POSEIDA THERAPEUTICS

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

June 2022

# 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.




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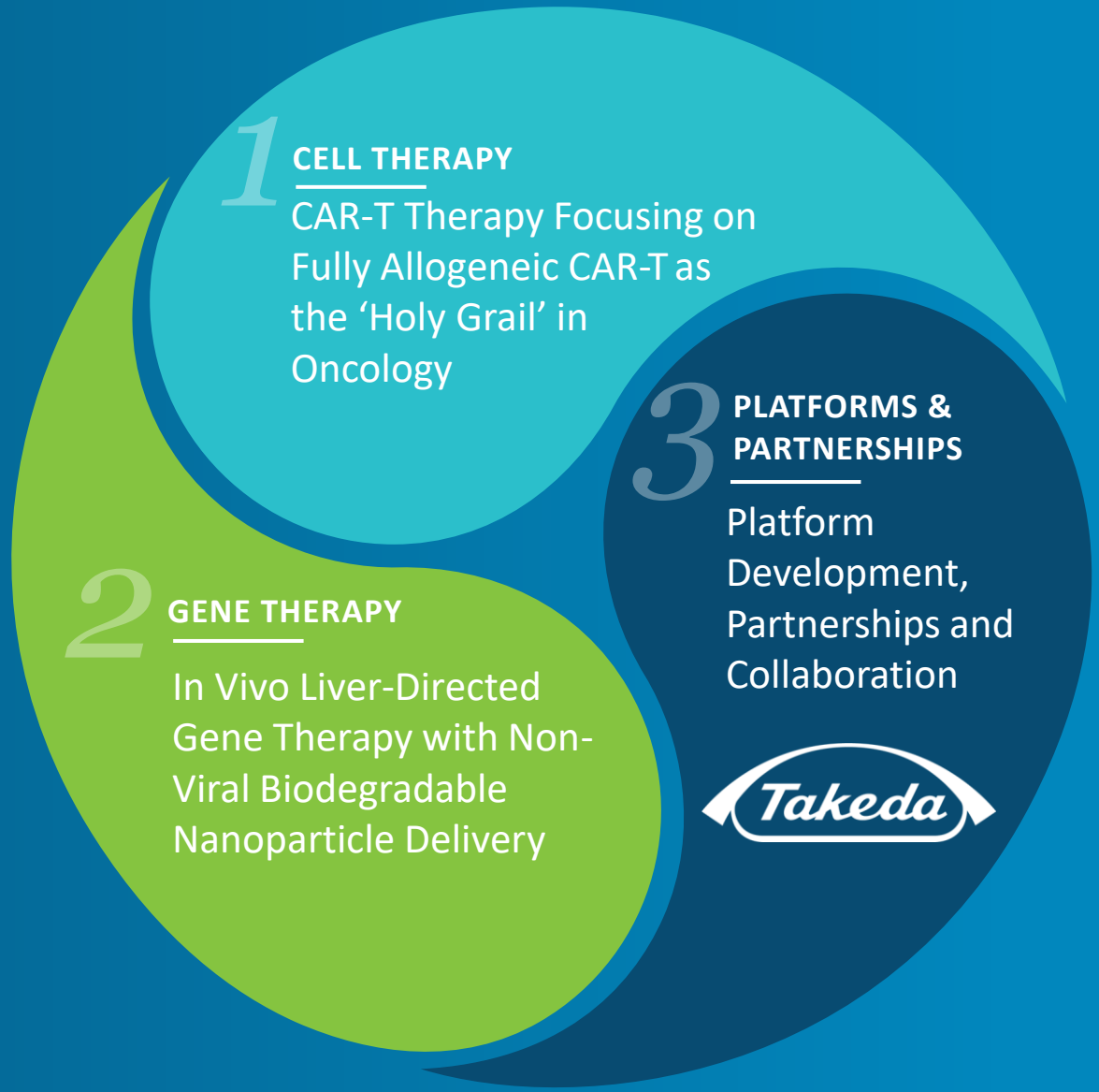
# On a Mission to Redefine Cell and Gene Therapy

NASDAQ: **PSTX**

**280+** Employees

Headquartered in **San Diego, CA**

Strong and **Broad IP** Portfolio







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# We Are The Next Generation of Genetic Engineering

*Broad differentiated in-house technology platforms create many opportunities*

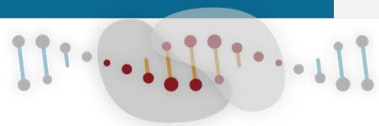
## Super piggyBac®

- 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™

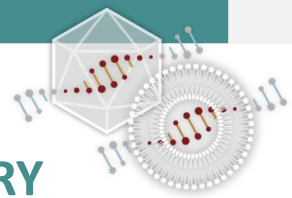
- Highly precise site-specific nucleases
- Ability to edit resting T cells while maintaining desirable $T_{SCM}$ characteristics
- Major advantages:
  - tolerability
  - ease of design
  - low cost
  - multiplexing ability



