Driving innovative therapeutics across the finish line

Corporate Presentation

AUGUST 15, 2024

Forward-Looking Statements

This presentation contains "forward-looking statements," including statements regarding expectations, beliefs, intentions or strategies for the future. These include statements regarding management's expectations, beliefs and intentions regarding, among other things, the potential benefits of APHEXDA®, the ongoing commercialization of APHEXDA and the plans and objectives of management for future operations and expectations and commercial potential of APHEXDA, as well as its potential investigational uses. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. In some cases, you can identify forward-looking statements by terms including "anticipates," "believes," "could," "estimates," "expects," "intends," "may," "plans," "potential," "predicts," "projects," "should," "will," "would," and similar expressions intended to identify forward-looking statements. Forward-looking statements reflect our current views with respect to future events and are based on assumptions and are subject to risks and uncertainties. You should not put undue reliance on any forward-looking statements. Factors that could our cause actual results to differ materially from those expressed or implied in such forward-looking statements include, but are not limited to: the clinical development, commercialization and market acceptance of our therapeutic candidates, including the degree and pace of market uptake of APHEXDA for the mobilization of hematopoietic stem cells for autologous transplantation in multiple myeloma patients; the initiation, timing, progress and results of our preclinical studies, clinical trials and other therapeutic candidate development efforts; our ability to advance our therapeutic candidates into clinical trials or to successfully complete our preclinical studies or clinical trials; whether the clinical trial results for APHEXDA will be predictive of real-world results; our receipt of regulatory approvals for our therapeutic candidates, and the timing of other regulatory filings and approvals; whether access to APHEXDA is achieved in a commercially viable manner and whether APHEXDA receives adequate reimbursement from third-party payors; our ability to establish, manage, and maintain corporate collaborations, as well as the ability of our collaborators to execute on their development and commercialization plans; our ability to integrate new therapeutic candidates and new personnel, as well as new collaborations; the interpretation of the properties and characteristics of our therapeutic candidates and of the results obtained with our therapeutic candidates in preclinical studies or clinical trials; the implementation of our business model and strategic plans for our business and therapeutic candidates; the scope of protection that we are able to establish and maintain for intellectual property rights covering our therapeutic candidates and our ability to operate our business without infringing the intellectual property rights of others; estimates of our expenses, future revenues, capital requirements and our need for and ability to access sufficient additional financing, including any unexpected costs or delays in the ongoing commercialization of APHEXDA; risks related to changes in healthcare laws, rules and regulations in the United States or elsewhere; competitive companies, technologies and our industry; and statements as to the impact of the political and security situation in Israel on our business, including the impact of Israel's war with Hamas and other militant groups, which may exacerbate the magnitude of the factors discussed above. These and other factors are more fully discussed in the "Risk Factors" section of BioLineRx's most recent annual report on Form 20-F filed with the Securities and Exchange Commission on March 26, 2024. In addition, any forward-looking statements represent BioLineRx's views only as of the date of this presentation and should not be relied upon as representing its views as of any subsequent date. BioLineRx does not assume any obligation to update any forward-looking statements unless required by law.

Fully integrated, commercial stage biopharmaceutical company

Best-in-class SCM agent FDA approved in September 2023 for autologous transplantation in MM patients

Estimated **$300 million** [1] **US SCM market** (>$500 million globally)

Projected **peak sales of ~$150 million**

Focused and efficient team (~80 people) combines many decades of **end-to-end expertise** in drug development and commercialization

Multiple opportunities for **further value creation** in gene and anti-tumor therapy, autologous and allogenic HSCT, and cytopenia management

1. Internal Analysis and Independent ZS Primary Market Research Feb 2022; 2. Internal Analysis

Pipeline focused on maximizing motixafortide therapeutic potential

*Investigator Initiated Study

Studies in Planning

APHEXDA® in Stem Cell Mobilization

Stem Cell Mobilization

Vision & Opportunity

APHEXDA® is best-in-class stem cell mobilization agent

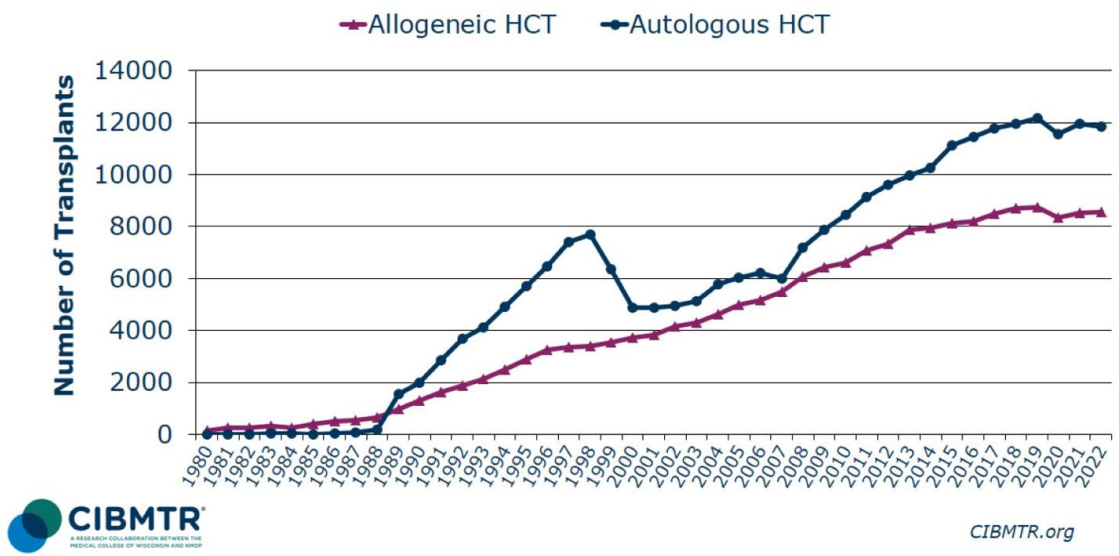
Initial indication for mobilization of stem cells for autologous transplantation in patients with multiple myeloma

