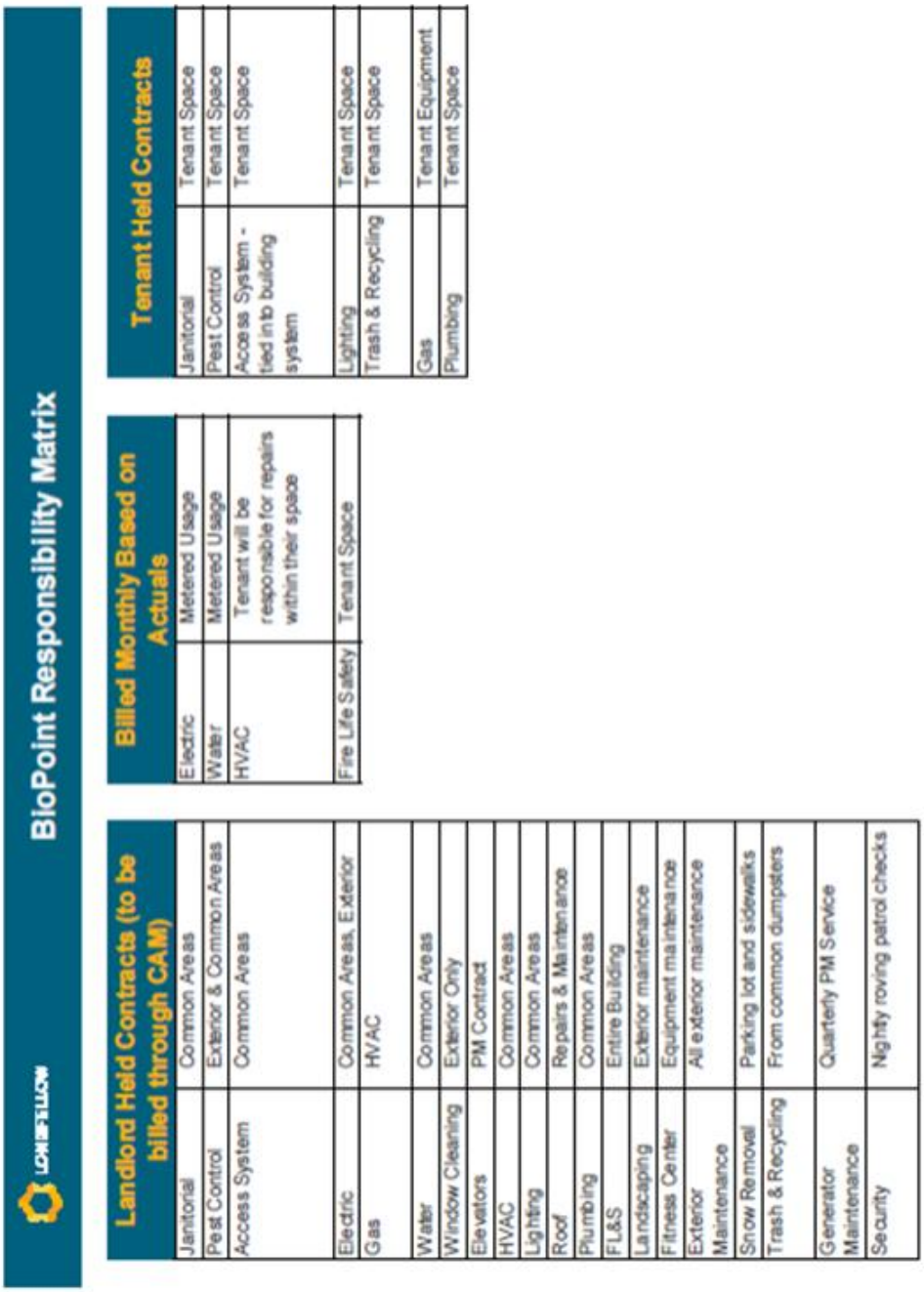
Title: _____

Date: _____

Telephone: _____

EXHIBIT H

RESPONSIBILITY MATRIX



BioPoint Responsibility Matrix

Landlord Held Contracts (to be billed through CAM)	
Janitorial	Common Areas
Pest Control	Exterior & Common Areas
Access System	Common Areas
Electric	Common Areas, Exterior
Gas	HVAC
Water	Common Areas
Window Cleaning	Exterior Only
Elevators	PM Contract
HVAC	Common Areas
Lighting	Common Areas
Roof	Repairs & Maintenance
Plumbing	Common Areas
FL&S	Entire Building
Landscaping	Exterior maintenance
Fitness Center	Equipment maintenance
Exterior Maintenance	All exterior maintenance
Snow Removal	Parking lot and sidewalks
Trash & Recycling	From common dumpsters
Generator Maintenance	Quarterly PM Service
Security	Nightly roving patrol checks

Billed Monthly Based on Actuals	
Electric	Metered Usage
Water	Metered Usage
HVAC	Tenant will be responsible for repairs within their space
Fire Life Safety	Tenant Space

Tenant Held Contracts	
Janitorial	Tenant Space
Pest Control	Tenant Space
Access System - tied into building system	Tenant Space
Lighting	Tenant Space
Trash & Recycling	Tenant Space
Gas	Tenant Equipment
Plumbing	Tenant Space

EXHIBIT I

STORAGE AREA

Exhibit 10.8

PRECISION BIOSCIENCES, INC.

2006 STOCK INCENTIVE PLAN

1. Purpose

The purpose of this 2006 Stock Incentive Plan (the "Plan") of Precision BioSciences, Inc., a Delaware corporation (the "Company"), is to advance the interests of the Company's stockholders by enhancing the Company's ability to attract, retain and motivate persons who are expected to make important contributions to the Company and by providing such persons with equity ownership opportunities and performance-based incentives that are intended to align their interests with those of the Company's stockholders. Except where the context otherwise requires, the term "Company" shall include any of the Company's present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "Code") and any other business venture (including, without limitation, joint venture or limited liability company) in which the Company has a controlling interest, as determined by the Board of Directors of the Company (the "Board").

2. Eligibility

All of the Company's employees, officers, directors, consultants and advisors are eligible to receive options, restricted stock, restricted stock units and other stock-based awards (each, an "Award") under the Plan. Each person who receives an Award under the Plan is deemed a "Participant".

3. Administration and Delegation

(a) Administration by Board of Directors. The Plan will be administered by the Board. The Board shall have authority to grant Awards and to adopt, amend and repeal such administrative rules, guidelines and practices relating to the Plan as it shall deem advisable. The Board may correct any defect, supply any omission or reconcile any inconsistency in the Plan or any Award in the manner and to the extent it shall deem expedient to carry the Plan into effect and it shall be the sole and final judge of such expediency. All decisions by the Board shall be made in the Board's sole discretion and shall be final and binding on all persons having or claiming any interest in the Plan or in any Award. No director or person acting pursuant to the authority delegated by the Board shall be liable for any action or determination relating to or under the Plan made in good faith.

(b) Appointment of Committees. To the extent permitted by applicable law, the Board may delegate any or all of its powers under the Plan to one or more committees or subcommittees of the Board (a "Committee"). All references in the Plan to the "Board" shall mean the Board or a Committee of the Board to the extent that the Board's powers or authority under the Plan have been delegated to such Committee.

4. Stock Available for Awards. Subject to adjustment under Section 8, Awards may be made under the Plan for up to 200,000 shares of common stock, $0.0001 par value per share, of the Company (the "Common Stock"). If any Award expires or is terminated, surrendered or

canceled without having been fully exercised or is forfeited in whole or in part (including as the result of shares of Common Stock subject to such Award being repurchased by the Company at the original issuance price pursuant to a contractual repurchase right) or results in any Common Stock not being issued, the unused Common Stock covered by such Award shall again be available for the grant of Awards under the Plan. Further, shares of Common Stock tendered to the Company by a Participant to exercise an Award shall be added to the number of shares of Common Stock available for the grant of Awards under the Plan. However, in the case of Incentive Stock Options (as hereinafter defined), the foregoing provisions shall be subject to any limitations under the Code. Shares issued under the Plan may consist in whole or in part of authorized but unissued shares or treasury shares. At no time while there is any Option (as defined below) outstanding and held by a Participant who was a resident of the State of California on the date of grant of such Option, shall the total number of shares of Common Stock issuable upon exercise of all outstanding options and the total number of shares provided for under any stock bonus or similar plan of the Company exceed the applicable percentage as calculated in accordance with the conditions and exclusions of Section 260.140.45. of the California Code of Regulations (the "California Regulations"), based on the shares of the Company which are outstanding at the time the calculation is made.

5. Stock Options

(a) General. The Board may grant options to purchase Common Stock (each, an "Option") and determine the number of shares of Common Stock to be covered by each Option, the exercise price of each Option and the conditions and limitations applicable to the exercise of each Option, including conditions relating to applicable federal or state securities laws, as it considers necessary or advisable. An Option which is not intended to be an Incentive Stock Option (as hereinafter defined) shall be designated a "Nonstatutory Stock Option".

(b) Incentive Stock Options. An Option that the Board intends to be an "incentive stock option" as defined in Section 422 of the Code (an "Incentive Stock Option") shall only be granted to employees of Precision BioSciences, any of Precision BioSciences' present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Code, and any other entities the employees of which are eligible to receive Incentive Stock Options under the Code, and shall be subject to and shall be construed consistently with the requirements of Section 422 of the Code. The Company shall have no liability to a Participant, or any other party, if an Option (or any part thereof) that is intended to be an Incentive Stock Option is not an Incentive Stock Option or for any action taken by the Board pursuant to Section 9(f), including without limitation the conversion of an Incentive Stock Option to a Nonstatutory Stock Option.

(c) Exercise Price. The Board shall establish the exercise price of each Option and specify such exercise price in the applicable option agreement.

(d) Duration of Options. Each Option shall be exercisable at such times and subject to such terms and conditions as the Board may specify in the applicable option agreement.

(e) Exercise of Option. Options may be exercised by delivery to the Company of a written notice of exercise signed by the proper person or by any other form of notice (including electronic notice) approved by the Board together with payment in full as specified in Section

5(f) for the number of shares for which the Option is exercised. Shares of Common Stock subject to the Option will be delivered by the Company following exercise either as soon as practicable or, subject to such conditions as the Board shall specify, on a deferred basis (with the Company's obligation to be evidenced by an instrument providing for future delivery of the deferred shares at the time or times specified by the Board).

(f) Payment Upon Exercise. Common Stock purchased upon the exercise of an Option granted under the Plan shall be paid for as follows:

(1) in cash or by check, payable to the order of the Company;

(2) except as the Board may otherwise provide in an option agreement, by (i) delivery of an irrevocable and unconditional undertaking by a creditworthy broker to deliver promptly to the Company sufficient funds to pay the exercise price and any required tax withholding or (ii) delivery by the Participant to the Company of a copy of irrevocable and unconditional instructions to a creditworthy broker to delivery promptly to the Company cash or a check sufficient to pay the exercise price and any required tax withholding;

(3) when the Common Stock is registered under the Exchange Act, by delivery of shares of Common Stock owned by the Participant valued at their fair market value as determined by (or in a manner approved by) the Board ("Fair Market Value"), provided (i) such method of payment is then permitted under applicable law, (ii) such Common Stock, if acquired directly from the Company, was owned by the Participant for such minimum period of time, if any, as may be established by the Board in its discretion and (iii) such Common Stock is not subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements;

(4) to the extent permitted by applicable law and by the Board, by (i) delivery of a promissory note of the Participant to the Company on terms determined by the Board, or (ii) payment of such other lawful consideration as the Board may determine; or

(5) by any combination of the above permitted forms of payment.

(g) Substitute Options. In connection with a merger or consolidation of an entity with the Company or the acquisition by the Company of property or stock of an entity, the Board may grant Options in substitution for any options or other stock or stock-based awards granted by such entity or an affiliate thereof. Substitute Options may be granted on such terms as the Board deems appropriate in the circumstances, notwithstanding any limitations on Options contained in the other sections of this Section 5 or in Section 2. Substitute Options shall not count against the overall share limit set forth in Section 4(a), except as may be required by reason of Section 422 and related provisions of the Code.

6. Restricted Stock; Restricted Stock Units

(a) General. The Board may grant Awards entitling recipients to acquire shares of Common Stock ("Restricted Stock"), subject to the right of the Company to repurchase all or part of such shares at their issue price or other stated or formula price (or to require forfeiture of such shares if issued at no cost) from the recipient in the event that conditions specified by the Board in the applicable Award are not satisfied prior to the end of the applicable restriction

period or periods established by the Board for such Award. Instead of granting Awards for Restricted Stock, the Board may grant Awards entitling the recipient to receive shares of Common Stock to be delivered at the time such shares of Common Stock vest ("Restricted Stock Units") (Restricted Stock and Restricted Stock Units are each referred to herein as a "Restricted Stock Award").

(b) Terms and Conditions. The Board shall determine the terms and conditions of a Restricted Stock Award, including the conditions for repurchase (or forfeiture) and the issue price, if any.

(c) Stock Certificates. Any stock certificates issued in respect of a Restricted Stock Award shall be registered in the name of the Participant and, unless otherwise determined by the Board, deposited by the Participant, together with a stock power endorsed in blank, with the Company (or its designee). At the expiration of the applicable restriction periods, the Company (or such designee) shall deliver the certificates no longer subject to such restrictions to the Participant or if the Participant has died, to the beneficiary designated, in a manner determined by the Board, by a Participant to receive amounts due or exercise rights of the Participant in the event of the Participant's death (the "Designated Beneficiary"). In the absence of an effective designation by a Participant, "Designated Beneficiary" shall mean the Participant's estate.

7. Other Stock-Based Awards

Other Awards of shares of Common Stock, and other Awards that are valued in whole or in part by reference to, or are otherwise based on, shares of Common Stock or other property, may be granted hereunder to Participants ("Other Stock Unit Awards"), including without limitation stock appreciation rights and Awards entitling recipients to receive shares of Common Stock to be delivered in the future. Such Other Stock Unit Awards shall also be available as a form of payment in the settlement of other Awards granted under the Plan or as payment in lieu of compensation to which a Participant is otherwise entitled. Other Stock Unit Awards may be paid in shares of Common Stock or cash, as the Board shall determine. Subject to the provisions of the Plan, the Board shall determine the conditions of each Other Stock Unit Award, including any purchase price applicable thereto.

8. Adjustments for Changes in Common Stock and Certain Other Events

(a) Changes in Capitalization. In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any distribution to holders of Common Stock other than an ordinary cash dividend, (i) the number and class of securities available under this Plan, (ii) the number and class of securities and exercise price per share of each outstanding Option, (iii) the repurchase price per share subject to each outstanding Restricted Stock Award, and (iv) the terms of each other outstanding Award shall be appropriately adjusted by the Company (or substituted Awards may be made, if applicable) to the extent determined by the Board.

(b) Reorganization Events

(1) Definition. A "Reorganization Event" shall mean: (a) any merger or consolidation of the Company with or into another entity as a result of which all of the Common Stock of the Company is converted into or exchanged for the right to receive cash, securities or other property or is cancelled, (b) any exchange of all of the Common Stock of the Company for cash, securities or other property pursuant to a share exchange transaction or (c) any liquidation or dissolution of the Company.

(2) Consequences of a Reorganization Event on Awards Other than Restricted Stock Awards. In connection with a Reorganization Event, the Board shall take any one or more of the following actions as to all or any outstanding Awards on such terms as the Board determines: (i) provide that Awards shall be assumed, or substantially equivalent Awards shall be substituted, by the acquiring or succeeding corporation (or an affiliate thereof), (ii) upon written notice to a Participant, provide that the Participant's unexercised Options or other unexercised Awards shall become exercisable in full and will terminate immediately prior to the consummation of such Reorganization Event unless exercised by the Participant within a specified period following the date of such notice, (iii) provide that outstanding Awards shall become realizable or deliverable, or restrictions applicable to an Award shall lapse, in whole or in part prior to or upon such Reorganization Event, (iv) in the event of a Reorganization Event under the terms of which holders of Common Stock will receive upon consummation thereof a cash payment for each share surrendered in the Reorganization Event (the "Acquisition Price"), make or provide for a cash payment to a Participant equal to (A) the Acquisition Price times the number of shares of Common Stock subject to the Participant's Options or other Awards (to the extent the exercise price does not exceed the Acquisition Price) minus (B) the aggregate exercise price of all such outstanding Options or other Awards, in exchange for the termination of such Options or other Awards, (v) provide that, in connection with a liquidation or dissolution of the Company, Awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise price thereof) and (vi) any combination of the foregoing.

For purposes of clause (i) above, an Option shall be considered assumed if, following consummation of the Reorganization Event, the Option confers the right to purchase, for each share of Common Stock subject to the Option immediately prior to the consummation of the Reorganization Event, the consideration (whether cash, securities or other property) received as a result of the Reorganization Event by holders of Common Stock for each share of Common Stock held immediately prior to the consummation of the Reorganization Event (and if holders were offered a choice of consideration, the type of consideration chosen by the holders of a majority of the outstanding shares of Common Stock); provided, however, that if the consideration received as a result of the Reorganization Event is not solely common stock of the acquiring or succeeding corporation (or an affiliate thereof), the Company may, with the consent of the acquiring or succeeding corporation, provide for the consideration to be received upon the exercise of Options to consist solely of common stock of the acquiring or succeeding corporation (or an affiliate thereof) equivalent value (as determined by the Board) to the per share consideration received by holders of outstanding shares of Common Stock as a result of the Reorganization Event.

To the extent all or any portion of an Option becomes exercisable solely as a result of clause (ii) above, the Board may provide that upon exercise of such Option the Participant shall receive shares subject to a right of repurchase by the Company or its successor

at the Option exercise price; such repurchase right (x) shall lapse at the same rate as the Option would have become exercisable under its terms and (y) shall not apply to any shares subject to the Option that were exercisable under its terms without regard to clause (ii) above.

(3) Consequences of a Reorganization Event on Restricted Stock Awards. Upon the occurrence of a Reorganization Event other than a liquidation or dissolution of the Company, the repurchase and other rights of the Company under each outstanding Restricted Stock Award shall inure to the benefit of the Company's successor and shall apply to the cash, securities or other property which the Common Stock was converted into or exchanged for pursuant to such Reorganization Event in the same manner and to the same extent as they applied to the Common Stock subject to such Restricted Stock Award. Upon the occurrence of a Reorganization Event involving the liquidation or dissolution of the Company, except to the extent specifically provided to the contrary in the instrument evidencing any Restricted Stock Award or any other agreement between a Participant and the Company, all restrictions and conditions on all Restricted Stock Awards then outstanding shall automatically be deemed terminated or satisfied.

