



THERAPEUTIC, TOOL

CAR Design Improvements for the Recognition of Low-Density Antigens

Brief Technology Description

Methods and tools to increase CAR-T cell recognition of tumor cells expressing low density antigens

BUSINESS OPPORTUNITY

Exclusive licence
Non-exclusive license
Sponsored research

TECHNOLOGY TYPE

Therapeutic
Tool

STAGE OF DEVELOPMENT

Preclinical *in vitro*

PATENT INFORMATION

[Patent Pending](#)

INVESTIGATOR OVERVIEW

Stanley Riddell, MD
Clinical Research Division

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Tech ID: 19-138
partnering@fredhutch.org
206-667-4304

Technology Overview

Adoptive transfer of CAR-expressing T cells is an effective cancer therapy for a proportion of individuals with B cell malignancies and multiple myeloma, but efficacy is limited by relapses that stem from antigen downregulation or loss. In addition, CAR T cell therapy is also not as effective for solid tumors, where tumor-associated antigens are expressed heterogeneously and at lower levels than hematological malignancies. Thus, enhancing CAR T cell recognition of low-density tumor antigens may both improve initial anti-tumor efficacy and reduce the risk of relapse. Although CARs were designed to mimic T cell receptor (TCR) signaling, natural TCRs have 100-fold greater sensitivity for recognition of peptide major histocompatibility antigen complexes. Members of the Riddell lab reasoned that comparing TCR and CAR signaling events might guide rationale adaptations to CAR design that improve antigen sensitivity. They studied the similarities and differences between TCR and CAR recognition-induced signaling and identified key TCR signaling intermediates not activated by CAR stimulation. They show that the addition of key domains into existing CAR structures improves CAR-T cell recognition of tumor cells expressing low amounts of surface antigen.

Applications

- This platform technology can be incorporated into existing CAR structures to fine tune their activity against a range of antigens

Potential Advantages

- Increased efficacy of CAR-expressing T cell therapies, especially in disease states where efficacy is limited by downregulation or heterogeneous/low expression of tumor associated antigens.

Market Overview:

The global immuno-oncology market is valued at \$56 billion USD in 2018, and is projected to have a CAGR of 14.9% from 2018- 2026.