



The Next Wave of Cell
and Gene Therapies
with the Capacity to Cure

November 2021

Disclaimer


This presentation and any accompanying oral commentary contain "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, as amended. Forward-looking statements are statements that are not historical facts and include, without limitation, statements related to future events; our future financial performance or condition; business strategy; expected timing and plans with respect to development milestones, clinical trials, and regulatory activities; estimated market opportunities for product candidates; and future results of anticipated development efforts. Words such as "expect(s)," "feel(s)," "believe(s)," "will," "may," "anticipate(s)", "potentially" or negative of these terms or similar expressions are intended to identify forward-looking statements. These forward-looking statements are based on management's current expectations of future events only as of the date of this presentation and are subject to a number of important risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in or implied by such forward-looking statements. These risks and uncertainties include, but are not limited to: risks associated with conducting clinical trials; whether any of our product candidates will be shown to be safe and effective; our ability to finance continued operations; our reliance on third parties for various aspects of our business; competition in our target markets; our ability to protect our intellectual property; our ability to retain key scientific or management personnel; and other risks and uncertainties described in our filings with the Securities and Exchange Commission, including under the heading "Risk Factors". Except as required by law, we assume no obligation to update these forward-looking statements, or to update the reasons why actual results could differ materially from those anticipated in the forward-looking statements, even if new information becomes available in the future.

On a Mission to Redefine Cell and Gene Therapy

 NASDAQ: **PSTX**

 Headquartered in
San Diego, CA

 **230+**
Employees

 Strong and **Broad IP**
Portfolio

1 CELL THERAPY
CAR-T Therapy Focusing
on Fully Allogeneic CAR-T
as the 'Holy Grail' in
Oncology

2 GENE THERAPY
In Vivo Liver-Directed
Gene Therapy with Non-
Viral Biodegradable
Nanoparticle Delivery

3 PLATFORMS &
PARTNERSHIPS
Platform
Development,
Partnerships and
Collaboration

Unique and Powerful Platform Technologies Drive Our Strategy

Proprietary in-house technology platforms for gene insertion, gene editing, and gene delivery

Super piggyBac®

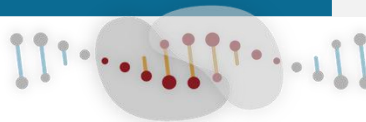
- Non-viral system
- Highly efficient technology to add DNA to genome
- Large genetic cargo capacity
- Broad range of cells
- Advantages in tolerability, potency, speed to clinic and costs



GENE INSERTION

Cas-CLOVER™

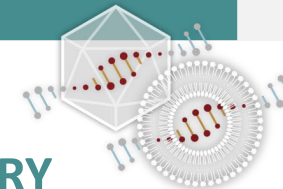
- Highly precise site-specific nucleases
- Ability to edit resting T cells while maintaining desirable T_{SCM} characteristics
- Major advantages:
 - tolerability
 - ease of design
 - low cost
 - multiplexing ability



GENE EDITING

Nanoparticles AAV Vectors

- Delivers long-term stable gene expression
- Non-viral and viral delivery of DNA and proteins both ex vivo and in vivo
- Ability to deliver to multiple cell types and target specific tissues

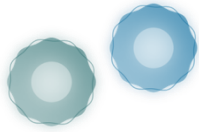


GENE DELIVERY

Individually or in combination, our core technologies enable us to engineer a portfolio of product candidates designed to overcome the limitations of current cell and gene therapeutics

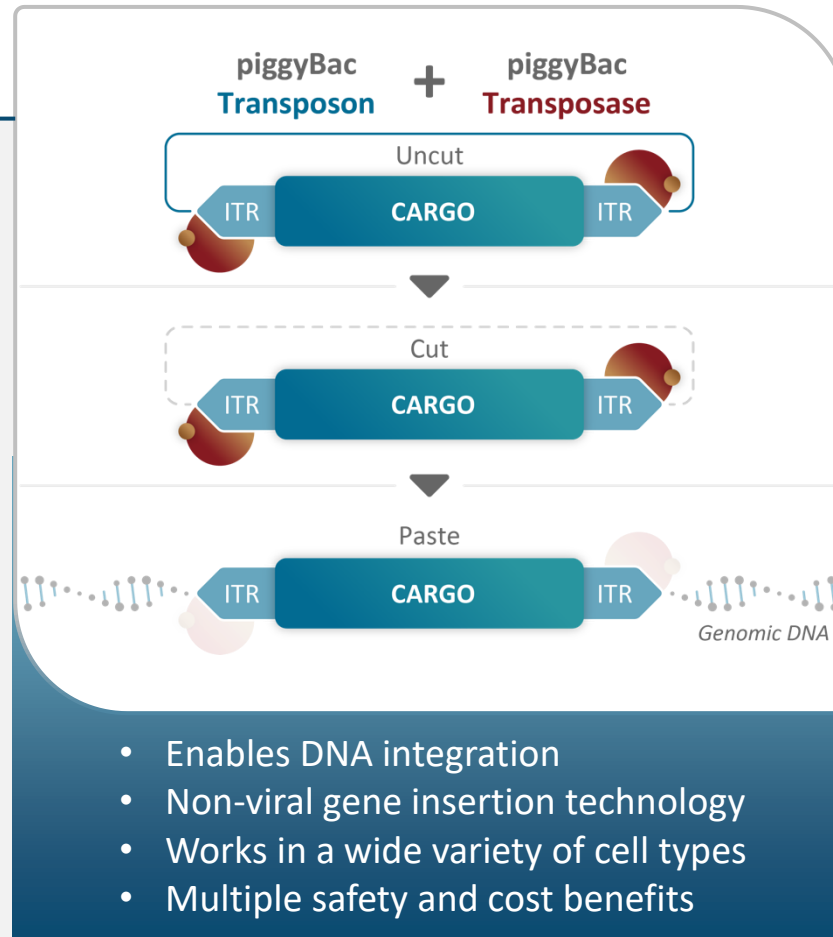
piggyBac: Versatility in DNA Delivery

BENEFITS IN CELL THERAPY

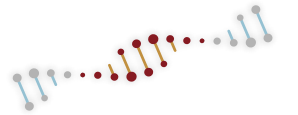


Generating CAR-T Products with Desirable High Percentage of T_{SCM} Cells

- Preferentially favors **stem cell memory T cells (T_{SCM})** and works well in **resting T cells** for potentially improved tolerability and more durable responses
- **Large cargo capacity** enables multi-CAR products, addition of safety switch and selection gene