**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*

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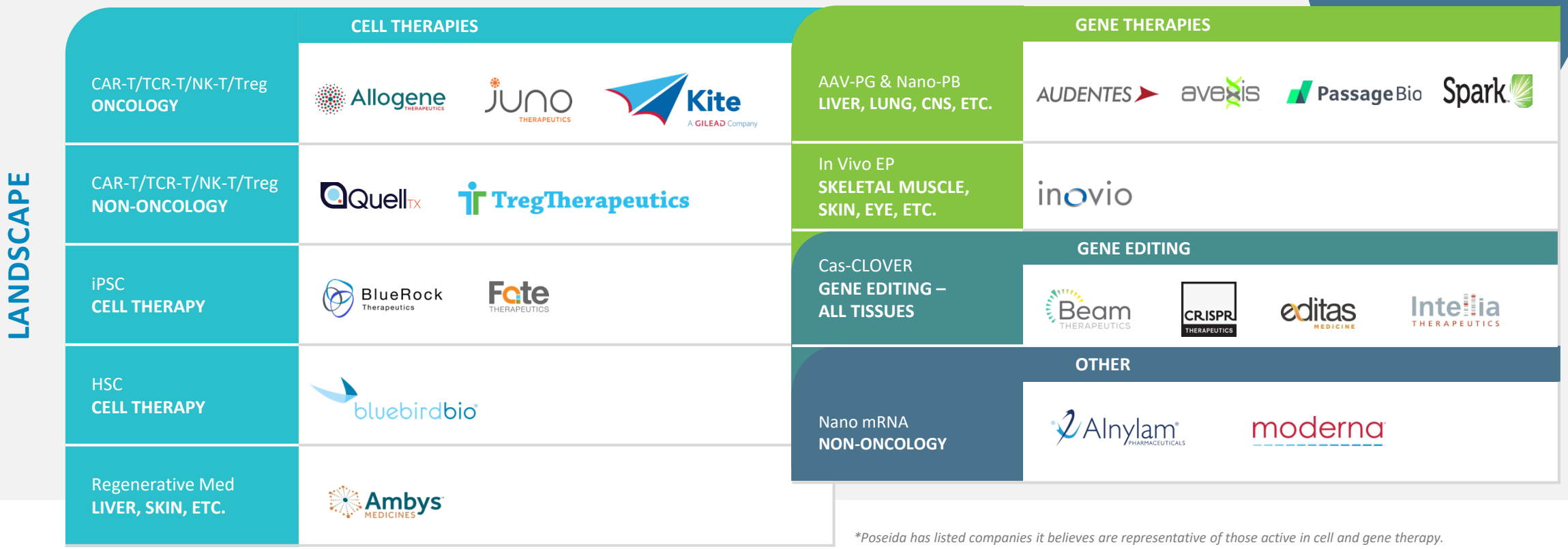
# Our Platform Technologies Have Broad Application

*Various combinations our innovative platform technologies create unique and valuable opportunities across cell and gene therapy*




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

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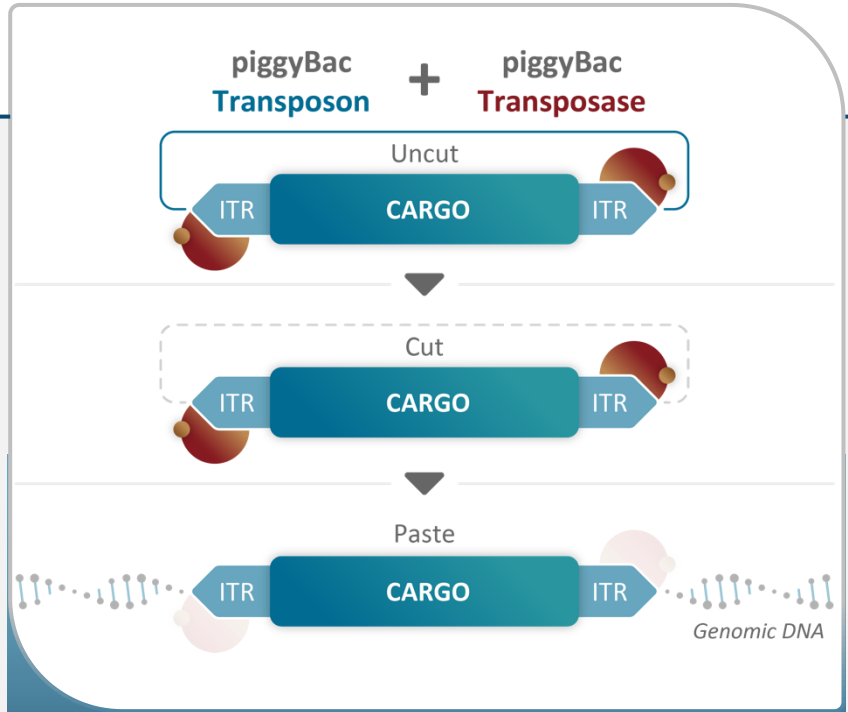
# PiggyBac®: Versatility in DNA Delivery

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




- Enables DNA integration
- Non-viral gene insertion technology
- Works in a wide variety of cell types
- Multiple safety and cost benefits