9. General Provisions Applicable to Awards

(a) Transferability of Awards. Except as the Board may otherwise determine or provide in an Award, Awards shall not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an Incentive Stock Option, pursuant to a qualified domestic relations order, and, during the life of the Participant, shall be exercisable only by the Participant. References to a Participant, to the extent relevant in the context, shall include references to authorized transferees.

(b) Documentation. Each Award shall be evidenced in such form (written, electronic or otherwise) as the Board shall determine. Each Award may contain terms and conditions in addition to those set forth in the Plan.

(c) Board Discretion. Except as otherwise provided by the Plan, each Award may be made alone or in addition or in relation to any other Award. The terms of each Award need not be identical, and the Board need not treat Participants uniformly.

(d) Termination of Status. The Board shall determine the effect on an Award of the disability, death, retirement, authorized leave of absence or other change in the employment or other status of a Participant and the extent to which, and the period during which, the Participant, or the Participant's legal representative, conservator, guardian or Designated Beneficiary, may exercise rights under the Award.

(e) Withholding. Each Participant shall pay to the Company, or make provision satisfactory to the Company for payment of, any taxes required by law to be withheld in connection with an Award to such Participant. Except as the Board may otherwise provide in an Award, for so long as the Common Stock is registered under the Exchange Act, Participants may satisfy such tax obligations in whole or in part by delivery of shares of Common Stock, including shares retained from the Award creating the tax obligation, valued at their Fair Market Value;

provided, however, except as otherwise provided by the Board, that the total tax withholding where stock is being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such supplemental taxable income). Shares surrendered to satisfy tax withholding requirements cannot be subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements. The Company may, to the extent permitted by law, deduct any such tax obligations from any payment of any kind otherwise due to a Participant.

(f) Amendment of Award. The Board may amend, modify or terminate any outstanding Award, including but not limited to, substituting therefor another Award of the same or a different type, changing the date of exercise or realization, and converting an Incentive Stock Option to a Nonstatutory Stock Option, provided that the Participant's consent to such action shall be required unless the Board determines that the action, taking into account any related action, would not materially and adversely affect the Participant.

(g) Conditions on Delivery of Stock. The Company will not be obligated to deliver any shares of Common Stock pursuant to the Plan or to remove restrictions from shares previously delivered under the Plan until (i) all conditions of the Award have been met or removed to the satisfaction of the Company, (ii) in the opinion of the Company's counsel, all other legal matters in connection with the issuance and delivery of such shares have been satisfied, including any applicable securities laws and any applicable stock exchange or stock market rules and regulations, and (iii) the Participant has executed and delivered to the Company such representations or agreements as the Company may consider appropriate to satisfy the requirements of any applicable laws, rules or regulations.

(h) Acceleration. The Board may at any time provide that any Award shall become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part, as the case may be.

10. Miscellaneous

(a) No Right To Employment or Other Status. No person shall have any claim or right to be granted an Award, and the grant of an Award shall not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan, except as expressly provided in the applicable Award.

(b) No Rights As Stockholder. Subject to the provisions of the applicable Award, no Participant or Designated Beneficiary shall have any rights as a stockholder with respect to any shares of Common Stock to be distributed with respect to an Award until becoming the record holder of such shares. Notwithstanding the foregoing, in the event the Company effects a split of the Common Stock by means of a stock dividend and the exercise price of and the number of shares subject to such Option are adjusted as of the date of the distribution of the dividend (rather than as of the record date for such dividend), then an optionee who exercises an Option between the record date and the distribution date for such stock dividend shall be entitled to receive, on

the distribution date, the stock dividend with respect to the shares of Common Stock acquired upon such Option exercise, notwithstanding the fact that such shares were not outstanding as of the close of business on the record date for such stock dividend.

(c) Effective Date and Term of Plan. The Plan shall become effective on the date on which it is adopted by the Board. No Awards shall be granted under the Plan after the completion of 10 years from the earlier of (i) the date on which the Plan was adopted by the Board or (ii) the date the Plan was approved by the Company's stockholders, but Awards previously granted may extend beyond that date.

(d) Amendment of Plan. The Board may amend, suspend or terminate the Plan or any portion thereof at any time.

(e) Authorization of Sub-Plans. The Board may from time to time establish one or more sub-plans under the Plan for purposes of satisfying applicable blue sky, securities or tax laws of various jurisdictions. The Board shall establish such sub-plans by adopting supplements to this Plan containing (i) such limitations on the Board's discretion under the Plan as the Board deems necessary or desirable or (ii) such additional terms and conditions not otherwise inconsistent with the Plan as the Board shall deem necessary or desirable. All supplements adopted by the Board shall be deemed to be part of the Plan, but each supplement shall apply only to Participants within the affected jurisdiction and the Company shall not be required to provide copies of any supplement to Participants in any jurisdiction which is not the subject of such supplement.

(f) Compliance with Code Section 409A. No Award shall provide for deferral of compensation that does not comply with Section 409A of the Code, unless the Board, at the time of grant, specifically provides that the Award is not intended to comply with Section 409A of the Code.

(g) Governing Law. The provisions of the Plan and all Awards made hereunder shall be governed by and interpreted in accordance with the laws of the State of Delaware, excluding choice-of-law principles of the law of such state that would require the application of the laws of a jurisdiction other than such state.

PRECISION BIOSCIENCES, INC.

2006 STOCK INCENTIVE PLAN

CALIFORNIA SUPPLEMENT

Pursuant to Section 10(e) of the Plan, the Board has adopted this supplement for purposes of satisfying the requirements of Section 25102(o) of the California Law:

Any Awards granted under the Plan to a Participant who is a resident of the State of California on the date of grant (a "California Participant") shall be subject to the following additional limitations, terms and conditions:

1. Additional Limitations on Options.

(a) Minimum Vesting Rate. Except in the case of Options granted to California Participants who are officers, directors, managers, consultants or advisors of the Company or its affiliates (which Options may become exercisable at whatever rate is determined by the Board), Options granted to California Participants shall become exercisable at a rate of no less than 20% per year over five years from the date of grant; provided, that, such Options may be subject to such reasonable forfeiture conditions as the Board may choose to impose and which are not inconsistent with Section 260.140.41 of the California Regulations.

(b) Minimum Exercise Price. The exercise price of Options granted to California Participants may not be less than 85% of the Fair Market Value of the Common Stock on the date of grant in the case of a Nonstatutory Stock Option or less than 100% of the Fair Market Value of the Common Stock on the date of grant in the case of an Incentive Stock Option; provided, however, that if the California Participant is a person who owns stock possessing more than 10% of the total combined voting power of all classes of stock of the Company or its parent or subsidiary corporations, the exercise price shall be not less than 110% of the Fair Market Value of the Common Stock on the date of grant.

(c) Maximum Duration of Options. No Options granted to California Participants will be granted for a term in excess of 10 years.

(d) Minimum Exercise Period Following Termination. Unless a California Participant's employment is terminated for cause (as defined in any contract of employment between the Company and such Participant, or if none, in the instrument evidencing the grant of such Participant's Option), in the event of termination of employment of such Participant, he or she shall have the right to exercise an Option, to the extent that he or she was otherwise entitled to exercise such Option on the date employment terminated, as follows: (i) at least six months from the date of termination, if termination was caused by such Participant's death or "permanent and total disability" (within the meaning of Section 22(e)(3) of the Code) and (ii) at least 30 days from the date of termination, if termination was caused other than by such Participant's death or "permanent and total disability" (within the meaning of Section 22(e)(3) of the Code).

(e) Limitation on Repurchase Rights. If an Option granted to a California Participant gives the Company the right to repurchase shares of Common Stock issued pursuant to the Plan upon termination of employment of such Participant, the terms of such repurchase right must comply with Section 260.140.41(k) of the California Regulations.

2. Additional Limitations for Restricted Stock Awards.

(a) Minimum Purchase Price. The purchase price for a Restricted Stock Award granted to a California Participant shall be not less than 85% of the Fair Market Value of the Common Stock at the time such Participant is granted the right to purchase shares under the Plan or at the time the purchase is consummated; provided, however, that if such Participant is a person who owns stock possessing more than 10% of the total combined voting power or value of all classes of stock of the Company or its parent or subsidiary corporations, the purchase price shall be not less than 100% of the Fair Market Value of the Common Stock at the time such Participant is granted the right to purchase shares under the Plan or at the time the purchase is consummated.

(b) Limitation of Repurchase Rights. If a Restricted Stock Award granted to a California Participant gives the Company the right to repurchase shares of Common Stock issued pursuant to the Plan upon termination of employment of such Participant, the terms of such repurchase right must comply with Section 260.140.42(h) of the California Regulations.

3. Additional Limitations for Other Stock-Based Awards. The terms of all Awards granted to a California Participant under Section 7 of the Plan shall comply, to the extent applicable, with Section 260.140.41 or Section 260.140.42 of the California Regulations.

4. Additional Requirement to Provide Information to California Participants. The Company shall provide to each California Participant and to each California Participant who acquires Common Stock pursuant to the Plan, not less frequently than annually, copies of annual financial statements (which need not be audited). The Company shall not be required to provide such statements to key employees whose duties in connection with the Company assure their access to equivalent information.

5. Additional Limitations on Timing of Awards. No Award granted to a California Participant shall become exercisable, vested or realizable, as applicable to such Award, unless the Plan has been approved by a majority of the Company's stockholders within 12 months before or after the date the Plan was adopted by the Board.

6. Additional Limitations Relating to Definition of Fair Market Value. For purposes of Section 1(b) and 2(a) of this supplement, "Fair Market Value" shall be determined in a manner not inconsistent with Section 260.140.50 of the California Regulations.

7. Additional Restriction Regarding Recapitalizations, Stock Splits, Etc. For purposes of Section 8 of the Plan, in the event of a stock split, reverse stock split, stock dividend, recapitalization, combination, reclassification or other distribution of the Company's securities, the number of securities allocated to each California Participant must be adjusted proportionately and without the receipt by the Company of any consideration from any California Participant.

PRECISION BIOSCIENCES, INC.
FIRST AMENDMENT OF 2006 STOCK INCENTIVE PLAN

THIS FIRST AMENDMENT of Precision Biosciences, Inc. 2006 Stock Incentive Plan is dated as of December 8, 2010.

WHEREAS, the Board of Directors of Precision Biosciences, Inc. (the "**Company**") has adopted and the stockholders of the Company have approved the Precision Biosciences, Inc. 2006 Stock Incentive Plan (the "**Plan**"); and

WHEREAS, the Board of Directors determines that it is in the best interests of the Company to amend the Plan in order to increase the number of shares of common stock issuable pursuant to options granted under the Plan (the "**Shares**") from Two Hundred Thousand (200,000) shares to Four Hundred Fifty Thousand (450,000) shares and to make such other amendments as set forth below.

NOW, THEREFORE, the Plan shall be amended as follows:

1. The first sentence of Section 4 of the Plan is hereby deleted in its entirety and the following substituted in lieu thereof:

> "Subject to adjustment under Section 8, Awards may be made under the Plan for up to 450,000 shares of common stock, $0.0001 par value per share, of the Company (the "Common Stock")."

Section 4 of the Plan is hereby further amended to delete the fourth sentence of such section (beginning with the word "However") and the following is substituted in lieu thereof:

> "Notwithstanding the above, if an Option (as defined below) should expire or become unexerciseable or otherwise terminate for any reason without having been exercised in full, the unpurchased Shares which were subject thereto shall not return to this Plan and shall not become available for other Options under this Plan and shall instead be immediately canceled."

2. Section 3(a) of the Plan is hereby amended to add the following immediately after the second sentence of such section:

> "In addition, the Board shall have the authority to: (a) interpret this Plan, the Awards and any agreement entered into with respect to the grant or exercise of Awards (including Options); (b) to authorize any person to execute on behalf of the Company any instrument required to effectuate the grant of an Award or to take such action as may be necessary or appropriate with respect to the Company's rights pursuant to Awards or agreements relating to the grant or exercise thereof; and (c) to make such other terminations and establish such other procedures as it deems necessary or advisable for the administration of the Plan."

3. Section 8(b)(1) of the Plan is hereby deleted in its entirety and the following substituted in lieu thereof:

"(1) Definition. A "Reorganization Event" shall mean one of the following events: (a) the merger, consolidation or other reorganization of the Company in which the outstanding Common Stock is converted into or exchanged for a different class of securities of the Company, a class of securities of any other issuer (except a parent or subsidiary of the Company), cash or other property; (b) the sale, lease or exchange of all or substantially all of the assets of the Company to any other corporation or entity (except a parent or subsidiary of the Company); or (c) the adoption by stockholders of the Company of a plan of liquidation or dissolution. Notwithstanding the above, a Reorganization Event shall not include a merger, consolidation or reorganization of the Company in which no person acquires more than fifty percent (50%) of the combined voting power of the Company's then outstanding stock."

4. Section 8(b)(3) of the Plan is hereby deleted in its entirety and the following substituted in lieu thereof:

"Upon the occurrence of a Reorganization Event, except to the extent specifically provided to the contrary in the instrument evidencing any Restricted Stock Award or any other agreement between a participant and the Company, all restrictions and conditions on all Restricted Stock Awards or Awards under any other such agreements then outstanding shall automatically be deemed terminated or satisfied."

5. Except as herein amended, the terms and provisions of the Plan shall remain in full force and effect as originally adopted and approved.

IN WITNESS WHEREOF, the undersigned hereby certifies that this First Amendment was duly adopted by the Board of Directors of the Company as of December 8, 2010.

PRECISION BIOSCIENCES, INC.

By: /s/Matt Kane
Name: Matt Kane
Title: CEO

PRECISION BIOSCIENCES, INC.

Incentive Stock Option Agreement
Granted Under 2006 Stock Incentive Plan

1. Grant of Option.

This agreement evidences the grant by Precision BioSciences, Inc., a Delaware corporation (the "Company"), on , 200[ ] (the "Grant Date") to [ ] an employee of the Company (the "Participant"), of an option to purchase, in whole or in part, on the terms provided herein and in the Company's 2006 Stock Incentive Plan (the "Plan"), a total of [ ] shares (the "Shares") of common stock, $0.0001 par value per share, of the Company ("Common Stock") at $ per Share.[1] Unless earlier terminated, this option shall expire at 5:00 p.m., Eastern time, on (the "Final Exercise Date").[2]

It is intended that the option evidenced by this agreement shall be an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "Code"). Except as otherwise indicated by the context, the term "Participant", as used in this option, shall be deemed to include any person who acquires the right to exercise this option validly under its terms.

2. Vesting Schedule.

This option will become exercisable ("vest") as to % of the original number of Shares on the [first] anniversary of the Grant Date and as to an additional % of the original number of Shares at the end of each successive [three-month] period following the first anniversary of the Grant Date until the [fourth] anniversary of the Grant Date.

The right of exercise shall be cumulative so that to the extent the option is not exercised in any period to the maximum extent permissible it shall continue to be exercisable, in whole or in part, with respect to all Shares for which it is vested until the earlier of the Final Exercise Date or the termination of this option under Section 3 hereof or the Plan.

3. Exercise of Option.

(a) Form of Exercise. Each election to exercise this option shall be in writing, signed by the Participant, and received by the Company at its principal office, accompanied by this agreement, and payment in full in the manner provided in the Plan. The Participant may

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1 This must be at least 100% of the fair market value of the Common Stock on the date of grant (or 110% in the case of a Participant that owns more than 10% of the total combined voting power of all classes of stock of the Company or its parent or subsidiary (a "10% Shareholder")) for the option to qualify as an incentive stock option (an "ISO") under Section 422 of the Code.

2 The Final Exercise Date must be no more than 10 years (5 years in the case of a 10% Shareholder) from the date of grant for the option to qualify as an ISO. The correct approach to calculate the final exercise date is to use the day immediately prior to the date ten years out from the date of the stock option award grant (5 years in the case of a 10% stockholder). For example, an award granted to someone on October 1, 2001 would expire on September 30, 2011 (not on October 1, 2011).

purchase less than the number of shares covered hereby, provided that no partial exercise of this option may be for any fractional share or for fewer than ten whole shares.

(b) Continuous Relationship with the Company Required. Except as otherwise provided in this Section 3, this option may not be exercised unless the Participant, at the time he or she exercises this option, is, and has been at all times since the Grant Date, an employee or officer of, or consultant or advisor to, the Company or any parent or subsidiary of the Company as defined in Section 424(e) or (f) of the Code (an "Eligible Participant").

(c) Termination of Relationship with the Company. If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (d) and (e) below, the right to exercise this option shall terminate three months after such cessation (but in no event after the Final Exercise Date), provided that this option shall be exercisable only to the extent that the Participant was entitled to exercise this option on the date of such cessation. Notwithstanding the foregoing, if the Participant, prior to the Final Exercise Date, violates the non-competition or confidentiality provisions of any employment contract, confidentiality and nondisclosure agreement or other agreement between the Participant and the Company, the right to exercise this option shall terminate immediately upon written notice to the Participant from the Company describing such violation.

(d) Exercise Period Upon Death or Disability. If the Participant dies or becomes disabled (within the meaning of Section 22(e)(3) of the Code) prior to the Final Exercise Date while he or she is an Eligible Participant and the Company has not terminated such relationship for "cause" as specified in paragraph (e) below, this option shall be exercisable, within the period of one year following the date of death or disability of the Participant, by the Participant (or in the case of death by an authorized transferee), provided that this option shall be exercisable only to the extent that this option was exercisable by the Participant on the date of his or her death or disability, and further provided that this option shall not be exercisable after the Final Exercise Date.

(e) Termination for Cause. If, prior to the Final Exercise Date, the Participant's employment is terminated by the Company for Cause (as defined below), the right to exercise this option shall terminate immediately upon the effective date of such termination of employment. If, prior to the Final Exercise Date, the Participant is given notice by the Company of the termination of his or her employment by the Company for Cause, and the effective date of such employment termination is subsequent to the date of delivery of such notice, the right to exercise this option shall be suspended from the time of the delivery of such notice until the earlier of (i) such time as it is determined or otherwise agreed that the Participant's employment shall not be terminated for Cause as provided in such notice or (ii) the effective date of such termination of employment (in which case the right to exercise this option shall, pursuant to the preceding sentence, terminate upon the effective date of such termination of employment). If the Participant is party to an employment or severance agreement with the Company that contains a definition of "cause" for termination of employment, "Cause" shall have the meaning ascribed to such term in such agreement. Otherwise, "Cause" shall mean willful misconduct by the Participant or willful failure by the Participant to perform his or her responsibilities to the Company (including, without limitation, breach by the Participant of any provision of any employment, consulting, advisory, nondisclosure, non-competition or other similar agreement

between the Participant and the Company), as determined by the Company, which determination shall be conclusive. The Participant shall be considered to have been discharged for Cause if the Company determines, within 30 days after the Participant's resignation, that discharge for cause was warranted.