Our commercially approved lead asset is a high affinity CXCR4 inhibitor with additional potential applications in stem cell mobilization for gene therapy, autologous and allogenic stem cell transplantation, and cytopenia management

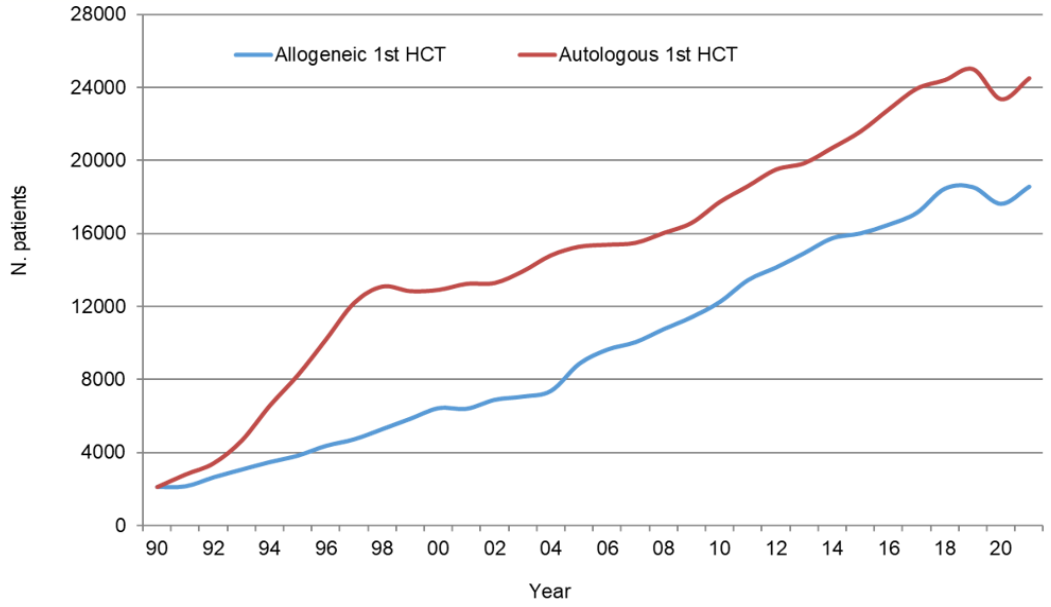
Stem cell transplants present a growing opportunity globally

Over 62,000 stem cell transplants performed in the U.S. and Europe and growing

US: ~20,000 HCTs[1]



Europe: ~42,000 HCTs[2]

