PRECISION BIOSCIENCES

39th Annual J.P. Morgan Healthcare Conference

January 13, 2021

Forward Looking Statements

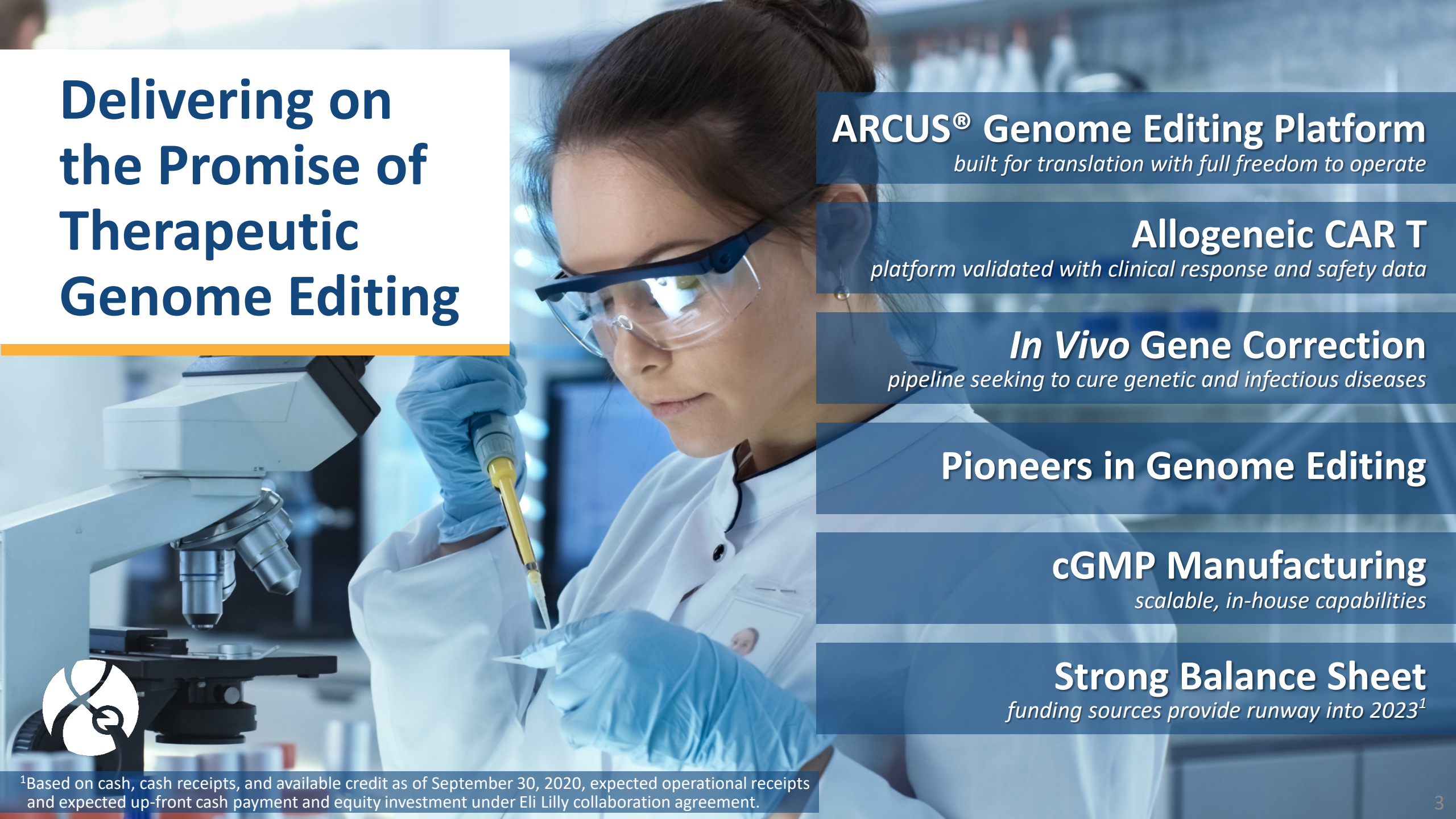
This presentation (together with any other statements or information that we may make in connection herewith) may contain forward-looking statements. All statements other than statements of present and historical facts contained in this presentation, including, without limitation statements regarding: the development of our product candidates involving our ARCUS® genome editing platform; the timing of trials, including clinical updates and interim data, and results therefrom of our "off-the-shelf" CAR T immunotherapy clinical candidates PBCAR0191 (CD19), PBCAR20A (CD20) and PBCAR269A (BCMA), our CD19 Stealth Cell candidate, PBCAR19B, and our *in vivo* gene correction therapies; the expected commencement of clinical studies for PBCAR19B; expected milestones for 2021, including, without limitation, updates regarding the Company's PH1 program and of any potential milestone payments; and the spinout of our food business, Elo Life Systems; the potential success, efficacy and capabilities of our product candidates, as well as plans and objectives of management for future operations; the consummation of the transactions with Eli Lilly and the expected benefits from such collaboration; and our projected cash runway, may be forward-looking statements. Without limiting the foregoing, the words "aim", "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. These forward-looking statements reflect various assumptions of Precision's management that may or may not prove to be correct. No forward-looking statement is a guarantee of future results, performance, or achievements, and one should avoid placing undue reliance on such statements.

Forward-looking statements are based on our management's current expectations, 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 important factors, including, but not limited to: our ability to become profitable; our ability to procure sufficient funding and requirements under our current debt instruments; and effects of restrictions thereunder; risks associated with raising additional capital; our operating expenses and our ability to predict what those expenses will be; our limited operating history; the success of our programs and product candidates in which we expend our resources; our limited ability or inability to assess the safety and efficacy of our product candidates; our dependence on our ARCUS technology; the initiation, cost, timing, progress, achievement of milestones and results of research and development activities, preclinical or greenhouse studies and clinical or field trials; public perception about genome editing technology and its applications; competition in the genome editing, biopharmaceutical, biotechnology and agricultural biotechnology fields; our or our collaborators' ability to identify, develop and commercialize product candidates; pending and potential liability lawsuits and penalties against us or our collaborators related to our technology and our product candidates; the U.S. and foreign regulatory landscape applicable to our and our collaborators' development of product candidates; our or our collaborators' ability to obtain and maintain regulatory approval of our product candidates, and any related restrictions, limitations and/or warnings in the label of an approved product candidate; our or our collaborators' ability to advance product candidates into, and successfully design, implement and complete, clinical or field trials; potential manufacturing problems associated with the development or commercialization of any of our product candidates; our ability to obtain an adequate supply of T cells from qualified donors; our ability to achieve our anticipated operating efficiencies at our manufacturing facility; delays or difficulties in our and our collaborators' ability to enroll patients; changes in interim "top-line" and initial data that we announce or publish; if our product candidates do not work as intended or cause undesirable side effects; risks associated with applicable healthcare, data protection, privacy and security regulations and our compliance therewith; the rate and degree of market acceptance of any of our product candidates; the success of our existing collaboration agreements, and our ability to enter into new collaboration arrangements; our current and future relationships with and reliance on third parties including suppliers and manufacturers; our ability to obtain and maintain intellectual property protection for our technology and any of our product candidates; potential litigation relating to infringement or misappropriation of intellectual property rights; our ability to effectively manage the growth of our operations; our ability to attract, retain, and motivate key executives and personnel; market and economic conditions; effects of system failures and security breaches; effects of natural and manmade disasters, public health emergencies and other natural catastrophic events effects of the outbreak of COVID-19, or any pandemic, epidemic or outbreak of an infectious disease; insurance expenses and exposure to uninsured liabilities; and other important factors discussed under the caption "Risk Factors" in our Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2020 as such factors may be updated from time to time in our other filings with the SEC, which filings are accessible on the SEC's website at www.sec.gov and the Investors & Media page of our website at investor.precisionbiosciences.com.

All forward-looking statements speak only as of the date of this presentation, 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.

This presentation may also contain estimates, projections, and/or other information regarding our industry, our business and the markets for certain of our product candidates, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Unless otherwise expressly stated, we obtained this industry, business, market and other data from reports, research surveys, clinical trials, studies and similar data prepared by market research firms and other third parties, from industry, medical and general publications, and from government data and similar sources. Information that is based on estimates, forecasts, projections, market research, or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information.

Delivering on the Promise of Therapeutic Genome Editing



ARCUS® Genome Editing Platform
built for translation with full freedom to operate

Allogeneic CAR T
platform validated with clinical response and safety data

***In Vivo* Gene Correction**
pipeline seeking to cure genetic and infectious diseases

Pioneers in Genome Editing

cGMP Manufacturing
scalable, in-house capabilities

Strong Balance Sheet
funding sources provide runway into 2023[1]

[1]Based on cash, cash receipts, and available credit as of September 30, 2020, expected operational receipts and expected up-front cash payment and equity investment under Eli Lilly collaboration agreement.

Focused on Overcoming Cancer and Curing Genetic Disease

Unlocking the full potential of proprietary ARCUS platform to address serious diseases

ARCUS

Permanently correct genetic diseases with *in vivo* gene editing

Optimize allogeneic CAR T cells for deep and durable responses

2020 Accomplishments Set up Key Milestones in 2021

- ✓ **Announced *in vivo* gene editing collaboration with Lilly to develop up to six targets, including DMD ($135M upfront + ≤$420M/target in milestones + tiered royalties)**
- ✓ **Achieved 83% Objective Response Rate with PBCAR0191 + Enhanced LD in patients (n=6) with NHL & B-ALL**
- ✓ **Expanded collaboration with Servier in hematologic cancers and solid tumors**
- ✓ **Initiated clinical trial with PBCAR20A in relapsed/refractory NHL, CLL & SLL**
- ✓ **Initiated clinical trial with PBCAR269A in relapsed/refractory multiple myeloma**
- ✓ **Filed IND for PBCAR19B CD19 stealth cell**