4. Company Right of First Refusal.

(a) Notice of Proposed Transfer. If the Participant proposes to sell, assign, transfer, pledge, hypothecate or otherwise dispose of, by operation of law or otherwise (collectively, "transfer") any Shares acquired upon exercise of this option, then the Participant shall first give written notice of the proposed transfer (the "Transfer Notice") to the Company. The Transfer Notice shall name the proposed transferee and state the number of such Shares the Participant proposes to transfer (the "Offered Shares"), the price per share and all other material terms and conditions of the transfer.

(b) Company Right to Purchase. For 30 days following its receipt of such Transfer Notice, the Company shall have the option to purchase all or part of the Offered Shares at the price and upon the terms set forth in the Transfer Notice. In the event the Company elects to purchase all or part of the Offered Shares, it shall give written notice of such election to the Participant within such 30-day period. Within 10 days after his or her receipt of such notice, the Participant shall tender to the Company at its principal offices the certificate or certificates representing the Offered Shares to be purchased by the Company, duly endorsed in blank by the Participant or with duly endorsed stock powers attached thereto, all in a form suitable for transfer of the Offered Shares to the Company. Promptly following receipt of such certificate or certificates, the Company shall deliver or mail to the Participant a check in payment of the purchase price for such Offered Shares; provided that if the terms of payment set forth in the Transfer Notice were other than cash against delivery, the Company may pay for the Offered Shares on the same terms and conditions as were set forth in the Transfer Notice; and provided further that any delay in making such payment shall not invalidate the Company's exercise of its option to purchase the Offered Shares.

(c) Shares Not Purchased By Company. If the Company does not elect to acquire all of the Offered Shares, the Participant may, within the 30-day period following the expiration of the option granted to the Company under subsection (b) above, transfer the Offered Shares which the Company has not elected to acquire to the proposed transferee, provided that such transfer shall not be on terms and conditions more favorable to the transferee than those contained in the Transfer Notice. Notwithstanding any of the above, all Offered Shares transferred pursuant to this Section 4 shall remain subject to the right of first refusal set forth in this Section 4 and such transferee shall, as a condition to such transfer, deliver to the Company a written instrument confirming that such transferee shall be bound by all of the terms and conditions of this Section 4.

(d) Consequences of Non-Delivery. After the time at which the Offered Shares are required to be delivered to the Company for transfer to the Company pursuant to subsection (b) above, the Company shall not pay any dividend to the Participant on account of such Offered Shares or permit the Participant to exercise any of the privileges or rights of a stockholder with

respect to such Offered Shares, but shall, insofar as permitted by law, treat the Company as the owner of such Offered Shares.

(e) Exempt Transactions. The following transactions shall be exempt from the provisions of this Section 4:

(1) any transfer of Shares to or for the benefit of any spouse, child, parent, uncle, aunt, sibling, mother or father-in law, sister or brother-in-law or grandchild of the Participant, or any other relatives of the Participant approved by the Board of Directors (collectively, "Approved Relatives") or to a trust established solely for the benefit of the Participant and/or Approved Relatives;

(2) any transfer pursuant to an effective registration statement filed by the Company under the Securities Act of 1933, as amended (the "Securities Act"); and

(3) the sale of all or substantially all of the shares of capital stock of the Company (including pursuant to a merger or consolidation);

provided, however, that in the case of a transfer pursuant to clause (1) above, such Shares shall remain subject to the right of first refusal set forth in this Section 4 and such transferee shall, as a condition to such transfer, deliver to the Company a written instrument confirming that such transferee shall be bound by all of the terms and conditions of this Section 4.

(f) Assignment of Company Right. The Company may assign its rights to purchase Offered Shares in any particular transaction under this Section 4 to one or more persons or entities.

(g) Termination. The provisions of this Section 4 shall terminate upon the earlier of the following events:

(1) the closing of the sale of shares of Common Stock in an underwritten public offering pursuant to an effective registration statement filed by the Company under the Securities Act; or

(2) the sale of all or substantially all of the capital stock, assets or business of the Company, by merger, consolidation, sale of assets or otherwise (other than a merger or consolidation in which all or substantially all of the individuals and entities who were beneficial owners of the Common Stock immediately prior to such transaction beneficially own, directly or indirectly, more than 50% of the outstanding securities entitled to vote generally in the election of directors of the resulting, surviving or acquiring corporation in such transaction).

(h) No Obligation to Recognize Invalid Transfer. The Company shall not be required (1) to transfer on its books any of the Shares which shall have been sold or transferred in violation of any of the provisions set forth in this Section 4, or (2) to treat as owner of such Shares or to pay dividends to any transferee to whom any such Shares shall have been so sold or transferred.

(i) Legends. The certificate representing Shares shall bear a legend substantially in the following form (in addition to, or in combination with, any legend required by applicable federal and state securities laws and agreements relating to the transfer of the Company securities):

> "The shares represented by this certificate are subject to a right of first refusal in favor of the Company, as provided in a certain stock option agreement with the Company."

5. Agreement in Connection with Public Offering.

The Participant agrees, in connection with the initial underwritten public offering of the Company's securities pursuant to a registration statement under the Securities Act, (i) not to sell, make short sale of, loan, grant any options for the purchase of, or otherwise dispose of any shares of Common Stock held by the Participant (other than those shares included in the offering) without the prior written consent of the Company or the underwriters managing such initial underwritten public offering of the Company's securities for a period of 180 days from the effective date of such registration statement, and (ii) to execute any agreement reflecting clause (i) above as may be requested by the Company or the managing underwriters at the time of such offering.

6. Tax Matters.

(a) Withholding. No Shares will be issued pursuant to the exercise of this option unless and until the Participant pays to the Company, or makes provision satisfactory to the Company for payment of, any federal, state or local withholding taxes required by law to be withheld in respect of this option.

(b) Disqualifying Disposition. If the Participant disposes of Shares acquired upon exercise of this option within two years from the Grant Date or one year after such Shares were acquired pursuant to exercise of this option, the Participant shall notify the Company in writing of such disposition.

7. Nontransferability of Option.

This option-may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this option shall be exercisable only by the Participant.

8. Provisions of the Plan.

This option is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this option.

IN WITNESS WHEREOF, the Company has caused this option to be executed under its corporate seal by its duly authorized officer. This option shall take effect as a sealed instrument.

PRECISION BIOSCIENCES, INC.

Dated: _____

By: _____

Name: _____

Title: _____

NOTICE OF STOCK OPTION EXERCISE

Date: _____

Precision BioSciences, Inc.
2225 Gentry Drive
Durham, NC 27705

Attention: Treasurer

Dear Sir or Madam:

I am the holder of an Incentive Stock Option granted to me under the Precision BioSciences, Inc. (the "Company") 2006 Stock Incentive Plan on for the purchase of shares of Common Stock of the Company at a purchase price of $ per share.

I hereby exercise my option to purchase shares of Common Stock (the "Shares"), for which I have enclosed in the amount of . Please register my stock certificate as follows:

Name(s): _____

_____

Address: _____

Tax I.D. #: _____

I represent, warrant and covenant as follows:

1. I am purchasing the Shares for my own account for investment only, and not with a view to, or for sale in connection with, any distribution of the Shares in violation of the Securities Act of 1933 (the "Securities Act"), or any rule or regulation under the Securities Act.

2. I have had such opportunity as I have deemed adequate to obtain from representatives of the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company.

3. I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

4. I can afford a complete loss of the value of the Shares and am able to bear the economic risk of holding such Shares for an indefinite period.

5. I understand that (i) the Shares have not been registered under the Securities Act and are “restricted securities” within the meaning of Rule 144 under the Securities Act, (ii) the Shares cannot be sold, transferred or otherwise disposed of unless they are subsequently registered under the Securities Act or an exemption from registration is then available; (iii) in any event, the exemption from registration under Rule 144 will not be available for at least one year and even then will not be available unless a public market then exists for the Common Stock, adequate information concerning the Company is then available to the public, and other terms and conditions of Rule 144 are complied with; and (iv) there is now no registration statement on file with the Securities and Exchange Commission with respect to any stock of the Company and the Company has no obligation or current intention to register the Shares under the Securities Act.

Very truly yours,

_____

(Signature)

PRECISION BIOSCIENCES, INC.

Nonstatutory Stock Option Agreement
Granted Under 2006 Stock Incentive Plan

1. Grant of Option.

This agreement evidences the grant by Precision BioSciences, Inc., a Delaware corporation (the "Company"), on , 200[ ] (the "Grant Date") to , an [employee], [consultant], [director] of the Company (the "Participant"), of an option to purchase, in whole or in part, on the terms provided herein and in the Company's 2006 Stock Incentive Plan (the "Plan"), a total of [ ] shares (the "Shares") of common stock, $0.0001 par value per share, of the Company ("Common Stock") at $[ ] per Share.[1] Unless earlier terminated, this option shall expire at 5:00 p.m., Eastern time, on [ ] (the "Final Exercise Date").

It is intended that the option evidenced by this agreement shall not be an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "Code"). Except as otherwise indicated by the context, the term "Participant", as used in this option, shall be deemed to include any person who acquires the right to exercise this option validly under its terms.

2. Vesting Schedule.

This option will become exercisable ("vest") as to % of the original number of Shares on the [first] anniversary of the Grant Date and as to an additional % of the original number of Shares at the end of each successive [three-month] period following the first anniversary of the Grant Date until the [fourth] anniversary of the Grant Date.

The right of exercise shall be cumulative so that to the extent the option is not exercised in any period to the maximum extent permissible it shall continue to be exercisable, in whole or in part, with respect to all Shares for which it is vested until the earlier of the Final Exercise Date or the termination of this option under Section 3 hereof or the Plan.

3. Exercise of Option.

(a) Form of Exercise. Each election to exercise this option shall be in writing, signed by the Participant, and received by the Company at its principal office, accompanied by this agreement, and payment in full in the manner provided in the Plan. The Participant may purchase less than the number of shares covered hereby, provided that no partial exercise of this option may be for any fractional share or for fewer than ten whole shares.

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1 Under the Plan, there are no restrictions on the exercise price; however, if the exercise price is less than 100% of fair market value of the Common Stock as of the date of grant, the Company will incur a charge to earnings as the result of the grant of the option.

(b) Continuous Relationship with the Company Required. Except as otherwise provided in this Section 3, this option may not be exercised unless the Participant, at the time he or she exercises this option, is, and has been at all times since the Grant Date, an employee, officer or director, or consultant or advisor to, the Company or any other entity the employees, officers, directors, consultants, or advisors of which are eligible to receive option grants under the Plan (an "Eligible Participant").

(c) Termination of Relationship with the Company. If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (d) and (e) below, the right to exercise this option shall terminate [three] months after such cessation (but in no event after the Final Exercise Date), provided that this option shall be exercisable only to the extent that the Participant was entitled to exercise this option on the date of such cessation. Notwithstanding the foregoing, if the Participant, prior to the Final Exercise Date, violates the non-competition or confidentiality provisions of any employment contract, confidentiality and nondisclosure agreement or other agreement between the Participant and the Company, the right to exercise this option shall terminate immediately upon written notice to the Participant from the Company describing such violation.

(d) Exercise Period Upon Death or Disability. If the Participant dies or becomes disabled (within the meaning of Section 22(e)(3) of the Code) prior to the Final Exercise Date while he or she is an Eligible Participant and the Company has not terminated such relationship for "cause" as specified in paragraph (e) below, this option shall be exercisable, within the period of one year following the date of death or disability of the Participant, by the Participant (or in the case of death by an authorized transferee), provided that this option shall be exercisable only to the extent that this option was exercisable by the Participant on the date of his or her death or disability, and further provided that this option shall not be exercisable after the Final Exercise Date.

(e) Termination for Cause. If, prior to the Final Exercise Date, the Participant's employment or other relationship with the Company is terminated by the Company for Cause (as defined below), the right to exercise this option shall terminate immediately upon the effective date of such termination of employment or other relationship. If, prior to the Final Exercise Date, the Participant is given notice by the Company of the termination of his or her employment or other relationship by the Company for Cause, and the effective date of such employment or other termination is subsequent to the date of the delivery of such notice, the right to exercise this option shall be suspended from the time of the delivery of such notice until the earlier of (i) such time as it is determined or otherwise agreed that the Participant's employment or other relationship shall not be terminated for Cause as provided in such notice or (ii) the effective date of such termination of employment or other relationship (in which case the right to exercise this option shall, pursuant to the preceding sentence, terminate immediately upon the effective date of such termination of employment or other relationship). If the Participant is party to an employment, consulting or severance agreement with the Company that contains a definition of "cause" for termination of employment or other relationship, "Cause" shall have the meaning ascribed to such term in such agreement. Otherwise, "Cause" shall mean willful misconduct by the Participant or willful failure by the Participant to perform his or her responsibilities to the Company (including, without limitation, breach by the Participant of any provision of any employment, consulting, advisory, nondisclosure, non-competition or other similar agreement

between the Participant and the Company), as determined by the Company, which determination shall be conclusive. The Participant shall be considered to have been discharged for "Cause" if the Company determines, within 30 days after the Participant's resignation, that discharge for cause was warranted.

4. Company Right of First Refusal.

(a) Notice of Proposed Transfer. If the Participant proposes to sell, assign, transfer, pledge, hypothecate or otherwise dispose of, by operation of law or otherwise (collectively, "transfer") any Shares acquired upon exercise of this option, then the Participant shall first give written notice of the proposed transfer (the "Transfer Notice") to the Company. The Transfer Notice shall name the proposed transferee and state the number of such Shares the Participant proposes to transfer (the "Offered Shares"), the price per share and all other material terms and conditions of the transfer.

(b) Company Right to Purchase. For 30 days following its receipt of such Transfer Notice, the Company shall have the option to purchase all or part of the Offered Shares at the price and upon the terms set forth in the Transfer Notice. In the event the Company elects to purchase all or part of the Offered Shares, it shall give written notice of such election to the Participant within such 30-day period. Within 10 days after his or her receipt of such notice, the Participant shall tender to the Company at its principal offices the certificate or certificates representing the Offered Shares to be purchased by the Company, duly endorsed in blank by the Participant or with duly endorsed stock powers attached thereto, all in a form suitable for transfer of the Offered Shares to the Company. Promptly following receipt of such certificate or certificates, the Company shall deliver or mail to the Participant a check in payment of the purchase price for such Offered Shares; provided that if the terms of payment set forth in the Transfer Notice were other than cash against delivery, the Company may pay for the Offered Shares on the same terms and conditions as were set forth in the Transfer Notice; and provided further that any delay in making such payment shall not invalidate the Company's exercise of its option to purchase the Offered Shares.

(c) Shares Not Purchased By Company. If the Company does not elect to acquire all of the Offered Shares, the Participant may, within the 30-day period following the expiration of the option granted to the Company under subsection (b) above, transfer the Offered Shares which the Company has not elected to acquire to the proposed transferee, provided that such transfer shall not be on terms and conditions more favorable to the transferee than those contained in the Transfer Notice. Notwithstanding any of the above, all Offered Shares transferred pursuant to this Section 4 shall remain subject to the right of first refusal set forth in this Section 4 and such transferee shall, as a condition to such transfer, deliver to the Company a written instrument confirming that such transferee shall be bound by all of the terms and conditions of this Section 4.

(d) Consequences of Non-Delivery. After the time at which the Offered Shares are required to be delivered to the Company for transfer to the Company pursuant to subsection (b) above, the Company shall not pay any dividend to the Participant on account of such Offered Shares or permit the Participant to exercise any of the privileges or rights of a stockholder

with respect to such Offered Shares, but shall, insofar as permitted by law, treat the Company as the owner of such Offered Shares.

(e) Exempt Transactions. The following transactions shall be exempt from the provisions of this Section 4:

(1) any transfer of Shares to or for the benefit of any spouse, child, parent, uncle, aunt, sibling, mother or father-in law, sister or brother-in-law or grandchild of the Participant, or any other relatives of the Participant approved by the Board of Directors (collectively, "Approved Relatives") or to a trust established solely for the benefit of the Participant and/or Approved Relatives;

(2) any transfer pursuant to an effective registration statement filed by the Company under the Securities Act of 1933, as amended (the "Securities Act"); and

(3) the sale of all or substantially all of the shares of capital stock of the Company (including pursuant to a merger or consolidation);

provided, however, that in the case of a transfer pursuant to clause (1) above, such Shares shall remain subject to the right of first refusal set forth in this Section 4 and such transferee shall, as a condition to such transfer, deliver to the Company a written instrument confirming that such transferee shall be bound by all of the terms and conditions of this Section 4.

(f) Assignment of Company Right. The Company may assign its rights to purchase Offered Shares in any particular transaction under this Section 4 to one or more persons or entities.

(g) Termination. The provisions of this Section 4 shall terminate upon the earlier of the following events:

(1) the closing of the sale of shares of Common Stock in an underwritten public offering pursuant to an effective registration statement filed by the Company under the Securities Act; or

(2) the sale of all or substantially all of the capital stock, assets or business of the Company, by merger, consolidation, sale of assets or otherwise (other than a merger or consolidation in which all or substantially all of the individuals and entities who were beneficial owners of the Common Stock immediately prior to such transaction beneficially own, directly or indirectly, more than 50% of the outstanding securities entitled to vote generally in the election of directors of the resulting, surviving or acquiring corporation in such transaction).

(h) No Obligation to Recognize Invalid Transfer. The Company shall not be required (1) to transfer on its books any of the Shares which shall have been sold or transferred in violation of any of the provisions set forth in this Section 4, or (2) to treat as owner of such Shares or to pay dividends to any transferee to whom any such Shares shall have been so sold or transferred.

(i) Legends. The certificate representing Shares shall bear a legend substantially in the following form (in addition to, or in combination with, any legend required by applicable federal and state securities laws and agreements relating to the transfer of the Company securities):

> "The shares represented by this certificate are subject to a right of first refusal in favor of the Company, as provided in a certain stock option agreement with the Company."

5. Agreement in Connection with Public Offering.

The Participant agrees, in connection with the initial underwritten public offering of the Company's securities pursuant to a registration statement under the Securities Act, (i) not to sell, make short sale of, loan, grant any options for the purchase of, or otherwise dispose of any shares of Common Stock held by the Participant (other than those shares included in the offering) without the prior written consent of the Company or the underwriters managing such initial underwritten public offering of the Company's securities for a period of 180 days from the effective date of such registration statement, and (ii) to execute any agreement reflecting clause (i) above as may be requested by the Company or the managing underwriters at the time of such offering.

6. Withholding.

No Shares will be issued pursuant to the exercise of this option unless and until the Participant pays to the Company, or makes provision satisfactory to the Company for payment of, any federal, state or local withholding taxes required by law to be withheld in respect of this option.

7. Nontransferability of Option.

This option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this option shall be exercisable only by the Participant.

8. Provisions of the Plan.

This option is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this option.

IN WITNESS WHEREOF, the Company has caused this option to be executed under its corporate seal by its duly authorized officer. This option shall take effect as a sealed instrument.