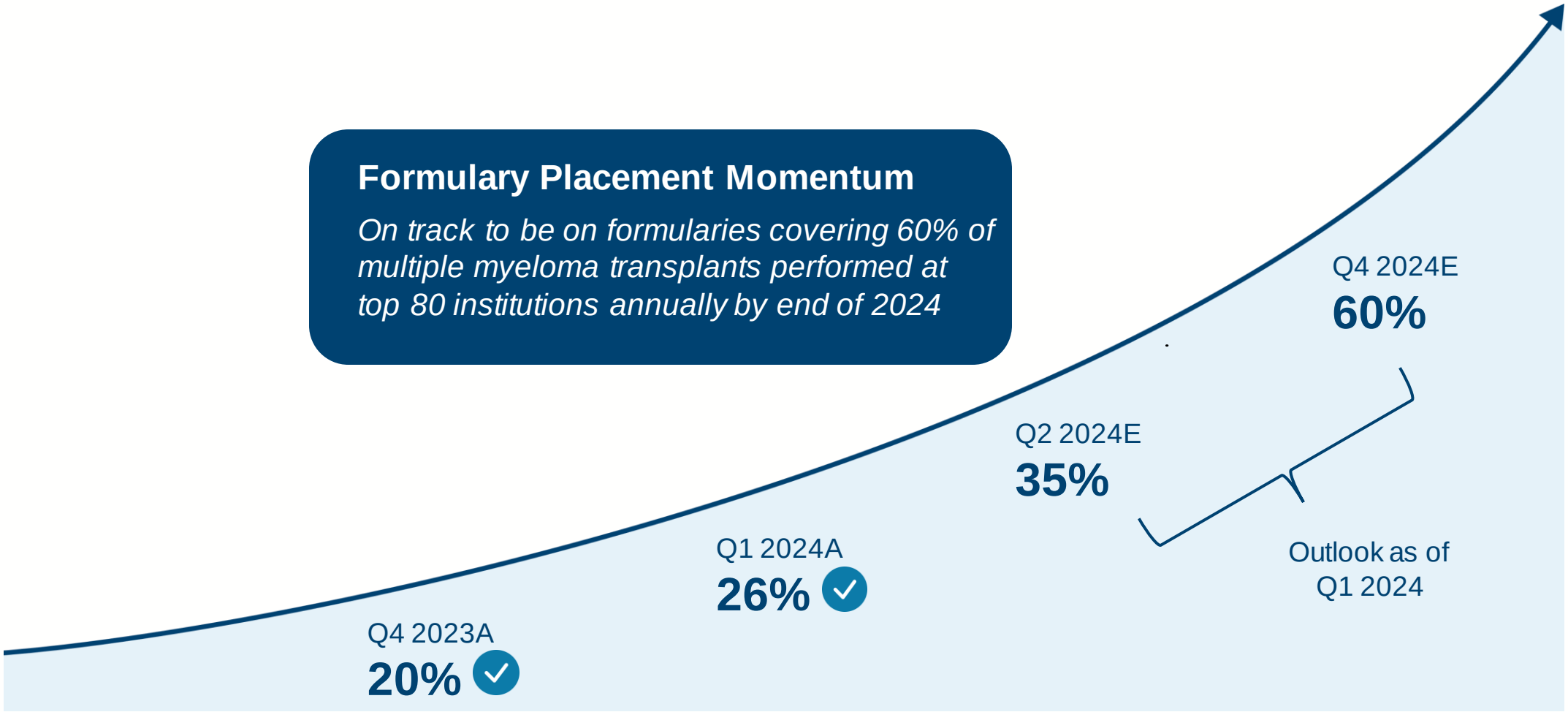


- In the U.S., 71% of all autologous transplants occur in patients with multiple myeloma[1]
- The number of multiple myeloma patients mobilized in the U.S. in 2024 is estimated at ~10,000[3]

1 CIMBTR 2022 Summary Slides (US); 2. EBMT Transplant Activity Survey 2019 Summary (EU); 3 Internal analysis

Positive momentum growing APHEXDA® user base in well-defined transplant market

Top 80 of 212 U.S. transplant centers perform ~85% of stem cell transplant procedures[1]



1 Internal analysis

Current clinical trials in stem cell mobilization to support growth

Focus Areas	Disease Area	U.S. Market Opportunity	U.S. Development Status	ROW Development Status
Autologous Transplantation	Multiple Myeloma	~10,000 per year (patients mobilized)	☑ Approved in U.S.	**Bridging study in China initiated 2H 2024**
HSC Cell/Gene Therapy	Sickle Cell Disease	~16,000 total addressable patient population	**Investigator initiated trials at top centers enrolling**	

Stem Cell Mobilization

Value Proposition in Multiple Myeloma

Significant unmet need and opportunity in multiple myeloma (MM)

MM is the **second most common** hematologic malignancy[1] and autologous stem cell transplantation (ASCT) is integral to the prospect of improving survival and helping to restore the immune system

Roughly **35,000 patients**[2] are diagnosed with MM annually, and of those, an estimated **18,000 patients**[2] are eligible for an ASCT in the US.

The number of ASCTs (~8,000 transplants, ~10,000 mobilized) in MM have nearly **doubled since 2010**[3]

Mobilization and collection is a **growing challenge** in the treatment of MM patients

Older patients (>60 years old)[4,5]

3- and 4-drug induction therapy[6,7]

Up to **47%** of patients have had challenges collecting target numbers of stem cells within 1 apheresis session depending on induction regimens and mobilization strategies[8,9]

Multiple apheresis sessions can lead to:

