Poseida Therapeutics Presents Positive Early Results from its Phase 1 Trial of Allogeneic CAR-T P-BCMA-ALLO1 in Relapsed-Refractory Multiple Myeloma at the 65th American Society of Hematology (ASH) Annual Meeting

82% ORR and deep clinical responses from off-the-shelf, allogeneic BCMA-targeted CAR-T in heavily pretreated patients receiving adequate lymphodepletion

100% ORR in these patients who were not previously treated with a BCMA-targeted bispecific T cell-engaging antibody

Favorable emerging safety and reliability profile, with all (100%) intent-to-treat (ITT) patients receiving therapy, no GvHD or dose-limiting toxicities and low incidences of CRS and neurotoxicity observed (all ≤ Grade 2)

Preliminary data show allogeneic T_{SCM}-rich CAR-T cells trafficking to bone marrow, differentiating to cell-killing effector T cells and persisting at least 6 weeks

Two additional poster presentations highlight advancements across the Company's cell and gene therapy programs and platforms

Company to host webcast and conference call today at 11:00 AM PST

SAN DIEGO, Dec. 10, 2023 /PRNewswire/ -- Poseida Therapeutics, Inc. (Nasdaq: PSTX), a clinical-stage cell and gene therapy company advancing a new class of treatments for patients with cancer and rare diseases, today announced early efficacy and safety results from its Phase 1 study of P-BCMA-ALLO1, its BCMA-targeted allogeneic, T stem cell memory (T_{SCM})-rich chimeric antigen receptor (CAR)-T therapy candidate. The Company is investigating P-BCMA-ALLO1 in partnership with Roche for the treatment of relapsed/refractory multiple myeloma (RRMM). Detailed study findings, along with two additional Company poster presentations in cell and gene therapy, are being featured at the 65th ASH Annual Meeting and Exposition being held in San Diego on December 9-12, 2023.

"Today, far too many patients are unable to benefit from autologous CAR-T therapy due to its limited supply, lengthy timelines, complex logistics, and cost," said Kristin Yarema, Ph.D., President, Cell Therapy at Poseida. "We have long believed that readily produced, off-the-shelf allogeneic, T_{SCM}-rich CAR-T products have the potential to offer a compelling efficacy and safety profile while also supporting patient access. T_{SCM}-rich CAR-T products can be difficult to produce with older virus-based technology, but we are able to create a portfolio of such products using Poseida's unique, non-viral set of technologies. We see these early P-BCMA-ALLO1 results in multiple myeloma, in which all enrolled patients received CAR-T therapy and most patients receiving adequate lymphodepletion achieved a stringent complete response (sCR) or very good partial response (VGPR), as validating our vision and eagerly await additional data yet to come from this study. This is also the first known publicly presented data set that provides clear clinical evidence supporting the hypothesis that T_{SCM} cells are the ideal cell type for allogeneic CAR-T, extending our previous findings with autologous T_{SCM} cells to the allogeneic setting. We hope that T_{SCM}-rich allogeneic CAR-T therapies may potentially offer the optimal combination of clinical results, on-demand availability and high-volume production, while supporting broader access to CAR-T therapies. We are excited to have taken this first step with our early P-BCMA-ALLO1 clinical results. They inspire us to further develop P-BCMA-ALLO1 in partnership with Roche, and to continue advancing our entire allogeneic T_{SCM} cell-based CAR-T portfolio."

P-BCMA-ALLO1 program data presentations

At the time of the October 23, 2023 data cut off, 39 patients were enrolled as an intent-to-treat (ITT) population in the ongoing Phase 1 multicenter, open-label dose-escalation study (NCT04960579). Enrolled patients had previously failed protease inhibitor, immunomodulatory drug (IMiD), and anti-CD38 antibody treatments or were otherwise triple-refractory. Previous treatment with B cell maturation antigen (BCMA)-targeted therapy was allowed including autologous BCMA CAR-T and bispecific T cell-engaging (TCE) antibodies. All enrolled patients completed lymphodepletion and went on to receive P-BCMA-ALLO1 a median of 7 days after enrollment for a 100% ITT treatment rate with no use of bridging therapy. Six patient cohorts varying in size (n=1 to n=6) received one of three fludarabine/cyclophosphamide (flu/cy) lymphodepleting conditioning regimens including 3 days of fludarabine at 30 mg/m^2/day for all patients and, depending upon the patient cohort, 3 days of cyclophosphamide at 300, 500, or 1,000 mg/m^2/day followed by infusion of P-BCMA-ALLO1 cells at cell doses varying by cohort up to 6x10^6 cells/kg to date.

Evaluable patients with at least 4 weeks of follow up (n=33) were heavily pretreated with a median of 7 prior lines of therapy. Additionally, 30% of these patients had high risk disease by cytogenetics and nearly 2 in 5 (39%) had received previous BCMA-targeted therapy. 11 of the 33 evaluable patients were in the two cohorts receiving 2x10^6 cells/kg of P-BCMA-ALLO1 and higher cyclophosphamide preconditioning doses at either 500 mg/m^2 ('P1 arm'; n=5) or 1,000 mg/m^2 ('P2 arm'; n=6).