Advanced In-House Manufacturing Capabilities

Ability to produce ARCUS-based CAR T and *in vivo* therapies

17,500 sq. ft.
facility in Durham, NC

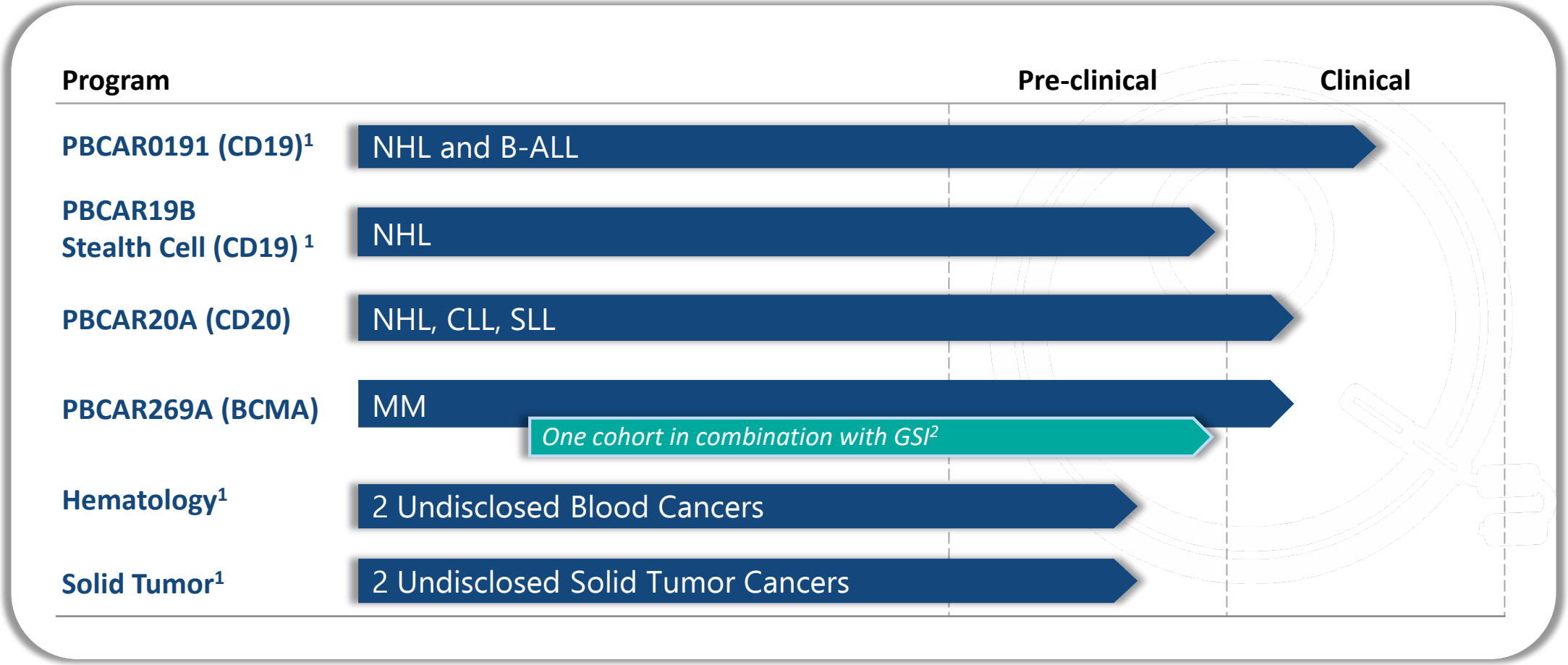
MCAT:
Manufacturing Center for Advanced Therapeutics

- Completed tech transfer of PBCAR0191 and PBCAR20A to MCAT
- Manufactured first batch and clinical trial material for PBCAR269A
- 100% on time delivery of clinical trial material to clinical sites during pandemic
- Produced clinical trial material for PBCAR19B stealth cell

Fully **cGMP** compliant

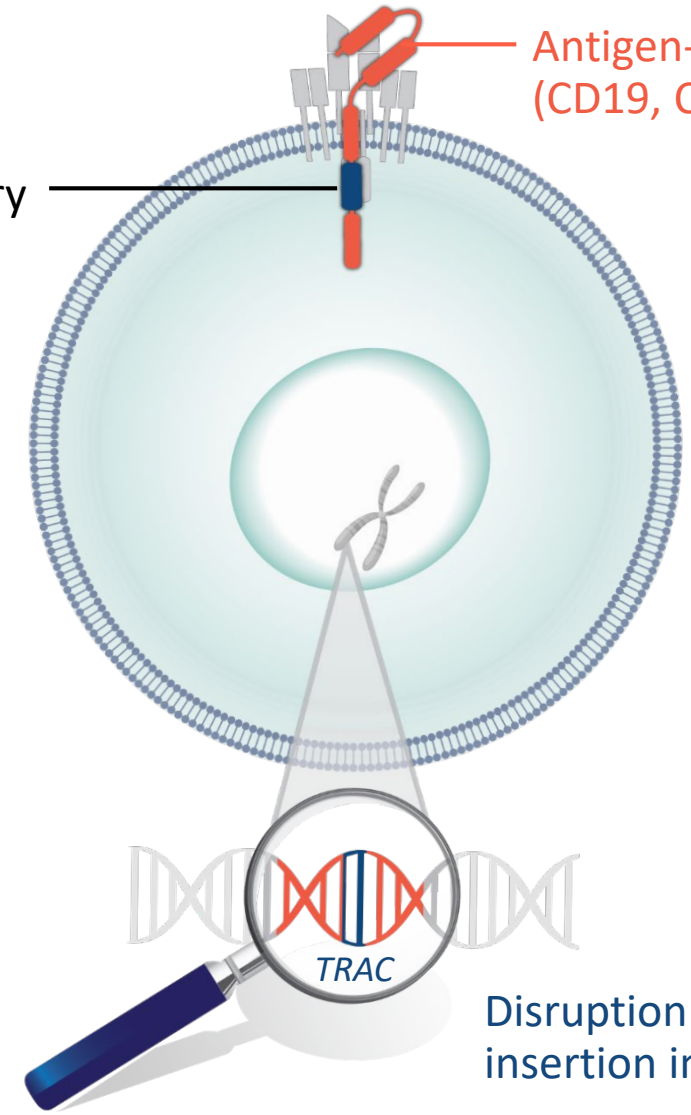
Suites for **CAR T cells, AAV, and mRNA**

Allogeneic CAR T Pipeline



[1] In partnership with Servier.
[2] In combination with gamma secretase inhibitor from SpringWorks Therapeutics.

Allogeneic CAR T Candidates Created with Proprietary Gene Editing



- **1-step gene editing process and efficient, scaled manufacturing process**
  - High yield
  - Consistent, predominantly naïve T cell phenotype
  - CD4:CD8 ratio approximately 1:1
- **CD19 clinical trial data includes cells from 5 batches of cells from 4 different donors**
- **Precision owns US and foreign patents claiming CAR T cells made by this process**

PBCAR0191 Phase 1/2a Clinical Design in R/R NHL[1] and R/R B-ALL[2]

Standard LD (sLD):

Fludarabine 30mg/m^2/day x 3 days plus
Cyclophosphamide 500 mg/m^2/day x 3 days

OR

Enhanced LD (eLD):

Fludarabine 30mg/m^2/day x 4 days plus
Cyclophosphamide 1000 mg/m^2/day x 3 days

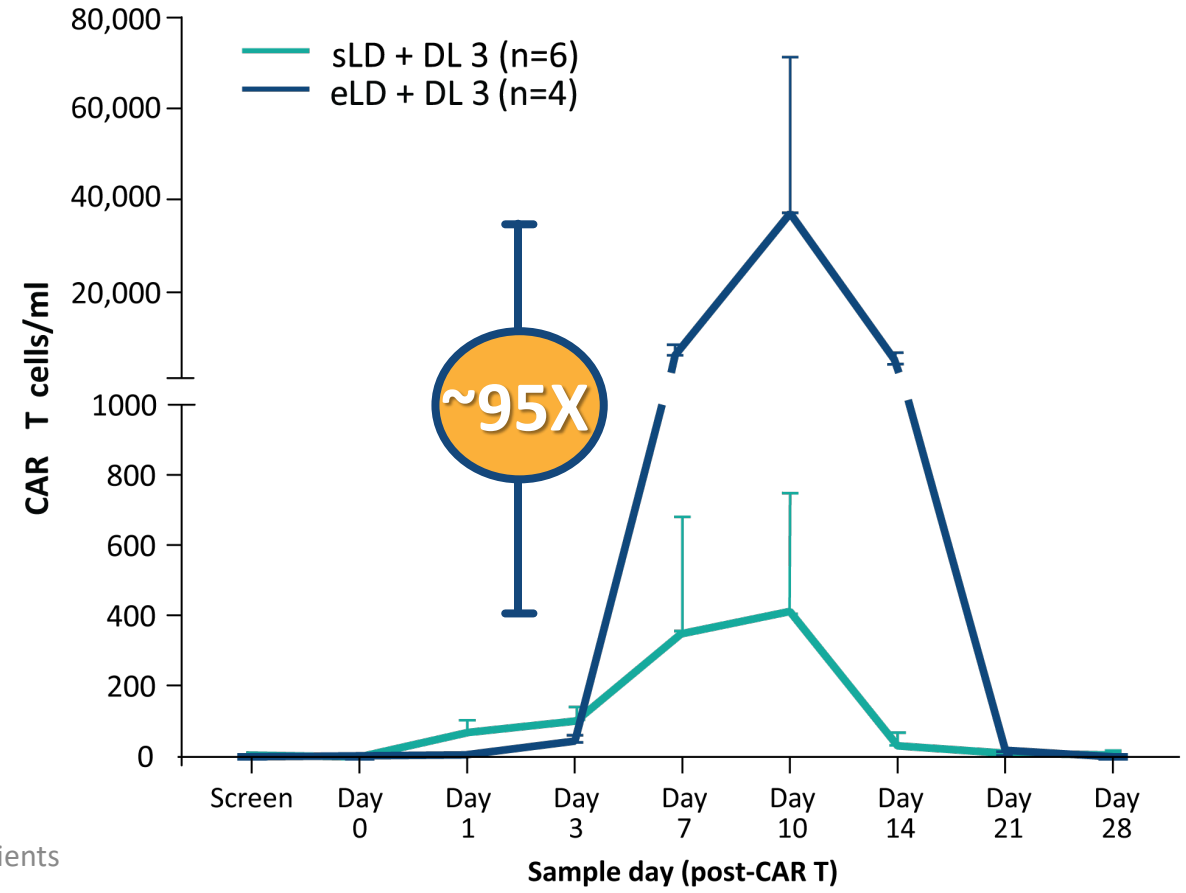
PBCAR0191

Primary objective	**Safety and maximum tolerated dose**
Secondary objective	**Clinical anti-tumor activity**
Exploratory evaluations	**Expansion, trafficking, and persistence**

[1]Relapsed/Refractory Non-Hodgkin Lymphoma
[2]Relapsed/Refractory B-cell Lymphoblastic Leukemia

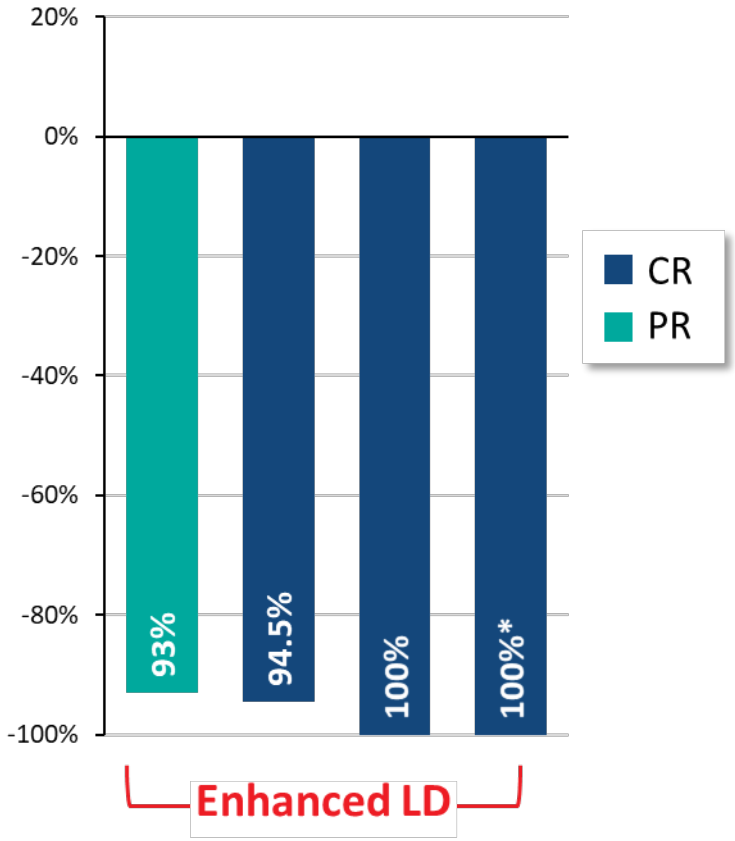
PBCAR0191: Enhanced LD Regimen Shows Promising Activity

