POSEIDA THERAPEUTICS

Corporate Presentation

January 2023

A New Class of Cell & Gene Therapies with the Capacity to Cure

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; statements regarding potential fees, milestone and royalty payments we may receive pursuant to our collaboration agreements; 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: the fact that collaboration agreements may not become effective or may be terminated early; the fact that we will have limited control over the efforts and resources our collaborators devote to advancing development programs under our collaboration agreements; 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 & Gene Therapy

ALLOGENEIC CAR-T

The Future of Cell Therapy is Allo

Roche

Takeda

IN VIVO GENE THERAPY

Moving Beyond Viral Vectors for Gene Therapy

PEOPLE
Passionate and dedicated team working on treatments for patients with cancer and rare diseases

PLATFORMS
Innovating with powerful and differentiated genetic engineering technologies

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Strategic Partnership with Roche in Allogeneic CAR-T

Focused on Hematological Indications with the Leader in Commercial Oncology

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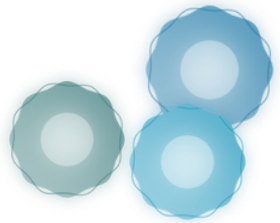
Roche

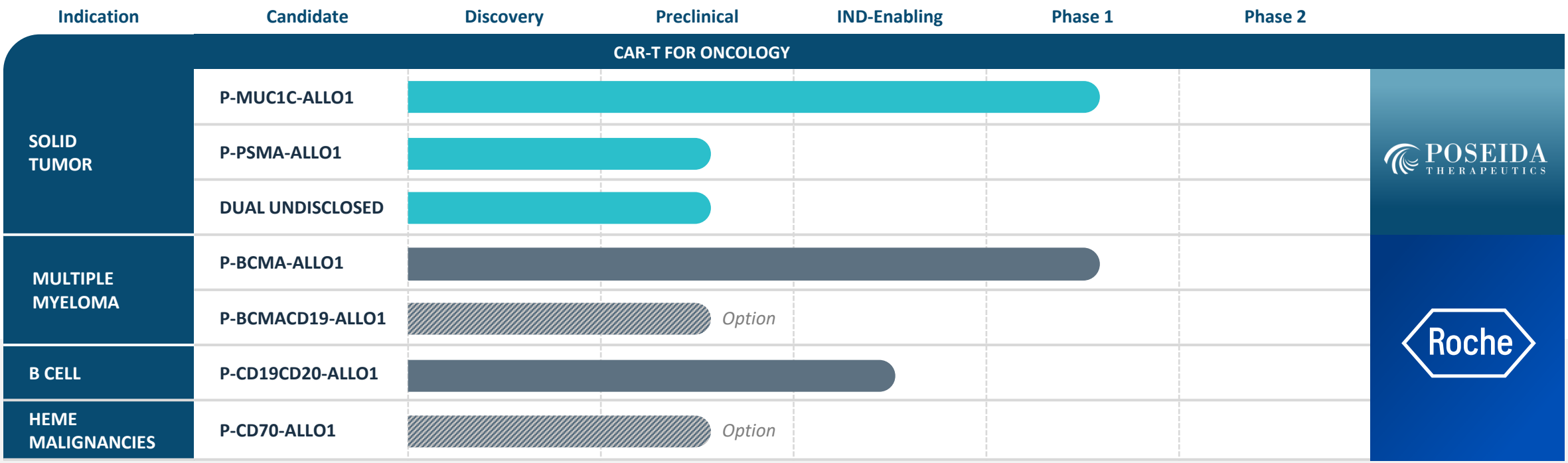
- Early clinical data show potential for Poseida's CAR-T approach to work in solid tumor - proof of concept in P-PSMA-101
- 1st solid tumor allogeneic CAR-T clinical trial, P-MUC1C-ALLO1, initiated in 2022
- Current focus is proof of concept in allogeneic solid tumor, ability to add additional programs through platform approach
- Poseida retains rights to platform technologies for allogeneic T cell solid tumor applications - preserved large commercial upside

- License to P-BCMA-ALLO1 and P-CD19CD20-ALLO1, options to 2 other heme programs
- Research collaboration focused on next generation allogeneic approaches, with up to 6 additional programs to be nominated
- Programs transitioned to Roche after Phase 1, alleviating investment in late-stage development for heme programs
- Up to $6.0 billion in economics plus royalties - including upfront of $110 million and $110 million in near-term payments

Our Allogeneic CAR-T Pipeline

Focused on Off-the-Shelf Cell Therapies for Both Solid and Liquid Tumors





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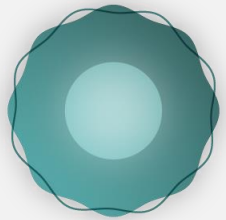
Highly Differentiated Innovation in CAR-T

A New Class of Allogeneic CAR-T for Oncology

Cell Type Matters

T_{SCM} Cell



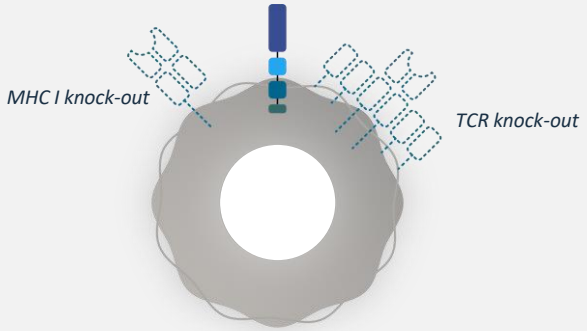
Stem Cell Memory

- Self-renewing
- Long lived
- Multipotent

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

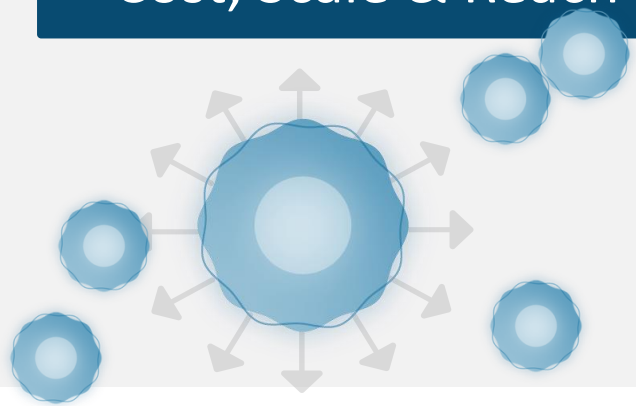
piggyBac® is the ideal non-viral gene insertion technology