PRECISION BIOSCIENCES, INC.

Dated: _____

By: _____

Name: _____

Title: _____

NOTICE OF STOCK OPTION EXERCISE

Date:

Precision BioSciences, Inc.
2225 Gentry Drive
Durham, NC 27705

Attention: Treasurer

Dear Sir or Madam:

I am the holder of Nonstatutory Stock Option granted to me under the Precision BioSciences, Inc. (the "Company") 2006 Stock Incentive Plan on for the purchase of shares of Common Stock of the Company at a purchase price of $ per share.

I hereby exercise my option to purchase shares of Common Stock (the "Shares"), for which I have enclosed in the amount of . Please register my stock certificate as follows:

Name(s): _____

_____

Address: _____

Tax I.D. #: _____

I represent, warrant and covenant as follows:

1. I am purchasing the Shares for my own account for investment only, and not with a view to, or for sale in connection with, any distribution of the Shares in violation of the Securities Act of 1933 (the "Securities Act"), or any rule or regulation under the Securities Act.

2. I have had such opportunity as I have deemed adequate to obtain from representatives of the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company.

3. I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

4. I can afford a complete loss of the value of the Shares and am able to bear the economic risk of holding such Shares for an indefinite period.

5. I understand that (i) the Shares have not been registered under the Securities Act and are “restricted securities” within the meaning of Rule 144 under the Securities Act, (ii) the Shares cannot be sold, transferred or otherwise disposed of unless they are subsequently registered under the Securities Act or an exemption from registration is then available; (iii) in any event, the exemption from registration under Rule 144 will not be available for at least one year and even then will not be available unless a public market then exists for the Common Stock, adequate information concerning the Company is then available to the public, and other terms and conditions of Rule 144 are complied with; and (iv) there is now no registration statement on file with the Securities and Exchange Commission with respect to any stock of the Company and the Company has no obligation or current intention to register the Shares under the Securities Act.

Very truly yours,

_____

(Signature)

PRECISION BIOSCIENCES, INC.

Restricted Stock Agreement
Granted Under 2006 Stock Incentive Plan

AGREEMENT made this day of , 200 , between Precision BioSciences, Inc., a Delaware corporation (the "Company"), and (the "Participant").

For valuable consideration, receipt of which is acknowledged, the parties hereto agree as follows:

1. Purchase of Shares.

The Company shall issue and sell to the Participant, and the Participant shall purchase from the Company, subject to the terms and conditions set forth in this Agreement, shares (the "Shares") of common stock, $0.001 par value, of the Company ("Common Stock"), at a purchase price of $[ ] per share. The aggregate purchase price for the Shares shall be paid by the Participant by check payable to the order of the Company or such other method as may be acceptable to the Company. Upon receipt by the Company of payment for the Shares, the Company shall issue to the Participant one or more certificates in the name of the Participant for that number of Shares purchased by the Participant. The Participant agrees that the Shares shall be subject to the purchase options set forth in Sections 2 and 5 of this Agreement and the restrictions on transfer set forth in Section 4 of this Agreement.

2. Purchase Option.

(a) In the event that the Participant ceases to be employed by the Company for any reason or no reason, with or without cause, prior to , [ ] , the Company shall have the right and option (the "Purchase Option") to purchase from the Participant, for a sum of $[ ][1] per share (the "Option Price"), some or all of the Unvested Shares (as defined below).

"Unvested Shares" means the total number of Shares multiplied by the Applicable Percentage at the time the Purchase Option becomes exercisable by the Company. The "Applicable Percentage" shall be (i) 66% during the 12-month period ending , 200_, (ii) [75%] less [6.25%] for each one month of service completed by the Participant with the Company from and after , 200 , and (iii) zero on or after , 200 .

(b) In the event that the Participant's employment with the Company is terminated by reason of death or disability, the number of the Shares for which the Purchase Option becomes exercisable shall be fifty percent (50%) of the number of Unvested Shares for which the Purchase Option would otherwise become exercisable. For this purpose, "disability" shall mean the inability of the Participant, due to a medical reason, to carry out his duties as an employee of the Company for a period of six consecutive months.

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1 This is generally equal to the purchase price paid.

(c) If the Participant is employed by a parent or subsidiary of the Company, any references in this Agreement to employment with the Company or termination of employment by or with the Company shall instead be deemed to refer to such parent or subsidiary.

3. Exercise of Purchase Option and Closing.

(a) The Company may exercise the Purchase Option by delivering or mailing to the Participant (or his estate), within 90 days after the termination of the employment of the Participant with the Company, a written notice of exercise of the Purchase Option. Such notice shall specify the number of Shares to be purchased. If and to the extent the Purchase Option is not so exercised by the giving of such a notice within such 90-day period, the Purchase Option shall automatically expire and terminate effective upon the expiration of such 90-day period.

(b) Within 10 days after delivery to the Participant of the Company's notice of the exercise of the Purchase Option pursuant to subsection (a) above, the Participant (or his estate) shall, pursuant to the provisions of the Joint Escrow Instructions referred to in Section 7 below, tender to the Company at its principal offices the certificate or certificates representing the Shares which the Company has elected to purchase in accordance with the terms of this Agreement, duly endorsed in blank or with duly endorsed stock powers attached thereto, all in form suitable for the transfer of such Shares to the Company. Promptly following its receipt of such certificate or certificates, the Company shall pay to the Participant the aggregate Option Price for such Shares (provided that any delay in making such payment shall not invalidate the Company's exercise of the Purchase Option with respect to such Shares).

(c) After the time at which any Shares are required to be delivered to the Company for transfer to the Company pursuant to subsection (b) above, the Company shall not pay any dividend to the Participant on account of such Shares or permit the Participant to exercise any of the privileges or rights of a stockholder with respect to such Shares, but shall, in so far as permitted by law, treat the Company as the owner of such Shares.

(d) The Option Price may be payable, at the option of the Company, in cancellation of all or a portion of any outstanding indebtedness of the Participant to the Company or in cash (by check) or both.

(e) The Company shall not purchase any fraction of a Share upon exercise of the Purchase Option, and any fraction of a Share resulting from a computation made pursuant to Section 2 of this Agreement shall be rounded to the nearest whole Share (with any one-half Share being rounded upward).

(f) The Company may assign its Purchase Option to one or more persons or entities.

4. Restrictions on Transfer.

(a) The Participant shall not sell, assign, transfer, pledge, hypothecate or otherwise dispose of, by operation of law or otherwise (collectively "transfer") any Shares, or any interest therein, that are subject to the Purchase Option, except that the Participant may

transfer such Shares (i) to or for the benefit of any spouse, child, parent, uncle, aunt, sibling, grandchild and any other relatives approved by the Board of Directors (collectively, "Approved Relatives") or to a trust established solely for the benefit of the Participant and/or Approved Relatives, provided that such Shares shall remain subject to this Agreement (including without limitation the restrictions on transfer set forth in this Section 4, the Purchase Option and the right of first refusal set forth in Section 5) and such permitted transferee shall, as a condition to such transfer, deliver to the Company a written instrument confirming that such transferee shall be bound by all of the terms and conditions of this Agreement; or (ii) as part of the sale of all or substantially all of the shares of capital stock of the Company (including pursuant to a merger or consolidation), provided that, in accordance with Section 9(b) below, the securities or other property received by the Participant in connection with such transaction shall remain subject to this Agreement; or

(b) The Participant shall not transfer any Shares, or any interest therein, that are no longer subject to the Purchase Option, except in accordance with Section 5 below.

5. Right of First Refusal.

(a) If the Participant proposes to transfer any Shares that are no longer subject to the Purchase Option (either because they are no longer Unvested Shares or because the Purchase Option expired unexercised), then the Participant shall first give written notice of the proposed transfer (the "Transfer Notice") to the Company. The Transfer Notice shall name the proposed transferee and state the number of such Shares the Participant proposes to transfer (the "Offered Shares"), the price per share and all other material terms and conditions of the transfer.

(b) For 30 days following delivery to the Company of such Transfer Notice, the Company shall have the option to purchase all or part of the Offered Shares at the price and upon the terms set forth in the Transfer Notice. In the event the Company elects to purchase all or part of the Offered Shares, it shall give written notice of such election to the Participant within such 30-day period. Within 10 days after delivery to the Participant of such notice, the Participant shall tender to the Company at its principal offices the certificate or certificates representing the Offered Shares to be purchased by the Company, duly endorsed in blank by the Participant or with duly endorsed stock powers attached thereto, all in form suitable for transfer of the Offered Shares to the Company[2]. Promptly following receipt of such certificate or certificates, the Company shall deliver or mail to the Participant a check in payment of the purchase price for the Offered Shares; provided that if the terms of payment set forth in the Transfer Notice were other than cash against delivery, the Company may pay for the Offered Shares on the same terms and conditions as were set forth in the Transfer Notice; and provided further that any delay in making such payment shall not invalidate the Company's exercise of its option to purchase the Offered Shares.

(c) If the Company does not elect to acquire any of the Offered Shares, the Participant may, within the 30-day period following the expiration of the option granted to the

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2 There are California blue sky limitations on the repurchase of shares. This should be reviewed for any Participants who are California residents.

Company under subsection (b) above, transfer the Offered Shares which the Company has not elected to acquire to the proposed transferee, provided that such transfer shall not be on terms and conditions more favorable to the transferee than those contained in the Transfer Notice. Notwithstanding any of the above, all Offered Shares transferred pursuant to this Section 5 shall remain subject to this Agreement (including without limitation the restrictions on transfer set forth in Section 4 and the right of first refusal set forth in this Section 5) and such transferee shall, as a condition to such transfer, deliver to the Company a written instrument confirming that such transferee shall be bound by all of the terms and conditions of this Agreement.

(d) After the time at which the Offered Shares are required to be delivered to the Company for transfer to the Company pursuant to subsection (b) above, the Company shall not pay any dividend to the Participant on account of such Offered Shares or permit the Participant to exercise any of the privileges or rights of a stockholder with respect to such Shares, but shall, in so far as permitted by law, treat the Company as the owner of such Offered Shares.

(e) The following transactions shall be exempt from the provisions of this Section 5:

(1) a transfer of Shares to or for the benefit of any Approved Relatives, or to a trust established solely for the benefit of the Participant and/or Approved Relatives;

(2) any transfer pursuant to an effective registration statement filed by the Company under the Securities Act of 1933, as amended (the "Securities Act"); and

(3) the sale of all or substantially all of the shares of capital stock of the Company (including pursuant to a merger or consolidation);

provided, however, that in the case of a transfer pursuant to clause (1) above, such Shares shall remain subject to this Agreement (including without limitation the restrictions on transfer set forth in Section 4 and the right of first refusal set forth in this Section 5) and such transferee shall, as a condition to such transfer, deliver to the Company a written instrument confirming that such transferee shall be bound by all of the terms and conditions of this Agreement.

(f) The Company may assign its rights to purchase Offered Shares in any particular transaction under this Section 5 to one or more persons or entities.

(g) The provisions of this Section 5 shall terminate upon the earlier of the following events:

(1) the closing of the sale of shares of Common Stock in an underwritten public offering pursuant to an effective registration statement filed by the Company under the Securities Act; or

(2) the sale of all or substantially all of the capital stock, assets or business of the Company, by merger, consolidation, sale of assets or otherwise (other than a merger or consolidation in which all or substantially all of the individuals and entities who were

beneficial owners of the Common Stock immediately prior to such transaction beneficially own, directly or indirectly, more than 75% of the outstanding securities entitled to vote generally in the election of directors of the resulting, surviving or acquiring corporation in such transaction).

(h) The Company shall not be required (1) to transfer on its books any of the Shares which shall have been sold or transferred in violation of any of the provisions set forth in this Agreement, or (2) to treat as owner of such Shares or to pay dividends to any transferee to whom any such Shares shall have been so sold or transferred.

6. Agreement in Connection with Public Offering.

The Participant agrees, in connection with the initial underwritten public offering of the Company's securities pursuant to a registration statement under the Securities Act, (i) not to sell, make short sale of, loan, grant any options for the purchase of, or otherwise dispose of any shares of Common Stock held by the Participant (other than those shares included in the offering) without the prior written consent of the Company or the underwriters managing such initial underwritten public offering of the Company's securities for a period of 180 days from the effective date of such registration statement, and (ii) to execute any agreement reflecting clause (i) above as may be requested by the Company or the managing underwriters at the time of such offering.

7. Escrow.

The Participant shall, upon the execution of this Agreement, execute Joint Escrow Instructions in the form attached to this Agreement as Exhibit A. The Joint Escrow Instructions shall be delivered to the Secretary of the Company, as escrow agent thereunder. The Participant shall deliver to such escrow agent a stock assignment duly endorsed in blank, in the form attached to this Agreement as Exhibit B, and hereby instructs the Company to deliver to such escrow agent, on behalf of the Participant, the certificate(s) evidencing the Shares issued hereunder. Such materials shall be held by such escrow agent pursuant to the terms of such Joint Escrow Instructions.

8. Restrictive Legends.

All certificates representing Shares shall have affixed thereto legends in substantially the following form, in addition to any other legends that may be required under federal or state securities laws:

> "The shares of stock represented by this certificate are subject to restrictions on transfer and an option to purchase set forth in a certain Restricted Stock Agreement between the corporation and the registered owner of these shares (or his predecessor in interest), and such Agreement is available for inspection without charge at the office of the Secretary of the corporation."
>
> "The shares represented by this certificate have not been registered under the Securities Act of 1933, as amended, and may not be sold, transferred or otherwise disposed of in the absence of an effective

registration statement under such Act or an opinion of counsel satisfactory to the corporation to the effect that such registration is not required."

9. Provisions of the Plan.

(a) This Agreement is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Agreement.

(b) As provided in the Plan, upon the occurrence of a Reorganization Event (as defined in the Plan), the repurchase and other rights of the Company hereunder shall inure to the benefit of the Company's successor and shall apply to the cash, securities or other property which the Shares were converted into or exchanged for pursuant to such Reorganization Event in the same manner and to the same extent as they applied to the Shares under this Agreement. If, in connection with a Reorganization Event, a portion of the cash, securities and/or other property received upon the conversion or exchange of the Shares is to be placed into escrow to secure indemnification or similar obligations, the mix between the vested and unvested portion of such cash, securities and/or other property that is placed into escrow shall be the same as the mix between the vested and unvested portion of such cash, securities and/or other property that is not subject to escrow.

10. Investment Representations.

The Participant represents, warrants and covenants as follows:

(a) The Participant is purchasing the Shares for his own account for investment only, and not with a view to, or for sale in connection with, any distribution of the Shares in violation of the Securities Act, or any rule or regulation under the Securities Act.

(b) The Participant has had such opportunity as he has deemed adequate to obtain from representatives of the Company such information as is necessary to permit him to evaluate the merits and risks of his investment in the Company.

(c) The Participant has sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

(d) The Participant can afford a complete loss of the value of the Shares and is able to bear the economic risk of holding such Shares for an indefinite period.

(e) The Participant understands that (i) the Shares have not been registered under the Securities Act and are "restricted securities" within the meaning of Rule 144 under the Securities Act; (ii) the Shares cannot be sold, transferred or otherwise disposed of unless they are subsequently registered under the Securities Act or an exemption from registration is then available; (iii) in any event, the exemption from registration under Rule 144 will not be available for at least one year and even then will not be available unless a public market then exists for the Common Stock, adequate information concerning the Company is then available to the public, and other terms and conditions of Rule 144 are complied with; and (iv) there is now no

registration statement on file with the Securities and Exchange Commission with respect to any stock of the Company and the Company has no obligation or current intention to register the Shares under the Securities Act.

11. Withholding Taxes; Section 83(b) Election.

(a) The Participant acknowledges and agrees that the Company has the right to deduct from payments of any kind otherwise due to the Participant any federal, state or local taxes of any kind required by law to be withheld with respect to the purchase of the Shares by the Participant or the lapse of the Purchase Option.

(b) The Participant has reviewed with the Participant's own tax advisors the federal, state, local and foreign tax consequences of this investment and the transactions contemplated by this Agreement. The Participant is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. The Participant understands that the Participant (and not the Company) shall be responsible for the Participant's own tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement. The Participant understands that it may be beneficial in many circumstances to elect to be taxed at the time the Shares are purchased rather than when and as the Company's Purchase Option expires by filing an election under Section 83(b) of the Internal Revenue Code of 1986 with the IRS within 30 days from the date of purchase.

THE PARTICIPANT ACKNOWLEDGES THAT IT IS SOLELY THE PARTICIPANT'S RESPONSIBILITY AND NOT THE COMPANY'S TO FILE TIMELY THE ELECTION UNDER SECTION 83(B), EVEN IF THE PARTICIPANT REQUESTS THE COMPANY OR ITS REPRESENTATIVES TO MAKE THIS FILING ON THE PARTICIPANT'S BEHALF.

12. Miscellaneous.

(a) No Rights To Employment. Nothing contained in this Agreement shall be construed as giving the Participant any right to be retained, in any position, as an employee of the Company. The Participant acknowledges and agrees that the vesting of the Shares pursuant to Section 2 hereof is earned only by continuing service as an employee at the will of the Company (not through the act of being hired or purchasing shares hereunder). The Participant further acknowledges and agrees that the transactions contemplated hereunder and the vesting schedule set forth herein do not constitute an express or implied promise of continued engagement as an employee for the vesting period, for any period, or at all.

(b) Severability. The invalidity or unenforceability of any provision of this Agreement shall not affect the validity or enforceability of any other provision of this Agreement, and each other provision of this Agreement shall be severable and enforceable to the extent permitted by law.

(c) Waiver. Any provision for the benefit of the Company contained in this Agreement may be waived, either generally or in any particular instance, by the Board of Directors of the Company.

(d) Binding Effect. This Agreement shall be binding upon and inure to the benefit of the Company and the Participant and their respective heirs, executors, administrators, legal representatives, successors and assigns, subject to the restrictions on transfer set forth in Sections 4 and 5 of this Agreement.

(e) Notice. All notices required or permitted hereunder shall be in writing and deemed effectively given upon personal delivery or five days after deposit in the United States Post Office, by registered or certified mail, postage prepaid, addressed to the other party hereto at the address shown beneath his or its respective signature to this Agreement, or at such other address or addresses as either party shall designate to the other in accordance with this Section 12(e).

(f) Pronouns. Whenever the context may require, any pronouns used in this Agreement shall include the corresponding masculine, feminine or neuter forms, and the singular form of nouns and pronouns shall include the plural, and vice versa.

(g) Entire Agreement. This Agreement constitutes the entire agreement between the parties, and supersedes all prior agreements and understandings, relating to the subject matter of this Agreement.

(h) Amendment. This Agreement may be amended or modified only by a written instrument executed by both the Company and the Participant.

(i) Governing Law. This Agreement shall be construed, interpreted and enforced in accordance with the internal laws of the State of Delaware without regard to any applicable conflicts of laws.

