Platform Technology for Pluripotent Stem Cell-Derived T cell Immunotherapy

Grant Award Details

Platform Technology for Pluripotent Stem Cell-Derived T cell Immunotherapy

Grant Type: Quest - Discovery Stage Research Projects

Grant Number: DISC2-10134

Project Objective: Develop a Platform Technology for Pluripotent Stem Cell-Derived T cell Immunotherapies.

Investigator:

Name:	Gay Crooks
Institution:	University of California, Los Angeles
Type:	PI

Disease Focus: Cancer

Human Stem Cell Use: Embryonic Stem Cell

Award Value: $965,636

Status: Active

Grant Application Details

Application Title: Platform Technology for Pluripotent Stem Cell-Derived T cell Immunotherapy

Public Abstract:

Research Objective

We will combine a novel method to produce T cells from stem cells with gene editing tools, to create pluripotent stem cells that can serve as a universal source of T cells for cancer immunotherapy.

Impact

We will address a major bottleneck for T cell immunotherapy: the complexity and therefore limited access to therapies that must be engineered de novo for each patient.

Major Proposed Activities

- We will design and optimize methods for deletion of 3 key genes that are involved in how T cells respond to, and reject, foreign cells.
- We will delete each of the 3 genes separately in pluripotent stem cells (PSCs), and test how each modification affects how T cells develop and function
- We will combine deletion of all three genes in the same PSC clone, and test whether we can direct the gene edited T cells to specifically target and kill tumors.
- Using our novel method to generate T cells from stem cells, we will thoroughly characterize the gene expression profile in T cells produced from gene-edited PSC.

Statement of Benefit to California:

It is estimated that each year over 170,000 Californians will be diagnosed with cancer and approximately 60,000 will die of this disease. Exciting successes have been seen by harnessing the immune system to kill cancer using T cell therapy. However, not all patients who could benefit are able to access this therapy because of the need to manufacture each product from the patients' own blood. An off-the-shelf universal T cell product would dramatically expand the reach of this promising therapy.

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