More adverse events

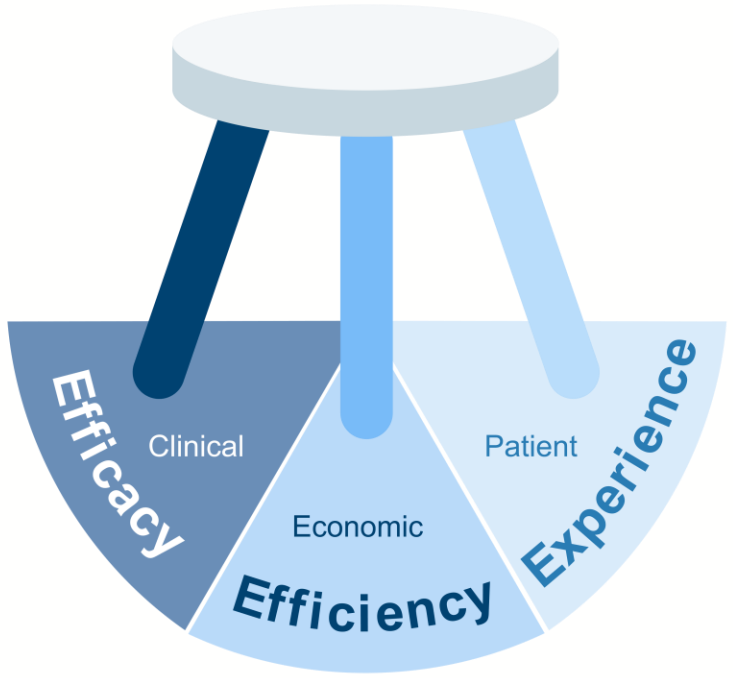
Higher costs

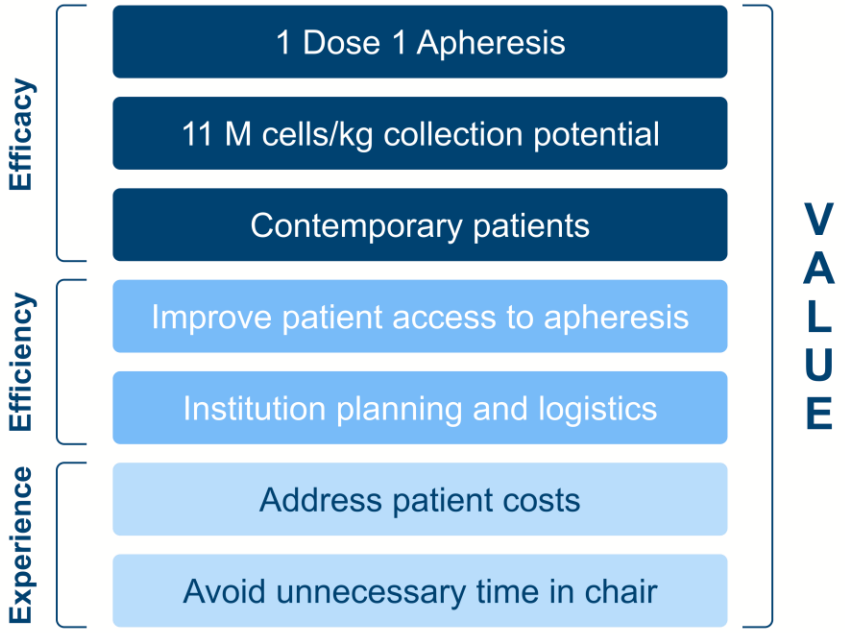
Inconvenience for patients and transplant center administrators[10]

1. Anderson, K.C. (2011). Multiple Myeloma: A Clinical Overview. *Oncology,* 25(12); 2. National Cancer Institute. Cancer Stat Facts: Myeloma. Bethesda, MD. Accessed August 22, 2023.;3. CIMBTR; 4 Giralt S, et al. *Biol Blood Marrow Transplant.* 2014;20(3):295-308. doi:10.1016/j.bbmt.2013.10.013; 5 Hagen PA, Stiff P. *Biol Blood Marrow Transplant.* 2019;25(3):e98-e107. doi:10.1016/j.bbmt.2018.12.002; 6 Hulin C, et al. *Haematologica.* 2021;106(8):2257-2260. doi:10.3324/haematol.2020.261842; 7 Chhabra S, et al.*Transplant Cell Ther*. 2023;29(3):174.e1-174.e10. doi:10.1016/j.jtct.2022.11.029; 8 Edmisson J, et al. Poster presented at: 64th American Society of Hematology Annual Meeting and Exposition; December 10-13, 2022; New Orleans, LA.; 9. DiPersio JF, et al. Blood. 2009; 113(23):5720-6; 10. Shaughnessy P, et al. Biol Blood Marrow Transplant. 2013;19(9):1301-1309.