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

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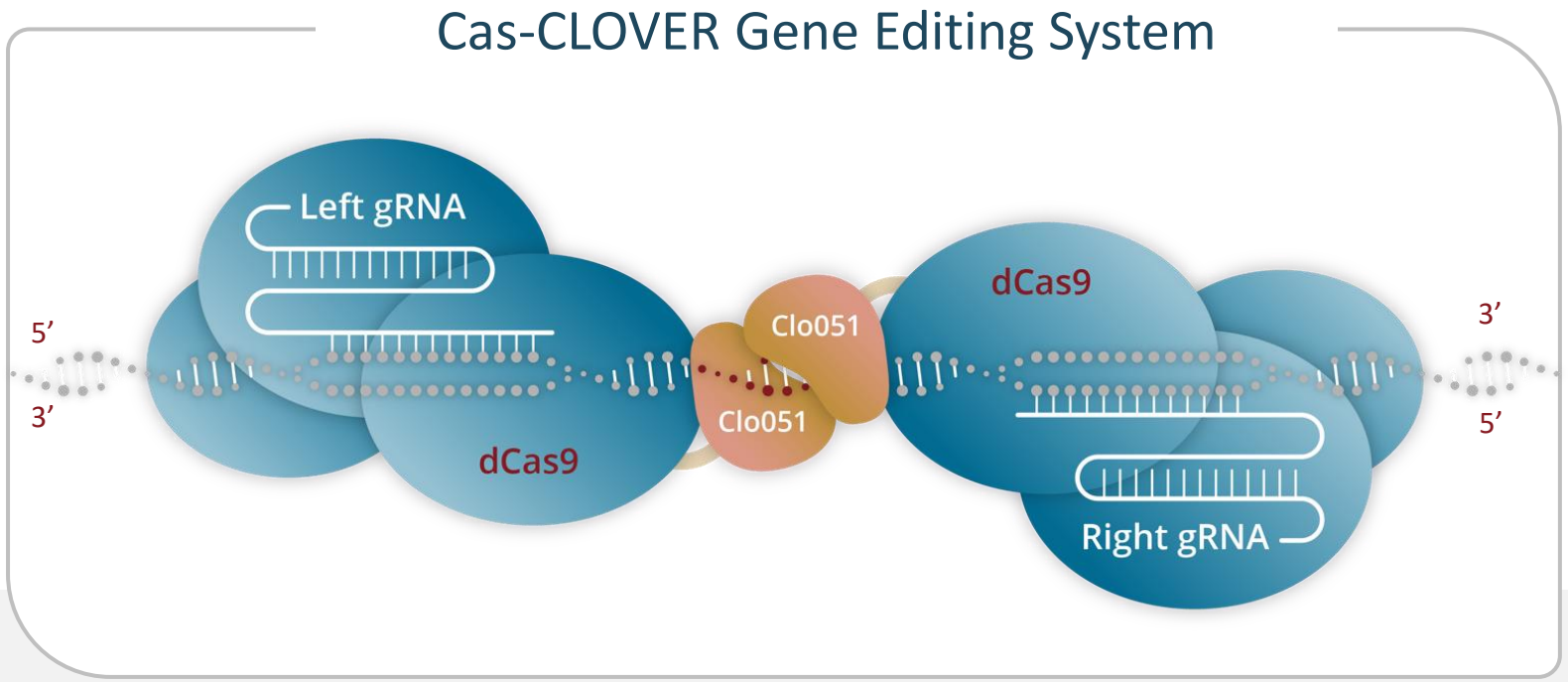
# Cas-CLOVER: Clean Gene Editing




- **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**

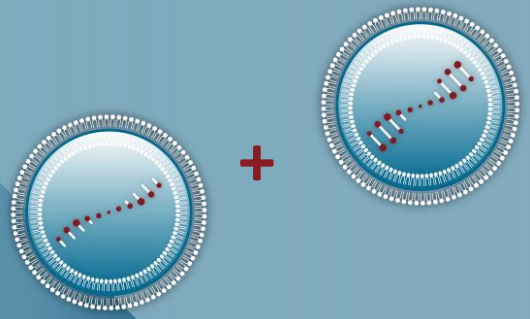
AAV (SPB-DNA)
AAV (PB-DNA)

**HYBRID**

Nanoparticle (SPB-RNA)
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

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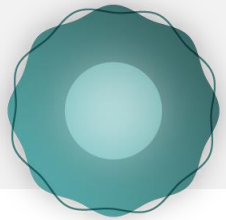
# Disruptive Innovation in CAR-T

*Allogeneic CAR-T Therapy for Oncology*

## Cell Type Matters

$T_{SCM}$ Cell



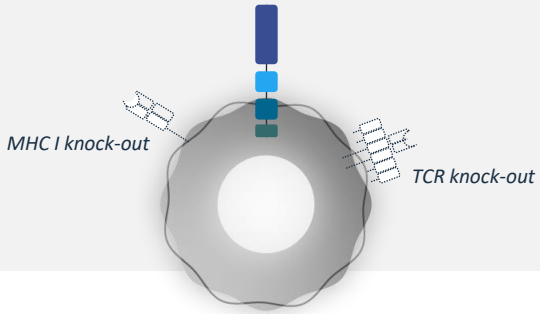
**Stem Cell Memory**

- Self-renewing
- Long lived
- Multipotent

**$T_{SCM}$** is the ideal cell type for CAR-T due to greater safety and durability

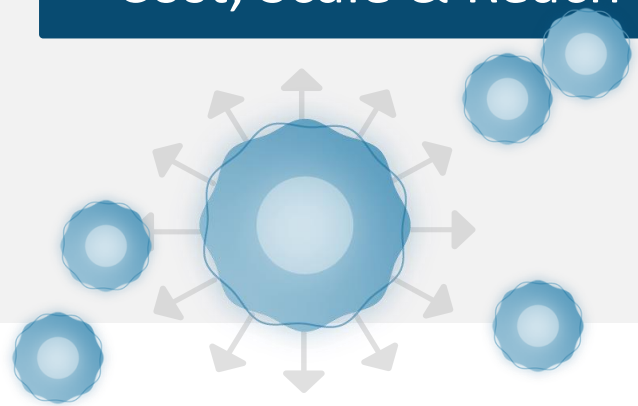
**piggyBac®** is the ideal non-viral gene insertion technology

## 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 with the potential to deliver 100's of doses at low cost

Enables outpatient dosing and expanded patient reach

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# Not All T Cells are Created Equally

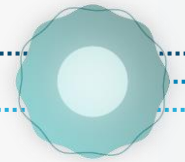
## *The Importance of Stem Cell Memory T Cells ($T_{SCM}$)*