BENEFITS IN GENE THERAPY

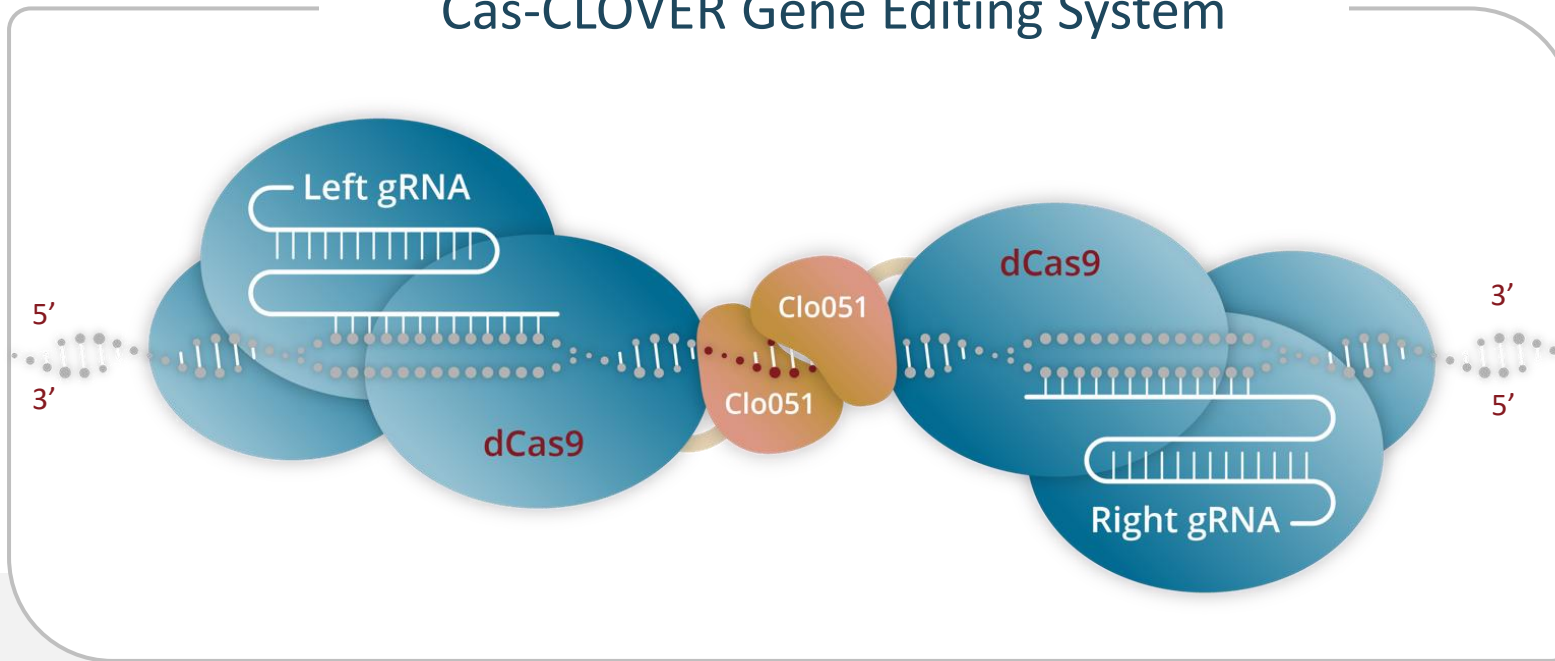


Integrates Into DNA Delivering Stable Long-Term Expression

- Ideal for use in **dividing tissues** like those in juvenile liver
- **Highly efficient** integration may allow **reduced dosing and single treatment cures**
- **Large cargo** for delivering larger genes
- **Delivered using AAV + nanoparticle** or *in vivo* EP

Cas-CLOVER: Clean Gene Editing

Cas-CLOVER Gene Editing System



- Low-to-no off-target cutting
- High Editing Efficiency in resting T-cells resulting in high % of T_{SCM} cells
- Ease of use/design
- Multiplexing ability
- High specificity
- Lower cost

Potentially the Cleanest Gene Editing Platform

with important ability to efficiently edit resting cells enables fully **Allogeneic CAR-T** products and **Gene Therapy** applications including ongoing development for non-viral in vivo gene editing

Delivery: Moving Toward Non-Viral Biodegradable Nanoparticles

OUR GOAL:

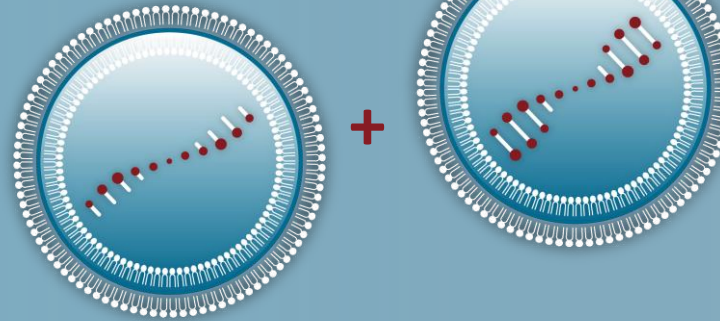
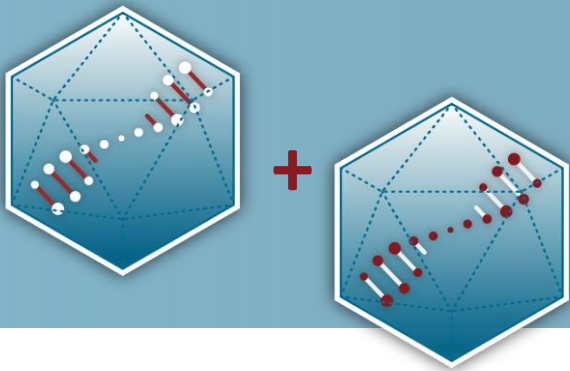
Develop Single Treatment Cures Utilizing Our
In Vivo Gene Therapy Technologies



Potential for Single-Treatment Cures

VIRAL

AAV (SPB-DNA)
AAV (PB-DNA)



NON-VIRAL

Nanoparticle (SPB – RNA)
Nanoparticle (PB – DNA)

In pre-clinical studies piggyBac+AAV enabled **permanent and stable DNA integration** and **long-term expression**








Ability to effectively **work in dividing tissues** including the juvenile liver

Ability to **deliver larger genes** with nanoparticle+piggyBac than AAV

Our Platform Technologies Have Broad Reach

Various combinations our innovative platform technologies create unique opportunities across the cell and gene therapy landscape

LANDSCAPE

	CELL THERAPIES	GENE THERAPIES
CAR-T/TCR-T/NK-T/Treg ONCOLOGY	  	AAV-PG & Nano-PB LIVER, LUNG, CNS, ETC.    
CAR-T/TCR-T/NK-T/Treg NON-ONCOLOGY	 	In Vivo EP SKELETAL MUSCLE, SKIN, EYE, ETC. 
iPSC CELL THERAPY	 	Cas-CLOVER GENE EDITING – ALL TISSUES    
HSC CELL THERAPY		Nano mRNA NON-ONCOLOGY  
Regenerative Med LIVER, SKIN, ETC.		

**Poseida has listed companies it believes are representative of those active in cell and gene therapy.*

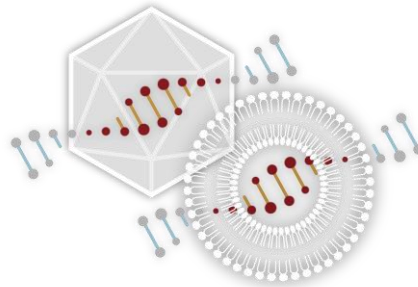
Disruption in Gene Therapy

In Vivo Gene Therapy for Rare Diseases



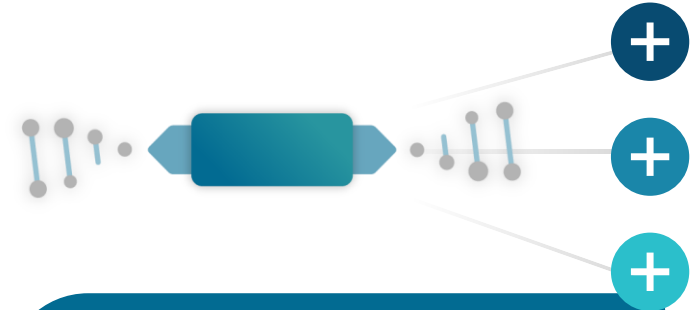
Fully Integrating

piggyBac integrates into DNA enabling the potential for single treatment cures



Addressing Challenges of Viral Delivery

piggyBac and **Nanoparticle** technology can address limitations of AAV



Broad Application

piggyBac cargo capacity addresses more indications and piggyBac can treat juvenile populations

Announcing Our First Strategic Gene Therapy Partnership

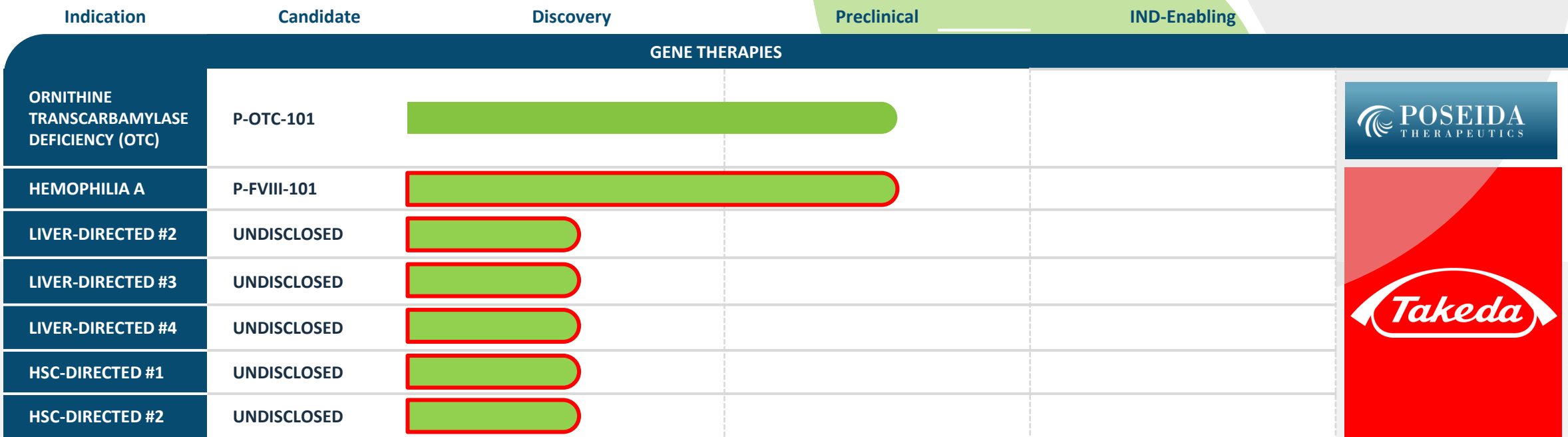
- Broad **non-viral in vivo gene therapy** research collaboration with Takeda
 - Liver-directed and HSC-directed indications
 - Six initial targets including **Hemophilia A**
 - Option for two additional targets
- Includes **all of Poseida's core technology platforms**
 - PiggyBac® gene insertion
 - Cas-CLOVER™ for gene editing
 - Biodegradable LNP nanoparticle for gene delivery
- Poseida responsible for research to candidate selection and Takeda has responsibility for development, manufacturing and commercialization