95X Increase in Peak Expansion



>90% Decrease in Tumor Size

Best % Change Tumor Area (SPPD, mm²)



[1]NHL patients

eLD Increased Cell Expansion; Correlated with 100% ORR (75% CR)[1]

PBCAR0191: Enhanced LD Resulted in 100% ORR in NHL

		NHL	
		eLD[1] (n=4)	**Total[2]** (n=16)
ORR at Day ≥28		4 (100%)	11 (69%)
Best Response at Day ≥28	*Complete Response*	3 (75%)[3]	6 (38%)
	Partial Response	1 (25%)	5 (31%)
	Progressive Disease	0	5 (31%)

1. Enhanced LD: Fludarabine 30mg/m^2/day x 4 days + Cyclophosphamide 1000 mg/m^2/day x 3 days
2. All patients including those treated with either Enhanced LD or Standard LD (Fludarabine 30mg/m^2/day x 3 days + Cyclophosphamide 500 mg/m^2/day x 3 days; includes patients across dose levels 1,2, and 3)
3. One NHL patient received a second infusion of cells at Day 10 without repeat LD

Acceptable Safety Profile Observed with Enhanced LD

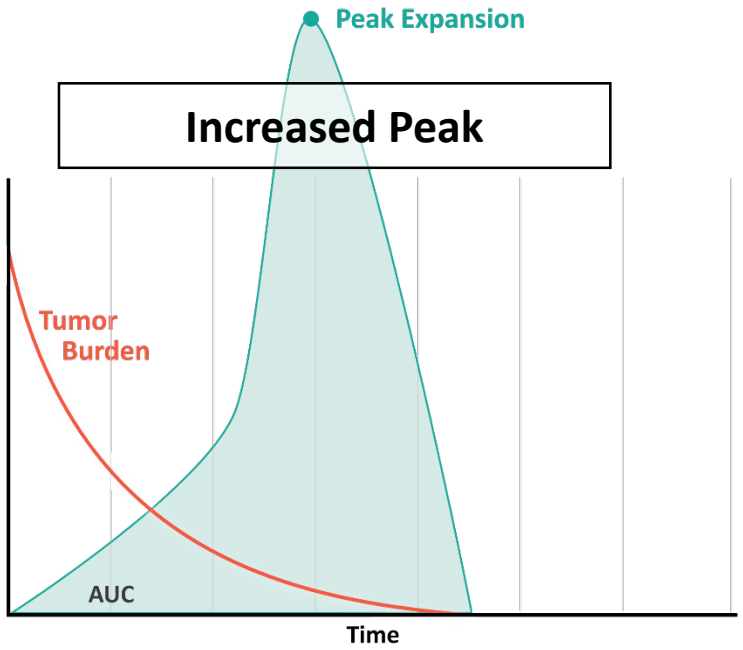
Phase 1 NHL patients who received a dose of cells and have completed 28-day follow-up by November 16, 2020 (n = 16 patients)

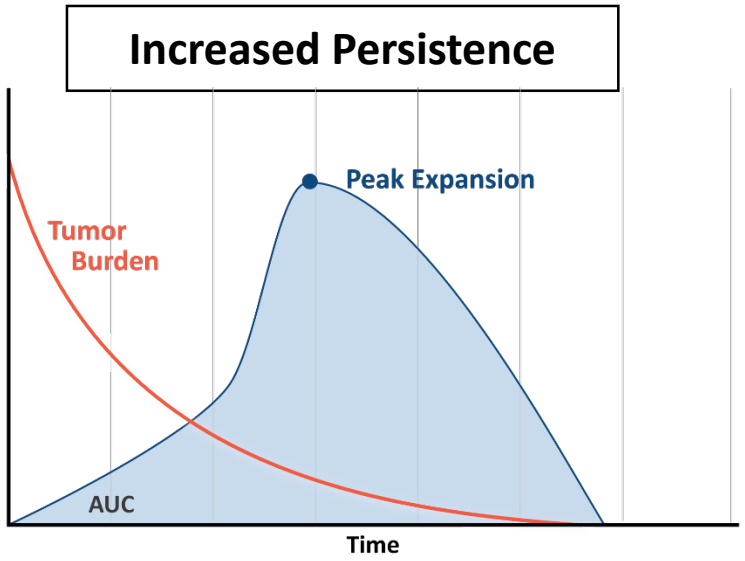
Number (%) of patients experiencing events		eLD (n=4)	Total (n=16)
CRS *(Cytokine Release Syndrome)*	*Grade 1 or Grade 2*	3 (75%)	9 (56%)
	Grade 3 or higher	0	0
ICANS *(Immune Effector Cell Neurotoxicity)*	*Grade 1 or Grade 2*	2 (50%)	5 (31%)
	Grade 3 or higher	0	0
GvHD *(Graft versus Host Disease)*		0	0
Infection	*Grade 1 or Grade 2*	0 (0%)	1 (6%)
	Grade 3 or higher[1]	2 (50%)	3 (19%)

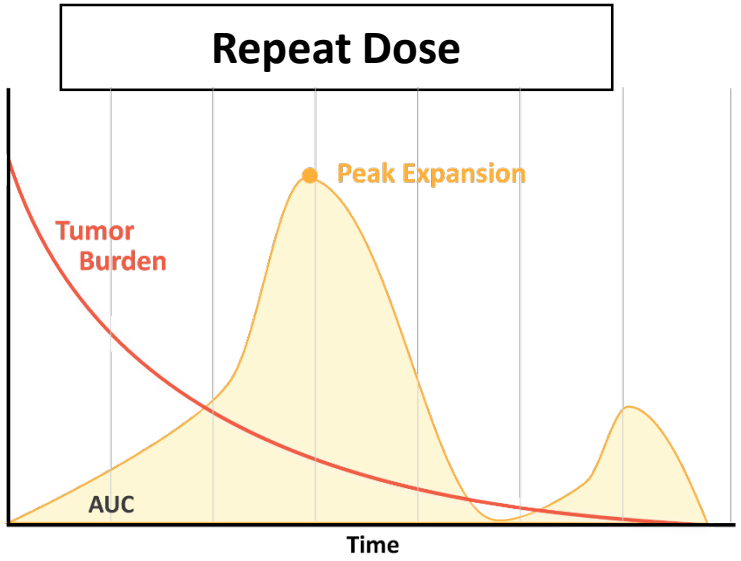
Subsequent event post data cut-off: one NHL patient had a Grade 3 sepsis related to a previously known septic joint on Day 27 which resolved on Day 34. Sepsis occurred again at Day 40 and patient died on day 42 with Grade 5 sepsis.

[1]One NHL patient had Grade 3 sepsis; occurred prior to and resolved before cell administration

PBCAR0191 Clinical Update Expected by Mid-2021







1. Enhanced Lymphodepletion

- Enrolling additional NHL and B-ALL patients with eLD

2. Higher Starting Doses

- Approved to give $5x10^8$ or $7.5x10^8$ CAR T cells on Day 0 (~2-3X Dose Level 3)

3. Novel Lymphodepletion Regimens

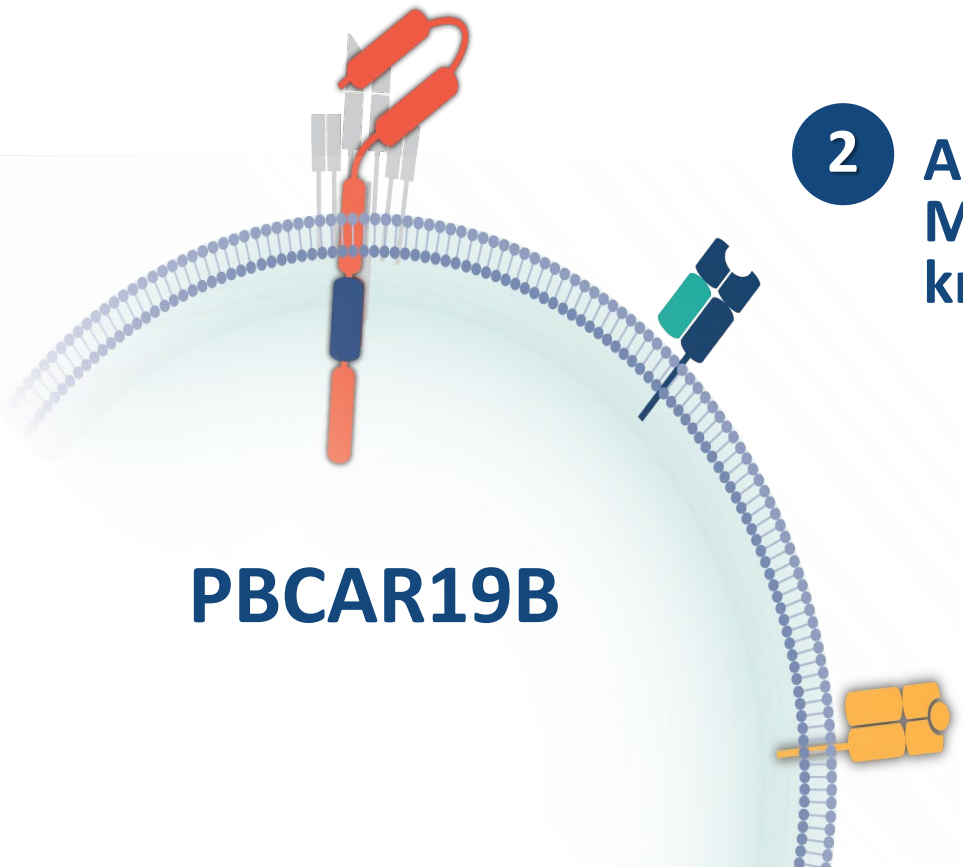
- Novel LD regimens designed to enhance cell persistence are currently being evaluated
- Regimens do not incorporate a long-acting biologic

4. Scheduled Repeat Dose with Repeat Lymphodepletion

- Enrolling NHL and B-ALL patients with a scheduled second dose of LD + CAR T cells