APHEXDA® value proposition – a three-legged stool

High value option for stem cell mobilization

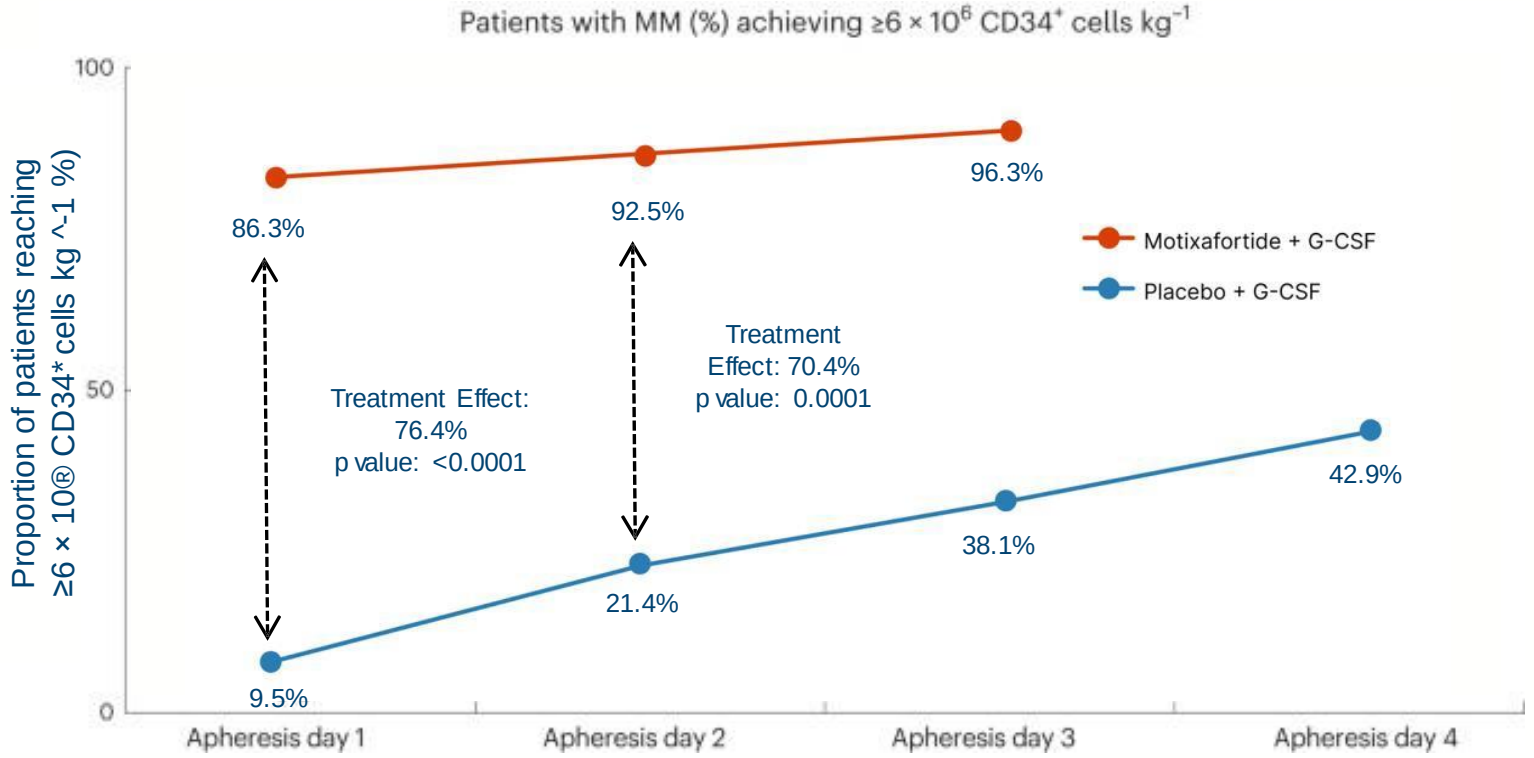




GENESIS Phase 3 clinical trial efficacy results

- Majority of patients successfully collected **target goal of ≥ 6 million stem cells** after only 1 dose[1]
- Trial included **patients representative of current multiple myeloma population** undergoing autologous HSCT[2]
- Motixafortide plus G-CSF had a **favorable safety-profile and was generally well tolerated**[1]

GENESIS Results: Local lab data were used for clinical treatment decisions



1. Data on file; 2. Crees, Z.D., et al., (2023). Motixafortide and G-CSF to Mobilize Hematopoietic Stem Cells for Autologous Transplantation in Multiple Myeloma..

Potential to increase transplant center patient throughput

Recent studies highlight benefits of APHEXDA® on transplant center efficiency and economics

Switching to G-CSF plus APHEXDA could increase apheresis center capacity

(based on institutions performing 20 transplants per month)[1]

+52 patient days/month

VS. G-CSF alone

+12.3 patient days/month

VS. G-CSF + plerixafor

Switching to G-CSF plus APHEXDA may confer a similar or better overall financial impact [2]

For every 100 patients, those in the **G-CSF + plerixafor** cohort **required additional costs* of +$119,274 due to added apheresis days**, compared to additional costs* of +$76,446 for patients who received G-CSF + APHEXDA

**inclusive of drug costs*

"Relying on drug cost alone when determining therapy choice may inadvertently result in unintended opportunity cost"

1. Waller, E., Enhancing Apheresis Center Efficiency with CXCR4 Antagonists: Evidence from the Phase 3 Trials, the American Society for Apheresis (ASFA), 2024; 2. Skaar, J., The Institutional Level Impact of Additional Apheresis Days for Multiple Myeloma Patients Undergoing Autologous Stem Cell Transplantation on Costs and Healthcare Resource Utilization, the International Society for Pharmacoeconomics and Outcomes Research (ISPOR), 2024

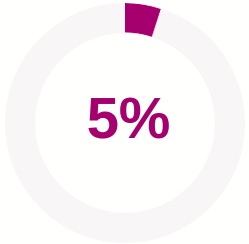
Stem Cell Mobilization

Life-Cycle Management

Sickle Cell Disease

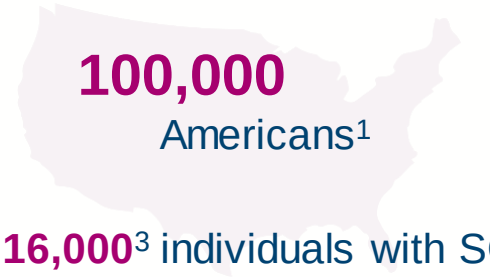
Significant unmet need and opportunity in sickle cell disease (SCD)

SCD is one of the most common inherited genetic disorders globally,[1] and approximately



of the world's population carries trait genes for hemoglobin disorders (including SCD)[2]

SCD affects approximately



100,000
Americans[1]

Greater than **16,000**[3] individuals with SCD may be supported by gene therapy

Effective HSC-based gene therapies depend upon the collection of **significant quantities of stem cells** to engineer the treatments that enable the potential genetic reversal of SCD

Common mobilization agent G-CSF is contraindicated in SCD and therefore there is a **need for non-GCSF mobilization regimens that reliably yield optimal numbers of HSCs** for gene therapy

1. ASH – Sickle Cell Disease; 2. Africa Health Organization Fact Sheet; 3. Internal analysis

Large CD34+ HSC collection targets can add to patient burden, create delays, and risk participation