LESS DIFFERENTIATED

$T_{SCM}$ Cell

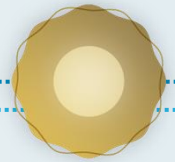
**Stem Cell Memory**

- Self renewing
- Long lived
- Multipotent



$T_{CM}$ Cell

**Central Memory**



$T_{EM}$ Cell

**Effector Memory**

MORE DIFFERENTIATED

$T_{EFF}$ Cell

**Effector T-Cell**

**piggyBac**
Designed to Preferentially Transpose $T_{SCM}$ Cells

**STEMNESS MATTERS**

Products with High % of $T_{SCM}$ Cells:

- Strong correlation with best responses in the clinic
- More gradual tumor killing with less toxicity
- Better duration of response and potential for re-response
- $T_{SCM}$ engrafts in bone marrow – key to CAR-T success in solid tumors

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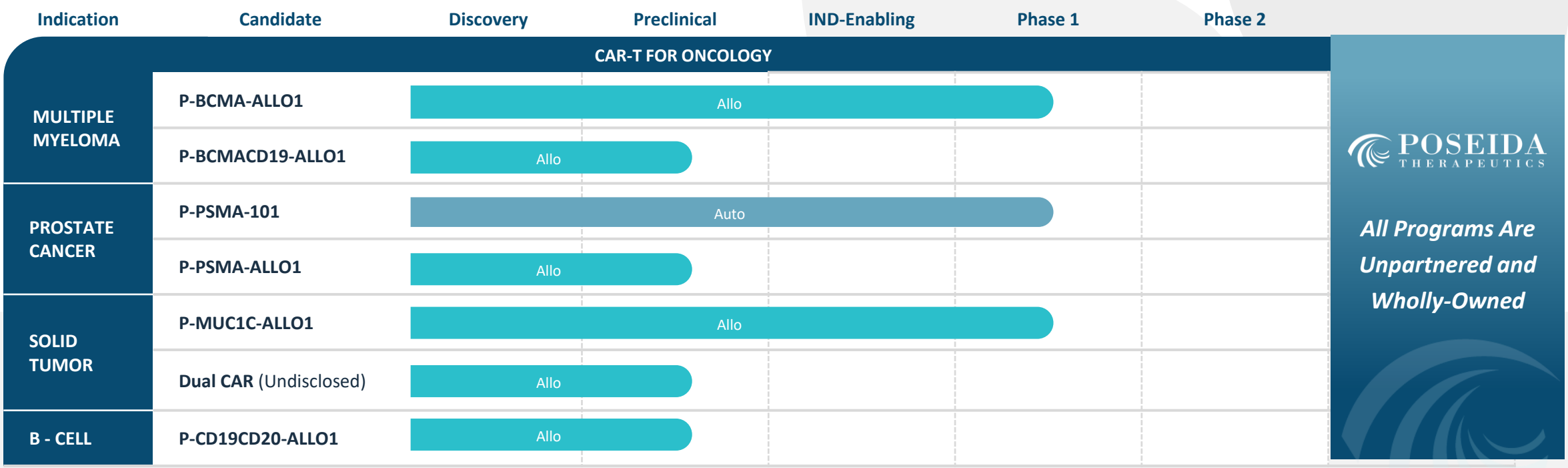
# Cell Therapy Pipeline

*Autologous and Allogeneic CAR-T for Solid and Liquid Tumors*







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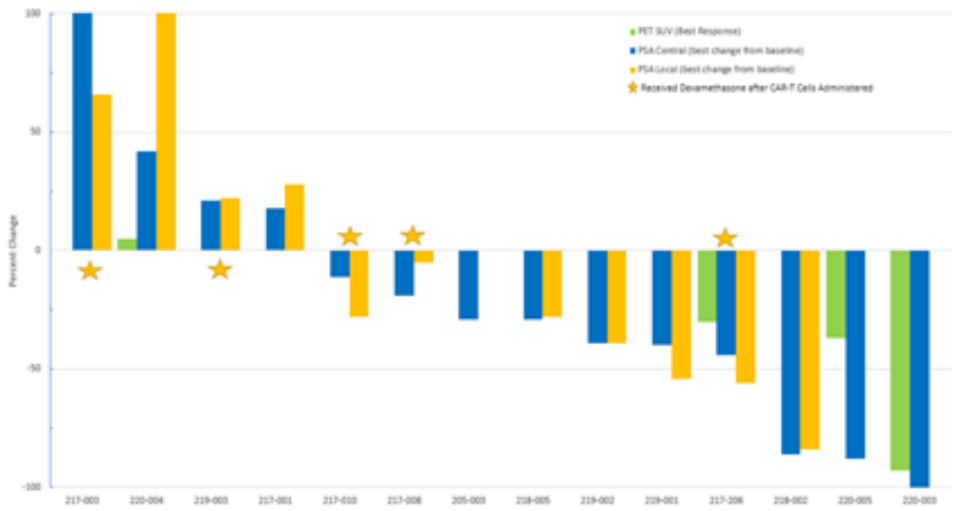
# P-PSMA-101: Clinical Data Provide Strong Evidence That High-$T_{SCM}$ CAR-T Can Work In Solid Tumor Indications

**ASCO GU – February 2022**




P-PSMA-101 early clinical results show promising activity in difficult to treat mCRPC patient population

- P-PSMA-101 Phase 1 Trial ongoing in castrate resistant metastatic prostate cancer
- Salivary gland tumors – a high unmet need population added to study protocol
- Our long-term goal remains shifting to allogeneic platform and approach
  - P-PSMA-ALLO1 with VH binder and improved levels of Tscm in early pipeline

