Poseida Therapeutics Presents High-Fidelity Genome Editing System for Production of Allogeneic "Universal Donor" CAR-T Cells at ASCO

SAN DIEGO, June 5, 2017 -- Poseida Therapeutics, Inc. ("Poseida"), a San Diego-based company translating best-in-class gene editing technologies into lifesaving therapeutics, today announced preclinical data demonstrating the use of the company's proprietary high-fidelity genome editing system, NextGEN™ CRISPR, for production of allogeneic "universal donor" chimeric antigen receptor T-cells (CAR-T). In a study presented today at the American Society of Clinical Oncology (ASCO) 2017 Annual Meeting, the world's premier oncology event, researchers at Poseida used its proprietary gene editing tools to create a universal donor CAR-T cell therapy that circumvents rejection by the body and avoids premature CAR-T cell exhaustion – two key challenges that have hindered the development of an "off the shelf" CAR-T cell therapy.

"CAR-T cell therapies have proven to be a powerful weapon for the treatment of cancer, however currently available products require the extraction, modification, purification and re-administration of a patient's own T-cells, which creates challenges with cost and time," said Eric Ostertag, M.D., Ph.D., chief executive officer of Poseida. "Development of universal donor CAR-T products can significantly reduce cost and can potentially be administered to any patient globally for the treatment of hematological and solid cancers."

Recent reports indicate that the first-generation CRISPR-Cas9 gene editing system can result in hundreds to thousands of unexpected mutations in engineered cells. In stark contrast, NextGEN™ CRISPR offers low-to-no unwanted mutations in the editing of resting human T cells for the production of allogeneic CAR-T cell products. High fidelity is achieved by the requirement of simultaneous and spatial binding of two half-site components that are critical for a productive editing event to occur. Allogeneic CAR-T cells generated with NextGEN™ CRISPR neither reacted to, nor were rejected by unmatched allo pan T cells, demonstrating the manufacture of a true allogeneic CAR-T product. In addition, gene-edited CAR-T cells were fully capable of killing tumor cells and exhibited a highly favorable stem-cell memory phenotype (TSCM), considered critical for durable control of possible cancer relapse in treated patients.

"Data presented by our group at this year's ASCO meeting demonstrate the utility of our NextGEN™ CRISPR technology for the safe and effective production of allogeneic CAR-T cells," added Dr. Ostertag. "This best-in-class gene-editing technology is combined with Poseida's non-viral gene delivery system, the piggyBac™ DNA Modification System, for the creation of our wholly-owned allogeneic CAR-T products."

Presentation Title: High-fidelity genome editing using NextGEN CRISPR (Clo51-dCas9) system for the production of allogeneic CAR-T cells
Abstract Number: 3048
Poster Board Number: 143
Date and Time: 8:00 a.m. - 11:30 a.m. EDT, Monday, June 5, 2017
Location: McCormick Place, Hall A

Key findings from the presentation include:

High efficiency: NextGEN™ CRISPR exhibited high-efficiency gene editing (up to 91%) of T-cell proteins mediating graft vs host (GvH) alloreactivity and host vs graft (HvG) rejection, as well as numerous receptors responsible for checkpoint inhibition and immune suppression.

High fidelity: Site-specific targeting by NextGEN™ CRISPR was highly restricted and required the simultaneous binding of both half-sites of two distinct guides within a specific distance at the gene target site.

Elimination of alloreactivity: Successful disruption of critical targets mediating the allo-response completely inhibited the alloreactivity of NextGEN™ CRISPR gene-edited T cells.

Potent functionality: Knock-out of critical alloreactivity proteins did not negatively affect the ability of CAR-T cells to kill tumor cells.

Significant T-cell memory: Greater than 80% of NextGEN™ CRISPR gene-edited CAR-T cells exhibited a favorable TSCM phenotype. This is a highly-desirable characteristic for CAR-T therapies due to the capability of self-renewing multipotent progenitors to reconstitute the entire spectrum of T cell subsets required to eliminate and control possible cancer relapse. Similar competitor products typically report 0-20% SCM composition.

The ASCO poster, titled "High Fidelity Genome Editing Using NextGEN™ CRISPR (Clo51-dCas9)

System for the Production of Allogeneic CAR-T Cells," is available on the publications page of Poseida's website at www.poseida.com/publications.

About Poseida Therapeutics, Inc.

Poseida Therapeutics is translating best-in-class gene editing technologies into lifesaving treatments. The company is developing CAR T-cell immunotherapies for multiple myeloma and other cancer types, as well as gene therapies for orphan diseases. Poseida has assembled a suite of industry-leading gene editing technologies, including the piggyBac™ DNA Modification System, XTN™ TALEN and NextGEN™ CRISPR site-specific nucleases, and Footprint-Free™ Gene Editing. For more information, visit www.poseida.com.