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 translating into low cost and broader patient and commercial reach

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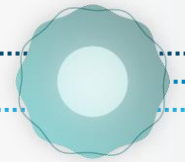
Stem Cell Memory T Cells (T_{SCM}) are the Ideal Cell Type for CAR-T

LESS DIFFERENTIATED

T_{SCM} Cell

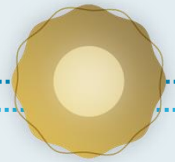
Stem Cell Memory

- 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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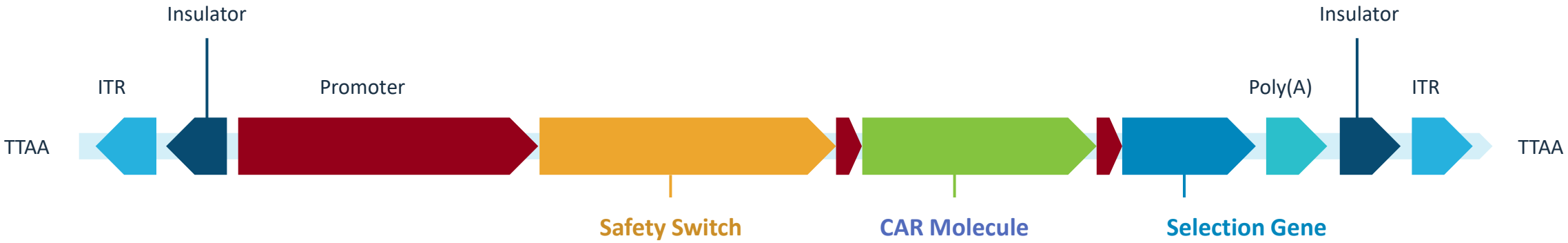
Beyond Cell Type: piggyBac Enables Differentiation

Purposely Designed With Novel Product Attributes



INCORPORATES PROPRIETARY SAFETY SWITCH

- Rapid, dose-dependent **elimination** of engineered T- cells as needed
- Potential **management of** Cytokine Release Syndrome (**CRS**) or other AEs

DIFFERENTIATED BINDING CAR-T MOLECULE

- VH or next generation molecules with **high-specificity binding**
- VH binders are fully human with no **tonic signaling observed to date**

DRUG RESISTANCE GENE PERMITS POSITIVE SELECTION

- **~100% of T-cells** in final product express the CAR molecule
- Predicted to result in **greater therapeutic index**

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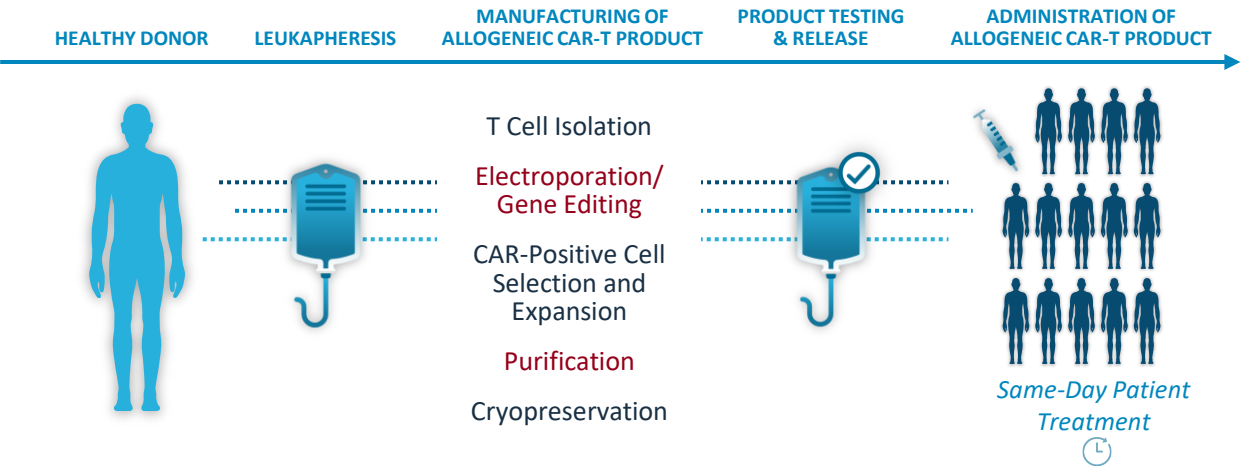
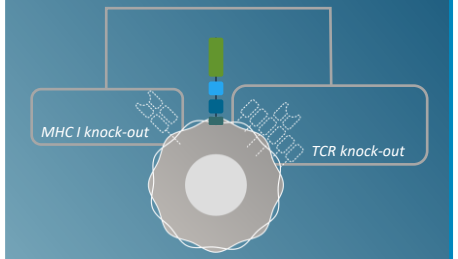
Unique Allogeneic Manufacturing Platform



FULLY ALLOGENEIC

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



- Preserve/improve high T_{SCM}
  - Multiplexed gene editing in resting T-cells allows for high T_{SCM} final product
  - Healthy donor material
- TCR knockout- purification
- MHC1 knockout- mixed population
- Large cargo capacity allows room for safety switch
- Ability to add in additional gene edits as needed
- Booster Molecule
  - Lower cost per dose
  - Up to 100s of doses

- Internal GMP pilot manufacturing plant went into operation in 2019
- **Pilot plant currently sourcing Phase 1 material for P-BCMA-ALLO1, P-MUC1C-ALLO1 and IND-enabling material for P-CD19CD20-ALLO1**