CD19 Stealth Cell Designed to Prevent Rejection by T Cells and NKs

1 **Anti-CD19 CAR** → TCR is knocked out to prevent GvHD



PBCAR19B

2 **Anti-Beta 2 Microglobulin (B2M) knockdown by shRNA** → Reduce MHC Class I expression to avoid rejection by allo-reactive CAR T cells

3 **Transgenic HLA-E** → Avoid rejection by NK cells sensitized to reduced MHC-I HLA-ABC levels

Phase 1 Interim Data for PBCAR20A & PBCAR269A Expected in 2021

	Population	Approved Dose Escalation Range	Status
PBCAR20A Targeting CD20	Adult patients with: • R/R NHL (including MCL), or • R/R CLL or SLL	DL1 = 1.0 × 10^6 cells/kg[1] DL2 = 3.0 × 10^6 cells/kg DL3 = 480x10^6 (fixed dose) *(max dose - 6.0 × 10^6 cells/kg)*	• **First patient dosed 04/2020** • **Orphan Drug Designation for MCL** • **DL2 underway** • **DL3 expected to begin in Q1/2021**
PBCAR269A Targeting BCMA	Adult patients with R/R multiple myeloma	DL1 = 6.0 × 10^5 cells/kg DL2 = 2.0 × 10^6 cells/kg DL3 = 6.0 × 10^6 cells/kg	• **First patient dosed 06/2020** • **Fast Track Status & Orphan Drug Designation** • **DL2 underway** • **DL3 expected to begin in Q1/2021** • **Expected to begin cohort with nirogacestat in 1H/2021**

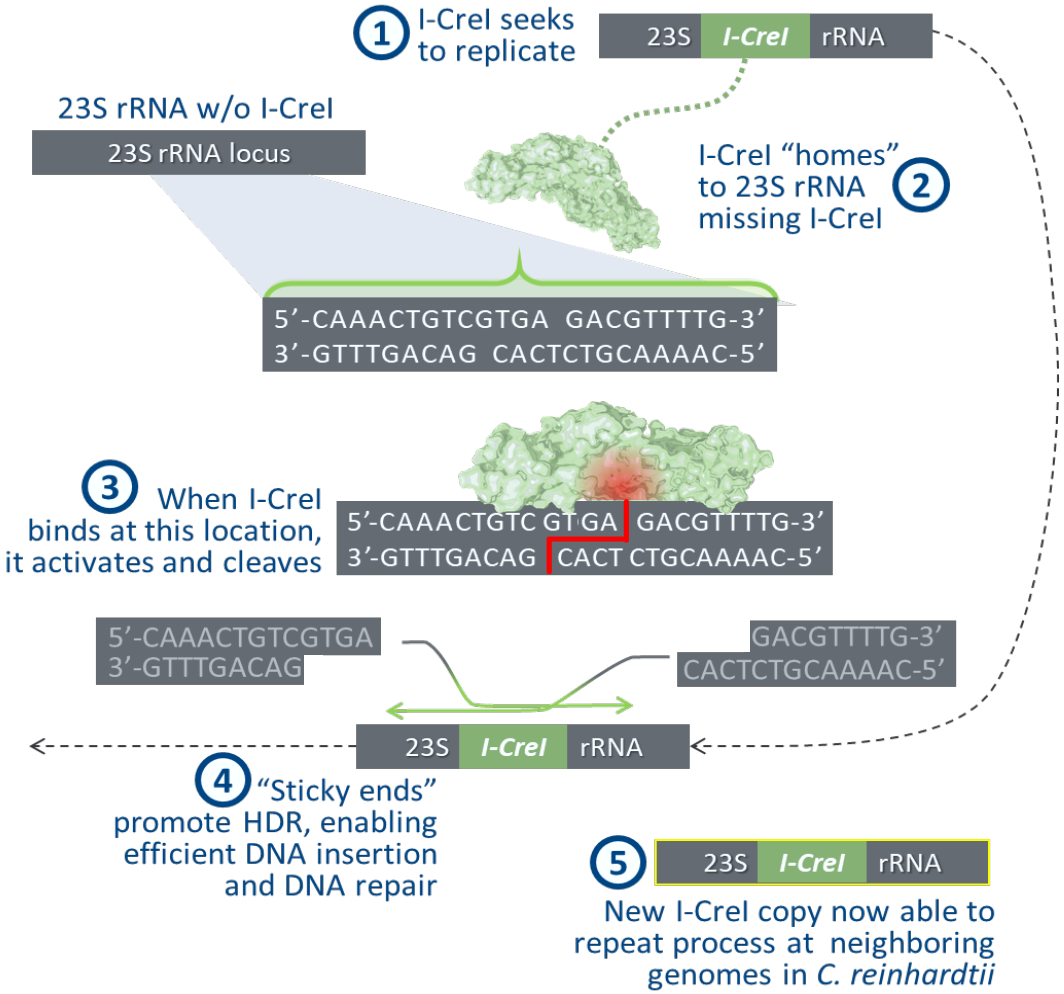
[1]FDA approved study to skip the 3.0 x 10^5 cells/kg dose and begin dosing at 1.0 × 10^6 cells/kg based on PBCAR0191 safety profile.

I-CreI: A Natural Genome Editing Enzyme

Attributes that make I-CreI an excellent therapeutic editing tool:

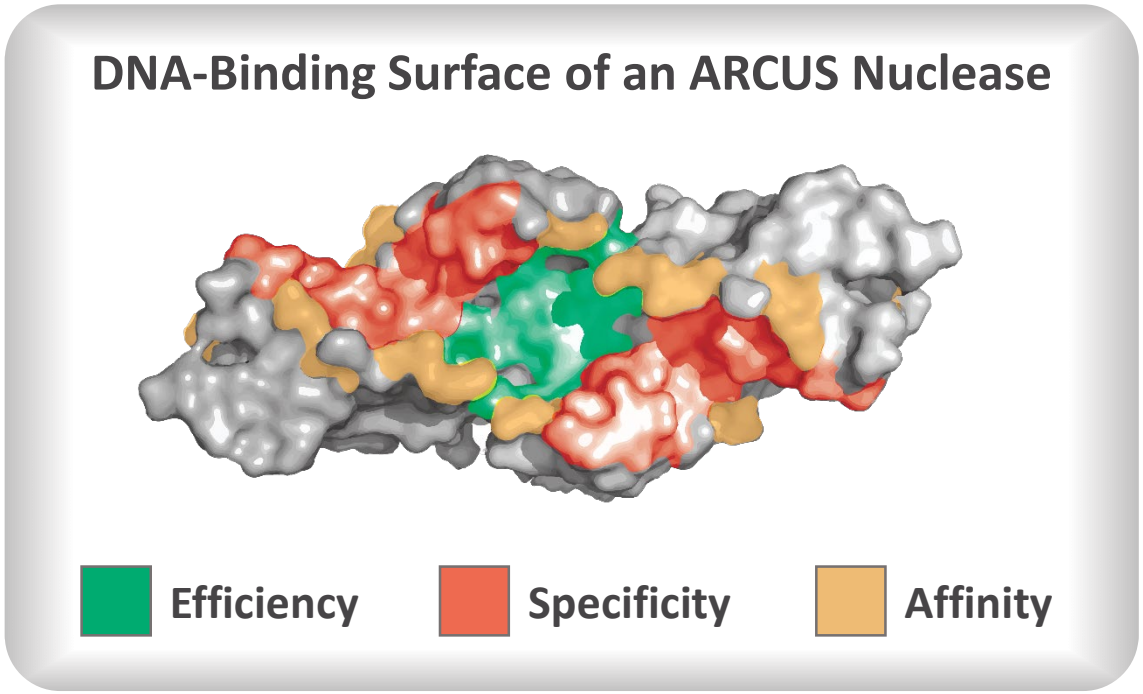
- **Specificity.** I-CreI recognizes a large target site (22 base pairs) and rarely edits off-target sites because it self-inactivates after editing
- **Type of cut.** 3’ “sticky ends” promote homology-directed repair (HDR), enabling efficient DNA insertion and DNA repair
- **Small size.** Compact size (364 amino acids) enables efficient delivery to tissues and cells using viral and non-viral delivery technologies

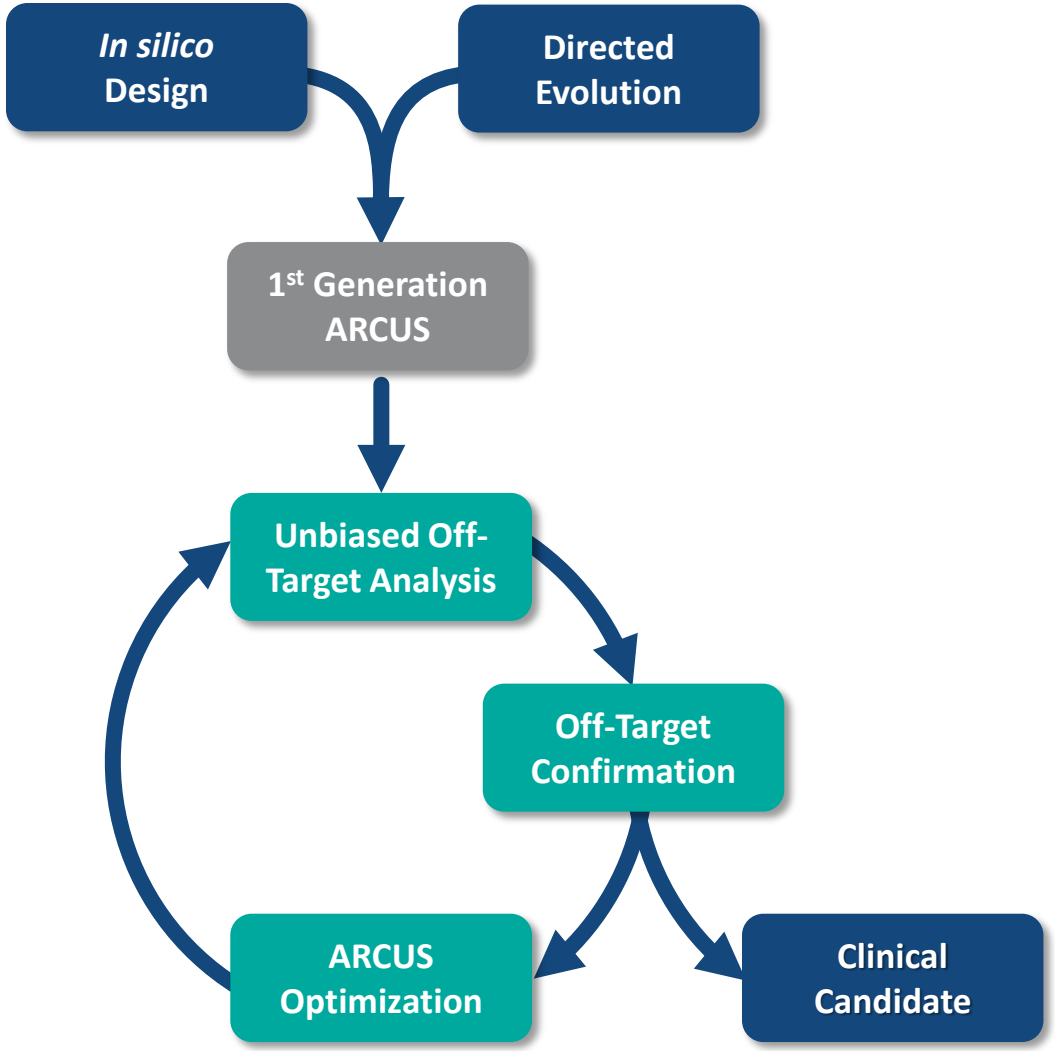
Precision’s platform and products are protected by an IP portfolio that includes more than 65 patents to date