LYFGENIA[1]

15 million CD34+ cells/kg for manufacturing

1.5 million additional CD34+ cells/kg for backup

CASGEVY[2]

20 million CD34+ cells/kg for manufacturing

2 million additional CD34+ cells/kg for backup

Potential to Improve Patient Experience

- Mobilization cycles include **2-to-3 days of apheresis sessions**
- Additional **mobilization cycles**, when needed, must be **separated by at least 14 days**
- In the CASGEVY registration trial, the number of **apheresis cycles** required for manufacturing and backup **ranged from 1-to-6** with a median of 2
- In the CASGEVY registration trial, **10% of patients were unable to collect the minimum cells required**

"Mobilization is critical to the initiation of the gene therapy treatment process. There is high unmet need."

***U.S.* KOL transplanter**

1. LYFGENIA prescribing information December 2023; 2. CASGEVY prescribing information December 2023.

Phase 1 studies evaluating HSC mobilization in SCD patients

Two investigator-initiated studies (IIS) enrolling with leading experts in both gene therapy and stem cell mobilization

Washington University in St. Louis

- BioLineRx and Washington University School of Medicine are **advancing a Phase 1 clinical trial** evaluating the safety and feasibility of motixafortide as monotherapy and in combination with natalizumab (VLA-4 inhibitor) to mobilize HSCs for gene therapies in patients with SCD
- First patient dosed December 2023; data anticipated 2H of 2024

St. Jude Children's Research Hospital®

- BioLineRx and St. Jude Children's Research Hospital are **advancing a Phase 1 clinical trial** that will evaluate the safety, tolerability, and feasibility of single-agent motixafortide for the mobilization of HSCs for gene therapies in patients with SCD
- First patient dosed anticipated September 2024

Motixafortide as Anti-Tumor Therapy

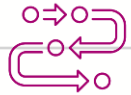
Pancreatic Cancer

Significant motixafortide + PD-1 + SOC chemotherapy opportunity in pancreatic cancer (PDAC)

Pancreatic cancer (PDAC) is associated with **poor patient outcomes** because efficacious therapies do not yet exist

PDAC has the highest mortality rate among solid tumor malignancies, and globally, nearly a **half million** people were diagnosed in 2020 alone[1]

PD-1 inhibitors have demonstrated significant efficacy in multiple solid tumor types, but **no survival benefit** in a large randomized PDAC trial comparing combination immunotherapy and standard-of-care chemotherapy vs standard-of-care chemotherapy alone[2-4]



Motixafortide prevents tumor secreted CXCL12 from binding to T-cells enabling their penetration into tumors, while also reducing recruitment of immunosuppressive cells. **Combining motixafortide with chemotherapy**, which induces tumor death and activation and expansion of new tumor-reactive T-cells, **and PD-1 inhibitors**, which maintain and restore activity of T-cells within tumors, **could increase therapeutic potential** [5]

A **Phase 2 trial** in second-line patients **with motixafortide + PD-1 inhibitor + SOC chemotherapy** demonstrated **proof of mechanism** and improvements across all study endpoints compared to the most appropriate historical control**, and triggered Phase 2b trials enrolling patients** with first-line disease[6-9]

1. Cancer Net – Pancreatic Cancer Statistics; 2. O'Reilly, EM JAMA Oncol. 2019; 3 Wainberg ZA Clin. Cancer Res. 2020; 4 Renauf DJ Nat Commun. 2022; 5. Chen, D. et al. Immunity Review 2013; 6. Mortezaee, 2020; Sleightholm et al 2017; 7 Petrelli et al Eu J Cancer 2017; [8] Onivyde SMPC; [9] Wang Gillam Eu J cancer 2019