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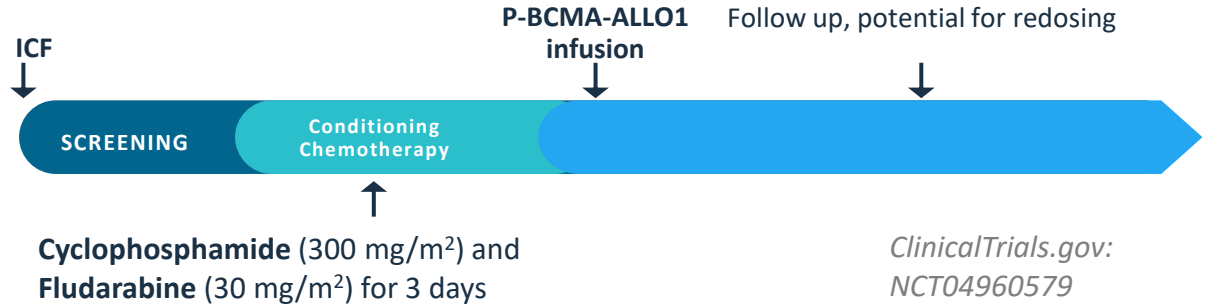
Phase 1 P-BCMA-ALLO1 Partnered with Roche

- Early clinical data presented at ESMO-IO (Dec 2022)
  - Favorable tolerability profile (10 evaluable patients)
    - No dose-limiting toxicities (DLTs), cytokine release syndrome (CRS), graft vs host disease (GVHD) or immune effector cell-associated neurotoxicity syndrome (ICANS)
  - Early signs of efficacy (6 evaluable patients)
    - 3 of 6 responders including patients that have received previous BCMA therapy and/or high-risk cytogenetics, including p53 deletions
- Multiple learnings from autologous program informed allogeneic approach
  - Even higher T_{SCM}
  - Better binder technology (utilizing VH binder)
  - Booster molecule (lower cost)
- Ongoing dose escalation

KEY ELIGIBILITY

- Relapsed Refractory Multiple Myeloma
- Received at least 3 lines of therapy that include a PI, IMiDs and CD38 mAb
- Measurable Disease
- ECOG status of 0 to 1

Study Schematic: Trial Design



PRIMARY ENDPOINTS

- Assess safety and MTD based on DLT

SECONDARY OUTCOMES

- Safety/feasibility: AE, Cytokine Release Syndrome (CRS), neurotoxicity, Graft vs Host Disease (GVHD)
- Efficacy: IMWG criteria: ORR, TTR, DOR, PFS, OS will be analyzed

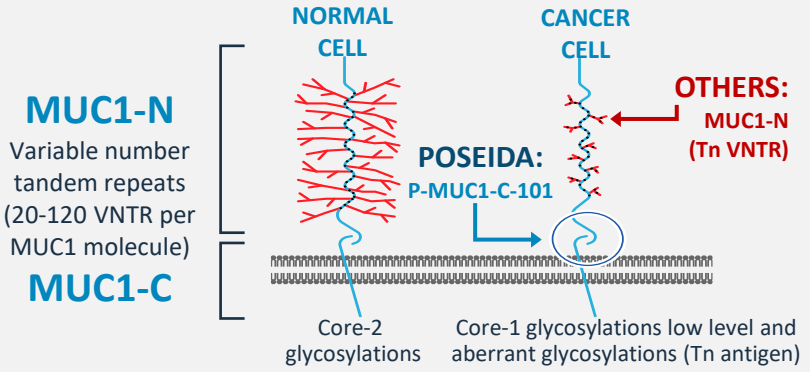
P-MUC1C-ALLO1 Phase 1 Solid Tumor Basket Trial

- MUC1C a unique binding target
  - Different than other MUC1 programs
- Early clinical data presented at ESMO-IO (Dec 2022)
  - Good tolerability profile (6 evaluable patients)
    - No dose-limiting toxicities (DLTs), cytokine release syndrome (CRS), graft vs host disease (GVHD) or immune effector cell-associated neurotoxicity syndrome (ICANS)
  - Early signs of clinical activity (4 evaluable patients)
    - 1 PR in HR+/HER2- Breast cancer
    - 2 patients with SD (pancreatic cancer and colorectal cancer)
- Outpatient administration allowable
- Ongoing dose escalation
- Large potential patient population
  - Strong preclinical data in breast cancer (TNBC) and ovarian cancer

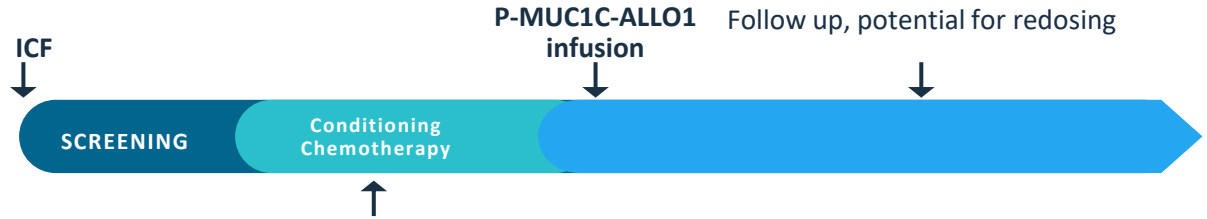
KEY ELIGIBILITY

- Advanced treatment-resistant solid tumors, including but not limited to breast, ovarian, pancreatic, NSCLC and other epithelial solid tumors
- Measurable Disease per RECIST criteria
- ECOG status of 0 to 1

Our MUC1-C Approach vs Others



Study Schematic: Trial Design



ClinicalTrials.gov: NCT05239143

PRIMARY ENDPOINTS

- Assess safety and MTD based on DLT

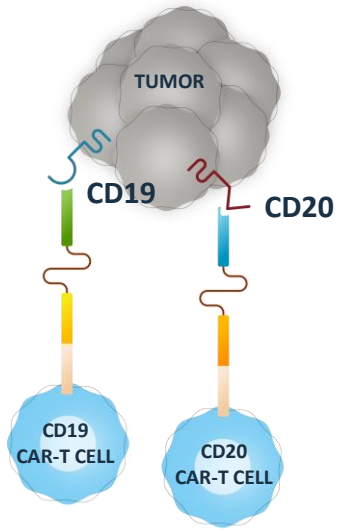
SECONDARY OUTCOMES

- Safety/feasibility: AE, Cytokine Release Syndrome (CRS), neurotoxicity, Graft vs Host Disease (GVHD)
- Efficacy: RECIST criteria: ORR, TTR, DOR, PFS, OS will be analyzed