(j) Participant's Acknowledgements. The Participant acknowledges that he or she: (i) has read this Agreement; (ii) has been represented in the preparation, negotiation, and execution of this Agreement by legal counsel of the Participant's own choice or has voluntarily declined to seek such counsel; (iii) understands the terms and consequences of this Agreement; (iv) is fully aware of the legal and binding effect of this Agreement; and (v) understands that the law firm of WilmerHale is acting as counsel to the Company in connection with the transactions contemplated by the Agreement, and is not acting as counsel for the Participant.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

PRECISION BIOSCIENCES, INC.

Dated: _____

By: _____

Title: _____

Address: _____

_____

_____

[Name of Participant]

Address: _____

_____

Exhibit A

Precision BioSciences, Inc.

Joint Escrow Instructions

_____, [ ]

Secretary
Precision BioSciences, Inc.
2225 Gentry Drive
Durham, NC 27705

Dear Sir:

As Escrow Agent for Precision BioSciences, Inc., a Delaware corporation, and its successors in interest under the Restricted Stock Agreement (the "Agreement") of even date herewith, to which a copy of these Joint Escrow Instructions is attached (the "Company"), and the undersigned person ("Holder"), you are hereby authorized and directed to hold the documents delivered to you pursuant to the terms of the Agreement in accordance with the following instructions:

1. Appointment. Holder irrevocably authorizes the Company to deposit with you any certificates evidencing Shares (as defined in the Agreement) to be held by you hereunder and any additions and substitutions to said Shares. For purposes of these Joint Escrow Instructions, "Shares" shall be deemed to include any additional or substitute property. Holder does hereby irrevocably constitute and appoint you as his attorney-in-fact and agent for the term of this escrow to execute with respect to such Shares all documents necessary or appropriate to make such Shares negotiable and to complete any transaction herein contemplated. Subject to the provisions of this Section 1 and the terms of the Agreement, Holder shall exercise all rights and privileges of a stockholder of the Company while the Shares are held by you.

2. Closing of Purchase.

(a) Upon any purchase by the Company of the Shares pursuant to the Agreement, the Company shall give to Holder and you a written notice specifying the number of Shares to be purchased, the purchase price for the Shares, as determined pursuant to the Agreement, and the time for a closing hereunder (the "Closing") at the principal office of the Company. Holder and the Company hereby irrevocably authorize and direct you to close the transaction contemplated by such notice in accordance with the terms of said notice.

(b) At the Closing, you are directed (i) to date the stock assignment form or forms necessary for the transfer of the Shares, (ii) to fill in on such form or forms the number of Shares being transferred, and (iii) to deliver same, together with the certificate or certificates

evidencing the Shares to be transferred, to the Company against the simultaneous delivery to you of the purchase price for the Shares being purchased pursuant to the Agreement.

3. Withdrawal. The Holder shall have the right to withdraw from this escrow any Shares as to which the Purchase Option and Right of First Refusal (each as defined in the Agreement) have terminated or expired.

4. Duties of Escrow Agent.

(a) Your duties hereunder may be altered, amended, modified or revoked only by a writing signed by all of the parties hereto.

(b) You shall be obligated only for the performance of such duties as are specifically set forth herein and may rely and shall be protected in relying or refraining from acting on any instrument reasonably believed by you to be genuine and to have been signed or presented by the proper party or parties. You shall not be personally liable for any act you may do or omit to do hereunder as Escrow Agent or as attorney-in-fact of Holder while acting in good faith and in the exercise of your own good judgment, and any act done or omitted by you pursuant to the advice of your own attorneys shall be conclusive evidence of such good faith.

(c) You are hereby expressly authorized to disregard any and all warnings given by any of the parties hereto or by any other person or entity, excepting only orders or process of courts of law, and are hereby expressly authorized to comply with and obey orders, judgments or decrees of any court. If you are uncertain of any actions to be taken or instructions to be followed, you may refuse to act in the absence of an order, judgment or decrees of a court. In case you obey or comply with any such order, judgment or decree of any court, you shall not be liable to any of the parties hereto or to any other person or entity, by reason of such compliance, notwithstanding any such order, judgment or decree being subsequently reversed, modified, annulled, set aside, vacated or found to have been entered without jurisdiction.

(d) You shall not be liable in any respect on account of the identity, authority or rights of the parties executing or delivering or purporting to execute or deliver the Agreement or any documents or papers deposited or called for hereunder.

(e) You shall be entitled to employ such legal counsel and other experts as you may deem necessary properly to advise you in connection with your obligations hereunder and may rely upon the advice of such counsel.

(f) Your rights and responsibilities as Escrow Agent hereunder shall terminate if (i) you cease to be Secretary of the Company or (ii) you resign by written notice to each party. In the event of a termination under clause (i), your successor as Secretary shall become Escrow Agent hereunder; in the event of a termination under clause (ii), the Company shall appoint a successor Escrow Agent hereunder.

(g) If you reasonably require other or further instruments in connection with these Joint Escrow Instructions or obligations in respect hereto, the necessary parties hereto shall join in furnishing such instruments.

(h) It is understood and agreed that if you believe a dispute has arisen with respect to the delivery and/or ownership or right of possession of the securities held by you hereunder, you are authorized and directed to retain in your possession without liability to anyone all or any part of said securities until such dispute shall have been settled either by mutual written agreement of the parties concerned or by a final order, decree or judgment of a court of competent jurisdiction after the time for appeal has expired and no appeal has been perfected, but you shall be under no duty whatsoever to institute or defend any such proceedings.

(i) These Joint Escrow Instructions set forth your sole duties with respect to any and all matters pertinent hereto and no implied duties or obligations shall be read into these Joint Escrow Instructions against you.

(j) The Company shall indemnify you and hold you harmless against any and all damages, losses, liabilities, costs, and expenses, including attorneys' fees and disbursements, (including without limitation the fees of counsel retained pursuant to Section 4(e) above), for anything done or omitted to be done by you as Escrow Agent in connection with this Agreement or the performance of your duties hereunder, except such as shall result from your gross negligence or willful misconduct.

5. Notice. Any notice required or permitted hereunder shall be given in writing and shall be deemed effectively given upon personal delivery or upon deposit in the United States Post Office, by registered or certified mail with postage and fees prepaid, addressed to each of the other parties thereunto entitled at the following addresses, or at such other addresses as a party may designate by ten days' advance written notice to each of the other parties hereto.

COMPANY:	Notices to the Company shall be sent to the address set forth in the salutation hereto, Attn: President
HOLDER:	Notices to Holder shall be sent to the address set forth below Holder's signature below.
ESCROW AGENT:	Notices to the Escrow Agent shall be sent to the address set forth in the salutation hereto.

6. Miscellaneous.

(a) By signing these Joint Escrow Instructions, you become a party hereto only for the purpose of said Joint Escrow Instructions, and you do not become a party to the Agreement.

(b) This instrument shall be binding upon and inure to the benefit of the parties hereto and their respective successors and permitted assigns.

Very truly yours,

PRECISION BIOSCIENCES, INC.

By: _____
Tide: _____

HOLDER:

_____
(Signature)

_____
Print Name

Address:

_____

_____

Date Signed: _____

ESCROW AGENT:

_____

Exhibit B

(STOCK ASSIGNMENT SEPARATE FROM CERTIFICATE)

FOR VALUE RECEIVED, I hereby sell, assign and transfer unto ( ) shares of Common Stock, $[0.01] par value per share, of Precision BioSciences, Inc. (the "Corporation") standing in my name on the books of the Corporation represented by Certificate(s) Number herewith, and do hereby irrevocably constitute and appoint attorney to transfer the said stock on the books of the Corporation with full power of substitution in the premises.

Dated: _____

IN PRESENCE OF _____

_____

NOTICE: The signature(s) to this assignment must correspond with the name as written upon the face of the certificate, in every particular, without alteration, enlargement, or any change whatever and must be guaranteed by a commercial bank, trust company or member firm of the Boston, New York or Midwest Stock Exchange.

PRECISION BIOSCIENCES, INC.

2015 STOCK INCENTIVE PLAN

1. Purpose

The purpose of this 2015 Stock Incentive Plan (the "**Plan**") of Precision BioSciences, Inc., a Delaware corporation (the "**Company**"), is to advance the interests of the Company's stockholders by enhancing the Company's ability to attract, retain and motivate persons who are expected to make important contributions to the Company and by providing such persons with equity ownership opportunities and performance-based incentives that are intended to align their interests with those of the Company's stockholders. Except where the context otherwise requires, the term "**Company**" includes the Company's present or future parent or subsidiary corporations as defined in Sections 424(e) or (f) of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "**Code**") and other business ventures (including, without limitation, any joint venture or limited liability company) in which the Company has a controlling interest, as determined by the Company's Board of Directors (the "**Board**").

2. Eligibility

All of the Company's employees, officers, directors, consultants, advisors, advisory board members, or other service providers (each a "**Service Provider**") are eligible to receive options, restricted stock, restricted stock units and other stock-based awards (each, an "**Award**") under the Plan. Each person who receives an Award under the Plan is deemed a "**Participant**."

3. Administration and Delegation

(a) Administration by Board of Directors. The Plan shall be administered by the Board. The Board shall have authority to grant Awards and to adopt, amend and repeal such administrative rules, guidelines and practices relating to the Plan as it shall deem advisable. The Board may correct any defect, supply any omission or reconcile any inconsistency in the Plan or any Award in the manner and to the extent it shall deem expedient to carry the Plan into effect and it shall be the sole and final judge of such expediency. All decisions by the Board shall be made in the Board's sole discretion and shall be final and binding on all persons having or claiming any interest in the Plan or in any Award. No director or person acting pursuant to the authority delegated by the Board shall be liable for any action or determination relating to or under the Plan made in good faith.

(b) Appointment of Committees. To the extent permitted by applicable law, the Board may delegate any or all of its powers under the Plan to one or more committees or subcommittees of the Board (a "**Committee**"). All references in the Plan to the "**Board**" shall mean the Board or a Committee of the Board to the extent that the Board's powers or authority under the Plan have been delegated to such Committee.

4. Stock Available for Awards.

(a) Subject to adjustment under Section 8, Awards may be made under the Plan for up to Eleven Million Two Hundred Fifty Thousand (11,250,000) shares of the Company's common stock, $0.000005 par value per share (the "**Common Stock**"). All shares reserved under the Plan may be granted as Incentive Stock Options or any other form of award permitted under the Plan in the Board's

discretion. If any Award expires or is terminated, surrendered or canceled without having been fully exercised or is forfeited in whole or in part (including as the result of shares of Common Stock subject to such Award being repurchased by the Company at the original issuance price pursuant to a contractual repurchase right) or results in any Common Stock not being issued, the unused Common Stock covered by such Award shall again be available for the grant of Awards under the Plan. Further, shares of Common Stock tendered to the Company by a Participant to exercise an Award shall be added to the number of shares of Common Stock available for the grant of Awards under the Plan. However, in the case of Incentive Stock Options (as hereinafter defined), the foregoing provisions shall be subject to any applicable limitations under the Code. Shares issued under the Plan may consist in whole or in part of authorized but unissued shares or treasury shares. At no time while there is any Option (as defined below) outstanding and held by a Participant who was a resident of the State of California on the date of grant of such Option, shall the total number of shares of Common Stock issuable upon exercise of all outstanding options and the total number of shares provided for under any stock bonus or similar plan or agreement of the Company exceed the applicable percentage as calculated in accordance with the conditions and exclusions of Section 260.140.45 of the California Code of Regulations, as amended or any successor regulations (the "**California Regulations**"), based on the shares of the Company which are outstanding at the time the calculation is made unless the Plan complies with all conditions of Rule 701 of the Securities Act of 1933, as amended.

(b) Substitute Awards. In connection with a merger or consolidation of an entity with the Company or the acquisition by the Company of property or stock of an entity, the Board may grant Awards in substitution for any options or other stock or stock-based awards granted by such entity or an affiliate thereof. Substitute Awards may be granted on such terms as the Board deems appropriate in the circumstances, notwithstanding any limitations on Awards contained in the Plan. Substitute Awards shall not count against the overall share limit set forth in Section 4(a), except as may be required by reason of Section 422 and related provisions of the Code.

5. Stock Options

(a) General. The Board may grant options to purchase Common Stock (each, an "**Option**") and determine the number of shares of Common Stock to be covered by each Option, the exercise price of each Option and the conditions and limitations applicable to the exercise of each Option, including conditions relating to applicable federal or state securities laws, as it considers necessary or advisable. An Option, or portion of an Option, which is not intended to be or fails to qualify as an Incentive Stock Option (as hereinafter defined) for any reason whatsoever shall be designated a "**Nonstatutory Stock Option.**"

(b) Incentive Stock Options. An Option that the Board intends to be an "incentive stock option" as defined in Section 422 of the Code (an "**Incentive Stock Option**") shall only be granted to employees of the Company and any other entities the employees of which are eligible to receive Incentive Stock Options under the Code, and shall be subject to and shall be construed consistently with the requirements of Section 422 of the Code. A Participant who owns more than 10% of the total combined voting power of all classes of outstanding stock of the Company shall not be eligible for the grant of an Incentive Stock Option unless (i) the exercise price is at least 110% of the Fair Market Value (as defined below) on the date the Option is granted and (ii) such Incentive Stock Option by its terms is not exercisable after the expiration of five years from the date the Option is granted. The Company shall have no liability to a Participant, or any other party, if an Option (or any part thereof) that is intended to be an Incentive Stock Option is not an Incentive Stock Option or for any action taken by the Board pursuant to Section 9(f), including without limitation the conversion of an Incentive Stock Option to a Nonstatutory Stock Option.

(c) Exercise Price. The Board shall establish the exercise price of each Option and specify such exercise price in the applicable option agreement. The exercise price shall be not less than 100% of the Fair Market Value on the date the Option is granted; provided that if the Board approves the grant of an Option with an exercise price to be determined on a future date, the exercise price shall be not less than 100% of the Fair Market Value on such future date. The term "**Fair Market Value**" shall mean, as of a given date: (i) if the Common Stock is listed on a national securities exchange, the last sale price of the Common Stock in the principal trading market for the Common Stock on such date; (ii) if the Common Stock is not listed on a national securities exchange, but is traded in the over-the counter market, the closing bid price for the Common Stock on such date, as reported by the OTC Bulletin Board or the National Quotation Bureau, Incorporated or similar publisher of such quotations; or (iii) if the Common Stock is not listed on a national securities exchange or traded in the over-the-counter market, such price as shall be determined by (or in a manner approved by) the Board in good faith and in compliance with applicable provisions of the Code and the regulations issued thereunder.

(d) Duration of Options. Each Option shall be exercisable at such times and subject to such terms and conditions as the Board may specify in the applicable option agreement.

(e) Exercise of Option. Options may be exercised by delivery to the Company of a written notice of exercise signed by the proper person or by any other form of notice (including electronic notice) approved by the Board together with payment in full as specified in Section 5(f) for the number of shares of Common Stock for which the Option is exercised. Shares of Common Stock subject to the Option will be delivered by the Company following exercise either as soon as practicable or, subject to such conditions as the Board shall specify, on a deferred basis (with the Company's obligation to be evidenced by an instrument providing for future delivery of the deferred shares at the time or times specified by the Board).

(f) Payment Upon Exercise. Common Stock purchased upon the exercise of an Option granted under the Plan shall be paid for as follows:

(1) in cash or by check, payable to the order of the Company;

(2) when the Common Stock is registered under the Securities Exchange Act of 1934, as amended (the "**Exchange Act**") and to the extent expressly provided for in the applicable option agreement or approved by the Board, in its sole discretion, by (i) delivery of an irrevocable and unconditional undertaking by a creditworthy broker to deliver promptly to the Company sufficient funds to pay the exercise price and any required tax withholding or (ii) delivery by the Participant to the Company of a copy of irrevocable and unconditional instructions to a creditworthy broker to deliver promptly to the Company cash or a check sufficient to pay the exercise price and any required tax withholding;

(3) when the Common Stock is registered under the Exchange Act and to the extent expressly provided for in the applicable option agreement or approved by the Board, in its sole discretion, by delivery (either by actual delivery or attestation) of shares of Common Stock owned by the Participant valued at their Fair Market Value, provided (i) such method of payment is then permitted under applicable law, (ii) such Common Stock, if acquired directly from the Company, was owned by the Participant for such minimum period of time, if any, as may be established by the Board in its discretion and (iii) such Common Stock is not subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements;

(4) to the extent permitted by applicable law and provided for in the applicable option agreement or approved by the Board, in its sole discretion, by (i) delivery of a promissory note of the Participant to the Company on terms determined by the Board, or (ii) payment of such other lawful consideration as the Board may determine; or

(5) by any combination of the above permitted forms of payment.

6. Restricted Stock; Restricted Stock Units

(a) General. The Board may grant Awards entitling recipients to acquire shares of Common Stock ("**Restricted Stock**"), subject to the right of the Company to repurchase all or part of such shares at their issue price or other stated or formula price (or to require forfeiture of such shares if issued at no cost) from the recipient in the event that conditions specified by the Board in the applicable Award are not satisfied prior to the end of the applicable restriction period or periods established by the Board for such Award. Instead of granting Awards for Restricted Stock, the Board may grant Awards entitling the recipient to receive shares of Common Stock to be delivered at the time such shares of Common Stock vest ("**Restricted Stock Units**") (Restricted Stock and Restricted Stock Units are each referred to herein as a "**Restricted Stock Award**").

(b) Terms and Conditions. The Board shall determine the terms and conditions of a Restricted Stock Award, including the conditions for repurchase (or forfeiture) and the issue price, if any.

(c) Additional Provisions Relating to Restricted Stock.

(1) Dividends. Participants holding shares of Restricted Stock will be entitled to all ordinary cash dividends paid with respect to such shares, unless otherwise provided by the Board. If any such dividends or distributions are paid in shares, or consist of a dividend or distribution to holders of Common Stock other than an ordinary cash dividend, the shares, cash or other property will be subject to the same restrictions on transferability and forfeitability as the shares of Restricted Stock with respect to which they were paid. Each dividend payment will be made no later than the end of the calendar year in which the dividends are paid to stockholders of that class of stock or, if later, the 15th day of the third month following the date the dividends are paid to stockholders of that class of stock.

(2) Stock Certificates. The Company may require that any stock certificates issued in respect of a Restricted Stock Award shall be registered in the name of the Participant and be deposited by the Participant, together with a stock power endorsed in blank, with the Company (or its designee). After the expiration of the applicable restriction periods, upon request of a Participant or as otherwise determined by the Company, the Company (or such designee) shall deliver the certificates no longer subject to such restrictions to the Participant or if the Participant has died, to the beneficiary designated, in a manner determined by the Board, by a Participant to receive amounts due or exercise rights of the Participant in the event of the Participant's death (the "**Designated Beneficiary**"). In the absence of an effective designation by a Participant, "Designated Beneficiary" shall mean the Participant's then living spouse, or, if none, the Participant's estate.

