
Targeted off-the-shelf immunotherapy to treat refractory cancers

Grant Award Details

Targeted off-the-shelf immunotherapy to treat refractory cancers

Grant Type: Quest - Discovery Stage Research Projects

Grant Number: DISC2-09615

Project Objective: To use human induced pluripotent stem cells (iPSCs) to produce a novel targeted, "off-the-shelf" cellular immunology product that can be translated to clinical therapies to treat patients with relapsed/refractory cancers that do not currently have an effective treatment option.

Investigator:

Name:	Dan Kaufman
Institution:	University of California, San Diego
Type:	PI

Disease Focus: Blood Cancer, Cancer, Ovarian Cancer, Solid Tumors

Human Stem Cell Use: Embryonic Stem Cell, iPS Cell

Award Value: \$1,936,936

Status: Closed

Progress Reports

Reporting Period: Year 3 NCE

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Grant Application Details

Application Title: Targeted off-the-shelf immunotherapy to treat refractory cancers

Public Abstract:**Research Objective**

This project will use human pluripotent stem cells to produce a standardized, off-the-shelf immunotherapy using novel immune cells that are specifically targeted to cure otherwise lethal cancers.

Impact

Unlike current immunotherapies produced on a patient-specific basis, iPSC-derived immune cells are targeted to tumors with high specificity, no off-target effects and without need for patient matching

Major Proposed Activities

- Produce novel human iPSC-derived natural killer (NK) cells expressing a specifically designed receptor (CAR) to more effectively and efficiently target and kill human ovarian and other cancer cells.
- Engineer novel NK cell-specific CAR constructs with NK cell-specific intracellular signaling domains to enhance iPSC-NK cell activation upon recognition of ovarian cancer target cells.
- Optimize anti-leukemia activity of iPSC-derived NK cells using defined iPSC-NK cell populations with differing receptor profiles that target specific tumor profiles.
- Optimize iPSC-NK cell expansion using systems that can be rapidly translated into clinical cell production. This will ensure we efficiently produce enough targeted iPSC-NK cells for clinical trials

Statement of Benefit to California:

Cancer remains the second leading cause of death in California, the US and worldwide. Despite advances in many areas of cancer treatment including chemotherapy and even immunotherapy, outcomes for relapsed or refractory cancers remain dismal. Here, we will use human iPSCs as the basis to develop a novel targeted cell population that can serve as a universal cellular immunotherapy to better treat and cure cancers for potentially thousands of patients in California each year.

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