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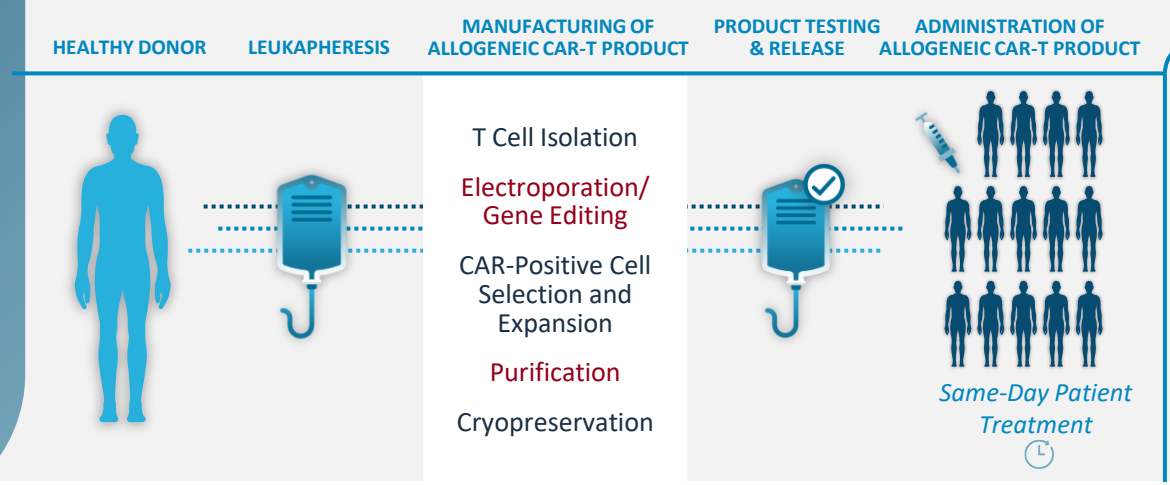
# Allogeneic CAR-T for BCMA

*P-BCMA-ALLO1 Phase 1 Trial in Progress – First Clinical Data Expected 2H 2022*

- BCMA autologous space is competitive - but Allogeneic race remains wide open
- Poseida approach conveys significant advantages
- Multiple learnings from autologous program informed allogeneic approach
  - Even higher $T_{SCM}$
  - Better binder technology
  - Booster molecule (lower cost)

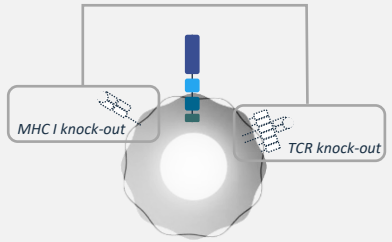
## Unique Allogeneic Platform

- Preserve/improve **high $T_{SCM}$**
- **Improved BCMA VH Binder**
- **Optimized dosing** regimens
- **Healthy donor** material
- **Robust manufacturing**
- **Booster Molecule**
  - Lower **cost**
  - Up to **100s of doses**




**FULLY ALLOGENEIC**

Multiplex gene editing to address graft vs host (safety) and host vs graft (persistence)







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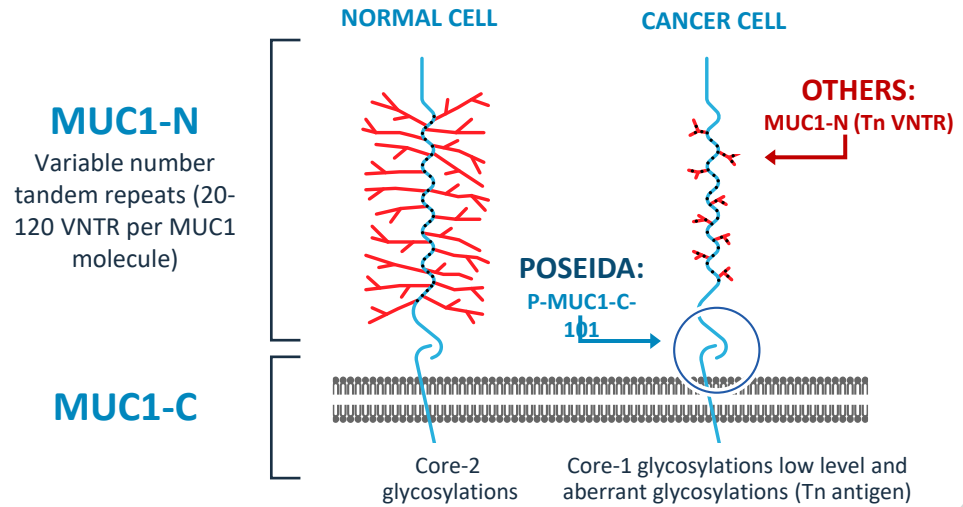
# MUC1C Allogeneic Program in Multiple Solid Tumors

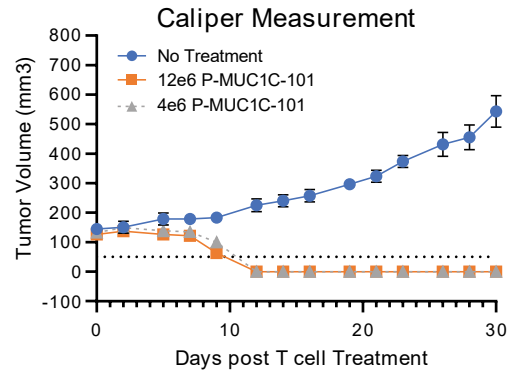
*P-MUC1C-ALLO1 Phase 1 in Progress – First Clinical Data Expected in 2H 2022*

- **P-MUC1C-ALLO1** addresses patient populations in **multiple solid tumor indications**
  - Breast, Ovarian, NSCLC, Colorectal and others
    - Top 4 indications alone represent ~1M US patients
  - High unmet need indications like pancreatic and liver also in scope
- P-MUC1C-ALLO1 is first program to be **manufactured in internal manufacturing plant**
- Recent clinical update from P-PSMA-101 underscores our excitement for P-MUC1C-ALLO1 with a High $T_{SCM}$ CAR-T