Chemo4MetPanc randomized Phase 2b clinical trial in first-line PDAC

IIS currently enrolling, equally funded by Regeneron and BioLineRx

Randomized Trial Recruiting

Primary Endpoint
median PFS

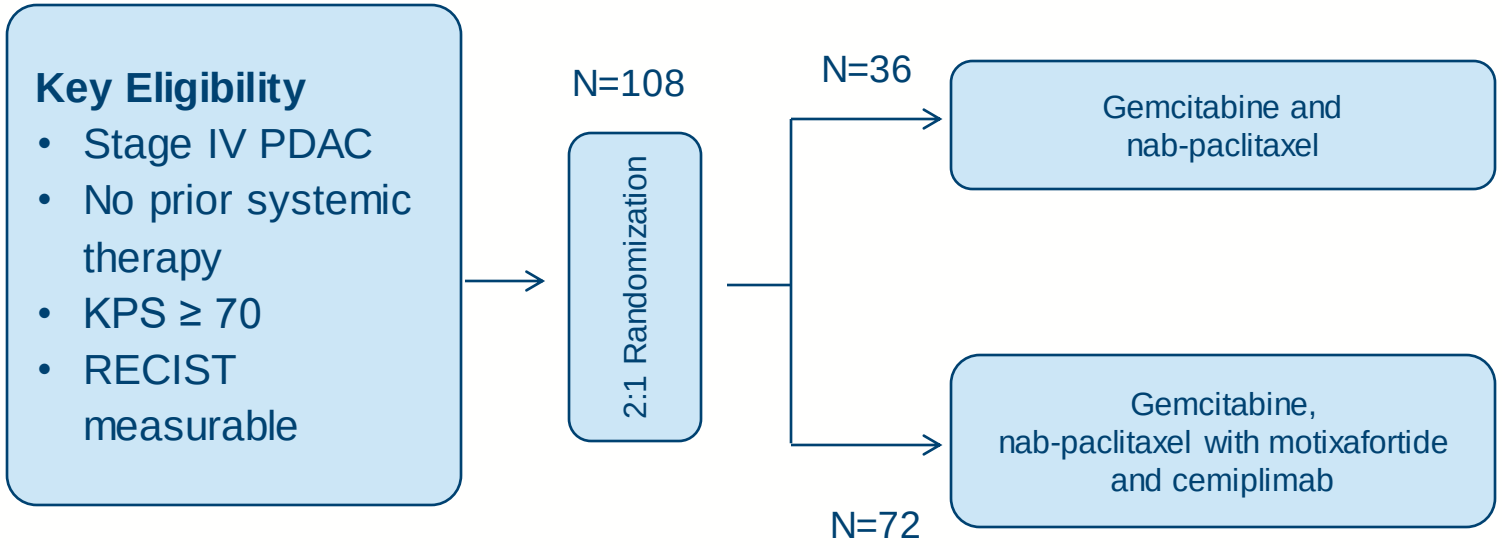
Secondary Endpoints
OS, RR

Correlates
mIF, snRNAseq, cytokine

Trial Sites

- Columbia University (PI Dr. Manji)
- Brown University
- University of California - San Francisco
- Medical College of Wisconsin
- Northwell Health

Study Design



*Key Milestones**

- Pilot phase (promising findings reported at AACR Pancreas 2023)
- Prespecified interim futility analysis (when 40% of PFS events observed)
- Full enrollment projected in 2027

*Independent Investigator Study (IIS) timelines, as well as other study related decisions, are ultimately controlled by the independent investigator-sponsor and are, therefore, subject to change.

Chemo4MetPanc Phase 2b clinical trial pilot phase data

Encouraging early findings presented at AACR

American Association for Cancer Research®
FINDING CURES TOGETHER®

Gemcitabine, nab-paclitaxel, motixafortide and cemiplimab resulted in **Overall Response Rate (PR) 64%**
Disease Control Rate (DCR) 91%
Median PFS 9.6 months

One patient experienced **resolution of hepatic (liver) metastatic** lesion as of July 20, 2023

The combination demonstrated a **tolerable safety profile**

No unexpected Grade 4 or 5 treatment related adverse events

Compares favorably to historical PR (23%) and DCR (48%) with gemcitabine and nab-paclitaxel alone

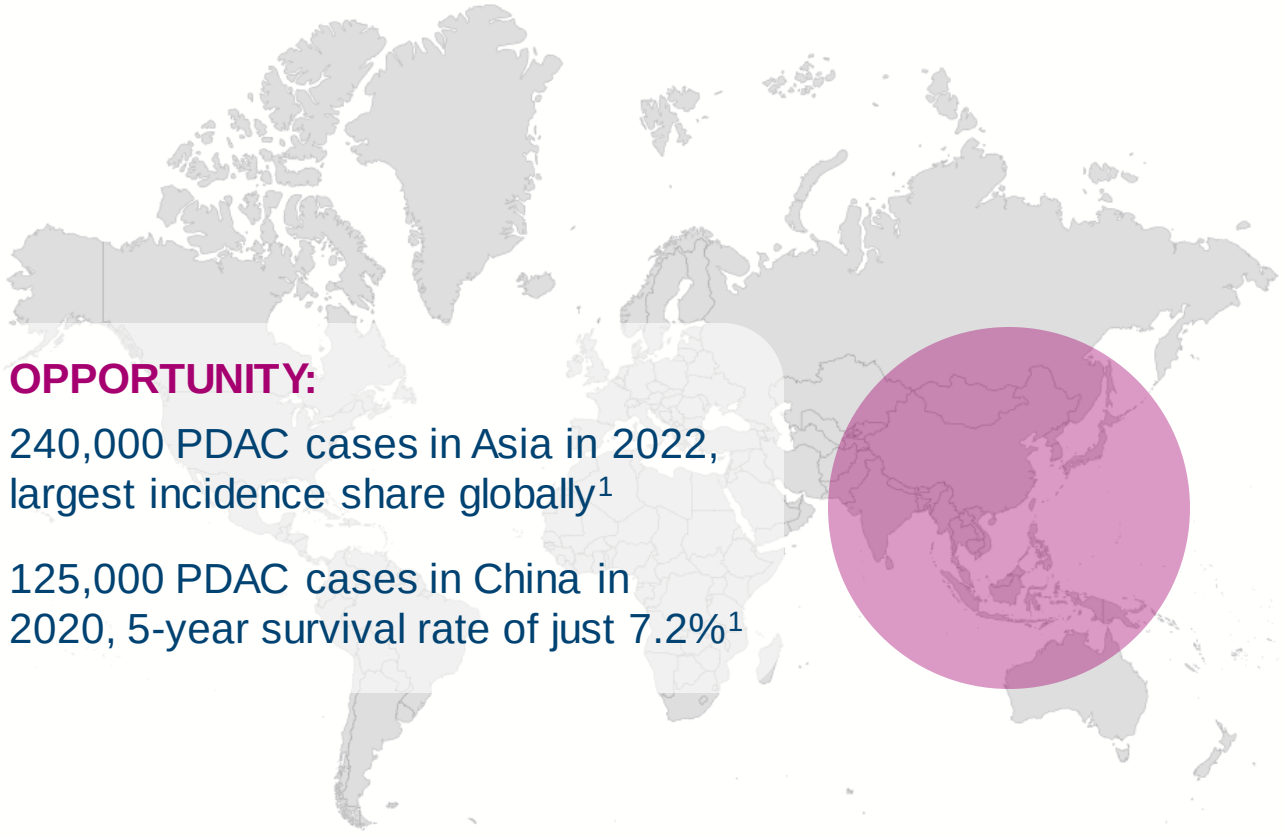
Correlative analysis on paired tumor biopsies on all patients are ongoing