An overall objective response rate (ORR) of 82% (9/11 total patients) was reached among patients in the pooled P1 and P2 arms. ORR in the P2 arm was 83% (5/6) with 100% (5/5) of the responding P2 patients achieving a VGPR or better and 40% (2/5) achieving sCR. 80% ORR was obtained in the P1 arm (4/5) with 50% of responding patients achieving VGPR. Both nonresponding patients, one in each of the P1 and P2 arms, had received and not achieved clinical response with the BCMAxCD3 bispecific TCE antibody therapy teclistamab prior to receiving P-BCMA-ALLO1.

A 100% ORR (9/9) was achieved among patients in P1 and P2 arms who had not received a prior BCMA-targeting bispecific TCE antibody as well as 100% ORR (2/2) in patients who had received prior autologous CAR-T BCMA targeted therapy.

P-BCMA-ALLO1 was very well tolerated, with no graft-vs-host disease (GvHD) at any dose and low rates of cytokine release syndrome (CRS) and neurotoxicity, all Grade 2 or less, found among all evaluable patients.

Expansion and persistence of the CAR-T cells in patients after infusion was found to be highly dependent upon the conditioning dose of

cyclophosphamide, with P-BCMA-ALLO1 levels measured in the blood much higher in patient cohorts in the P1 and P2 arms receiving the 500 mg/m^2 and 1,000 mg/m^2 conditioning doses than in any of the 300 mg/m^2 (arm 'S', n=20) cohorts. Clinical responses in patients receiving arm S conditioning treatment were inferior to those achieved by patients in P1 or P2.

Analysis of P-BCMA-ALLO1 cellular kinetics in two patients with high CAR-T expansion showed CAR-T cells persisted and were measurable in the peripheral blood of one patient for at least 4 weeks and engrafted and persisted at a high level in the bone marrow of the other for at least 6 weeks. Moreover, in both cases cells in the T_{SCM}-rich CAR-T infused drug product underwent differentiation after infusion to generate a much more effector T cell-rich population, particularly among the important CD8+ 'killer T cell' subpopulation. These findings are the first known direct clinical evidence supporting the theory that allogeneic T_{SCM}-based CAR-T cells can act as effective prodrugs because they can expand, traffic to the relevant tissues, differentiate into effector cells and persist, all of which may contribute to driving deep clinical responses in patients while also being well-tolerated.

"Despite the emergence of autologous BCMA-targeted therapies, multiple myeloma remains an incurable malignancy. Autologous CAR-T therapies may be associated with numerous challenges for patients and physicians, including prolonged manufacturing times, inconsistent drug quality and serious safety issues," said Bhagirathbhai Dholaria, M.D., Associate Professor of Medicine (Hematology/Oncology) at the Vanderbilt-Ingram Cancer Center. "Allogeneic CAR-T therapies have the potential to overcome many of these challenges. Today's data demonstrate that P-BCMA-ALLO1 is a well-tolerated off-the-shelf therapy with a favorable emerging safety profile and encouraging evidence of early clinical activity. In addition, the data show that P-BCMA-ALLO1 can achieve deep clinical responses in patients with high-risk disease and those who have previously received BCMA targeting therapies. Importantly, P-BCMA-ALLO1 was delivered to all patients in the ITT population with all drug product meeting all quality specifications. We look forward to continuing to enroll patients in this study."

Enrollment is ongoing including additional exploration of dose regimens and lymphodepleting conditioning regimens. While still early to assess durability, at the time of the data cut off 8 of the 9 responding patients in P1 and P2 arms remained in response. The Company, together with Roche, plans to present additional clinical data updates for P-BCMA-ALLO1 at scientific meetings in 2024, subject to coordination with Roche.

A second Poseida-sponsored poster highlights the development of an in vivo bioassay for assessing BCMA CAR-T final product potency and presents data suggesting P-BCMA-ALLO1 drug product may have greater potency than drug products produced in the Company's earlier, autologous P-BCMA-101 CAR-T program.

P-FVIII-101 program data presentation

The Company has also presented a third poster describing P-FVIII-101, a fully non-viral liver-directed gene therapy combining Poseida's proprietary piggyBac® DNA Delivery System with nanoparticle delivery for the treatment of Hemophilia A. This poster demonstrates the capabilities of the piggyBac DNA insertion system and non-viral approach in providing stable Factor VIII (FVIII) transgene expression through genomic integration, along with the potential for redosing. The poster highlights 52-week durability in an adult Hemophilia A model along with a favorable tolerability profile of Poseida's liver-targeted non-viral delivery platform providing further proof-of-principle toward developing an effective and durable treatment for Hemophilia A.

Company-Hosted Webcast and Conference Call Information:

Poseida will host a webcast and conference call today, December 10th at 11:00 AM PST / 2:00 PM EST. The conference call can be accessed by dialing 800-225-9448 (United States) or 203-518-9708 (International) with the conference ID PSTX23. A live webcast may be accessed using the link here, or by visiting the Events and Presentations section of the Poseida website at investors.poseida.com. After the live webcast, the event will remain archived on the Poseida site for 90 days.