- Financial Terms
- \$45 million cash up front and pre-clinical milestones could exceed \$125 million in the aggregate
- \$435 million in clinical development, regulatory and commercial milestones per program
- Tiered royalties on commercial sales
- Takeda responsible for research program costs

Gene Therapy Pipeline

In Vivo Liver-Directed and HSC-Directed Gene Therapy

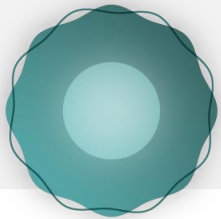


Innovation in CAR-T

Allogeneic CAR-T Therapy for Oncology

Cell Type Matters

T_{SCM} Cell

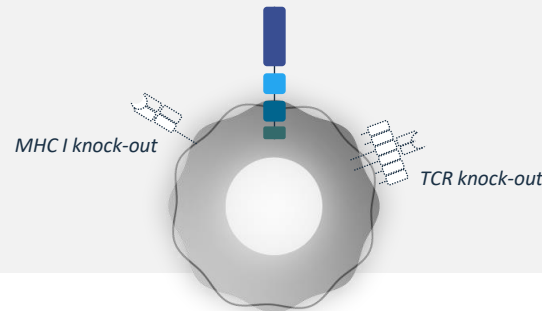


Stem Cell Memory

- Self-renewing
- Long lived
- Multipotent

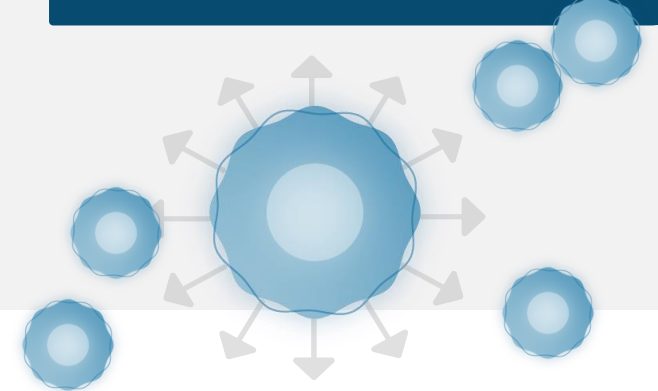
T_{SCM} is the ideal cell type for CAR-T due to greater safety and durability
piggyBac® is the ideal non-viral gene insertion technology

Fully Allogeneic CAR-T



Addressing both Graft v Host and Host v Graft alloreactivity with **Cas-CLOVER Gene Editing**

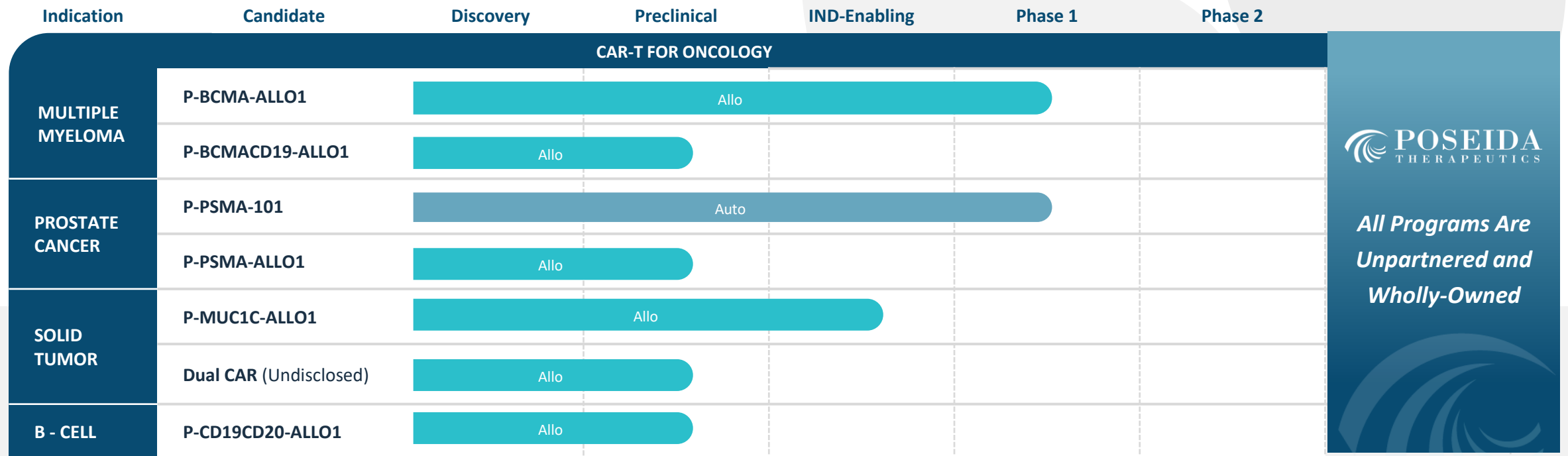
Cost, Scale & Reach



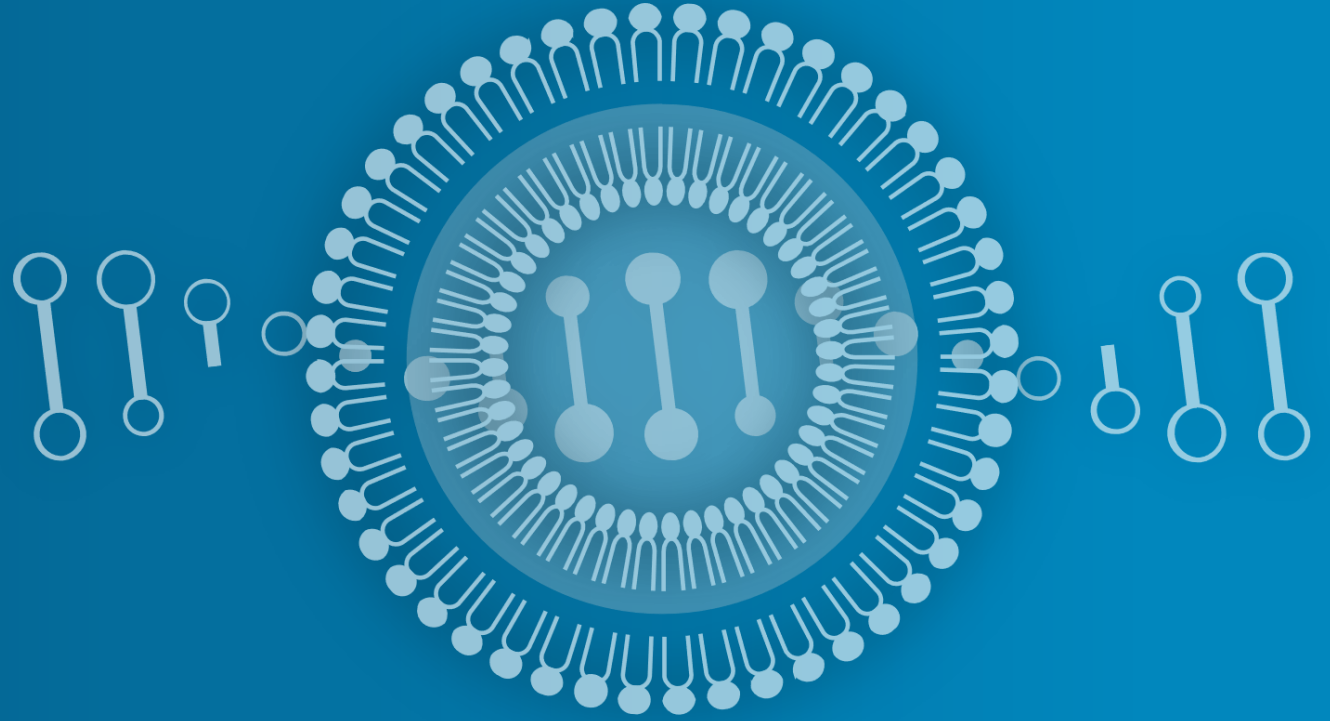
Booster Molecule technology delivers 100's of doses at low cost
Enables outpatient dosing and expanded patient reach