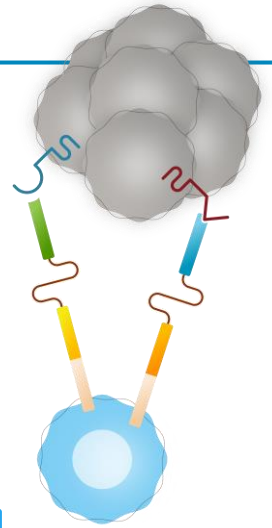
POSEIDA THERAPEUTICS

Multiple Antigen Targeting with Dual CAR/CAR-TCR to Improve Efficacy

Single CAR
Co-administered



Dual CAR
Co-localized dual engagement



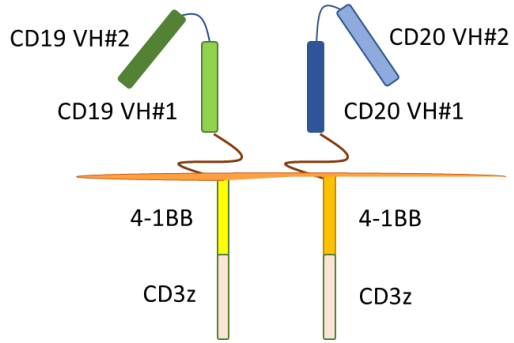
ADVANTAGES

- **Overcome single antigen loss (heme)**
  CD19 CAR-T clinical trials: up to 40% of relapse is caused by loss of CD19 antigen
- **Target heterogeneous tumors (solid)**
  Highly heterogeneous antigen expression may contribute to poor CAR-T clinical responses against solid tumor
- **Large cargo capacity of piggyBac allows dual delivery of both CAR and TCR genes**

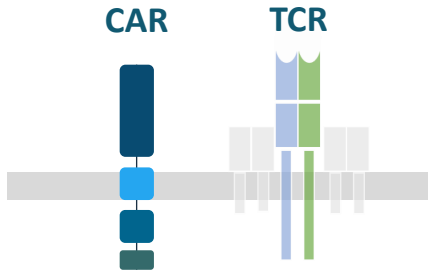
Competitive Advantage

Additional Approaches Beyond Single CARs

Dual-CAR Tandem



CAR-TCR



Next in Poseida's Pipeline

1. **P-CD19CD20-ALLO1***
   B cell Leukemia and Lymphoma
2. **P-BCMACD19-ALLO1****
   Multiple Myeloma
3. **Dual ALLO (Undisclosed)**
   Solid Tumors

*Licensed with Roche
**Optioned with Roche

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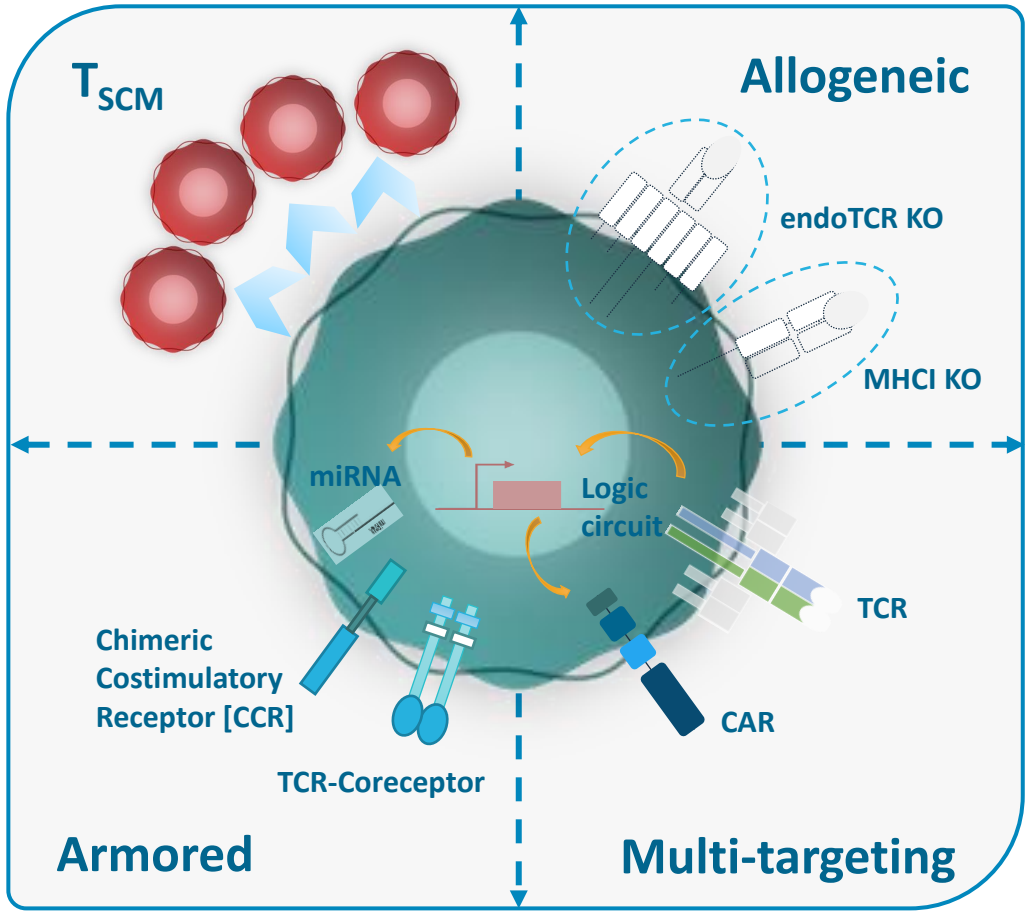
Poseida's Advantages in Developing Allogeneic TCR-T and CAR+TCR-T

Unique Approach Addresses Key Limitations of Current TCR-T therapies



1. **High T_{SCM}** — Poseida process and technology generates a durable T_{SCM} enriched cell therapy product
2. **Allogeneic** — PiggyBac, Cas-CLOVER, Booster molecule, and our Allo proprietary process
3. **Multi-targeting** — PiggyBac enables delivery of multiple genes for targeting via CAR-TCR and activation-gated expression
4. **Armored** — Optimized platform with multiple molecular "armors" to enhance TCR-T performance

Strategic Partnership with Takeda in Gene Therapy

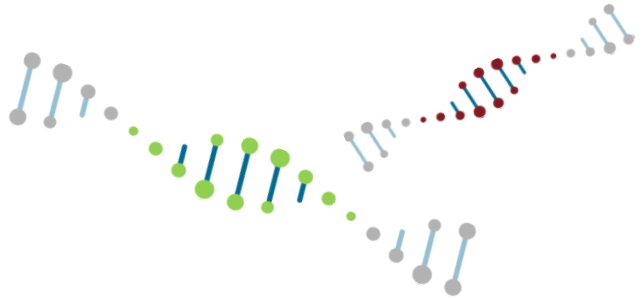
Collaboration Focused on Liver- and HSC- Directed In Vivo Gene Therapy