ARCUS: Engineered I-CreI Nucleases

Advanced protein engineering process involving changes to the specificity, affinity, and catalytic efficiency of I-CreI





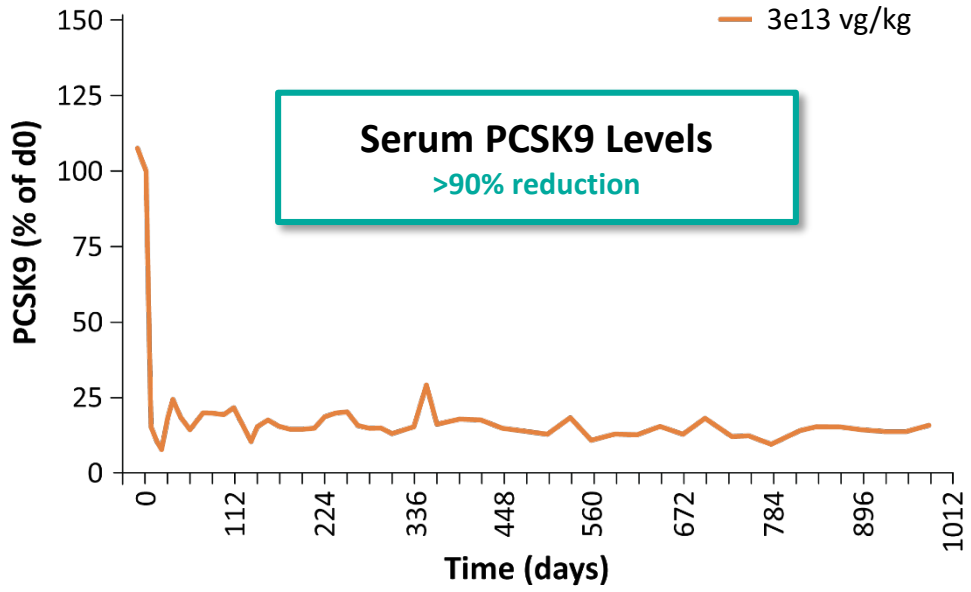
ARCUS Knock-Out of *PCSK9* Gene in Liver

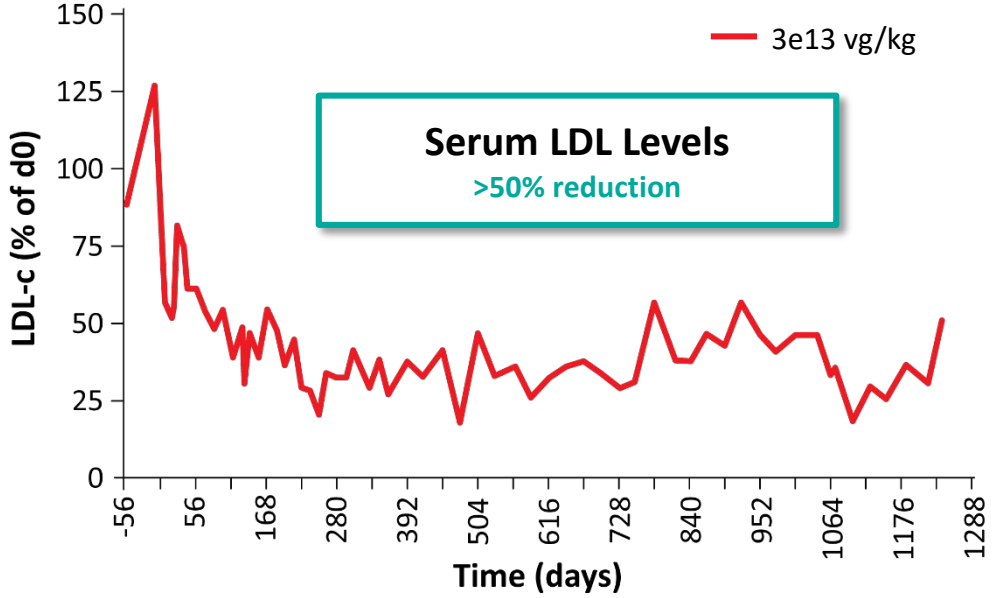
Familial Hypercholesterolemia (FH)

Rare genetic disorder leading to high levels of serum LDL, severe cholesterol deposits, and **early-onset heart disease.**

Non-Human Primate Animal Model

One-time delivery of an AAV-ARCUS vector results in long-term reductions in serum PCSK9 and LDL





Wang et al, Nature Biotechnology, 2018

ARCUS Knock-Out of *TTR* Gene in Liver

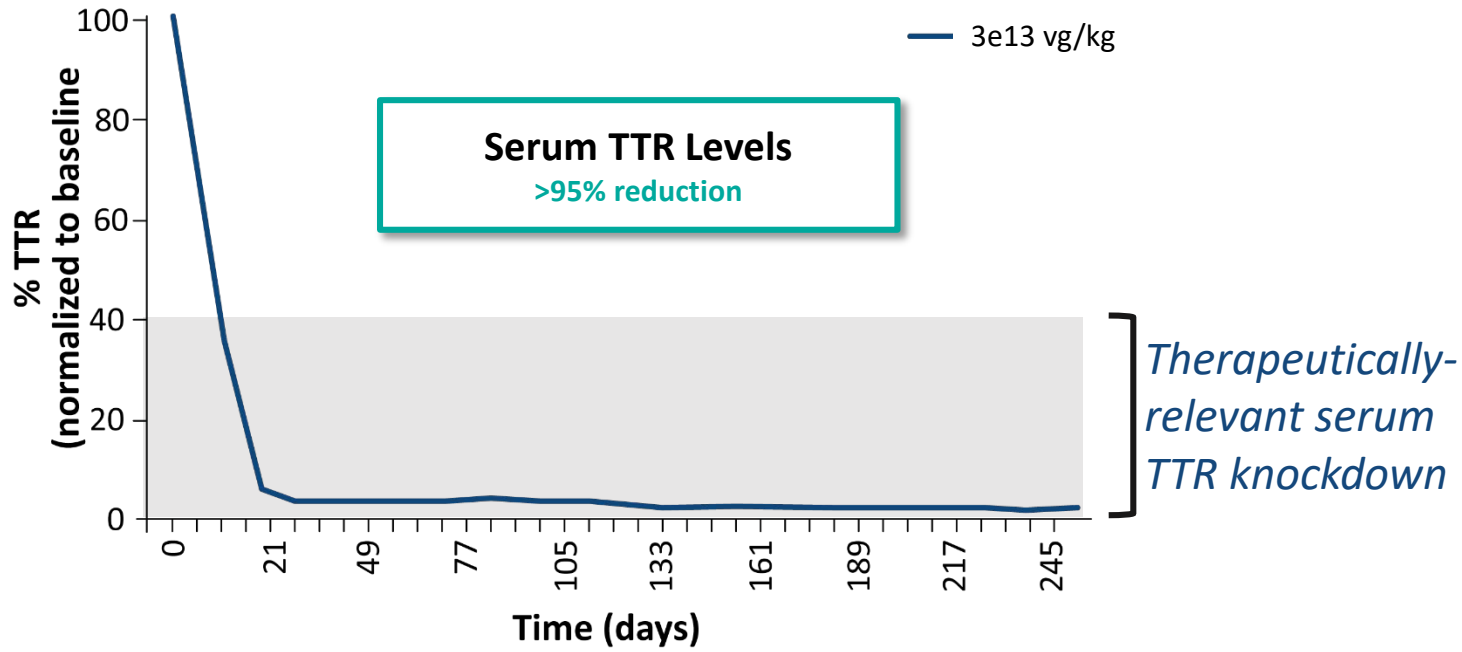
Hereditary Transthyretin Amyloidosis (ATTR)

Rare genetic disease characterized by accumulation of **mutant transthyretin protein** in peripheral organs, which leads to **neuropathy** and/or **cardiomyopathy**.

Non-Human Primate Animal Model

One-time delivery of an AAV-ARCUS vector results in long-term reductions in serum TTR

ARCUS treatment resulted in therapeutically-relevant reduction of serum TTR levels



ARCUS Efficiently Targets Single-Nucleotide Polymorphisms (SNPs)

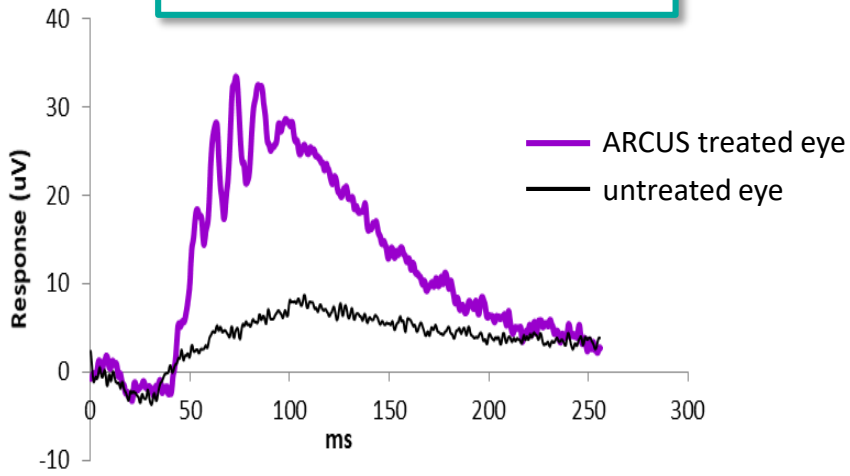
Autosomal Dominant Retinitis Pigmentosa (adRP)

P23H is the most common mutation causing adRP. It is a SNP that causes rhodopsin to aggregate in rod cells **leading to degeneration of the retina.**