Cell Therapy Pipeline

CAR-T for Oncology and Beyond

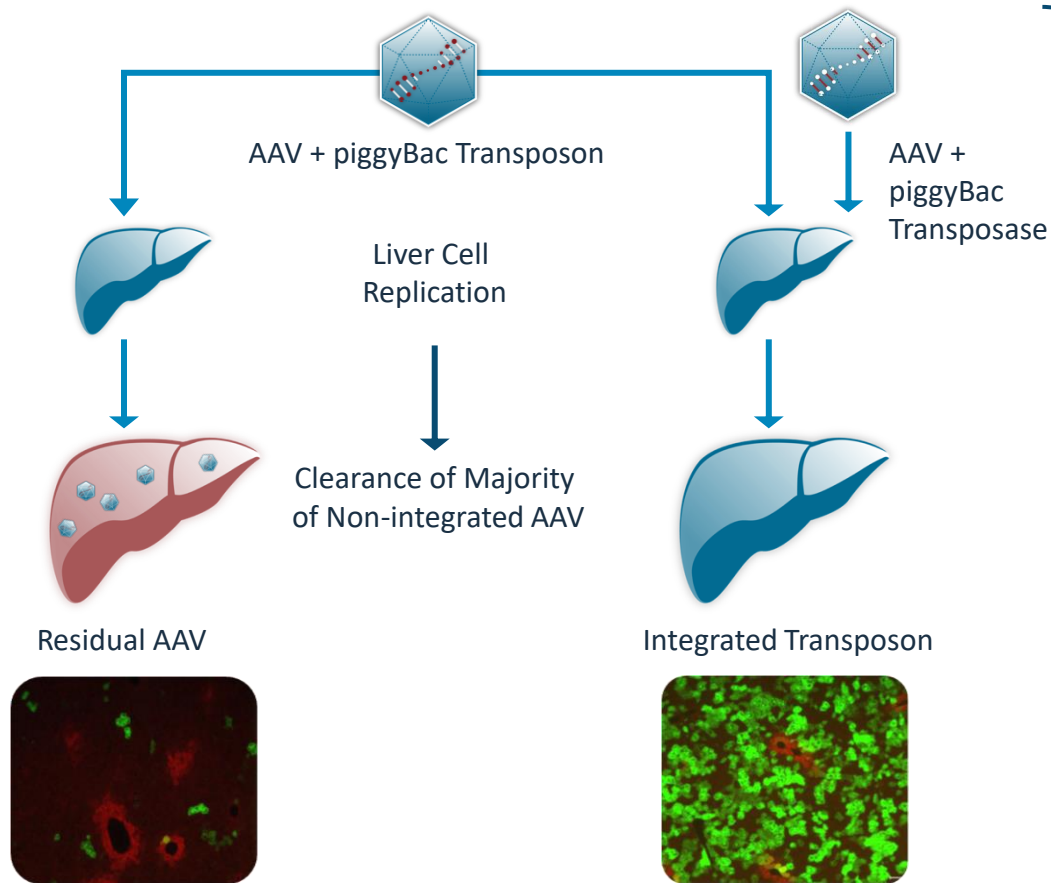


Gene Therapy Program



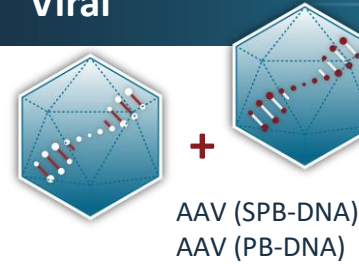
Changing the Game in Liver-Directed Gene Therapy

piggyBac+AAV followed by piggyBac+Nanoparticle

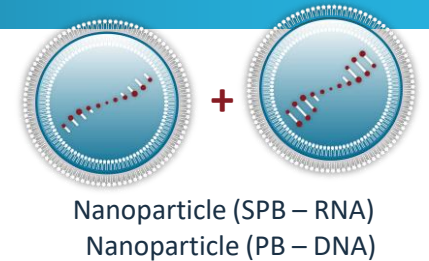


Single-treatment cure in mouse models of OTC, ASS1, PFIC3

Viral



Non-Viral

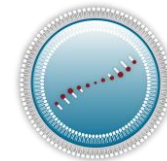


Luc Transposon Alone



PB DNA LNP

Transposase + Luc Transposon

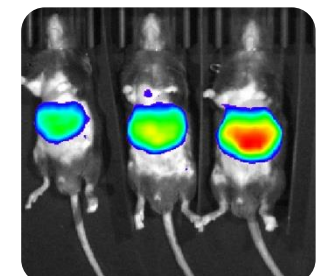
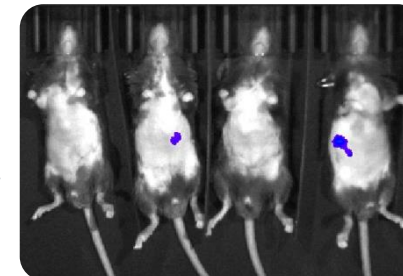