*(2017) (American Cancer Society)*

## Our Approach vs Others




**Triple-Negative Breast Cancer Model**

# The Advantages of Multiple Antigen Targeting with Dual CAR-T

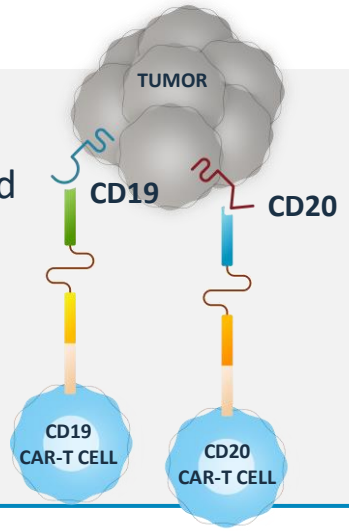
## 1. Overcome single antigen loss (heme)

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

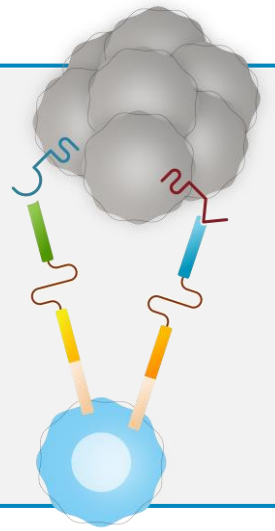
## 2. Target heterogeneous tumors (solid)

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

**Single CAR**
Co-administered

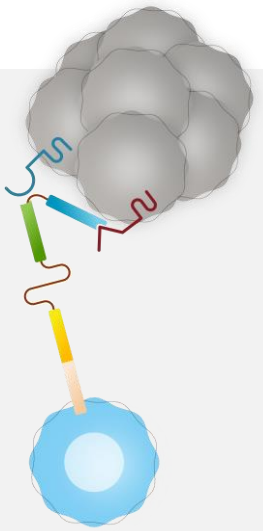



**Dual CAR**
Co-localized dual engagement



Competitive Advantage

**Tandem CAR**
Conformation challenges?



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

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)

1. **ALLO CD19/CD20**
   B cell Leukemia and Lymphoma
2. **ALLO CD19/BCMA**
   Multiple Myeloma
3. **Dual ALLO (Undisclosed)**
   Solid Tumors

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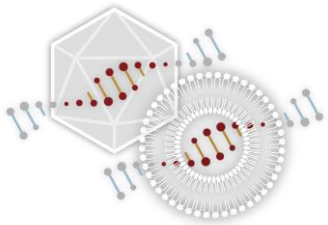
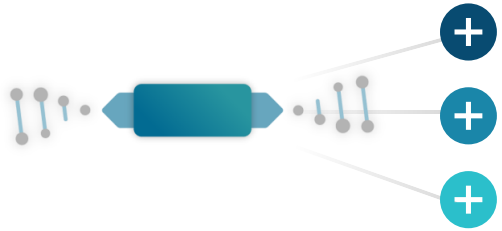
# Disruption in Gene Therapy

*In Vivo Gene Therapy for Rare Diseases and Hard-to-Treat Juvenile Populations*





## 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

Takeda

- Broad in-vivo gene therapy collaboration with Takeda in October 2021 validates our approach
- Collaboration extends across Poseida platforms and includes FVIII for Heme A
- Up to 8 targets and $3.6B in potential payments plus royalties

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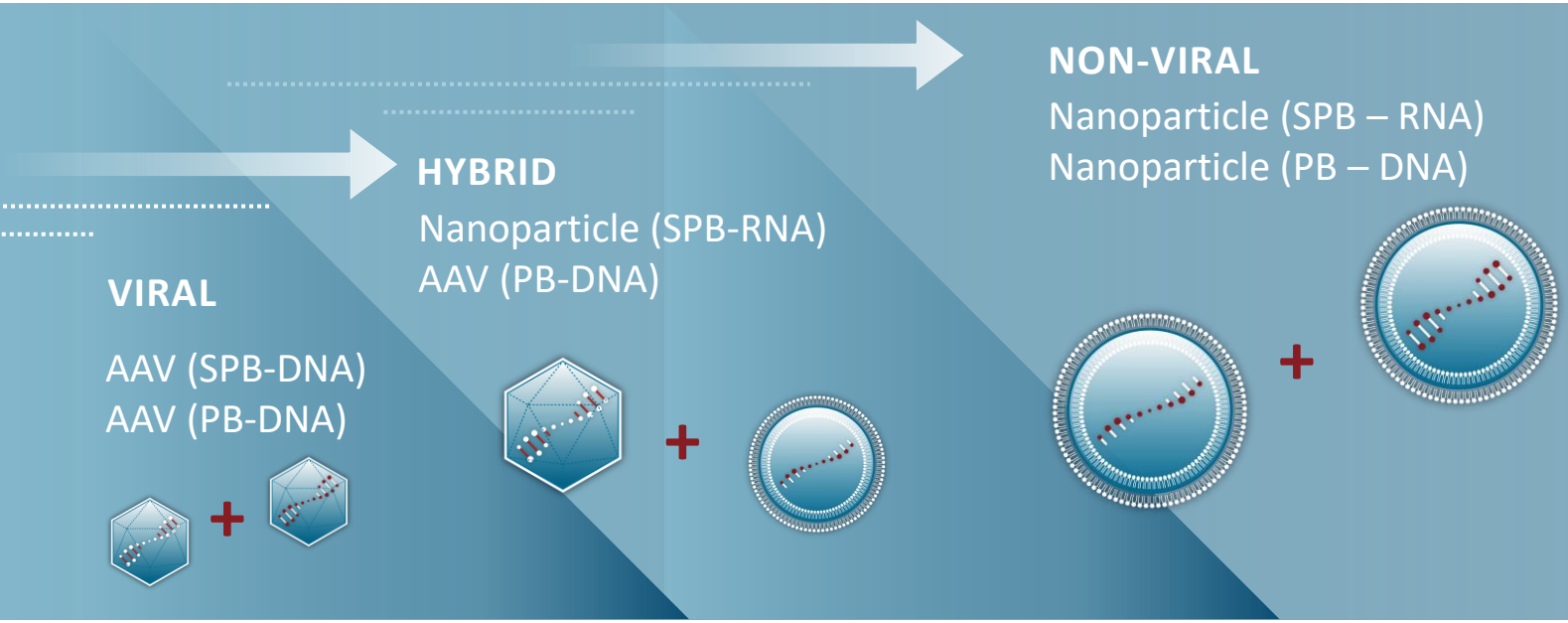
# Delivering Potential Cures and Overcoming the Challenges of AAV