Manji, GA AACR Pancreatic Cancer 2023 (Censor Date – July 20, 2023)

Additional randomized study in first-line PDAC in China

- Asian rights to motixafortide licensed to GloriaBio in Oct 2023. Upfront payment of $15M; up to ~$50M in potential development and regulatory milestones; up to ~$200M in potential commercial milestones; and tiered royalties of 10-20%

- GloriaBio will execute an additional randomized first-line PDAC trial in China evaluating motixafortide in combination with PD-1 inhibitor *zimberelimab and standard of care combination chemotherapy



OPPORTUNITY:

240,000 PDAC cases in Asia in 2022, largest incidence share globally[1]

125,000 PDAC cases in China in 2020, 5-year survival rate of just 7.2%[1]

1. Datamonitor Healthcare; the National Central Cancer Registry of China (NCCR); United Nations, 2022; China CDC Weekly, 2022, 4(24): 527-531

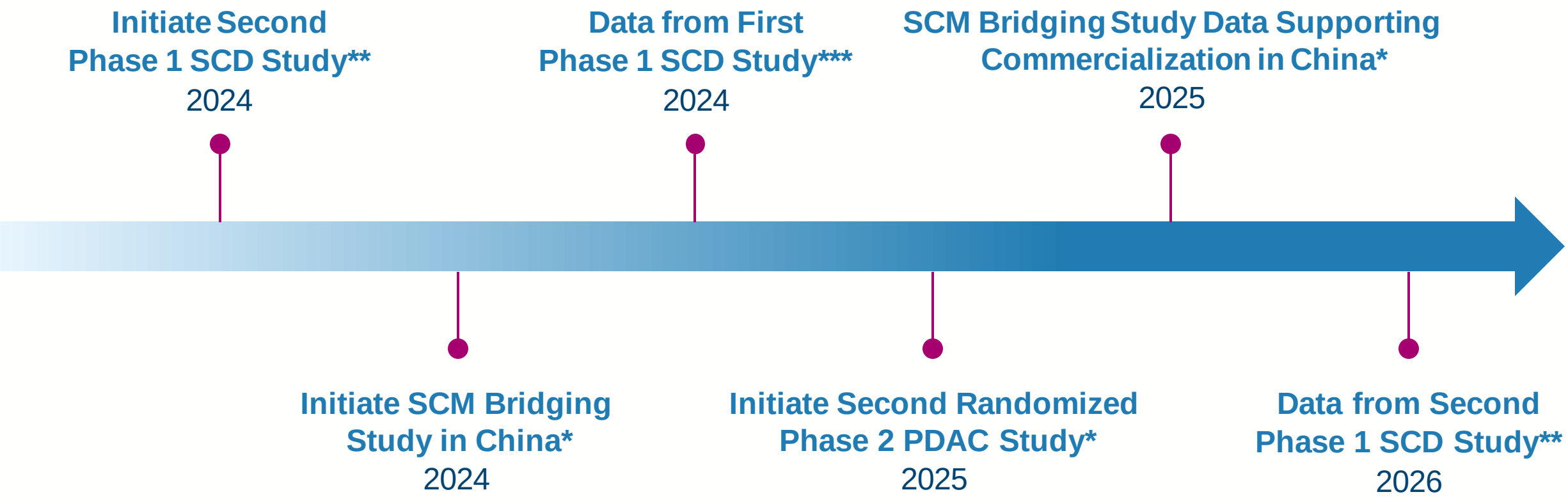
*Gilead Sciences and Arcus Biosciences have the exclusive rights to develop and commercialize zimberelimab throughout the world except in Greater China and certain territories

Summary and Upcoming Milestones

Focused vision for growth

- Maximize value of APHEXDA® in stem cell mobilization
  - Projected peak sales of **~$150 million**
- Leverage US commercial infrastructure with potential additional transplant assets
- Continued development of motixafortide in combination with PD-1 inhibitors in pancreatic cancer
- Broaden pipeline via in-licensing of selected assets

Expected major pipeline milestones over next 18 months



*Clinical development with GloriaBio
**IIS with St. Jude
***IIS with Wash U. in St. Louis

Independent Investigator Study (IIS) timelines: IIS timelines, as well as other study related decisions, are ultimately controlled by the independent investigator-sponsor and are, therefore, subject to change.

Thank You