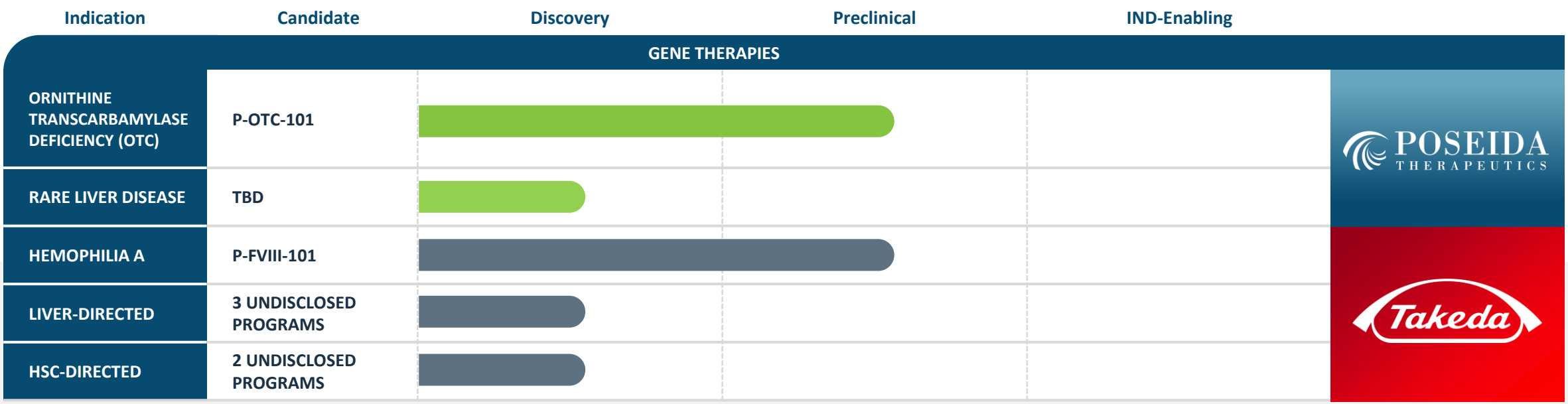
- Poseida retains rights to P-OTC-101 and all other liver- and HSC- directed targets not subject to collaboration
- Poseida retains rights for all gene editing applications other than collaboration targets
- Poseida retains rights to in vivo gene therapy for all other tissue types
- Poseida retains right to all ex vivo gene therapy applications

- Strategic Partnership in In Vivo Gene Therapy for Rare Diseases
  - Six initial disease targets including P-FVIII-101 for Hemophilia A
  - Option to add 2 additional targets
- Broad technology access for specific targets
  - Targets are liver- and HSC- directed
- Up to $3.6 Billion in potential milestones plus royalties

Our In Vivo Gene Therapy Pipeline

Initial Focus on Liver-Directed Gene Therapy





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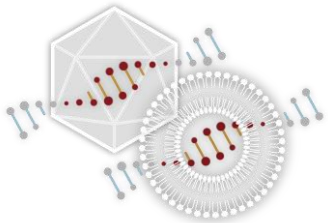
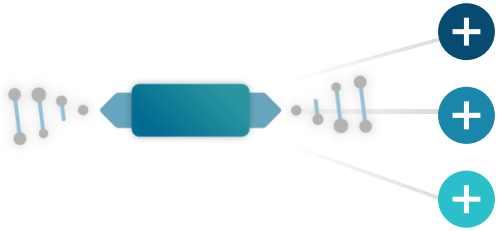
Disruption in Gene Therapy

A New Class of Products for Rare Diseases and Hard-to-Treat 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

*Focused on Genetic Correction and Improved Delivery with the **Capacity to Cure***

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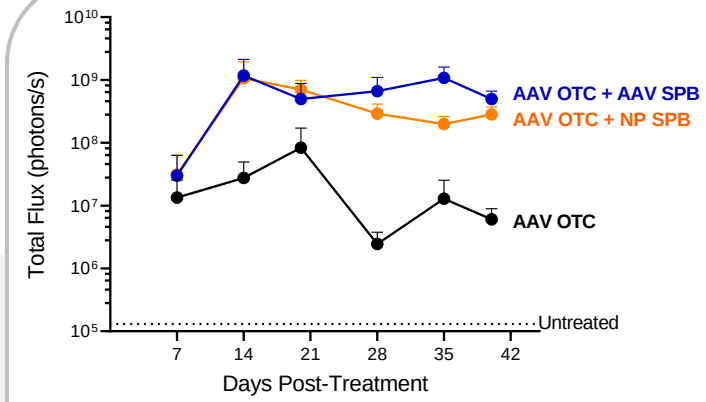
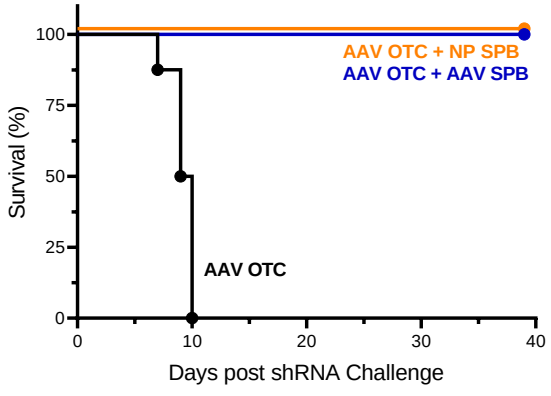
Poseida's Ornithine Transcarbamylase Deficiency Program

P-OTC-101 Advancing with Hybrid Delivery

- X-linked metabolic liver disorder
- Most common Urea Cycle Disorder
- 1 of 8,200 births in U.S.
- Severe OTCD in juveniles remains a high unmet need
- Transduction required to correct disease is >40%
- P-OTC-101 highlights multiple advantages of Poseida's AAV+AAV and Hybrid approach
  - DNA integration – single treatment correction
  - Ability to reduce AAV dosing
  - Ability to treat juvenile patients