## OUR GOAL:

Develop Single Treatment Cures Utilizing Our
In Vivo Gene Therapy Technologies

**Potential for Single-Treatment Cures**




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

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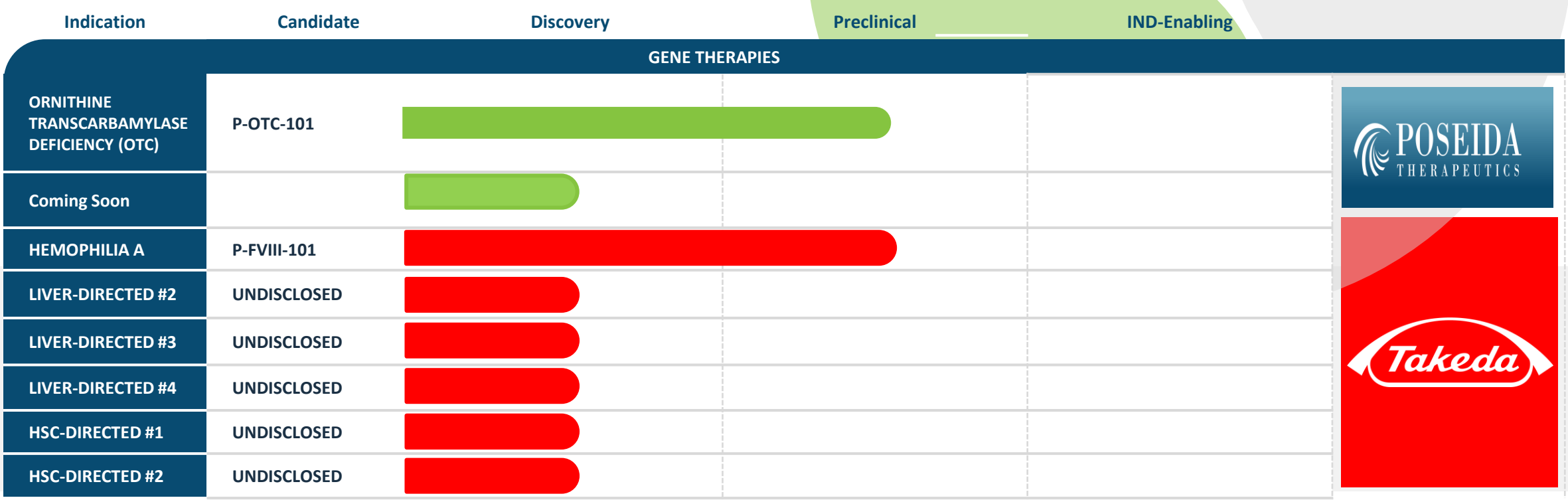
# Gene Therapy Pipeline

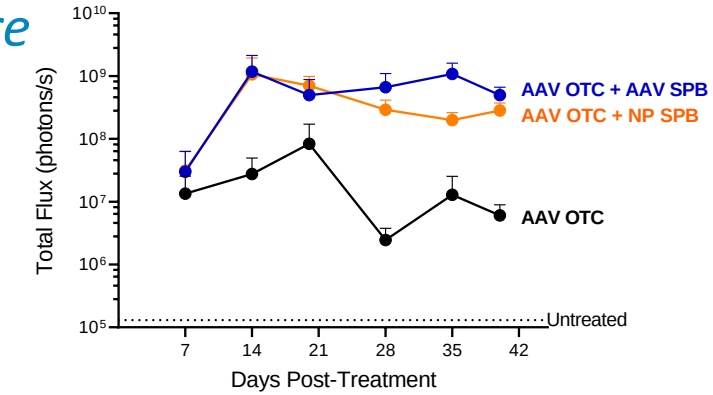
## *In Vivo Liver-Directed and HSC-Directed Gene Therapy*