7. Other Stock-Based Awards

Other Awards of shares of Common Stock, and other Awards that are valued in whole or in part by reference to, or are otherwise based on, shares of Common Stock, may be granted hereunder to Participants ("**Other Stock-Based Awards**"), including without limitation stock appreciation rights and Awards entitling recipients to receive shares of Common Stock to be delivered in the future. Such Other

Stock-Based Awards shall also be available as a form of payment in the settlement of other Awards granted under the Plan or as payment in lieu of compensation to which a Participant is otherwise entitled. Other Stock-Based Awards may be paid in shares of Common Stock or cash, as the Board shall determine. Subject to the provisions of the Plan, the Board shall determine the conditions of each Other Stock-Based Award, including any purchase price applicable thereto.

8. Adjustments for Changes in Common Stock and Certain Other Events

(a) Changes in Capitalization. In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of Common Stock other than an ordinary cash dividend, (i) the number and class of securities available under this Plan, (ii) the number and class of securities and exercise price per share of each outstanding Option, (iii) the number of shares subject to and the repurchase price per share subject to each outstanding Restricted Stock Award, and (iv) the terms of each other outstanding Award shall be equitably adjusted by the Company (or substituted Awards may be made, if applicable) in the manner determined by the Board. Without limiting the generality of the foregoing, in the event the Company effects a split of the Common Stock by means of a stock dividend and the exercise price of and the number of shares subject to an outstanding Option are adjusted as of the date of the distribution of the dividend (rather than as of the record date for such dividend), then an optionee who exercises an Option between the record date and the distribution date for such stock dividend shall be entitled to receive, on the distribution date, the stock dividend with respect to the shares of Common Stock acquired upon such Option exercise, notwithstanding the fact that such shares were not outstanding as of the close of business on the record date for such stock dividend.

(b) Change in Control

(1) Definition. Unless otherwise specifically provided in an Award agreement, a "**Change in Control**" shall be deemed to have occurred upon the first to occur of:

(i) a transaction or series of related transactions in which a person, or a group of related persons, acquires from stockholders of the Company shares representing more than fifty percent (50%) of the outstanding voting power of the Company;

(ii) the closing of the sale, transfer, lease, exclusive license or other disposition, in one transaction or a series of related transactions, of all or substantially all of the Company's assets;

(iii) the consummation of the merger or consolidation of the Company with or into another entity (except a merger or consolidation in which the holders of capital stock of the Company immediately prior to such merger or consolidation continue to hold a majority of the voting power of the capital stock of the Company or the surviving or acquiring entity); or

(iv) the closing of the transfer (whether by merger, consolidation or otherwise), in one transaction or a series of related transactions in which the Company is a constituent party, to a person or group of affiliated persons (other than an underwriter of the Company's securities), of the Company's securities if, after such closing, such person or group of affiliated persons would hold a majority of the outstanding voting stock of the Company (or the surviving or acquiring entity).

(2) Consequences of a Change in Control on Awards Other than Restricted Stock Awards. Unless otherwise specifically provided in an Award Agreement, the Board may take any one or more of the following actions as to all (or any portion of) outstanding Awards other than Restricted Stock Awards on such terms as the Board determines in connection with a Change in Control: (i) provide that Awards shall be assumed, or substantially equivalent Awards shall be substituted, by the acquiring or succeeding corporation (or an affiliate thereof) in compliance with the applicable provisions of the Code, including Code Sections 409A, 422 and 424; (ii) upon written notice to a Participant, provide that the Participant's unexercised Options or other unexercised Awards will terminate immediately prior to the consummation of such Change in Control unless exercised by the Participant within a specified period following the date of such notice; (iii) provide that outstanding Awards shall become exercisable, realizable or deliverable, or restrictions applicable to an Award shall lapse, in whole or in part prior to or upon such Change in Control; (iv) in the event of a Change in Control under the terms of which holders of Common Stock will receive upon consummation thereof a cash payment for each share surrendered in the Change in Control (the "**Acquisition Price**"), make or provide for a cash payment to a Participant equal to the excess, if any, of (A) the Acquisition Price times the number of shares of Common Stock subject to the Participant's Options or other Awards (to the extent the exercise price does not exceed the Acquisition Price) less (B) the aggregate exercise price of all such outstanding Options or other Awards and any applicable tax withholdings, in exchange for the termination of such Options or other Awards; (v) provide that, in connection with a liquidation or dissolution of the Company, Awards shall convert into the right to receive liquidation proceeds (if applicable, net of the exercise price thereof); and (vi) any combination of the foregoing. In taking any of the actions permitted under this Section 8(b), the Board shall not be obligated by the Plan to treat all Awards, or all Awards of the same type, identically.

For purposes of clause (i) above, an Option shall be considered assumed if, following consummation of the Change in Control, the Option confers the right to purchase, for each share of Common Stock subject to the Option immediately prior to the consummation of the Change in Control, the consideration (whether cash, securities or other property) received as a result of the Change in Control by holders of Common Stock for each share of Common Stock held immediately prior to the consummation of the Change in Control (and if holders were offered a choice of consideration, the type of consideration chosen by the holders of a majority of the outstanding shares of Common Stock); provided, however, that if the consideration received as a result of the Change in Control is not solely common stock of the acquiring or succeeding corporation (or an affiliate thereof), the Company may, with the consent of the acquiring or succeeding corporation, provide for the consideration to be received upon the exercise of Options to consist solely of common stock of the acquiring or succeeding corporation (or an affiliate thereof) equivalent in value (as determined by the Board) to the per share consideration received by holders of outstanding shares of Common Stock as a result of the Change in Control.

(3) Consequences of a Change in Control on Restricted Stock Awards. Upon the occurrence of a Change in Control other than a liquidation or dissolution of the Company, the repurchase and other rights of the Company under each outstanding Restricted Stock Award shall inure to the benefit of the Company's successor and shall, unless the Board determines otherwise, apply to the cash, securities or other property which the Common Stock was converted into or exchanged for pursuant to such Change in Control in the same manner and to the same extent as they applied to the Common Stock subject to such Restricted Stock Award. Upon the occurrence of a Change in Control involving the liquidation or dissolution of the Company, except to the extent specifically provided to the contrary in the instrument evidencing any Restricted Stock Award or any other agreement between a Participant and the Company, all restrictions and conditions on all Restricted Stock Awards then outstanding shall automatically be deemed terminated or satisfied.

9. General Provisions Applicable to Awards

(a) Transferability of Awards. Except as the Board may otherwise expressly determine or provide in an Award, Awards shall not be sold, assigned, transferred, pledged or otherwise encumbered by the person to whom they are granted, either voluntarily or by operation of law, except by will or the laws of descent and distribution or, other than in the case of an Incentive Stock Option, pursuant to a qualified domestic relations order, and, during the life of the Participant, shall be exercisable only by the Participant. For the avoidance of doubt, the Board may not expressly provide for the transferability of an Incentive Stock Option in an Incentive Stock Option Agreement or otherwise except as may be permitted under Section 422 of the Code. References to a Participant, to the extent relevant in the context, shall include references to authorized transferees.

(b) Documentation. Unless otherwise expressly determined by the Board, each Nonstatutory Stock Option shall be evidenced by a Notice of Nonstatutory Stock Option and Nonstatutory Stock Option Agreement substantially in the form attached as **Exhibit A**, each Incentive Stock Option shall be evidenced by a Notice of Incentive Stock Option and Incentive Stock Option Agreement substantially in the form attached as **Exhibit B**, and each Restricted Stock Award shall be evidenced by a Summary of Restricted Stock Purchase and Restricted Stock Purchase Agreement or similar agreement in substantially the form approved by the Board for such purposes from time to time. Each Award may contain terms and conditions in addition to those set forth in the Plan.

(c) Board Discretion. Except as otherwise provided by the Plan, each Award may be made alone or in addition or in relation to any other Award. The terms of each Award need not be identical, and the Board need not treat Participants uniformly.

(d) Termination of Status. The Board shall determine the effect on an Award of the disability, death, termination of employment, authorized leave of absence or other change in the employment or other status of a Participant and the extent to which, and the period during which, the Participant, or the Participant's legal representative, conservator, guardian or Designated Beneficiary, may exercise rights under the Award.

(e) Withholding. The Participant must satisfy all applicable federal, state, and local or other income and employment tax withholding obligations before the Company will deliver stock certificates or otherwise recognize ownership of Common Stock under an Award. The Company may decide to satisfy the withholding obligations through additional withholding on salary or wages. If the Company elects not to or cannot withhold from other compensation, the Participant must pay the Company the full amount, if any, required for withholding or have a broker tender to the Company cash equal to the withholding obligations. Payment of withholding obligations is due before the Company will issue any shares on exercise or release from forfeiture of an Award or, if the Company so requires, at the same time as is payment of the exercise price unless the Company determines otherwise. If provided for in an Award or approved by the Board in its sole discretion, a Participant may satisfy such tax obligations in whole or in part by delivery of shares of Common Stock, including shares retained from the Award creating the tax obligation, valued at their Fair Market Value; provided, however, except as otherwise provided by the Board, that the total tax withholding where stock is being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such supplemental taxable income). Shares surrendered to satisfy tax withholding requirements cannot be subject to any repurchase, forfeiture, unfulfilled vesting or other similar requirements.

(f) Amendment of Award.

(1) The Board may amend, modify or terminate any outstanding Award, including but not limited to, substituting therefor another Award of the same or a different type, changing the date of exercise or realization, and converting an Incentive Stock Option to a Nonstatutory Stock Option, provided that the Participant's consent to such action shall be required unless the Board determines that the action, taking into account any related action, would not materially and adversely affect the Participant.

(2) The Board may, without stockholder approval, amend any outstanding Award granted under the Plan to provide an exercise price per share that is lower than the then-current exercise price per share of such outstanding Award provided that such amended exercise price is at least equal to the then-current Fair Market Value. The Board may also, without stockholder approval, cancel any outstanding award (whether or not granted under the Plan) and grant in substitution new Awards under the Plan covering the same or a different number of shares of Common Stock and having an exercise price per share lower than the then-current exercise price per share of the cancelled award.

(g) Conditions on Delivery of Stock. The Company will not be obligated to deliver any shares of Common Stock pursuant to the Plan or to remove restrictions from shares previously delivered under the Plan until (i) all conditions of the Award have been met or removed to the satisfaction of the Company, (ii) in the opinion of the Company's counsel, all other legal matters in connection with the issuance and delivery of such shares have been satisfied, including any applicable securities laws and any applicable stock exchange or stock market rules and regulations, and (iii) the Participant has executed and delivered to the Company such representations or agreements as the Company may consider appropriate to satisfy the requirements of any applicable laws, rules, regulations or contracts of the Company.

(h) Acceleration. The Board may at any time provide that any Award shall become immediately exercisable in full or in part, free of some or all restrictions or conditions, or otherwise realizable in full or in part, as the case may be.

10. Miscellaneous

(a) No Right To Employment or Other Status. No person shall have any claim or right to be granted an Award, and the grant of an Award shall not be construed as giving a Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with a Participant free from any liability or claim under the Plan, except as expressly provided in the applicable Award.

(b) No Rights As Stockholder. Subject to the provisions of the applicable Award, no Participant or Designated Beneficiary shall have any rights as a stockholder with respect to any shares of Common Stock to be distributed with respect to an Award until becoming the record holder of such shares. Notwithstanding the foregoing, in the event the Company effects a split of the Common Stock by means of a stock dividend or otherwise and the exercise price of and the number of shares subject to such Option are adjusted as of the effective date of the stock dividend or split (rather than as of the record date for such stock dividend or split), then an optionee who exercises an Option between the record date and the distribution date for such stock dividend or split shall be entitled to receive, on the distribution date, the stock dividend or split with respect to the shares of Common Stock acquired upon such Option exercise, notwithstanding the fact that such shares were not outstanding as of the close of business on the record date for such stock dividend or split.

(c) Effective Date and Term of Plan. The Plan shall become effective on the date on which it is adopted by the Board. No Awards shall be granted under the Plan after the expiration of ten (10) years from the earlier of (i) the date on which the Plan was adopted by the Board or (ii) the date the Plan was approved by the Company's stockholders, but Awards previously granted may extend beyond that date.

(d) Amendment of Plan. The Board may amend, suspend or terminate the Plan or any portion thereof at any time; provided, however, that if at any time the approval of the Company's stockholders is required as to any modification or amendment under Section 422 of the Code or any successor provision with respect to Incentive Stock Options, the Board may not effect such modification or amendment without such approval. Unless otherwise specified in the amendment, any amendment to the Plan adopted in accordance with this Section 10(d) shall apply to, and be binding on the holders of, all Awards outstanding under the Plan at the time the amendment is adopted, provided the Board determines that such amendment does not materially and adversely affect the rights of Participants under the Plan.

(e) Authorization of Sub-Plans. The Board may from time to time establish one or more sub-plans under the Plan for purposes of satisfying applicable blue sky, securities or tax laws of various jurisdictions. The Board shall establish such sub-plans by adopting supplements to this Plan containing (i) such limitations on the Board's discretion under the Plan as the Board deems necessary or desirable or (ii) such additional terms and conditions not otherwise inconsistent with the Plan as the Board shall deem necessary or desirable. All supplements adopted by the Board shall be deemed to be part of the Plan, but each supplement shall apply only to Participants within the affected jurisdiction and the Company shall not be required to provide copies of any supplement to Participants in any jurisdiction which is not the subject of such supplement.

(f) Compliance with Code Section 409A. It is intended that all Awards granted hereunder be either exempt from, or issued in compliance with, Code Section 409A. The Company shall have no liability to a Participant, or any other party, if an Award that is intended to be exempt from, or compliant with, Code Section 409A is not so exempt or compliant, or for any action taken by the Board.

(g) Governing Law. The provisions of the Plan and all Awards made hereunder shall be governed by and construed in accordance with the laws of the State of North Carolina without reference to conflict of law provisions.

* * * * * * * *

PRECISION BIOSCIENCES, INC.
FIRST AMENDMENT OF 2015 STOCK INCENTIVE PLAN

THIS FIRST AMENDMENT of Precision BioSciences, Inc. 2015 Stock Incentive Plan is dated as of May 24, 2018.

WHEREAS, the Board of Directors of Precision BioSciences, Inc. (the "**Company**") has adopted and the stockholders of the Company have approved the Precision Biosciences, Inc. 2015 Stock Incentive Plan (the "**Plan**"); and

WHEREAS, the Board of Directors determines that it is in the best interests of the Company and the Company's stockholders to amend the Plan in order to increase the number of shares of common stock issuable pursuant to Awards (as defined in the Plan) made under the Plan from eleven million two hundred fifty thousand (11,250,000) shares to Seventeen Million Five Hundred Thirty Thousand (17,530,000) shares.

NOW, THEREFORE, the Plan shall be amended as follows:

1. The first sentence of Section 4(a) of the Plan shall be deleted in its entirety and the following substituted in lieu thereof:

"Subject to adjustment under Section 8, Awards may be made under the Plan for up to Seventeen Million Five Hundred Thirty Thousand (17,530,000) shares of the Company's common stock, $0.000005 par value per share (the "**Common Stock**")."

2. Except as herein amended, the terms and provisions of the Plan shall remain in full force and effect as originally adopted and approved.

[Signature page follows.]

IN WITNESS WHEREOF, the undersigned hereby certifies that this First Amendment was duly adopted by the Board of Directors of the Company as of May 24, 2018.

PRECISION BIOSCIENCES, INC.

By: /s/ Matt Kane
Matthew Kane
President and Chief Executive Officer

EXHIBIT A

Notice of Nonstatutory Stock Option
and
Nonstatutory Stock Option Agreement

PRECISION BIOSCIENCES, INC.
NOTICE OF NONSTATUTORY STOCK OPTION
PRECISION BIOSCIENCES, INC. 2015 STOCK INCENTIVE PLAN

Precision BioSciences, Inc., a Delaware corporation (the "**Company**"), grants to the undersigned (the "**Participant**") the following nonstatutory stock option to purchase shares (the "**Shares**") of the common stock of the Company, $0.000005 par value per share (the "**Common Stock**"), pursuant to the Precision BioSciences, Inc. 2015 Stock Incentive Plan (the "**Plan**"):

Participant:	***[**Participant Name**]**
Total Number of Shares:	***[**Number of Shares**]**
Grant Date:	***[**Grant Date**]**
Exercise Price per Share:	$****[**Exercise Price (Must Be at Least FMV at Grant**]**
Vesting Commencement Date:	***[**Vesting Commencement Date**]**
Vesting Schedule:	***[%]*** of the Total Number of Shares shall vest and become exercisable on the ***[first]*** anniversary of the Vesting Commencement Date and an additional ***[ ]***% of the Total Number of Shares shall vest and become exercisable at the end of each successive three-month period following the first anniversary of the Vesting Commencement Date until the ***[fourth]*** anniversary of the Vesting Commencement Date, subject to the Participant remaining a Service Provider through each such vesting date.
Final Exercise Date:	***[**Expiration Date**]**. This option may expire earlier pursuant to Section 3 of the Nonstatutory Stock Option Agreement if the Participant's relationship with the Company is terminated, or pursuant to Section 9 of the Plan.

This nonstatutory stock option is granted under and governed by the terms and conditions of the Plan and accompanying Nonstatutory Stock Option Agreement, both of which are incorporated herein by reference. By signing below, the Participant accepts this nonstatutory stock option, acknowledges receipt of a copy of the Plan and the Nonstatutory Stock Option Agreement, and agrees to the terms thereof.

***[PARTICIPANT NAME]**

_____
(Signature)

Address: _____

_____

PRECISION BIOSCIENCES, INC.

By: _____

Name: _____

Title: _____

Date: _____

THE OPTION GRANTED PURSUANT TO THIS AGREEMENT AND THE SHARES ISSUABLE UPON THE EXERCISE THEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR ANY STATE SECURITIES LAWS, AND MAY NOT BE SOLD, PLEDGED OR OTHERWISE TRANSFERRED WITHOUT AN EFFECTIVE REGISTRATION THEREOF UNDER SUCH ACT OR APPLICABLE LAWS OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY AND ITS COUNSEL THAT SUCH REGISTRATION IS NOT REQUIRED.

PRECISION BIOSCIENCES, INC.

NONSTATUTORY STOCK OPTION AGREEMENT
Granted Under the Precision BioSciences, Inc. 2015 Stock Incentive Plan

1. Grant of Option.

This Nonstatutory Stock Option Agreement (the "**Agreement**") evidences the grant by Precision BioSciences, Inc., a Delaware corporation (the "**Company**"), on the Grant Date to the Participant, a**[**n**]** ***[**employee/officer/director/consultant/advisor**]** of the Company, of an option (this "**Option**") to purchase, in whole or in part, on the terms provided herein and in the Plan, the Total Number of Shares of Common Stock at the Exercise Price per Share, all as defined and set forth in the accompanying Notice of Nonstatutory Stock Option (the "**Notice**"). Capitalized terms that are not otherwise defined herein or in the Notice shall have the meanings given to such terms in the Plan.