SPB mRNA LNP

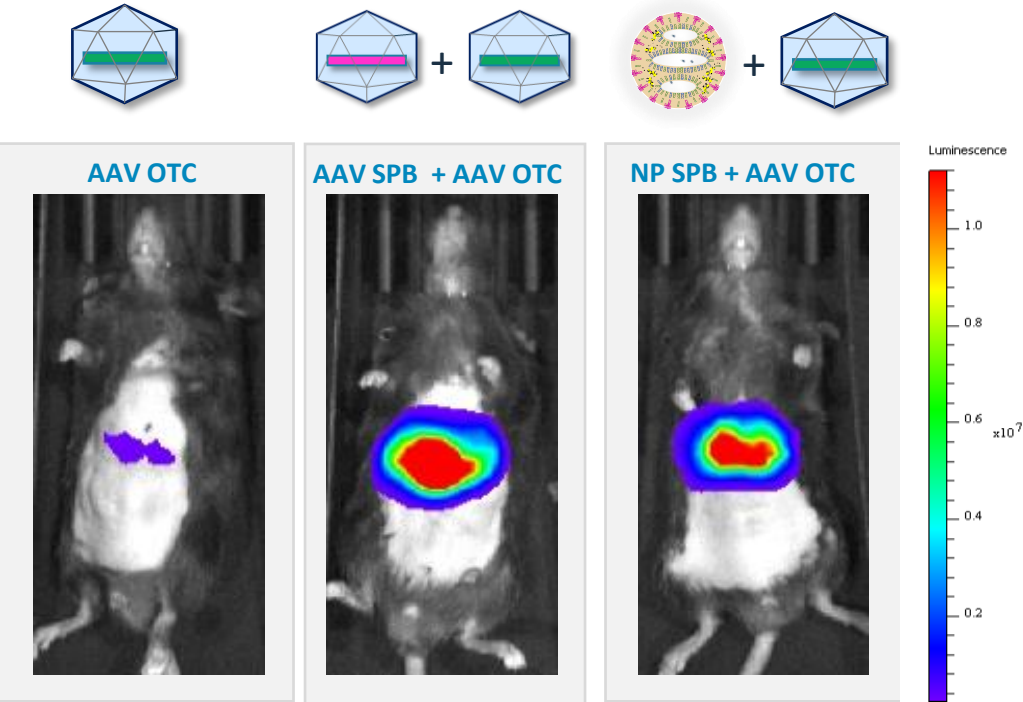


PB DNA LNP

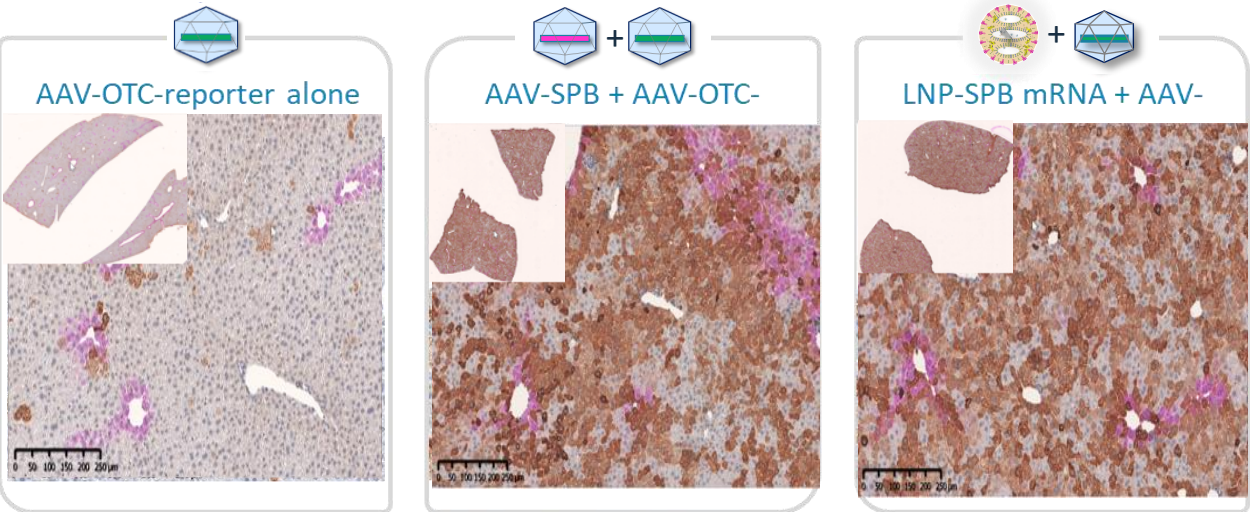
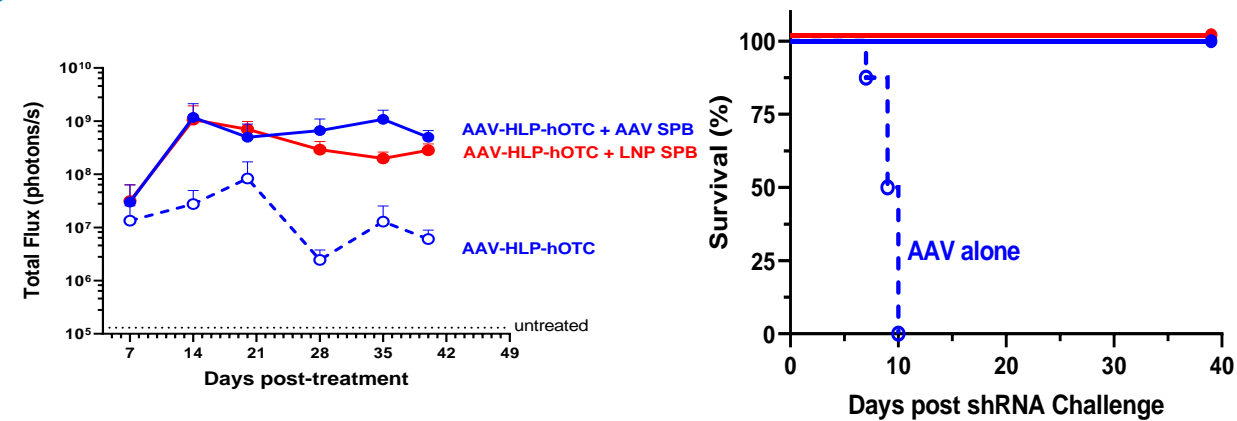
Juvenile Mice at
7 months post injection
(Injected at 4 Weeks)
CMV Promoter
0.25mg/kg DNA-LNP
0.25mg/kg RNA-LNP