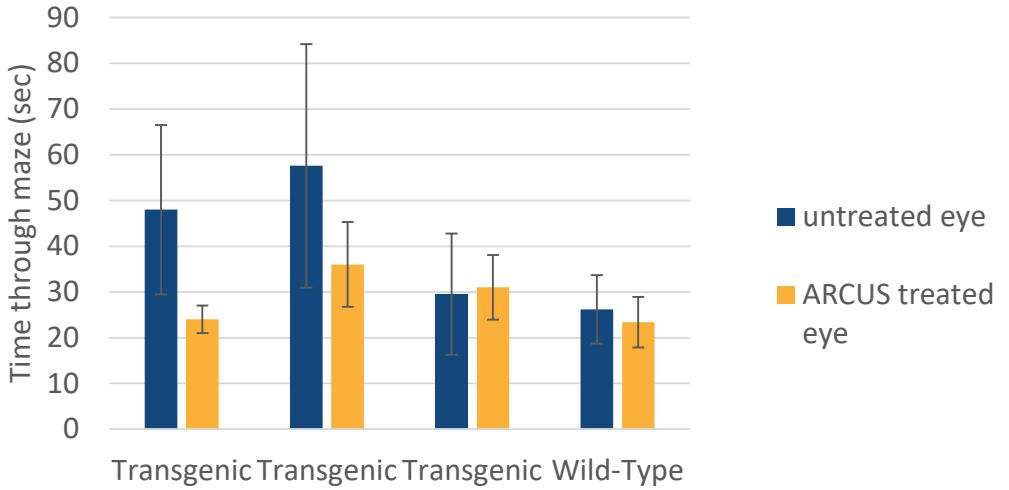
Pig Animal Model

One-time delivery of an AAV-ARCUS vector results in restoration of retina function and visual acuity

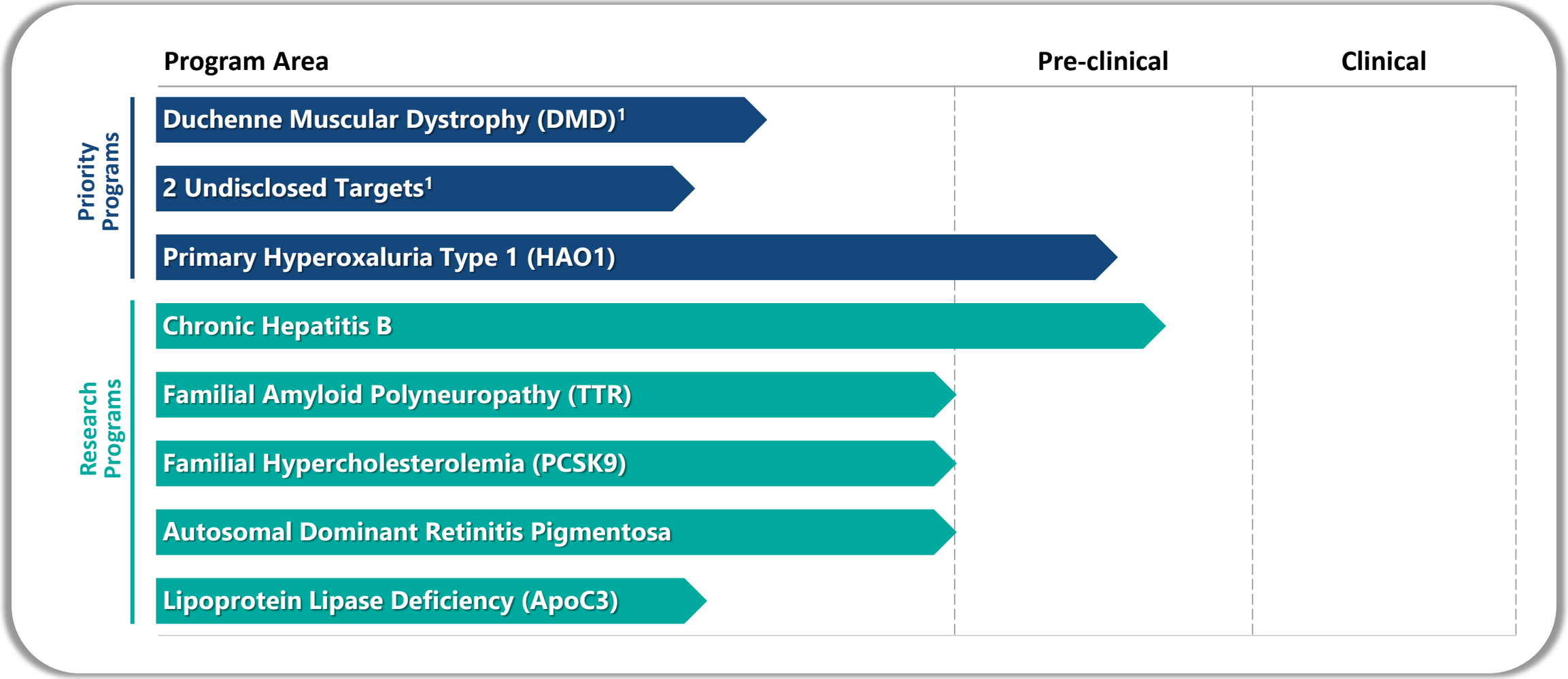
Rod Function Test
ARCUS treatment restores electroretinogram (ERG) signal



Visual Acuity (Maze) Test
ARCUS treatment allows pigs to more quickly navigate a maze



In Vivo Gene Correction Pipeline



[1]In partnership with Lilly

Precision-Lilly Partnership: Unlocking the Value of *in vivo* Gene Editing

Research collaboration and license agreement with Lilly aimed at treating challenging genetic diseases

3 + 3

Initial collaboration for 3 programs, including DMD

Lilly retains right to select up to 3 additional gene targets

- Upfront payment of **$135 million including $35 million equity stake**
- **Up to $420M per target** in development and commercialization milestones
- **Mid-single digit to low-teens** tiered royalties

Precision can opt to co-fund clinical development of one program

Duchenne Muscular Dystrophy Lacks a Curative Treatment

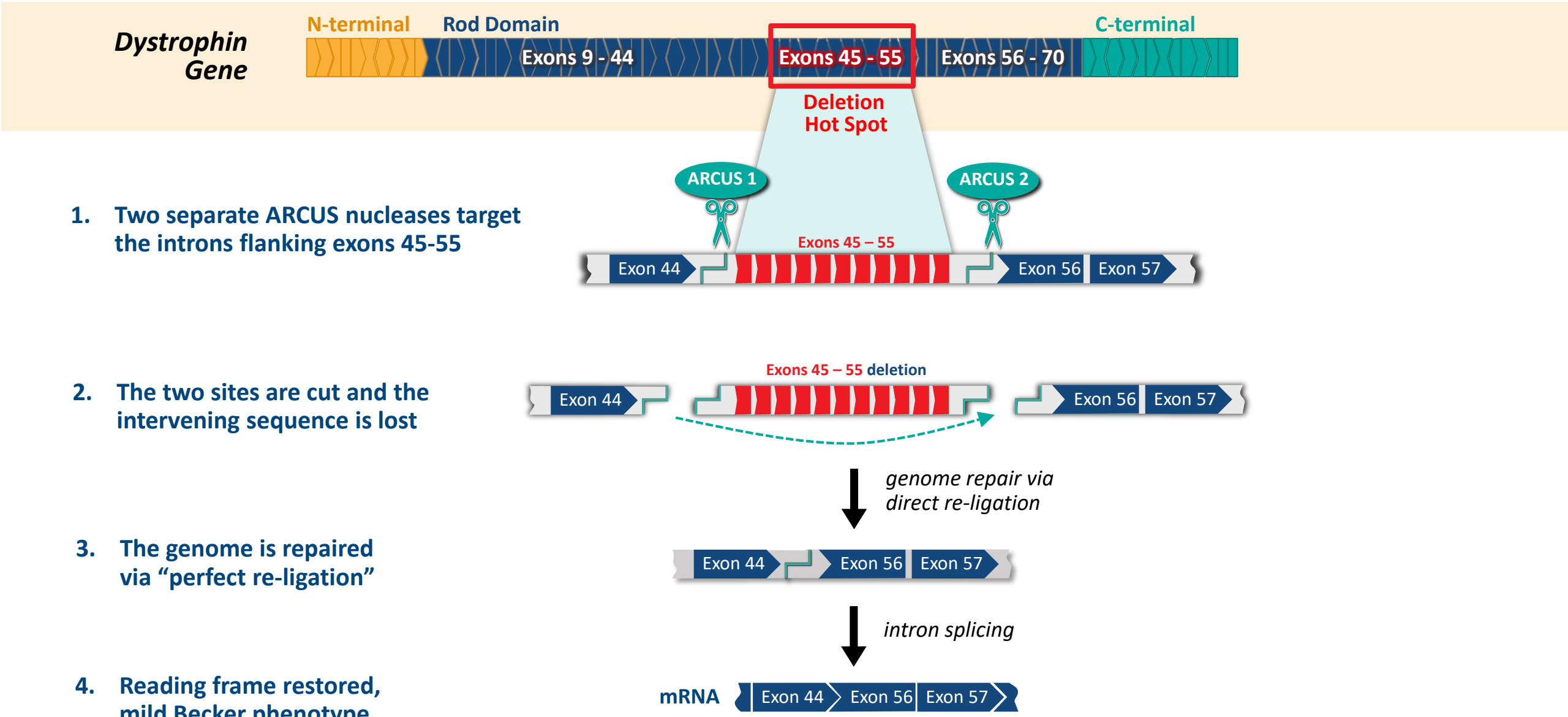
Mutation on the X chromosome interferes with dystrophin protein production, which is needed to form and maintain healthy muscle

On average, children **lose their ability to walk** by **age 12**

Affects approximately **1 in 3,500** live male births

Muscular Dystrophy Association (https://www.mda.org/disease/duchenne-muscular-dystrophy) accessed on 24Sep2020.
National Organization for Rare Disorders (https://rarediseases.org/rare-diseases/duchenne-muscular-dystrophy) accessed on 19Nov2020.