It is intended that this Option shall not be an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "**Code**"). Except as otherwise indicated by the context, the term "Participant," as used in this Agreement, shall include any person who acquires the right to exercise this Option validly under its terms.

2. Vesting Schedule.

This Option shall vest and become exercisable at the time or times set forth in the accompanying Notice**.** [In addition, the Option may vest and become exercisable on an accelerated basis as follows:

Immediately prior to the effective date of a Change in Control, one hundred percent (100%) of the Total Number of Shares subject to this Option shall vest and become fully exercisable; provided, however, that in no event shall the Participant be entitled to exercise the Option to purchase greater than the Total Number of Shares as a result of this provision. Such accelerated vesting shall be contingent upon consummation of the Change in Control.]

3. Exercise of Option.

(a) Form of Exercise. Each election to exercise this Option shall be in writing in substantially the form of the Notice of Stock Option Exercise attached to this Agreement as **Exhibit A**, signed by the Participant, and received by the Company at its principal office, accompanied by this Agreement, and payment in full in the manner provided in the Plan. The Participant may purchase less than the number of Shares subject to this Option; provided that, no partial exercise of this Option may be for any fractional share.

(b) Continuous Relationship with the Company Required. Except as otherwise provided in this Section 3, this Option may not be exercised unless the Participant, at the time of the exercise of this

Option, is, and has been at all times since the Grant Date, a Service Provider to or of the Company or any subsidiary of the Company as defined in Section 424 (f) of the Code (an "**Eligible Participant**").

(c) Termination of Relationship with the Company. If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (d) and (e) below, the right to exercise this Option shall terminate three (3) months after such cessation (but in no event after the Final Exercise Date); provided that, this Option shall be exercisable only to the extent that the Participant was entitled to exercise this Option on the date of such cessation. Notwithstanding the foregoing, if the Participant, prior to the Final Exercise Date, violates the non-competition or confidentiality provisions of any employment agreement, confidentiality and nondisclosure agreement, or other agreement between the Participant and the Company, the right to exercise this Option shall terminate immediately upon such violation.

(d) Exercise Period Upon Death or Disability. If the Participant dies or becomes disabled (within the meaning of Section 22(e)(3) of the Code) prior to the Final Exercise Date while the Participant is an Eligible Participant and the Company has not terminated such relationship for "Cause" (as defined below), this Option shall be exercisable, within the period of one year following the date of death or disability of the Participant, by the Participant (or in the case of death by an authorized transferee); provided that, this Option shall be exercisable only to the extent that this Option was exercisable by the Participant on the date of the Participant's death or disability, and further provided that this Option shall not be exercisable after the Final Exercise Date.

(e) Termination for Cause. If, prior to the Final Exercise Date, the Participant's status as a Service Provider is terminated by the Company for "Cause" (as such term is defined below), the right to exercise this Option shall terminate immediately upon the effective date of such termination. If the Participant is party to an employment agreement or other agreement with the Company that contains an applicable definition of "cause," then the term "**Cause**" for purposes of this Agreement shall have the meaning ascribed to such term in such agreement. Otherwise, the term "**Cause**" for purposes of this Agreement shall mean the following: (i) Participant's willful failure to perform Participant's duties; (ii) Participant's gross negligence or willful misconduct in the execution of Participant's duties; (iii) Participant's failure or refusal to comply with the Company's policies, procedures, practices, or directions; (iv) Participant's conviction of, or guilty plea as to, a felony or any crime involving fraud, misappropriation, or misrepresentation; or (v) Participant's breach (and subsequent failure to cure upon applicable notice) of any employment, consulting, advisory, nondisclosure, non-competition or other similar agreement between the Participant and the Company, as determined by the Company, which determination shall be conclusive. The Participant shall be considered to have been discharged for "Cause" if the Company determines, within 30 days after the Participant's resignation, that discharge for cause was warranted.

4. Bylaws; General Restrictions on Transfer.

The Participant acknowledges and agrees that the Shares are subject to the provisions of the Company's Bylaws, as amended from time to time (the "**Bylaws**"), including without limitation, any restrictions on transfer described in the Bylaws. The Participant may inspect the Bylaws at the Company's principal office.

5. Rights of First Refusal.

(a) If Participant proposes to sell, pledge or otherwise transfer any Shares acquired upon exercise of this Option (the "**Exercise Shares**"), the Company shall have the right to repurchase the Exercise Shares under the terms and subject to the conditions set forth in this Section 5 (the "**Right of First Refusal**").

(b) Notice of Proposed Transfer. Prior to any proposed transfer of the Exercise Shares, the Participant shall give a written notice (the "**Transfer Notice**") to the Company describing fully the proposed transfer, including the number of Exercise Shares, the name and address of the proposed transferee (the "**Proposed Transferee**"), the proposed transfer price and all other material terms and conditions of the proposed transfer.

(c)Exercise of Right of First Refusal. The Company shall have the right to purchase all, but not less than all, of the Exercise Shares at the purchase price and on the terms set forth in the Transfer Notice by delivery to the Participant of a notice of exercise of the Right of First Refusal within thirty (30) days after the date the Transfer Notice is delivered to the Company. The Company's exercise or failure to exercise the Right of First Refusal with respect to any proposed transfer described in a Transfer Notice shall not affect the Company's ability to exercise the Right of First Refusal with respect to any proposed transfer described in any other Transfer Notice, whether or not such other Transfer Notice is issued by the Participant or issued by any other person with respect to a proposed transfer to the same Proposed Transferee. If the Company exercises the Right of First Refusal, the Company and the Participant shall thereupon consummate the sale of the Exercise Shares to the Company on the terms set forth in the Transfer Notice; provided however, that if the Transfer Notice provides for the payment for the Exercise Shares other than in cash, the Company shall have the option of paying for the Exercise Shares by the discounted cash equivalent of the consideration described in the Transfer Notice as reasonably determined by the Board. For purposes of the foregoing, cancellation of any indebtedness of the Participant to the Company shall be treated as payment to the Participant in cash to the extent of the unpaid principal and any accrued interest cancelled.

(d) Failure to Exercise Right of First Refusal. If the Company fails to exercise such Right of First Refusal, the Participant may conclude a transfer to the Proposed Transferee of the Exercise Shares on the terms and conditions described in the Transfer Notice, provided such transfer occurs not later than three (3) months following expiration of the forty-five (45) day Right of First Refusal period provided in Section 5(c). Any proposed transfer on terms and conditions different from those described in the Transfer Notice, as well as any subsequent proposed transfer by the Participant, also shall be subject to the Right of First Refusal and shall require compliance by the Participant with the procedure described in this Section 5.

(e) Transferees of the Transfer Shares. All transferees of the Exercise Shares or any interest therein, other than the Company acquiring such Exercise Shares through its Right of First Refusal, shall be required as a condition of such transfer to agree in writing (in a form satisfactory to the Company) that such transferee shall receive and hold such Exercise Shares or interests subject to (i) the provisions of this Section 5 providing for the Right of First Refusal with respect to any subsequent transfer, (ii) the Right of Repurchase established under Section 6, and (iii) all other applicable restrictions set forth in the Plan and this Agreement.

(f) Transfers Not Subject to the Right of First Refusal. The Right of First Refusal shall not apply to any transfer or exchange of the Exercise Shares if: (i) such transfer is in connection with a Change in Control; (ii) such transfer is to one or more members of the Participant's immediate family (or a trust for their benefit) provided all such transferees agree in writing to the restrictions of Section 5(f); or (iii) such transfer has been expressly approved by the Board, which approval may be granted or withheld in its sole discretion.

(g) Assignment of the Right of First Refusal. The Company shall have the right to assign the Right of First Refusal at any time.

(h) Stock Dividends Subject to First Refusal Right. If, from time to time, there is any stock dividend, stock split, recapitalization, reclassification or other change in the character or amount of any of the outstanding stock of the Company, the stock of which is subject to the provisions of an Option issued pursuant to the Plan, then, in such event, any and all new substituted or additional securities to which the Participant is entitled by reason of the Participant's ownership of the Exercise Shares shall be immediately subject to the Right of First Refusal with the same force and effect as the Shares subject to the Right of First Refusal immediately before such event.

(i) Early Termination of the Right of First Refusal. The other provisions of this Section 5 notwithstanding, the Right of First Refusal shall terminate, and be of no further force and effect, upon the earlier of (i) the occurrence of a Change in Control, unless the surviving, continuing, successor, or purchasing corporation, as the case may be, assumes the Company's rights and obligations under the Plan, or (ii) the existence of a public market for the Shares. A "public market" shall be deemed to exist if (i) Shares are listed on a national securities exchange (as that term is used in the Exchange Act) or (ii) Shares are traded on the over-the-counter market and prices therefor are published daily on business days in a recognized financial journal.

(j) Escrow. To ensure the Shares subject to Right of First Refusal will be available for purchase, the Company may require a Participant to deposit certificates evidencing the Exercise Shares in escrow with the Company or an agent of the Company.

6. Right of Repurchase on Termination of Employment With or Cessation of Service to the Company. The Company shall have the right (but not the obligation) to repurchase any or all of the Exercise Shares upon the Participant's termination of employment or service as a Service Provider of the Company for any reason. The price per Exercise Share to be paid by the Company should it choose to exercise its repurchase right under this Section 6 shall equal the then Fair Market Value per Exercise Share. The Company's right of repurchase pursuant to this Section 6 shall commence on the date the Participant terminates service with the Company and continue until the first anniversary of such Participant's termination of service.

7. Legend. Any certificate representing Shares shall bear legends substantially in the following forms (in addition to, or in combination with, any legend required by applicable federal and state securities laws and other agreements relating to the Company's securities):

> "The securities represented by this certificate, and the transfer thereof, are subject to the restriction on transfer provisions of the Bylaws of the Company and the Nonstatutory Stock Option Agreement, copies of which are on file in, and may be examined at, the principal office of the Company."

8. Agreement in Connection with Public Offering.

The Participant agrees, in connection with the initial underwritten public offering of the Company's securities pursuant to a registration statement under the Securities Act of 1933, as amended (the "**Securities Act**"): (i) not to sell, make short sale of, loan, grant any options for the purchase of, or otherwise dispose of any shares of Common Stock held by the Participant (other than those shares included in the offering) without the prior written consent of the Company or the underwriters managing such initial underwritten public offering of the Company's securities for a period of 180 days from the effective date of such registration statement, which period may be extended upon the request of the underwriters for an additional period of up to fifteen (15) days if the Company issues or proposes to issue

an earnings or other public release within fifteen (15) days of the expiration of the 180-day lockup period, and (ii) to execute any agreement reflecting clause (i) above as may be requested by the Company or the managing underwriters at the time of such offering.

The Participant agrees to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters of such offering which are consistent with the foregoing or which are necessary to give further effect thereto. In addition, if requested, by the Company or the underwriters of such offering, the Participant shall provide, within 10 days of such request, such information as may be required by the Company or such underwriters in connection with the completion of any public offering of the Company's securities pursuant to a registration statement filed under the Securities Act. The obligations described in this Section 8 shall not apply to a registration relating solely to employee benefits plans on Form S-1 or Form S-8 or similar forms that may be promulgated in the future, or a registration relating solely to a Commission Rule 145 transaction on Form S-4 or similar forms that may be promulgated in the future. The Company may impose stop-transfer instructions with respect to the shares of Common Stock (or other securities) subject to the foregoing restriction until the end of the applicable period. Participant agrees that any transferee of this Option or Shares pursuant to this Agreement shall be bound by this Section 8.

9. Tax Matters.

(a) Withholding. No Shares shall be issued pursuant to the exercise of this Option unless and until the Participant pays to the Company, or makes provision satisfactory to the Company for payment of, any federal, state or local withholding or other taxes required by law to be withheld in respect of this Option.

(b) Code Section 409A. The Exercise Price is intended to be not less than the Fair Market Value of the Common Stock on the Grant Date. The Company has determined the Fair Market Value of the Common Stock in good faith and using the reasonable application of a reasonable valuation method, for purposes of determining the Exercise Price. Notwithstanding this, the Internal Revenue Service may assert that the Fair Market Value of the Common Stock on the Grant Date was greater than the Exercise Price. Under Code Section 409A, if the Exercise Price is less than the Fair Market Value of the Common Stock as of the Grant Date, this Option may be treated as a form of deferred compensation and the Participant may be subject to an additional twenty percent (20%) tax, plus interest and possible penalties. The Participant acknowledges that the Company has advised the Participant to consult with a tax adviser regarding the potential impact of Code Section 409A and that the Company, in the exercise of its sole discretion and without the consent of the Participant, may amend or modify this Agreement in any manner and delay the payment of any amounts payable pursuant to this Agreement to the minimum extent necessary to meet the requirements of Code Section 409A, as amplified by any Internal Revenue Service or U.S. Treasury Department regulations or guidance as the Company deems appropriate or advisable.

10. Nontransferability of Option. This Option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this Option shall be exercisable only by the Participant.

11. Provisions of the Plan. This Option is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Option.

12. Entire Agreement; Governing Law. The Plan and the Notice are incorporated herein by reference. This Agreement, the Notice and the Plan constitute the entire agreement between the Company and the Participant with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and the Participant with respect to the subject matter

hereof. This Agreement shall be governed by and construed in accordance with the laws of the State of North Carolina without reference to conflict of law provisions.

13. Amendment. Except as set forth in Section 9(b), this Agreement may not be modified or amended in any manner adverse to the Participant's interest except by means of a writing signed by the Company and Participant.

14. No Guarantee of Continued Service. THE PARTICIPANT ACKNOWLEDGES AND AGREES THAT THE VESTING OF OPTIONS PURSUANT TO THE VESTING SCHEDULE SET FORTH HEREIN AND IN THE NOTICE ARE EARNED ONLY BY CONTINUING SERVICE AT THE WILL OF THE COMPANY (NOT THROUGH THE ACT OF BEING HIRED, BEING GRANTED THIS OPTION OR ACQUIRING SHARES HEREUNDER). THE PARTICIPANT FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE VESTING SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED SERVICE FOR THE VESTING PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE IN ANY WAY WITH PARTICIPANT'S RIGHT OR THE COMPANY'S RIGHT TO TERMINATE PARTICIPANT'S SERVICE WITH OR WITHOUT CAUSE.

* * * * * * * * * * *

Exhibit A

PRECISION BIOSCIENCES, INC.

NOTICE OF NONSTATUTORY STOCK OPTION EXERCISE
PRECISION BIOSCIENCES, INC. 2015 STOCK INCENTIVE PLAN

The undersigned (the "**Participant**") has previously been awarded a nonstatutory stock option (the "**Option**") to purchase shares (the "**Shares**") of the common stock of Precision BioSciences, Inc., a Delaware corporation (the "**Company**"), pursuant to the Precision BioSciences, Inc. 2015 Stock Incentive Plan (the "**Plan**"), and hereby notifies the Company of the Participant's desire to exercise the Option on the terms set forth herein:

PARTICIPANT INFORMATION:

Name: _____

Address: _____

_____

Taxpayer ID #: _____

OPTION INFORMATION:

Grant Date: _____

Exercise Price Per Share: $_____

Total Shares Covered by Option: _____

EXERCISE INFORMATION:

Number of Shares Being Purchased: _____

Aggregate Exercise Price: $_____

Form of Payment (check all that apply):

☐ Check for $_____ made payable to the Company

☐ Cash in the amount of $_____

Please register the Shares in my name as follows: _____

(Print name as it is to appear on stock certificate)

REPRESENTATIONS AND WARRANTIES OF THE PARTICIPANT:

The Participant hereby represents and warrants to the Company that, as of the date hereof:

1. I am purchasing the Shares for my own account for investment only, and not with a view to, or for sale in connection with, any distribution of the Shares in violation of the Securities Act of 1933 (the "**Securities Act**"), or any rule or regulation under the Securities Act.

2. I have had such opportunity as I have deemed adequate to obtain from representatives of the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company.

3. I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

4. I can afford a complete loss of the value of the Shares and am able to bear the economic risk of holding such Shares for an indefinite period.

5. I acknowledge that I am acquiring the Shares subject to all other terms of the Plan, including the Notice of Nonstatutory Stock Option and related Nonstatutory Stock Option Agreement.

6. I acknowledge that the Company has encouraged me to consult my own adviser to determine the tax consequences of acquiring the Shares at this time. I acknowledge that the Company has encouraged me to consult my own adviser to determine the form of ownership that is appropriate for me.

7. I acknowledge that the Shares remain subject to the Company's right of first refusal, right of repurchase, voting agreement and proxy, and the market stand-off (sometimes referred to as the "lock-up"), all in accordance with the applicable Notice of Nonstatutory Stock Option and related Nonstatutory Stock Option Agreement.

8. I understand that (i) the Shares have not been registered under the Securities Act and are "restricted securities" within the meaning of Rule 144 under the Securities Act, (ii) the Shares cannot be sold, transferred or otherwise disposed of unless they are subsequently registered under the Securities Act or an exemption from registration is then available; (iii) in any event, the exemption from registration under Rule 144 will not be available for at least one year and even then will not be available unless a public market then exists for the Common Stock, adequate information concerning the Company is then available to the public, and other terms and conditions of Rule 144 are complied with; and (iv) there is now no registration statement on file with the Securities and Exchange Commission with respect to any stock of the Company and the Company has no obligation or current intention to register the Shares under the Securities Act.

_____

(Print Participant Name)

_____

(Signature)

Date: _____

EXHIBIT B

Notice of Incentive Stock Option
and
Incentive Stock Option Agreement

THE OPTION GRANTED PURSUANT TO THIS AGREEMENT AND THE SHARES ISSUABLE UPON THE EXERCISE THEREOF HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED, OR ANY STATE SECURITIES LAWS, AND MAY NOT BE SOLD, PLEDGED OR OTHERWISE TRANSFERRED WITHOUT AN EFFECTIVE REGISTRATION THEREOF UNDER SUCH ACT OR APPLICABLE LAWS OR AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY AND ITS COUNSEL THAT SUCH REGISTRATION IS NOT REQUIRED.

PRECISION BIOSCIENCES, INC.

INCENTIVE STOCK OPTION AGREEMENT
Granted Under the Precision BioSciences, Inc. 2015 Stock Incentive Plan

1. Grant of Option.

This Incentive Stock Option Agreement (the "**Agreement**") evidences the grant by Precision BioSciences, Inc., a Delaware corporation (the "**Company**"), on the Grant Date to the Participant, an employee of the Company, of an option (this "**Option**") to purchase, in whole or in part, on the terms provided herein and in the Plan, the Total Number of Shares of Common Stock at the Exercise Price per Share, all as defined and set forth in the accompanying Notice of Incentive Stock Option (the "**Notice**"). Capitalized terms that are not otherwise defined herein or in the Notice shall have the meanings given to such terms in the Plan.