P-OTC-101 Moving Toward the Clinic



Liver Bioluminescence



<3% OTC

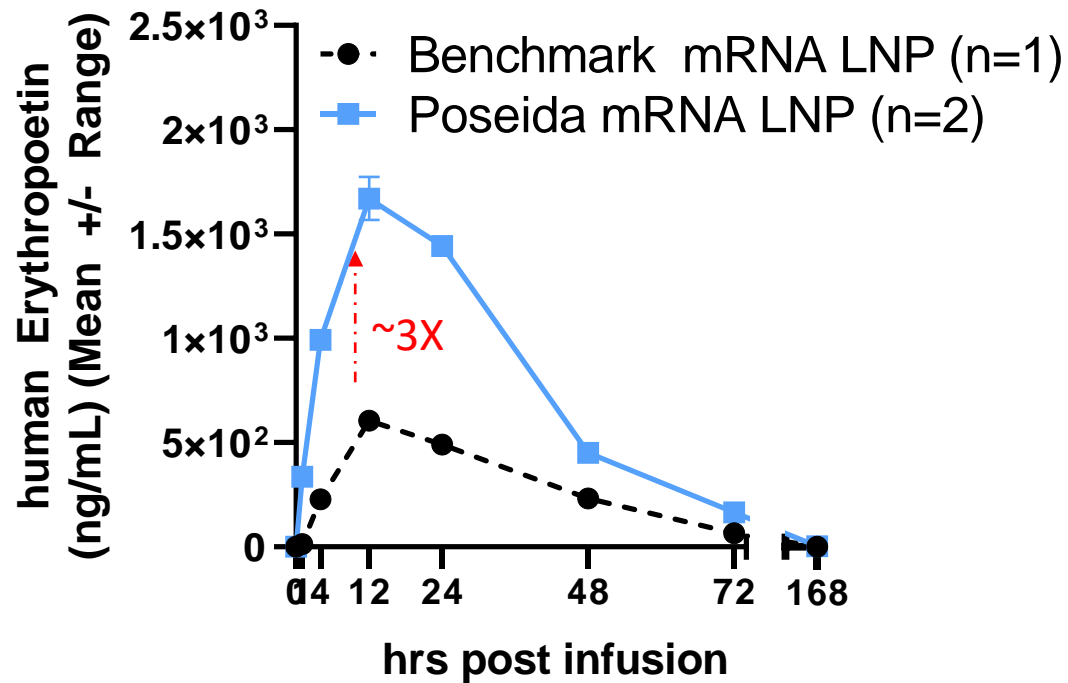
~46% OTC

~56% OTC

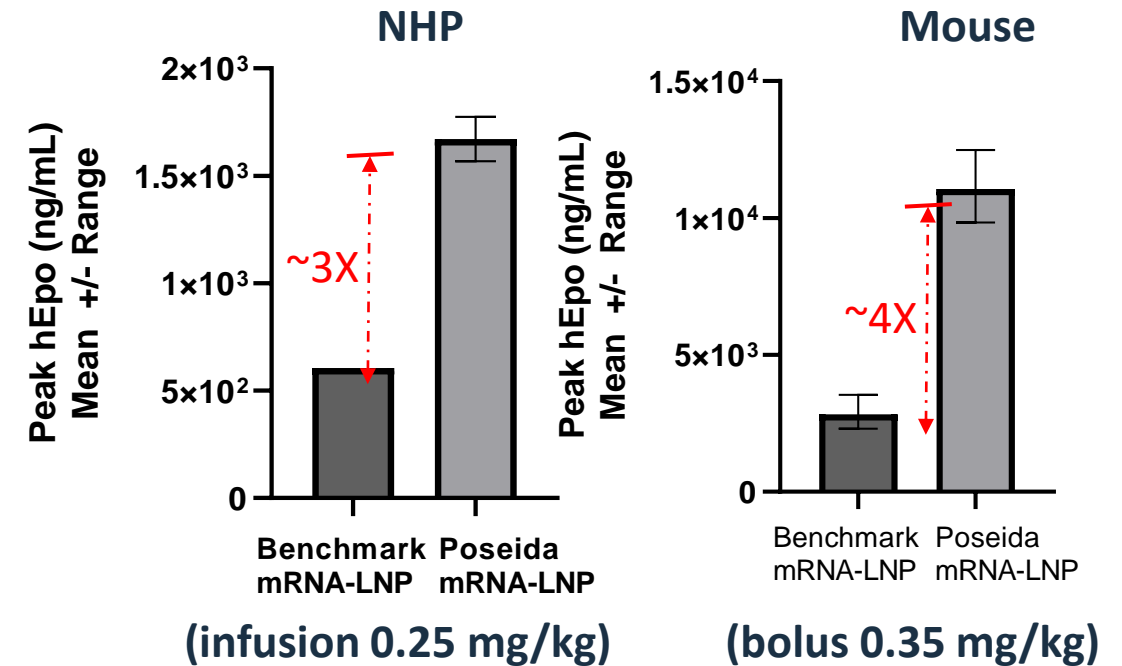
% Hepatocytes with OTC Expression

Poseida Biodegradable mRNA LNP Works in Non-Human Primates

>3X More Potency Compared With Benchmark



Cmax (0.25 mg/kg):
~1,500 ng/mL

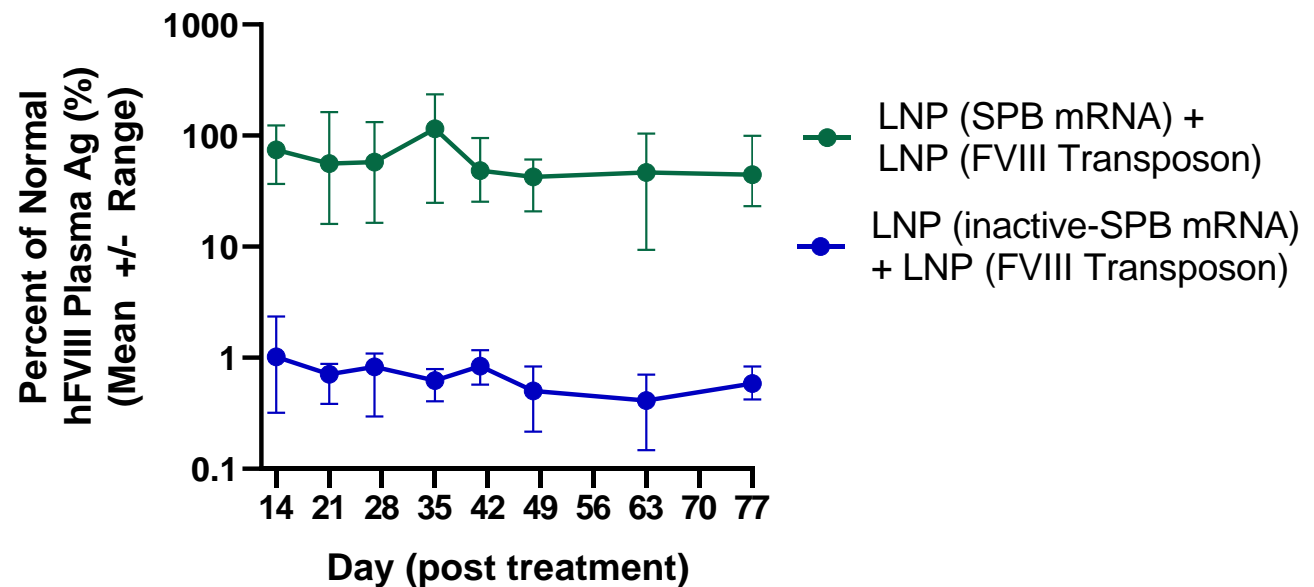


Nanoparticle + piggyBac for Factor VIII Delivery

Addressing Hemophilia A with Single Treatment Liver Directed Gene Therapy

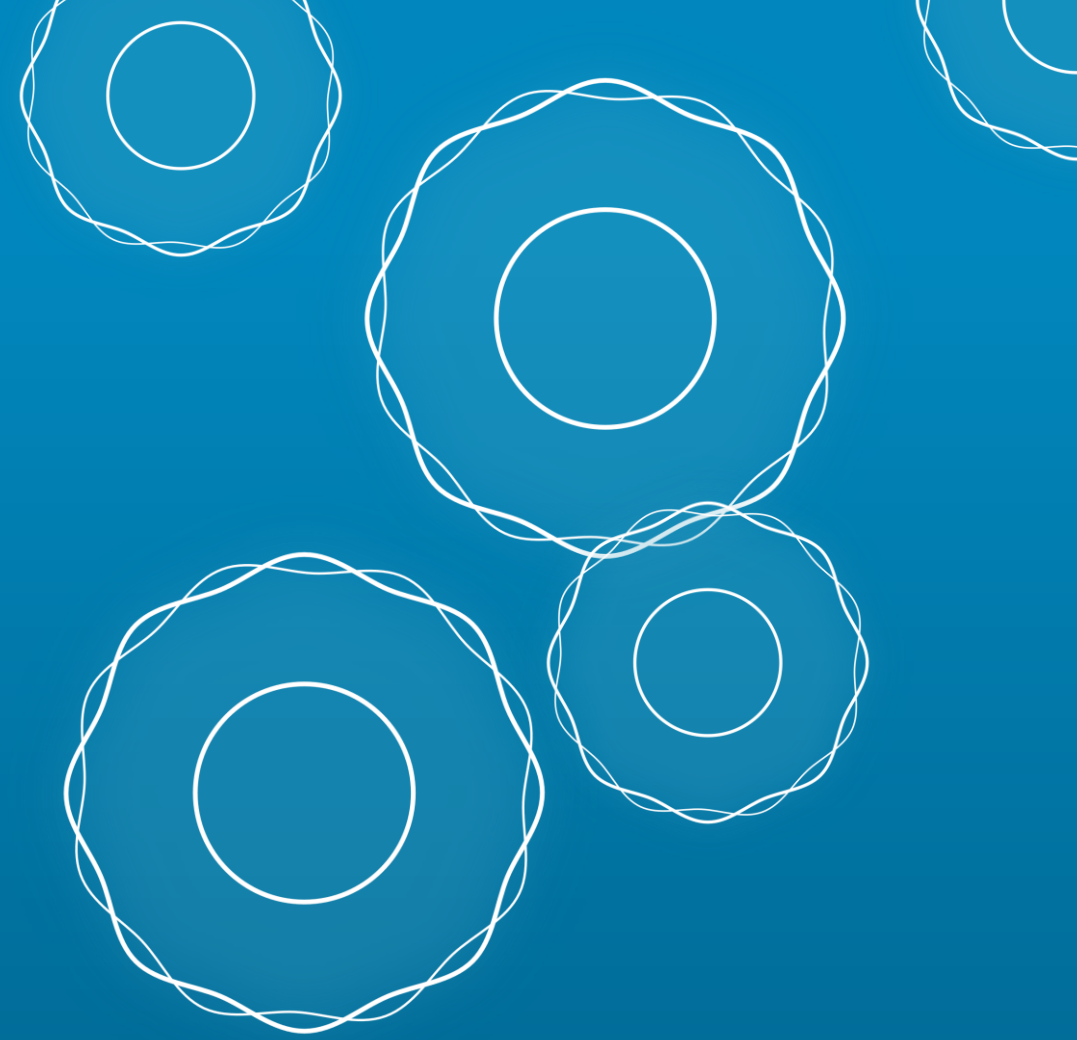
Hemophilia A

- Caused by deficiency in functional coagulation factor VIII (FVIII)
- ~1 in 5,000 male births with ~60% of patients suffering from severe form
- Disease managed through recombinant FVIII infusions
- Large transgene not amenable to AAV delivery
- Nanoparticle eliminates AAV toxicity and allows dose escalation and redosing