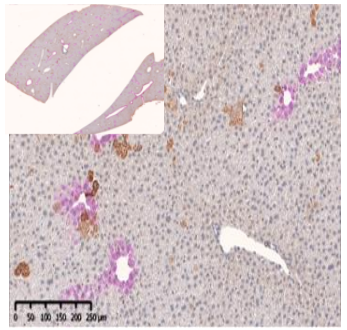


Liver Bioluminescence



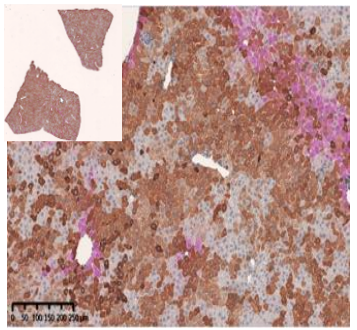
Survival

AAV OTC



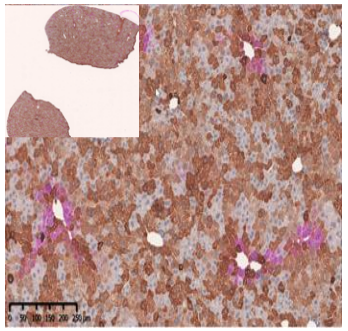
<3% OTC

AAV SPB + AAV OTC



~46% OTC

NP SPB + AAV OTC



~56% OTC

Percent Hepatocytes with OTC Expression

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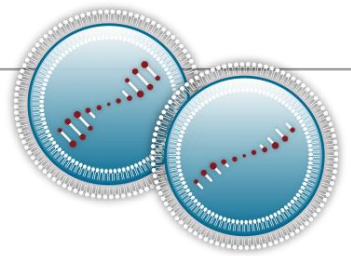
Non-Viral Delivery of Factor VIII with Super piggyBac for Heme A

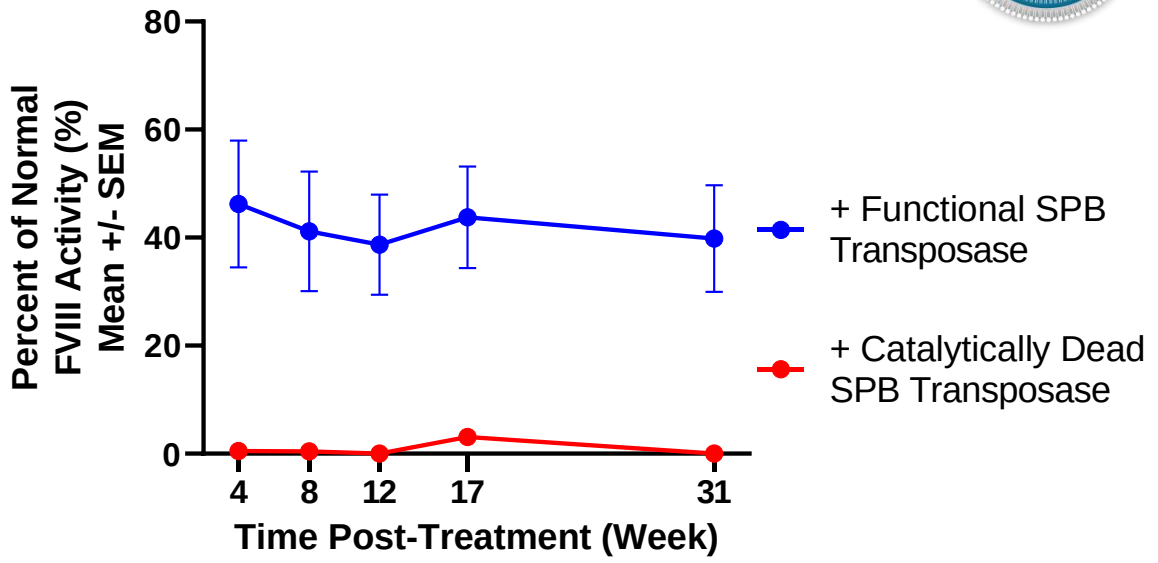
Hemophilia A Opportunity Remains Wide-Open for a Better Approach

Poseida differentiated technology is uniquely suited to address Hemophilia A

Nanoparticle delivery of piggyBac enables:

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





Research in collaboration with Denise Sabatino, Ph.D. (CHOP); preclinical data presented at ASH (Dec 2022)

Hemophilia A[1]

- Caused by deficiency in functional coagulation Factor VIII
- ~1 in 5,000 male births with ~60% of patients suffering from severe form
- Disease managed with lifelong, repeated administrations

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6717582/

Takeda

POSEIDA THERAPEUTICS

Genetic Engineering Platforms Designed to Perform

Novel Technologies that Deliver Differentiated Products

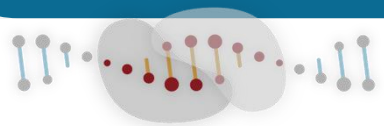
Super piggyBac

- 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

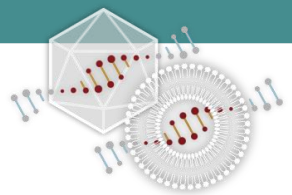
- Highly precise site-specific nucleases
- Ability to edit resting T cells while maintaining desirable T_{SCM} characteristics
- Major advantages:
  - tolerability
  - ease of design
  - low cost
  - multiplexing ability



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

Our focus on innovation continues with ongoing improvements to all our platforms including progress on site-specific Super piggyBac for precise gene editing and insertion