Goal: Restore Dystrophin Expression Using a Pair of ARCUS Nucleases

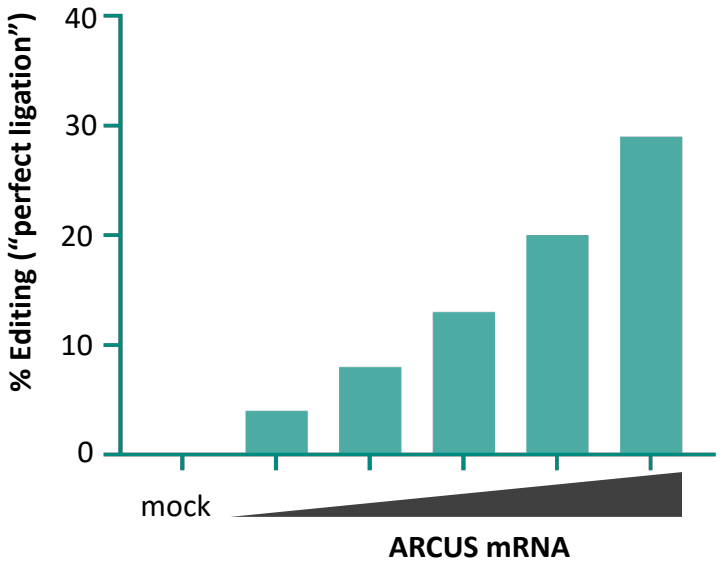


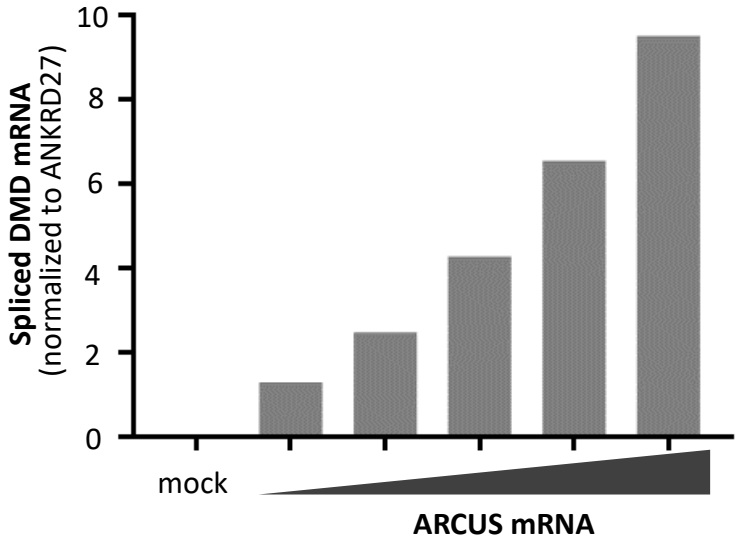
Dystrophin Gene Correction in DMD Patient Myoblasts

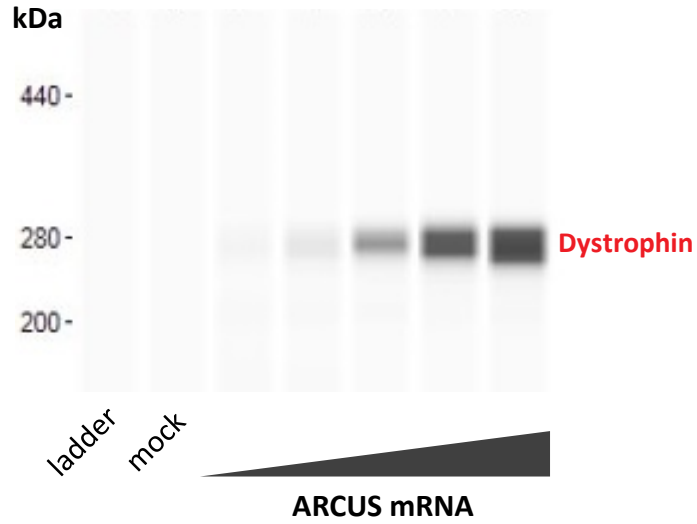
Corrected DNA
exons 45-55 deleted

Corrected mRNA
Exon 44 spliced to Exon 56

Corrected Protein
dystrophin protein expressed







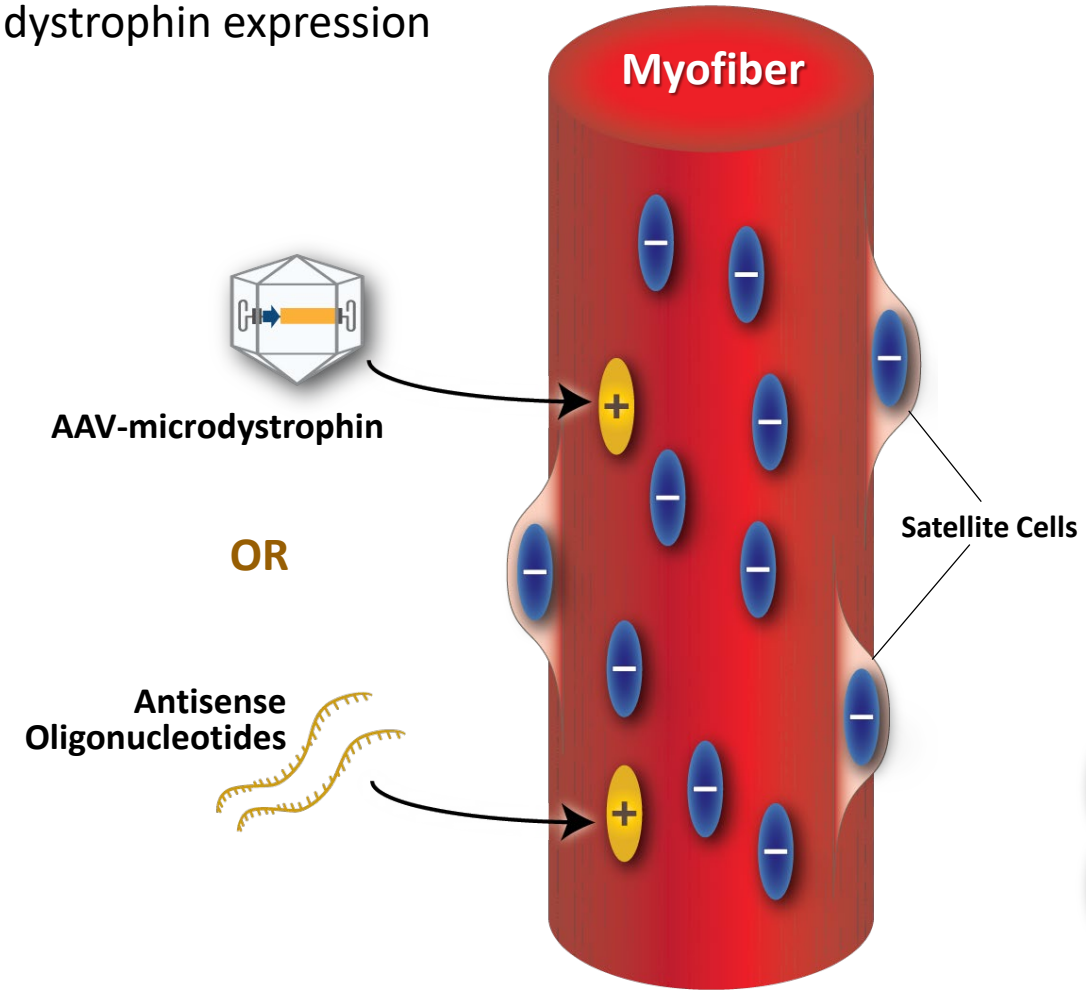
- **AB1098 DMD myoblasts were electroporated with mRNA encoding a pair of ARCUS nucleases**
  - Cells were differentiated and harvested on Day 8; samples were collected for genomic DNA, mRNA, and protein characterization

- **Cells were successfully edited in a dose-dependent manner with restoration of dystrophin gene expression**

Correction of Satellite Cells for Long-Term Benefit

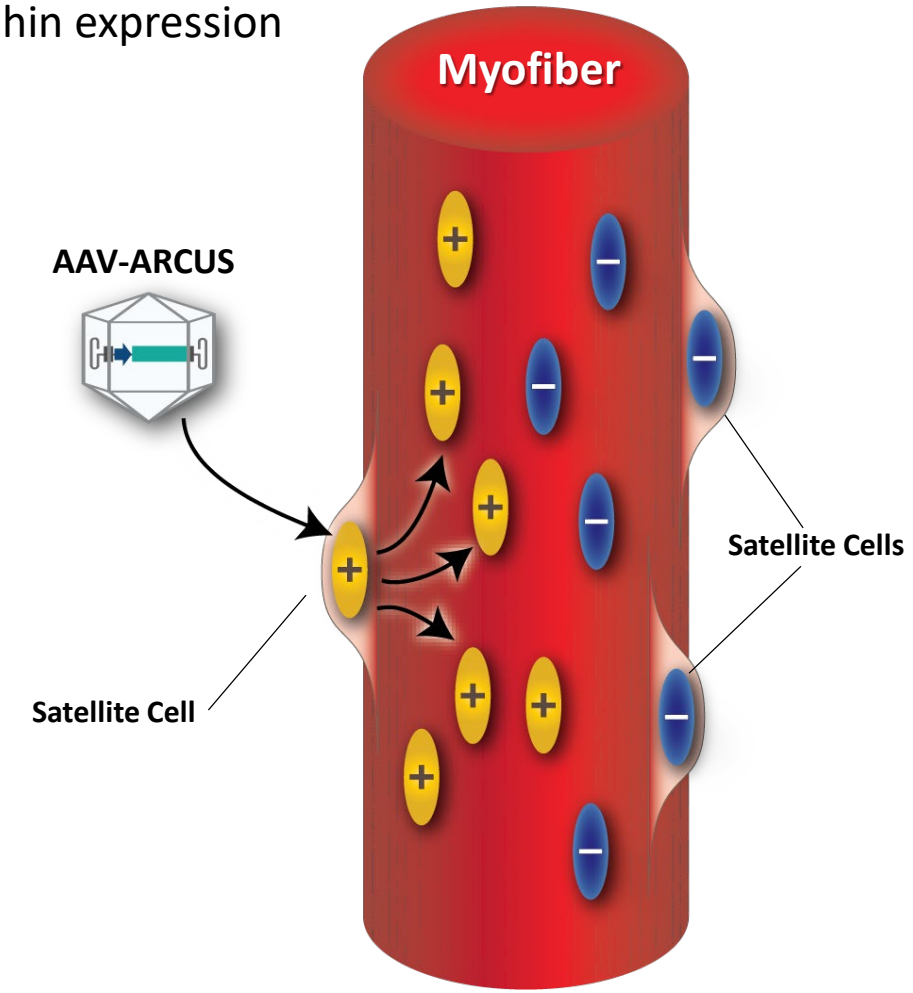
Microdystrophin or Antisense

Direct targeting of myofiber results in transient and low-level dystrophin expression



ARCUS Gene Correction

Goal: Targeting of satellite stem cells could result in amplified and long-term dystrophin expression



Dystrophin - nucleus

Dystrophin + nucleus

Overview of Primary Hyperoxaluria Type 1 (PH1)

Rare genetic disease characterized by accumulation of calcium oxalate in kidneys, which leads to painful kidney stones and ultimately end-stage renal disease

~40%
patients have end-stage renal disease at the time of diagnosis

Prevalence of
1-3/1,000,000

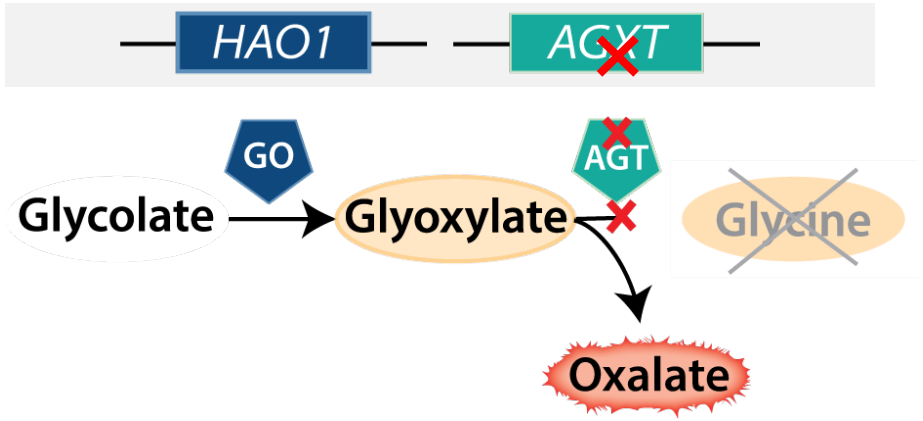
Combined
liver-kidney transplant
often required