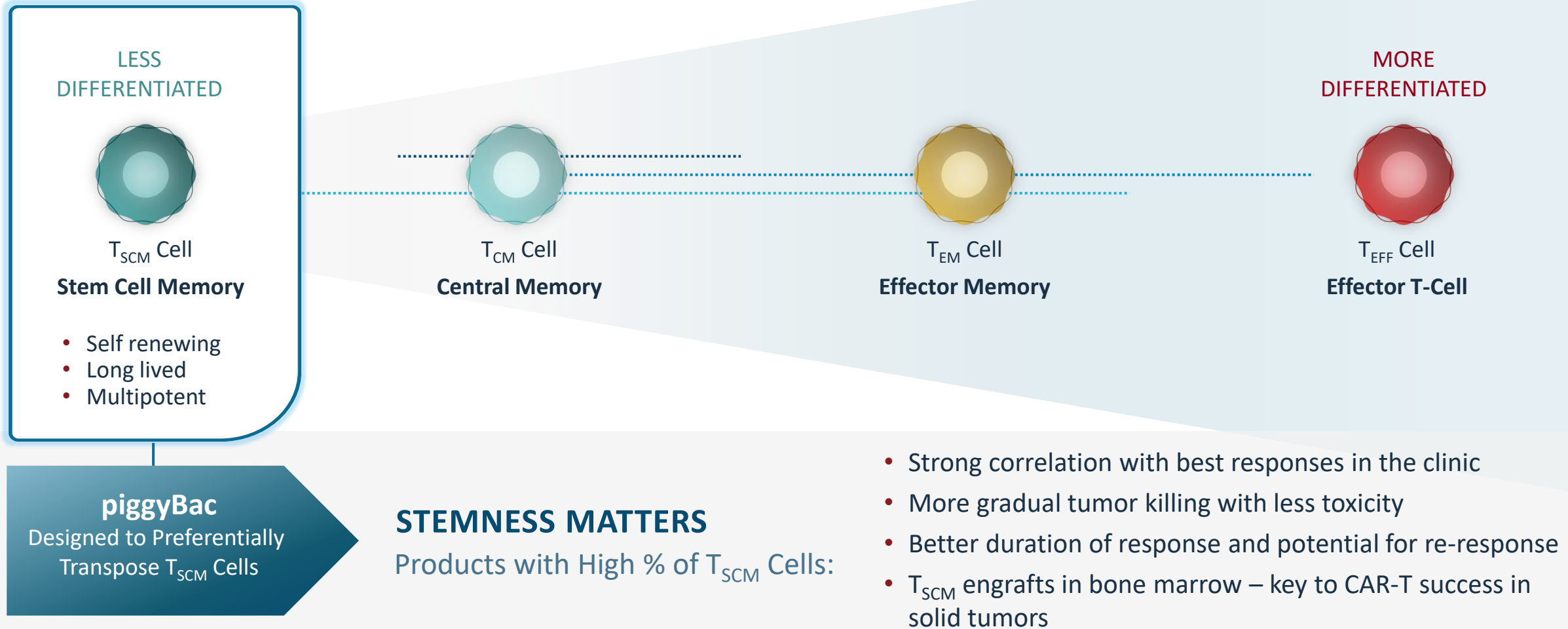
Research ongoing internally and in collaboration with KOL: Denise Sabatino, PhD

Immuno Oncology CAR-T Program



Not All T Cells are Created Equally

The Importance of Stem Cell Memory T Cells (T_{SCM})

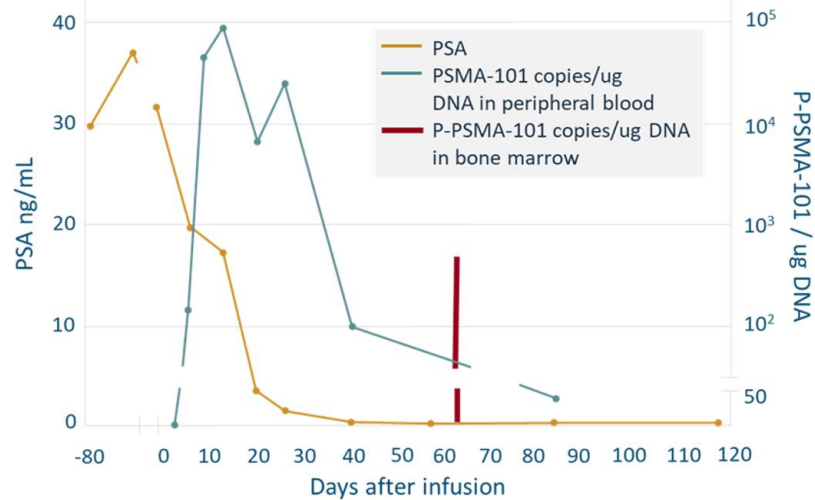


P-PSMA-101 Data Provides Strong Evidence That High Tscm CAR-T Can Work In Solid Tumors Even At Low Doses

Strong and Encouraging Early Results

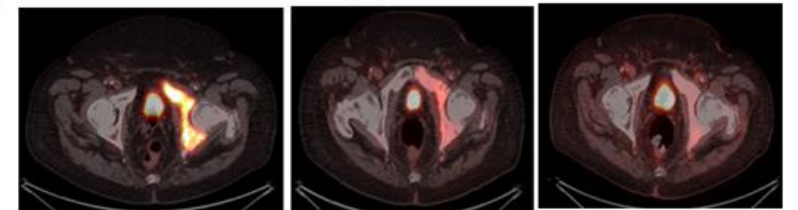
- P-PSMA-101 Phase 1 Trial in difficult to treat castrate resistant mCRPC patients
- Deep responses even at low doses
- Concordant imaging reductions
- Patient with complete tumor elimination at ~20M cell dose
- Manageable safety profile with no neurotoxicity observed
- Expected update at scientific conference in 1H 2022

Patient 3 PSA & PK



PSMA-PET Images

68Ga-PSMA-11 (PSMA-PET)



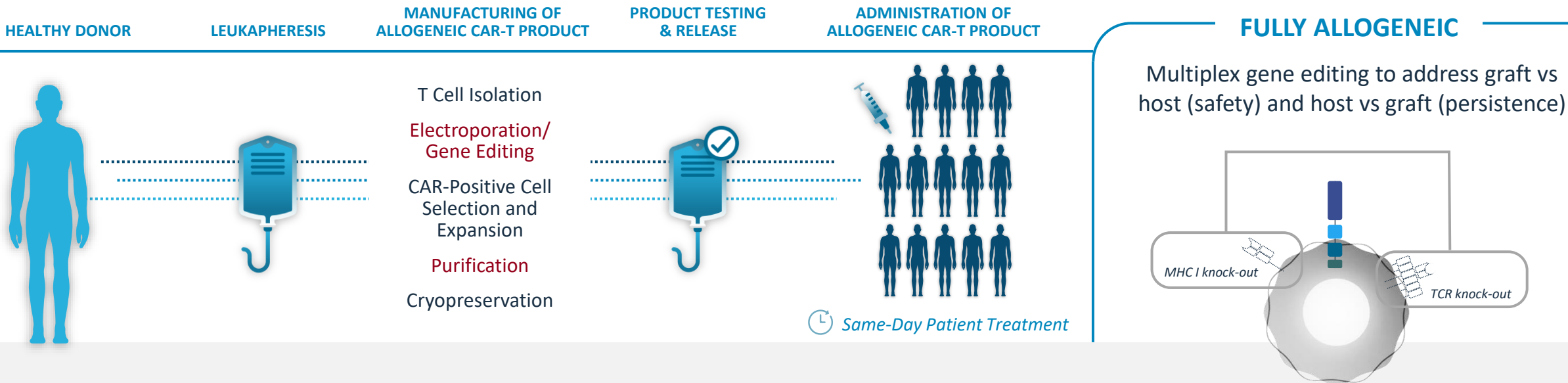
Tumor SUV: 28.5
Liver Background SUV: 8.6

8.3
3

2.8
8.2

Strategic Focus on Allogeneic CAR-T for BCMA

P-BCMA-ALLO1 IND Cleared by FDA and Trial Start-up in Progress



Unique Allogeneic Platform

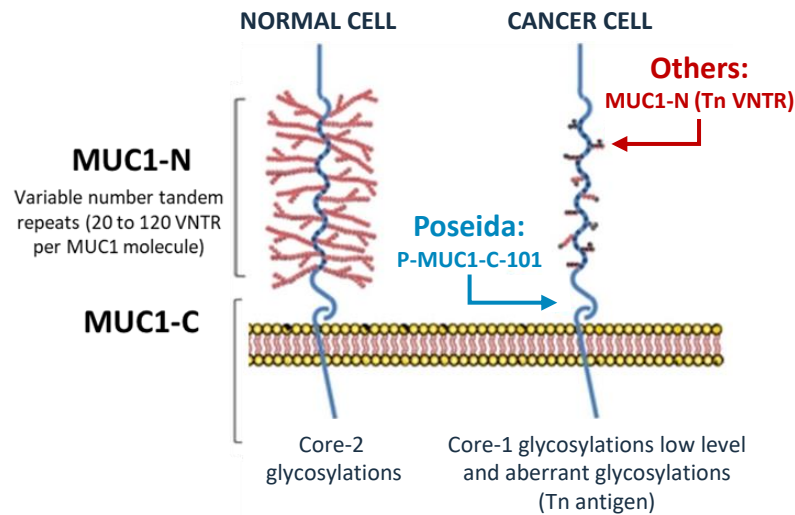
- Preserve/improve **high T_{SCM}**
- **Optimized dosing** regimens
- **Healthy donor** material
- **Robust manufacturing**
- **Dramatic cost reductions**
 - Up to **100s of doses**