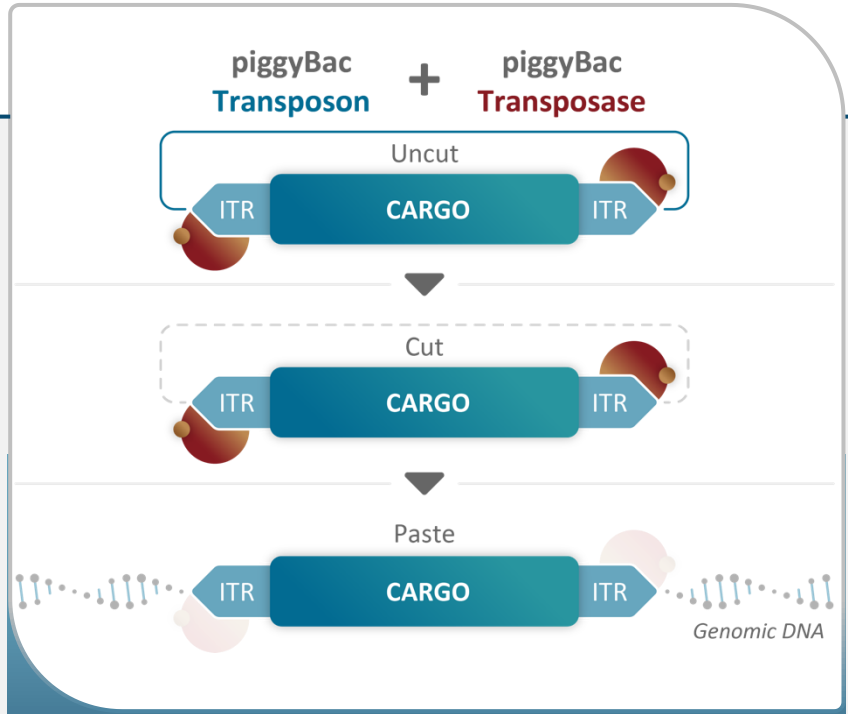
POSEIDA THERAPEUTICS

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



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

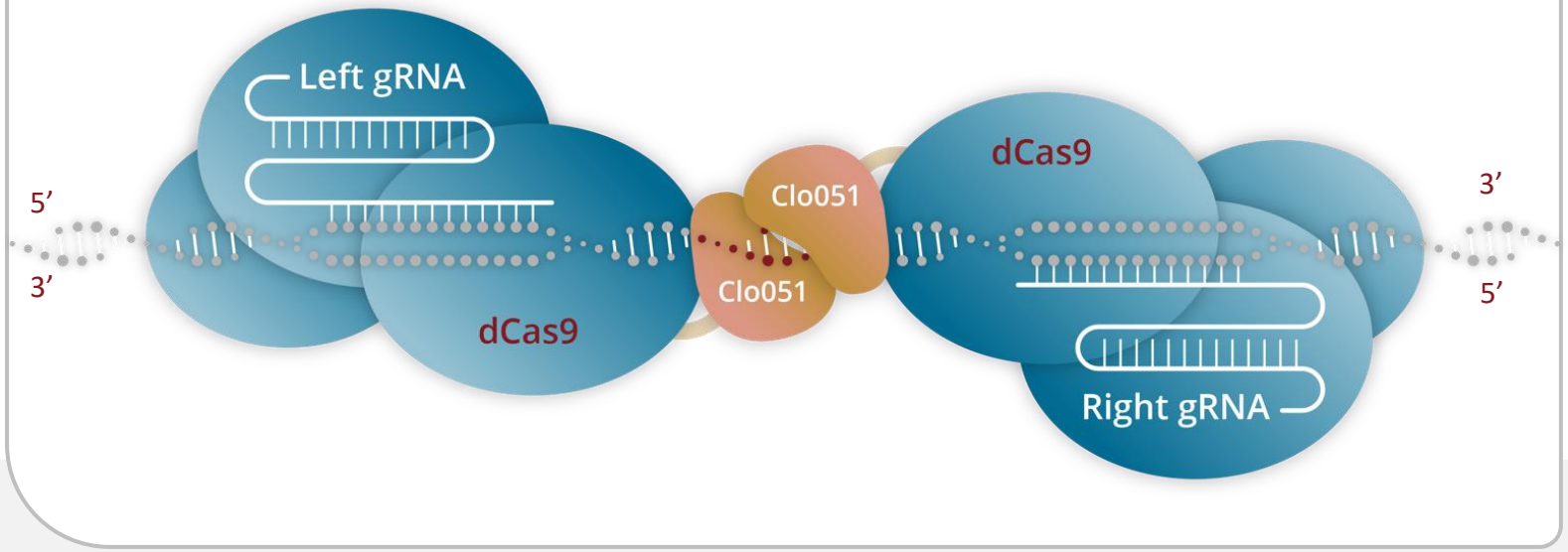
BENEFITS IN
GENE THERAPY

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 capacity** for delivering larger genes
- **Delivered using AAV + nanoparticle** or in vivo electroporation

Potentially the Cleanest Gene Editing with Cas-CLOVER

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

- Ability to efficiently edit resting cells which enables fully **Allogeneic High Tscm CAR-T** products
- Applications in in vivo **Gene Therapy and Gene Editing** applications

*Publication included in June 2022 volume of Molecular Therapy Nucleic Acids Journal: https://www.cell.com/molecular-therapy-family/nucleic-acids/fulltext/S2162-2531(22)00155-X