Poster Presentation Details:

Title: *Early Safety Results of P-BCMA-ALLO1, a Fully Allogeneic Chimeric Antigen Receptor T-Cell (CAR-T), in Patients with Relapsed/Refractory Multiple Myeloma (RRMM)*

- **Presenting Author:** Bhagirathbhai Dholaria, M.D., Associate Professor of Medicine (Hematology/Oncology) at the Vanderbilt-Ingram Cancer Center
- **Session Date & Time:** Sunday, December 10, 2023, at 6:00 – 8:00 PM PT
- **Publication Number:** 3479
- **Session Title:** 704. Cellular Immunotherapies: Early Phase and Investigational Therapies: Poster II
- **Location:** Halls G-H

Title: *A Tumor-Bearing Murine Xenograft Model as a Bioassay for Assessing CAR-T Product Potency Shows Positive Predictive Value for Clinical Performance*

- **Presenting Author:** Stacey Cranert, Ph.D., Poseida Therapeutics
- **Session Date & Time:** Saturday, December 9, 2023, at 5:30 – 7:30 PM PT
- **Publication Number:** 2293
- **Session Title:** 803. Emerging Tools, Techniques and Artificial Intelligence in Hematology: Poster I
- **Location:** Halls G-H

Title: *Effective Gene Therapy for Hemophilia A: Novel Re-Dosable Non-Viral Formulation That Provides Stable, and Durable FVIII Expression with Improved Tolerability*

- **Presenting Author:** Brian Truong, Ph.D., Poseida Therapeutics
- **Session Date & Time:** Saturday, December 9, 2023, at 5:30 – 7:30 PM PT
- **Publication Number:** 1232
- **Session Title:** 321. Coagulation and Fibrinolysis: Basic and Translational: Poster I
- **Location:** Halls G-H

About P-BCMA-ALLO1

P-BCMA-ALLO1 is an allogeneic CAR-T product candidate licensed to Roche targeting B-cell maturation antigen (BCMA) for the treatment of relapsed/refractory multiple myeloma in Phase 1 development. This allogeneic program includes a V_H-based binder that targets BCMA and has shown early evidence of encouraging safety and efficacy. Additional information about the Phase 1 study is available at www.clinicaltrials.gov using identifier: NCT04960579.

About P-FVIII-101

P-FVIII-101 is a liver-directed gene therapy combining Poseida's non-viral piggyBac platform and nanoparticle delivery technologies for the in vivo treatment of Hemophilia A. Hemophilia A is a bleeding disorder caused by a deficiency in Factor VIII production with a high unmet need. P-FVIII-101 utilizes the piggyBac gene integration system delivered via lipid nanoparticle, which has demonstrated stable and sustained Factor VIII expression in juvenile and adult animal models.

About Poseida Therapeutics, Inc.

Poseida Therapeutics is a clinical-stage biopharmaceutical company advancing differentiated cell and gene therapies with the capacity to cure certain cancers and rare diseases. The Company's pipeline includes allogeneic CAR-T cell therapy product candidates for both solid and liquid tumors as well as in vivo gene therapy product candidates that address patient populations with high unmet medical need. The Company's approach to cell and gene therapies is based on its proprietary genetic editing platforms, including its non-viral piggyBac® DNA Delivery System, Cas-CLOVER™ Site-Specific Gene Editing System, and nanoparticle and hybrid gene delivery technologies as well as in-house GMP cell therapy manufacturing. The Company has formed a global strategic collaboration with Roche to unlock the promise of cell therapies for patients with hematological malignancies. Learn more at www.poseida.com and connect with us on X and LinkedIn.

Forward-Looking Statements

Statements contained in this press release regarding matters that are not historical facts are "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward-looking statements include statements regarding, among other things, expected plans with respect to clinical trials, including timing of regulatory submissions and approvals and clinical data updates; anticipated timelines and milestones with respect to the Company's development programs and manufacturing activities and capabilities; the potential capabilities and benefits of the Company's technology platforms and product candidates, including the efficacy and safety profile of such product candidates; the quotes from Dr. Yarema and Dr. Dholaria; and the Company's plans and strategy with respect to developing its technologies and product candidates. Because such statements are subject to risks and uncertainties, actual results may differ materially from those expressed or implied by such forward-looking statements. These forward-looking statements are based upon the Company's current expectations and involve assumptions that may never materialize or may prove to be incorrect. Actual results could differ materially from those anticipated in such forward-looking statements as a result of various risks and uncertainties, which include, without limitation, the Company's reliance on third parties for various aspects of its business; risks and uncertainties associated with development and regulatory approval of novel product candidates in the biopharmaceutical industry; the Company's ability to retain key scientific or management personnel; and the other risks described in the Company's filings with the Securities and Exchange Commission. All forward-looking statements contained in this press release speak only as of the date on which they were made. The Company undertakes no obligation to update such statements to reflect events that occur or circumstances that exist after the date on which they were made, except as required by law.

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