

TCR mimic CAR T cells targeting PRAME/HLA-A2

Business Opportunity

Exclusive license
Non-exclusive license
Sponsored research

Technology Type

Cell Therapy

State of Development

Preclinical in vivo

Patent Information

Provisional application
filed

Investigator

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Tech ID

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Brief Description

Chimeric antigen receptor (CAR) that bind Preferentially Expressed Antigen in Melanoma (PRAME) ALYVDSLFFL (ALY) / HLA-A*0201 (HLA-A2) to treat PRAME-expressing cancers.

Technology Overview

PRAME is aberrantly expressed in childhood and adult AML and is absent in normal hematopoietic cells, providing an ideal target for adoptive T cell therapy. Dr. Soheil Meshinchi at the Fred Hutch has developed CAR T cells targeting the PRAME antigen in AML (referred to as PRAME mTCRCAR T cells). This CAR includes a binding domain derived from the Pr20, and a TCR mimic antibody that recognize PRAME AYL epitope in complex with HLA-A2. These mTCRCAR T cells showed strong in vitro efficacy against HLA-A2 restricted AML cell lines expressing the PRAME antigen and primary AML patient samples. In vivo cell-derived xenograft models treated with PRAME mTCRCAR T cells demonstrated potent leukemia clearance and improved survival compared to unmodified T cell controls. Additionally, co-administering interferon gamma increased PRAME expression by cancer cells, which enhanced the cytolytic activity of PRAME mTCRCAR T cells. These results support the evaluation of PRAME mTCRCAR T cells in clinical trials for refractory/relapsed AML and in a variety of solid tumors

Applications

- Adoptive CAR T cell therapy to treat t(8;21) AML, Inv(16) AML, or KMT2A-r AML
- Treatment for PRAME expressing-cancers, such as breast cancer, sarcoma, or neuroblastoma

Advantages

- Novel CAR T cell therapy for pediatric and adult AML, which lack disease-specific surface protein target
- Targeting intracellular protein instead of lineage markers, such as CD33 and CD123, avoids the risk of long-lasting or even permanent myelosuppression

Market Overview

- In the US, there are more than 69,700 people living with AML; in 2023, there will be 20,380 new cases and 11,310 deaths.