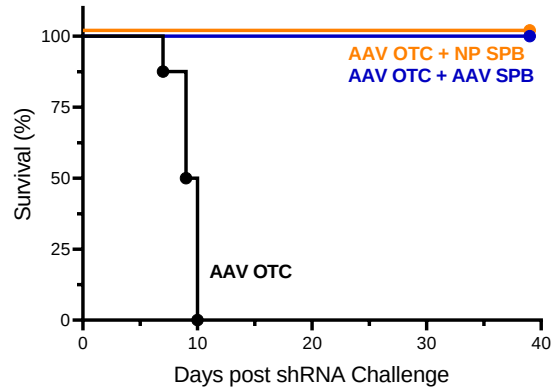


# Ornithine Transcarbamylase (OTC) Deficiency Program

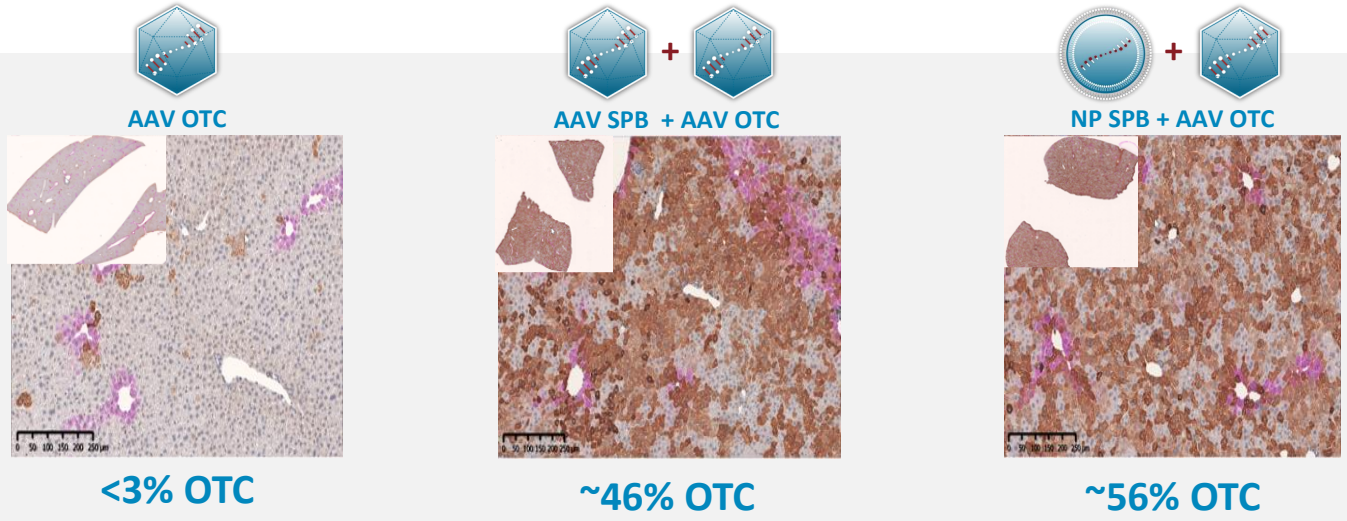
## *P-OTC-101 Potential for Single Treatment Cure*

- P-OTC-101 highlights **multiple advantages** of Poseida in vivo GT approach
  - **DNA integration** – single treatment correction
  - Ability **to reduce or eliminate AAV** dosing
  - Ability to **treat juvenile patients**
- X linked metabolic liver disorder
  - Most common Urea Cycle disorder
  - 1 of 8,200 births in US
- Severe OTC Deficiency in juveniles remains a high unmet need




**Liver Bioluminescence** | **Survival**




**Percent Hepatocytes with OTC Expression**

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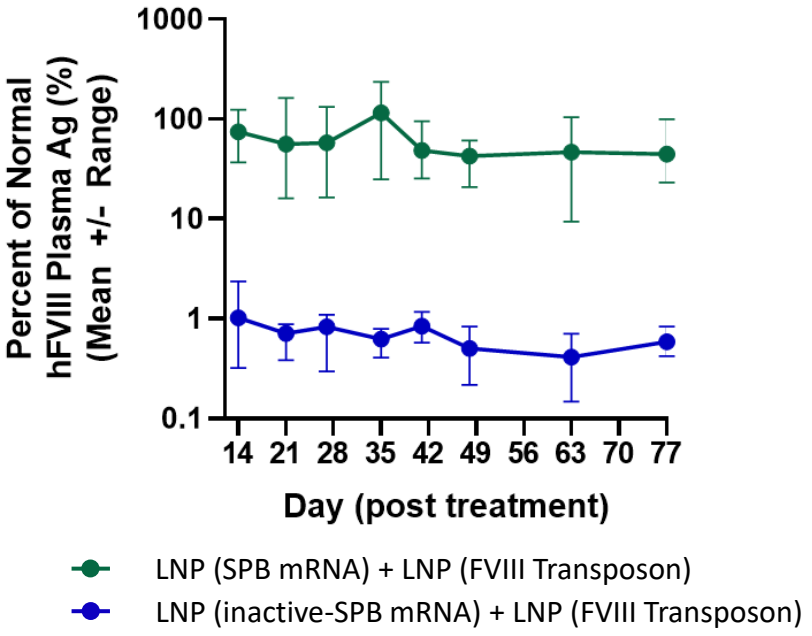
# Hemophilia A – Nanoparticle+ piggyBac Factor VIII Delivery

*Multiple Competitive Failures Leave the Field Wide-open for a Better Approach*

## Poseida differentiated technology uniquely suited to address Hemophilia A

PiggyBac plus nanoparticle delivers:

- Permanent genetic correction
- Large size of Factor VIII easily accommodated
- Nanoparticle delivery avoids AAV toxicity and enables redosing if needed




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

## 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

Takeda

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# Anticipated Upcoming Milestones

P-MUC1C-ALLO1
Clinical Update in 2H 2022

P-CD19CD20-ALLO1
IND in 1H 2023

P-BCMA-ALLO1 Clinical
Update in 2H 2022

P-OTC-101 Gene Therapy
Preclinical Data Updates

**Potential for Additional Strategic Partnerships**




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# Focused on Key Priorities to Drive Value Creation

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

- **Novel fully allogeneic high-$T_{SCM}$ CAR-T approach in both liquid and solid tumors**
- **Gene therapy focus on** single treatment cures and **strategic partnership with Takeda**
- **Collaboration and partnership** key to unlocking the value of broad platform technologies
- Platform Innovation continues with Site-Specific Super piggyBac, in vivo Gene Editing and TCR capabilities


 

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# Thank You

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