Affects adults and young children

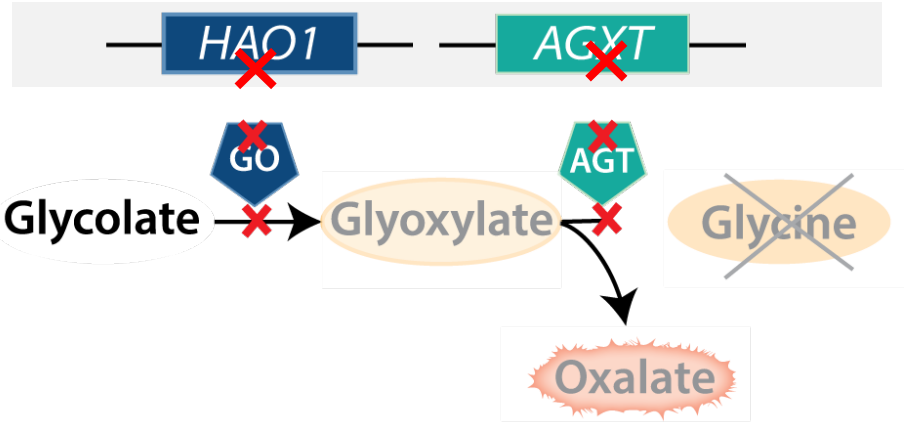
Orphanet (https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Expert=416) accessed on 10 Jan 2021.
K. Hopp, et al. *JASN* October 2015, 26 (10) 2559-2570.

Approach: Reduce Oxalate Levels by Editing HAO1

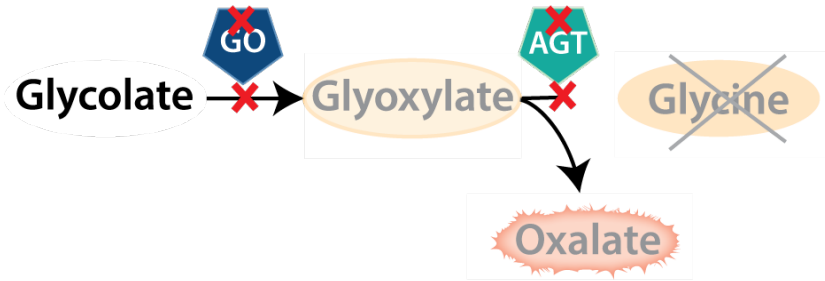
PH1 patient



ARCUS edited



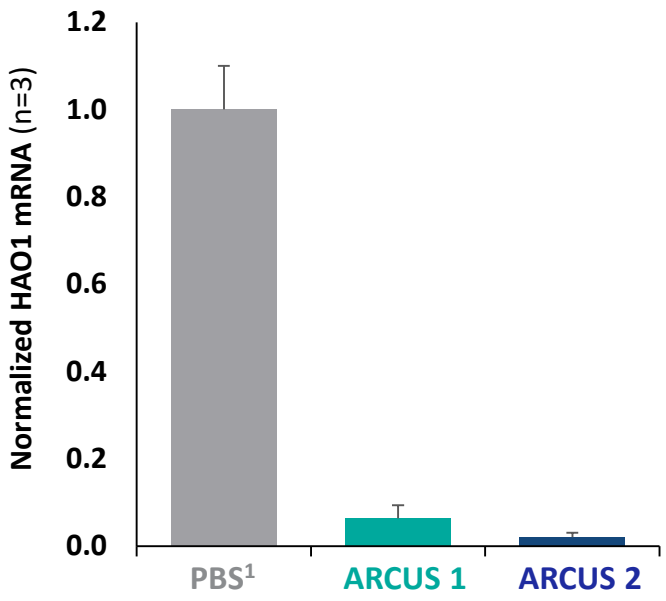
ARCUS Treatment Greatly Reduced *HAO1* Gene Expression in NHPs

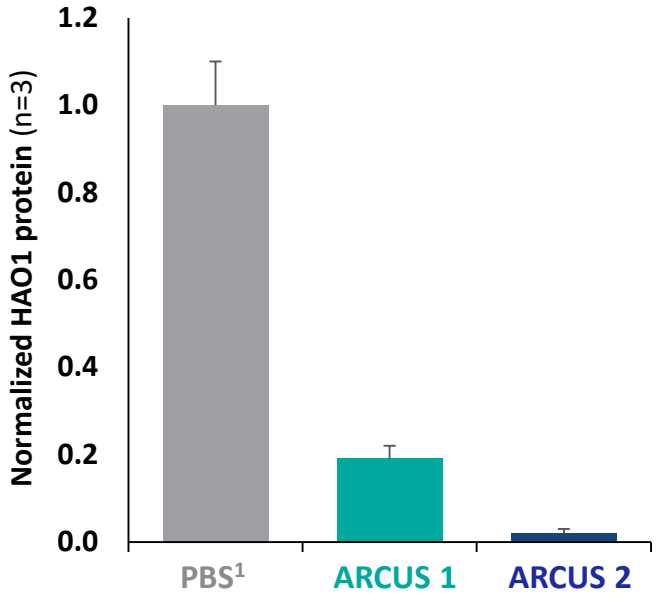


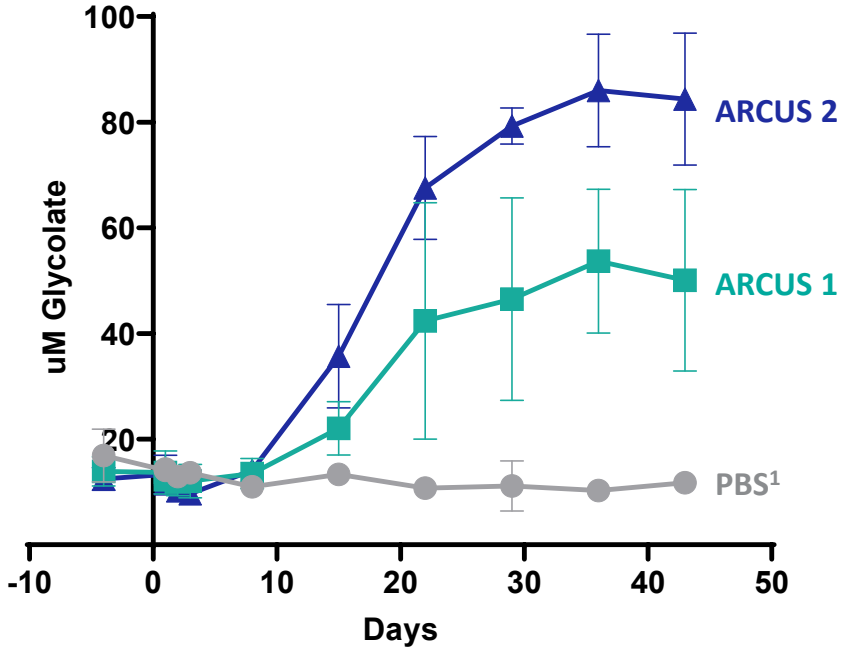
HAO1 mRNA
ARCUS treatment reduced *HAO1* mRNA levels >90% in liver of non-human primates

_GO_ protein
ARCUS treatment reduced *GO* protein levels >80% in liver of non-human primates

Serum glycolate
ARCUS treatment significantly increased serum glycolate levels in non-human primates

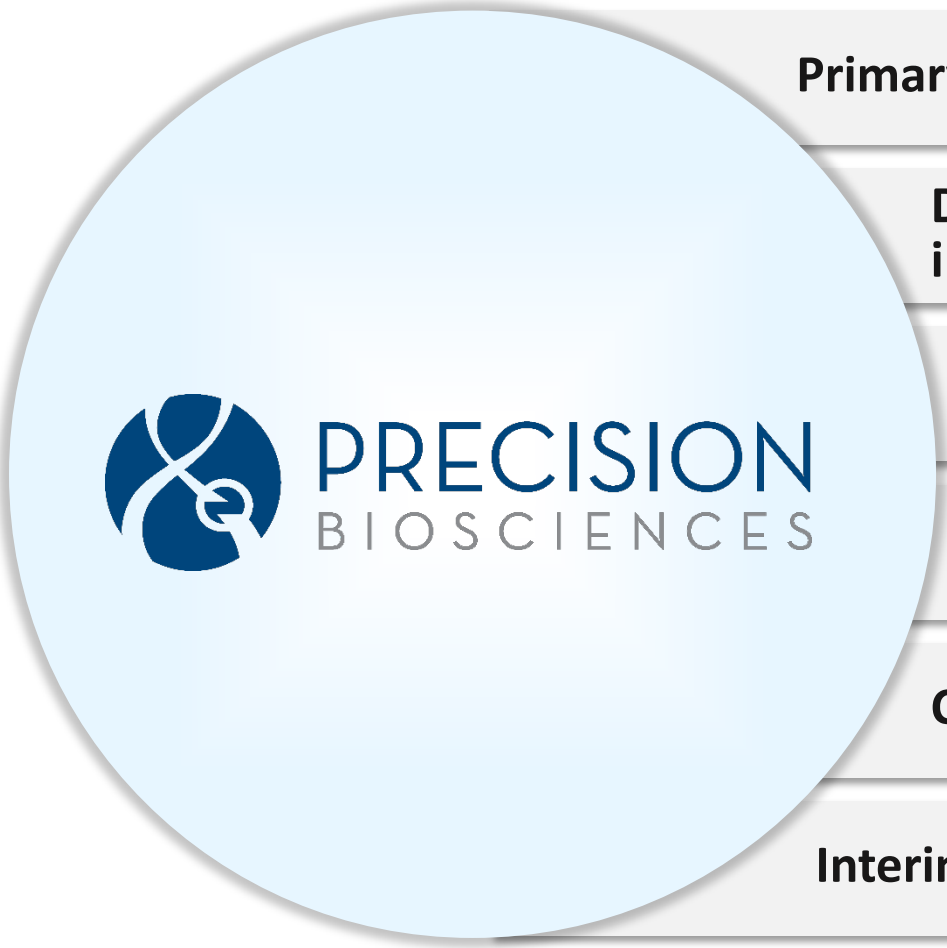






[1]Phosphate-buffered saline

Precision Expects to Achieve Important Milestones in 2021



- **Primary Hyperoxaluria Type 1 program update in 1H/2021**
- **Dose first patient with next generation PBCAR19B stealth cell in 1H/2021**
- **Initiate clinical cohort with PBCAR269A combined with GSI in 1H/2021**
- **Updated interim PBCAR0191 data by mid-2021**
- **Complete full spinout of food business, Elo Life Systems**
- **Interim data releases for PBCAR20A and PBCAR269A**

Patient recruitment and availability of follow-up patient data may be impacted by COVID-19 or other factors

Overcome cancer.

Cure genetic disease.

Dedicated To Improving Life