It is intended that this Option shall be an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended, and any regulations promulgated thereunder (the "**Code**"). If for any reason the Option, or any portion thereof, does not meet the requirements of Section 422 of the Code, then the Option, or any portion thereof, as necessary, shall be deemed a nonstatutory stock option granted under the Plan. Except as otherwise indicated by the context, the term "Participant," as used in this Agreement, shall include any person who acquires the right to exercise this Option validly under its terms.

2. Vesting Schedule.

This Option shall vest and become exercisable at the time or times set forth in the accompanying Notice. [In addition, the Option may vest and become exercisable on an accelerated basis as follows:

Immediately prior to the effective date of a Change in Control, one hundred percent (100%) of the Total Number of Shares subject to this Option shall vest and become fully exercisable; provided, however, that in no event shall the Participant be entitled to exercise the Option to purchase greater than the Total Number of Shares as a result of this provision. Such accelerated vesting shall be contingent upon consummation of the Change in Control.]

3. Exercise of Option.

(a) Form of Exercise. Each election to exercise this Option shall be in writing in substantially the form of the Notice of Stock Option Exercise attached to this Agreement as **Exhibit A**, signed by the Participant, and received by the Company at its principal office, accompanied by this Agreement, and payment in full in the manner provided in the Plan. The Participant may purchase less than the number of Shares subject to this Option; provided that, no partial exercise of this Option may be for any fractional share.

(b) Continuous Relationship with the Company Required. Except as otherwise provided in this Section 3, this Option may not be exercised unless the Participant, at the time of the exercise of this Option, is, and has been at all times since the Grant Date, a Service Provider to or of the Company or any subsidiary of the Company as defined in Section 424 (f) of the Code (an "**Eligible Participant**").

(c) Termination of Relationship with the Company. If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (d) and (e) below, the right to exercise this Option shall terminate three (3) months after such cessation (but in no event after the Final Exercise Date); provided that, this Option shall be exercisable only to the extent that the Participant was entitled to exercise this Option on the date of such cessation. Notwithstanding the foregoing, if the Participant, prior to the Final Exercise Date, violates the non-competition or confidentiality provisions of any employment agreement, confidentiality and nondisclosure agreement, or other agreement between the Participant and the Company, the right to exercise this Option shall terminate immediately upon such violation.

(d) Exercise Period Upon Death or Disability. If the Participant dies or becomes disabled (within the meaning of Section 22(e)(3) of the Code) prior to the Final Exercise Date while the Participant is an Eligible Participant and the Company has not terminated such relationship for "Cause" (as defined below), this Option shall be exercisable, within the period of one year following the date of death or disability of the Participant, by the Participant (or in the case of death by an authorized transferee); provided that, this Option shall be exercisable only to the extent that this Option was exercisable by the Participant on the date of the Participant's death or disability, and further provided that this Option shall not be exercisable after the Final Exercise Date.

(e) Termination for Cause. If, prior to the Final Exercise Date, the Participant's status as a Service Provider is terminated by the Company for "Cause" (as such term is defined below), the right to exercise this Option shall terminate immediately upon the effective date of such termination. If the Participant is party to an employment agreement or other agreement with the Company that contains an applicable definition of "cause," then the term "**Cause**" for purposes of this Agreement shall have the meaning ascribed to such term in such agreement. Otherwise, the term "**Cause**" for purposes of this Agreement shall mean the following: (i) Participant's willful failure to perform Participant's duties; (ii) Participant's gross negligence or willful misconduct in the execution of Participant's duties; (iii) Participant's failure or refusal to comply with the Company's policies, procedures, practices or directions; (iv) Participant's conviction of, or guilty plea as to, a felony or any crime involving, fraud, misappropriation, or misrepresentation; or (v) Participant's breach (and subsequent failure to cure upon applicable notice) of any employment, consulting, advisory, nondisclosure, non-competition or other similar agreement between the Participant and the Company, as determined by the Company, which determination shall be conclusive. The Participant shall be considered to have been discharged for "Cause" if the Company determines, within 30 days after the Participant's resignation, that discharge for cause was warranted.

4. Bylaws; General Restrictions on Transfer.

The Participant acknowledges and agrees that the Shares are subject to the provisions of the Company's Bylaws, as amended from time to time (the "**Bylaws**"), including without limitation, any restrictions on transfer described in the Bylaws. The Participant may inspect the Bylaws at the Company's principal office.

5. Rights of First Refusal.

(a) If Participant proposes to sell, pledge or otherwise transfer any Shares acquired upon exercise of this Option (the "**Exercise Shares**"), the Company shall have the right to repurchase the Exercise Shares under the terms and subject to the conditions set forth in this Section 5 (the "**Right of First Refusal**").

(b) Notice of Proposed Transfer. Prior to any proposed transfer of the Exercise Shares, the Participant shall give a written notice (the "**Transfer Notice**") to the Company describing fully the proposed transfer, including the number of Exercise Shares, the name and address of the proposed transferee (the "**Proposed Transferee**"), the proposed transfer price and all other material terms and conditions of the proposed transfer.

(c)Exercise of Right of First Refusal. The Company shall have the right to purchase all, but not less than all, of the Exercise Shares at the purchase price and on the terms set forth in the Transfer Notice by delivery to the Participant of a notice of exercise of the Right of First Refusal within thirty (30) days after the date the Transfer Notice is delivered to the Company. The Company's exercise or failure to exercise the Right of First Refusal with respect to any proposed transfer described in a Transfer Notice shall not affect the Company's ability to exercise the Right of First Refusal with respect to any proposed transfer described in any other Transfer Notice, whether or not such other Transfer Notice is issued by the Participant or issued by any other person with respect to a proposed transfer to the same Proposed Transferee. If the Company exercises the Right of First Refusal, the Company and the Participant shall thereupon consummate the sale of the Exercise Shares to the Company on the terms set forth in the Transfer Notice; provided however, that if the Transfer Notice provides for the payment for the Exercise Shares other than in cash, the Company shall have the option of paying for the Exercise Shares by the discounted cash equivalent of the consideration described in the Transfer Notice as reasonably determined by the Board. For purposes of the foregoing, cancellation of any indebtedness of the Participant to the Company shall be treated as payment to the Participant in cash to the extent of the unpaid principal and any accrued interest cancelled.

(d) Failure to Exercise Right of First Refusal. If the Company fails to exercise such Right of First Refusal, the Participant may conclude a transfer to the Proposed Transferee of the Exercise Shares on the terms and conditions described in the Transfer Notice, provided such transfer occurs not later than three (3) months following expiration of the forty-five (45) day Right of First Refusal period provided in Section 5(c). Any proposed transfer on terms and conditions different from those described in the Transfer Notice, as well as any subsequent proposed transfer by the Participant, also shall be subject to the Right of First Refusal and shall require compliance by the Participant with the procedure described in this Section 5.

(e) Transferees of the Transfer Shares. All transferees of the Exercise Shares or any interest therein, other than the Company acquiring such Exercise Shares through its Right of First Refusal, shall be required as a condition of such transfer to agree in writing (in a form satisfactory to the Company) that such transferee shall receive and hold such Exercise Shares or interests subject to (i) the provisions of this Section 5 providing for the Right of First Refusal with respect to any subsequent transfer, (ii) the Right of Repurchase established under Section 6, and (iii) all other applicable restrictions set forth in the Plan and this Agreement.

(f) Transfers Not Subject to the Right of First Refusal. The Right of First Refusal shall not apply to any transfer or exchange of the Exercise Shares if: (i) such transfer is in connection with a Change in Control; (ii) such transfer is to one or more members of the Participant's immediate family (or a trust for their benefit) provided all such transferees agree in writing to the restrictions of Section 5(e); or

(iii) such transfer has been expressly approved by the Board, which approval may be granted or withheld in its sole discretion.

(g) Assignment of the Right of First Refusal. The Company shall have the right to assign the Right of First Refusal at any time.

(h) Stock Dividends Subject to First Refusal Right. If, from time to time, there is any stock dividend, stock split, recapitalization, reclassification or other change in the character or amount of any of the outstanding stock of the Company, the stock of which is subject to the provisions of an Option issued pursuant to the Plan, then, in such event, any and all new substituted or additional securities to which the Participant is entitled by reason of the Participant's ownership of the Exercise Shares shall be immediately subject to the Right of First Refusal with the same force and effect as the Shares subject to the Right of First Refusal immediately before such event.

(i) Early Termination of the Right of First Refusal. The other provisions of this Section 5 notwithstanding, the Right of First Refusal shall terminate, and be of no further force and effect, upon the earlier of (i) the occurrence of a Change in Control, unless the surviving, continuing, successor, or purchasing corporation, as the case may be, assumes the Company's rights and obligations under the Plan, or (ii) the existence of a public market for the Shares. A "public market" shall be deemed to exist if (i) Shares are listed on a national securities exchange (as that term is used in the Exchange Act) or (ii) Shares are traded on the over-the-counter market and prices therefor are published daily on business days in a recognized financial journal.

(j) Escrow. To ensure the Shares subject to Right of First Refusal will be available for purchase, the Company may require a Participant to deposit certificates evidencing the Exercise Shares in escrow with the Company or an agent of the Company.

6. Right of Repurchase on Termination of Employment With or Cessation of Service to Company. The Company shall have the right (but not the obligation) to repurchase any or all of the Exercise Shares upon the Participant's termination of employment or service as a Service Provider of the Company for any reason. The price per Exercise Share to be paid by the Company should it choose to exercise its repurchase right under this Section 6 shall equal the then Fair Market Value per Exercise Share. The Company's right of repurchase pursuant to this Section 6 shall commence on the date the Participant terminates service with the Company and continue until the first anniversary of such Participant's termination of service.

7. Legend. Any certificate representing Shares shall bear legends substantially in the following forms (in addition to, or in combination with, any legend required by applicable federal and state securities laws and other agreements relating to the Company's securities):

> "The securities represented by this certificate, and the transfer thereof, are subject to the restriction on transfer provisions of the Bylaws of the Company and the Incentive Stock Option Agreement, copies of which are on file in, and may be examined at, the principal office of the Company."

8. Agreement in Connection with Public Offering. The Participant agrees, in connection with the initial underwritten public offering of the Company's securities pursuant to a registration statement under the Securities Act of 1933, as amended (the "**Securities Act**"): (i) not to sell, make short sale of, loan, grant any options for the purchase of, or otherwise dispose of any shares of Common Stock held by the

Participant (other than those shares included in the offering) without the prior written consent of the Company or the underwriters managing such initial underwritten public offering of the Company's securities for a period of 180 days from the effective date of such registration statement, which period may be extended upon the request of the underwriters for an additional period of up to fifteen (15) days if the Company issues or proposes to issue an earnings or other public release within fifteen (15) days of the expiration of the 180-day lockup period, and (ii) to execute any agreement reflecting clause (i) above as may be requested by the Company or the managing underwriters at the time of such offering.

The Participant agrees to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters of such offering which are consistent with the foregoing or which are necessary to give further effect thereto. In addition, if requested, by the Company or the underwriters of such offering, the Participant shall provide, within 10 days of such request, such information as may be required by the Company or such underwriters in connection with the completion of any public offering of the Company's securities pursuant to a registration statement filed under the Securities Act. The obligations described in this Section 8 shall not apply to a registration relating solely to employee benefits plans on Form S-1 or Form S-8 or similar forms that may be promulgated in the future, or a registration relating solely to a Commission Rule 145 transaction on Form S-4 or similar forms that may be promulgated in the future. The Company may impose stop-transfer instructions with respect to the shares of Common Stock (or other securities) subject to the foregoing restriction until the end of the applicable period. Participant agrees that any transferee of this Option or Shares pursuant to this Agreement shall be bound by this Section 8.

9. Tax Matters.

(a) Withholding. No Shares shall be issued pursuant to the exercise of this Option unless and until the Participant pays to the Company, or makes provision satisfactory to the Company for payment of, any federal, state or local withholding or other taxes required by law to be withheld in respect of this Option.

(b) Disqualifying Disposition. If the Participant disposes of Shares acquired upon exercise of this Option within two years from the Grant Date or one year after such Shares were acquired pursuant to exercise of this Option, the Participant shall immediately notify the Company in writing of such disposition and shall timely satisfy all resulting tax obligations and shall hold the Company harmless with respect to any such tax obligations.

(c) Code Section 409A. The Exercise Price is intended to be not less than the Fair Market Value of the Common Stock on the Grant Date. The Company has determined the Fair Market Value of the Common Stock in good faith and using the reasonable application of a reasonable valuation method, for purposes of determining the Exercise Price. Notwithstanding this, the Internal Revenue Service may assert that the Fair Market Value of the Common Stock on the Grant Date was greater than the Exercise Price. Under Code Section 409A, if the Exercise Price is less than the Fair Market Value of the Common Stock as of the Grant Date, this Option may be treated as a form of deferred compensation and the Participant may be subject to an additional twenty percent (20%) tax, plus interest and possible penalties. The Participant acknowledges that the Company has advised the Participant to consult with a tax adviser regarding the potential impact of Code Section 409A and that the Company, in the exercise of its sole discretion and without the consent of the Participant, may amend or modify this Agreement in any manner and delay the payment of any amounts payable pursuant to this Agreement to the minimum extent necessary to meet the requirements of Code Section 409A, as amplified by any Internal Revenue Service or U.S. Treasury Department regulations or guidance as the Company deems appropriate or advisable.

10. Nontransferability of Option. This Option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this Option shall be exercisable only by the Participant.

11. Provisions of the Plan. This Option is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Option.

12. Entire Agreement; Governing Law. The Plan and the Notice are incorporated herein by reference. This Agreement, the Notice and the Plan constitute the entire agreement between the Company and the Participant with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and the Participant with respect to the subject matter hereof. This Agreement shall be governed by and construed in accordance with the laws of the State of North Carolina without reference to conflict of law provisions.

13. Amendment. Except as set forth in Section 8(c), this Agreement may not be modified or amended in any manner adverse to the Participant's interest except by means of a writing signed by the Company and Participant.

14. No Guarantee of Continued Service. THE PARTICIPANT ACKNOWLEDGES AND AGREES THAT THE VESTING OF OPTIONS PURSUANT TO THE VESTING SCHEDULE SET FORTH HEREIN AND IN THE NOTICE ARE EARNED ONLY BY CONTINUING SERVICE AT THE WILL OF THE COMPANY (NOT THROUGH THE ACT OF BEING HIRED, BEING GRANTED THIS OPTION OR ACQUIRING SHARES HEREUNDER). THE PARTICIPANT FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE VESTING SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED SERVICE FOR THE VESTING PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE IN ANY WAY WITH PARTICIPANT'S RIGHT OR THE COMPANY'S RIGHT TO TERMINATE PARTICIPANT'S SERVICE WITH OR WITHOUT CAUSE.

* * * * *

Exhibit A

PRECISION BIOSCIENCES, INC.

NOTICE OF INCENTIVE STOCK OPTION EXERCISE
PRECISION BIOSCIENCES, INC. 2015 STOCK INCENTIVE PLAN

The undersigned (the "**Participant**") has previously been awarded an incentive stock option (the "**Option**") to purchase shares (the "**Shares**") of the common stock of Precision BioSciences, Inc., a Delaware corporation (the "**Company**"), pursuant to the Precision BioSciences, Inc. 2015 Stock Incentive Plan (the "**Plan**"), and hereby notifies the Company of the Participant's desire to exercise the Option on the terms set forth herein:

PARTICIPANT INFORMATION:

Name: _____

Address: _____

_____

Taxpayer ID #: _____

OPTION INFORMATION:

Grant Date: _____

Exercise Price Per Share: $_____

Total Shares Covered by Option: _____

EXERCISE INFORMATION:

Number of Shares Being Purchased: _____

Aggregate Exercise Price: $_____

Form of Payment (check all that apply):

☐ Check for $_____ made payable to the Company

☐ Cash in the amount of $_____

Please register the Shares in my name as follows:

_____
(Print name as it is to appear on stock certificate)

REPRESENTATIONS AND WARRANTIES OF THE PARTICIPANT:

The Participant hereby represents and warrants to the Company that, as of the date hereof:

1. I am purchasing the Shares for my own account for investment only, and not with a view to, or for sale in connection with, any distribution of the Shares in violation of the Securities Act of 1933 (the "**Securities Act**"), or any rule or regulation under the Securities Act.

2. I have had such opportunity as I have deemed adequate to obtain from representatives of the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company.

3. I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

4. I can afford a complete loss of the value of the Shares and am able to bear the economic risk of holding such Shares for an indefinite period.

5. I acknowledge that I am acquiring the Shares subject to all other terms of the Plan, including the Notice of Incentive Stock Option and related Incentive Stock Option Agreement.

6. I acknowledge that the Company has encouraged me to consult my own adviser to determine the tax consequences of acquiring the Shares at this time. I acknowledge that the Company has encouraged me to consult my own adviser to determine the form of ownership that is appropriate for me.

7. I acknowledge that the Shares remain subject to the Company's right of first refusal, right of repurchase, voting agreement and proxy, and the market stand-off (sometimes referred to as the "lock-up"), all in accordance with the applicable Notice of Incentive Stock Option and related Incentive Stock Option Agreement.

8. I understand that (i) the Shares have not been registered under the Securities Act and are "restricted securities" within the meaning of Rule 144 under the Securities Act, (ii) the Shares cannot be sold, transferred or otherwise disposed of unless they are subsequently registered under the Securities Act or an exemption from registration is then available; (iii) in any event, the exemption from registration under Rule 144 will not be available for at least one year and even then will not be available unless a public market then exists for the Common Stock, adequate information concerning the Company is then available to the public, and other terms and conditions of Rule 144 are complied with; and (iv) there is now no registration statement on file with the Securities and Exchange Commission with respect to any stock of the Company and the Company has no obligation or current intention to register the Shares under the Securities Act.

_____

(Print Participant Name)

_____

(Signature)

Date:_____

Exhibit 21.1

SUBSIDIARIES OF PRECISION BIOSCIENCES, INC.

Company Name	Jurisdiction
ELO Life Systems, Inc.	Delaware
ELO Life Systems Australia Pty. Ltd.	Australia

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the use in this Registration Statement on Form S-1 of our report dated February 21, 2019 (March 1, 2019 as to Note 15) relating to the financial statements of Precision BioSciences, Inc., appearing in the Prospectus, which is part of this Registration Statement.

We also consent to the reference to us under the headings “Experts” in such Prospectus.

/s/ Deloitte & Touche LLP

Raleigh, North Carolina
March 1, 2019