Booster Molecule

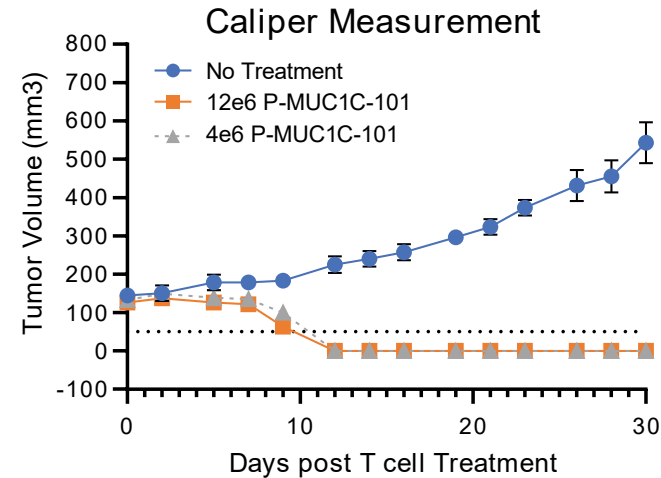
- Our patented technology is designed to overcome the “Allo Tax” and **significantly increase production yield** while **preserving desirable T_{SCM} attributes** of P-BCMA-ALLO1

MUC1C Allogeneic Solid Tumor Program IND by YE 2021

Our Approach vs Others



Triple-Negative Breast Cancer Model

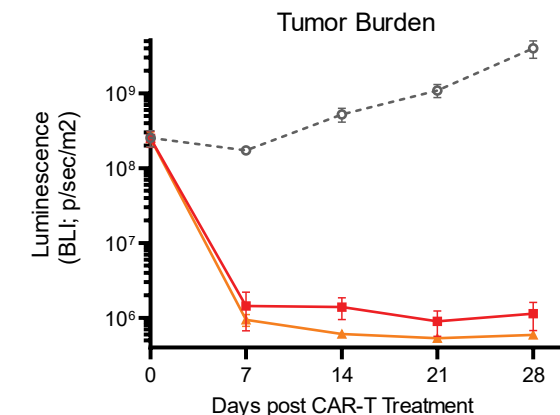


Tumor Elimination in
100% of Animals at
Standard and Low
Doses After ~2 Weeks

- **P-MUC1C-ALLO1** potentially addresses patient populations in **multiple solid tumor indications**
- MUC1 expressed at high levels on many endothelial-derived cancers
 - **Breast, Ovarian, NSCLC, Colorectal, Pancreatic and others**
- First program to be **manufactured in internal Pilot plant**

(2017) (American Cancer Society)

Ovarian Cancer Model



The Advantages of Multiple Antigen Targeting with Dual CAR-T

1. Overcome single antigen loss (heme)

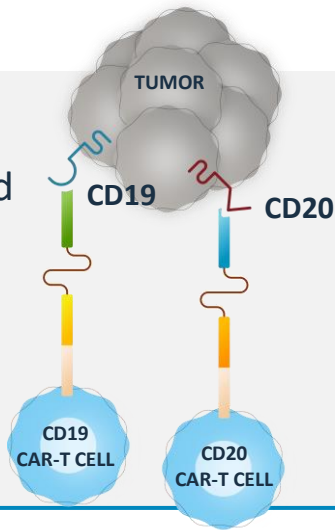
CD19 CAR T clinical trials: 7-39% of relapse is caused by loss of CD19 antigen

2. Target heterogeneous tumors (solid)

Highly heterogeneous antigen expression may contribute to modest CAR-T clinical responses against solid tumor

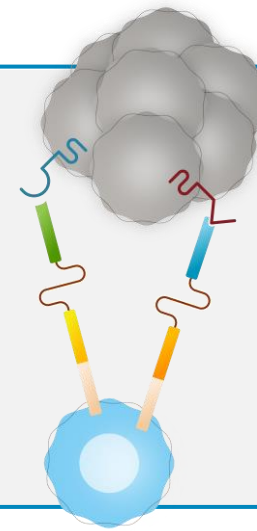
Single CAR

Co-administered



Dual CAR

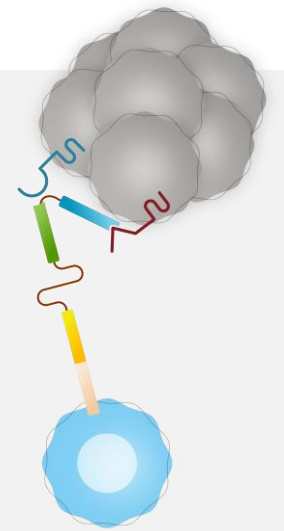
Co-localized dual engagement



Competitive Advantage

Tandem CAR

Conformation challenges?



Poseida's piggyBac transposon system has large cargo capacity and can effectively deliver two individual CARs, with capacity for safety switch, selection gene (and/or others)

Shah et al., Front Oncol. 2019; 9: 146

1

ALLO CD19/CD20

B cell Leukemia and Lymphoma

2

ALLO CD19/BCMA

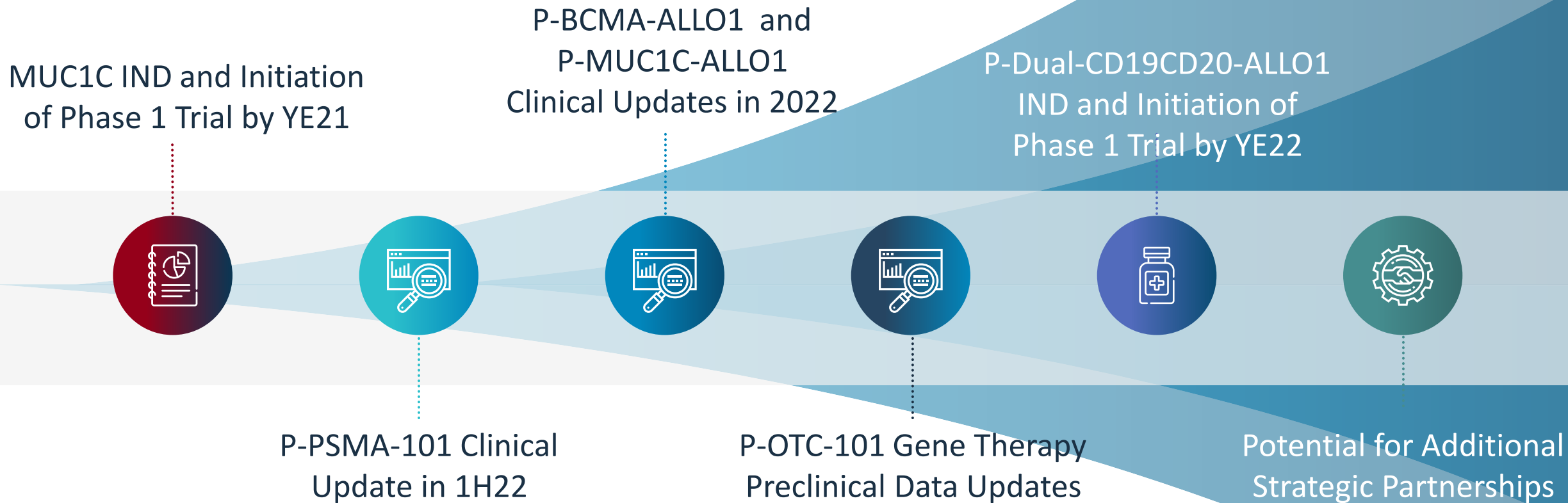
Multiple Myeloma

3

Dual ALLO (Undisclosed)

Solid Tumors

Anticipated Upcoming Milestones



Multiple Avenues to Significant Value Creation

Working to Engineer Single-Treatment Cures for Cancer & Genetic Diseases

- **Broad innovative genetic engineering technology platforms**
- **Novel fully allogeneic high-T_{SCM} CAR-T approach** as well as Autologous CAR-T targeting PSMA
- **Gene therapy focus on single treatment cures** with non-viral delivery and **strategic partnership with Takeda**





Thank You

The Next Wave of Cell & Gene Therapies with the
Capacity to Cure