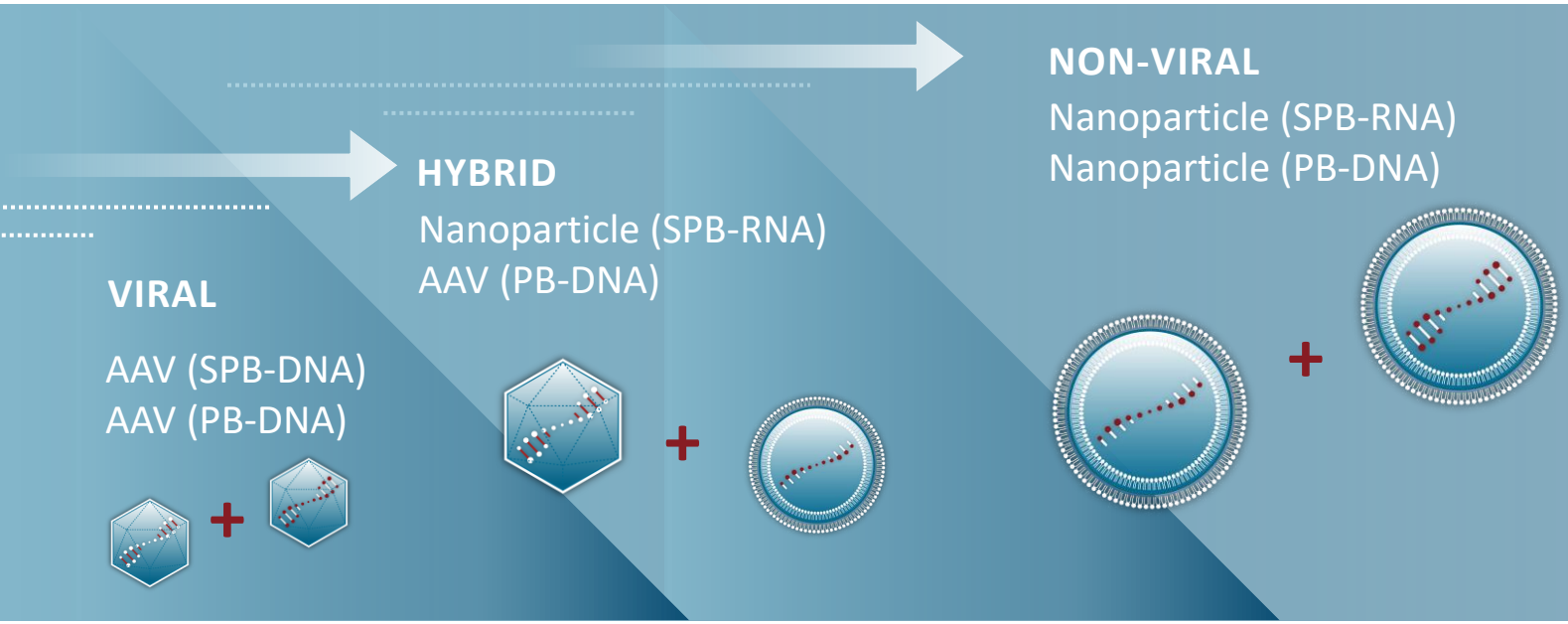
POSEIDA THERAPEUTICS

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



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

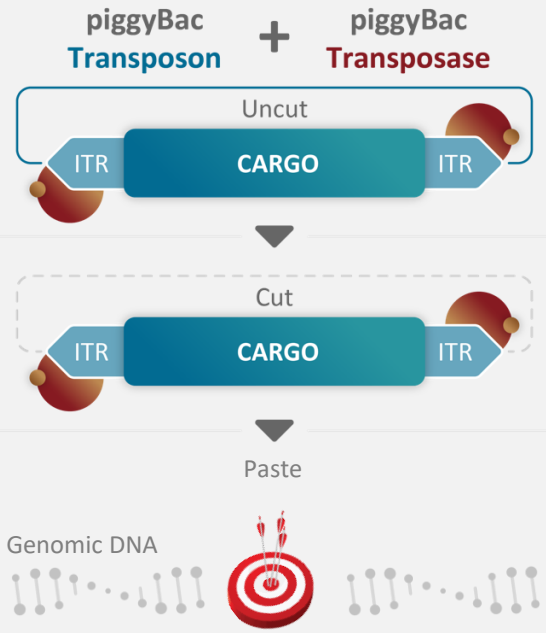
Ability to effectively **work in dividing tissues** including the juvenile liver

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

POSEIDA THERAPEUTICS

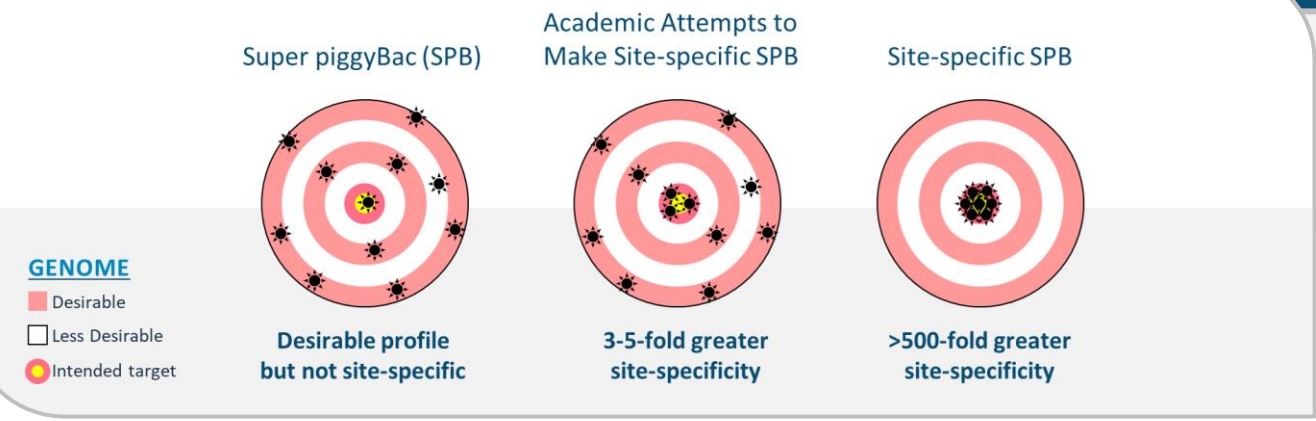
Platform Innovation Continues with Site-Specific Super piggyBac

Highly Specific Programmable Editing Platform



Site-Specific Super piggyBac platform:

- New emerging platform provides **500-fold** greater specificity than SPB
- **Enables simultaneous cargo knock-in and gene knock-out**
- **Versatile programmability** with multiple DNA binding domains
- **Large cargo capacity** inherent to piggyBac system provides potential for site-specific delivery of entire genes with all regulatory elements



POSEIDA THERAPEUTICS

Multiple Potential Milestones on the Horizon

- Poseida virtual R&D Day (Feb. 22)
  - P-CD19CD20-ALLO1 IND
  - P-BCMA-ALLO1 additional data
  - P-MUC1C-ALLO1 additional data
  - Gene therapy preclinical update(s)
- Potential Business Development Opportunities

2023 →

CELL THERAPY

GENE THERAPY

POSEIDA THERAPEUTICS

Advancing a New Class of Cell Therapy and Gene Therapy Products

Leveraging the Power of Products, Partnerships, People and Platforms

CELL THERAPY FOR ONCOLOGY

POSEIDA THERAPEUTICS

ALLOGENEIC CELL THERAPY FOR ONCOLOGY

Roche

GENE THERAPY / GENE EDITING

POSEIDA THERAPEUTICS

IN VIVO GENE THERAPY

Takeda

Strong innovation engine, dedicated people and powerful differentiated platform technologies drive our opportunities

POSEIDA THERAPEUTICS

POSEIDA THERAPEUTICS

Thank You