
Stem cell-based rapid identification of SARS-CoV-2 T cell epitopes and T cell receptors for therapeutic use

Grant Award Details

Stem cell-based rapid identification of SARS-CoV-2 T cell epitopes and T cell receptors for therapeutic use

Grant Type: Discovery Research Projects

Grant Number: DISC2COVID19-11817

Project Objective: The objective of the project is to develop a platform tool technology to identify both SARS-CoV-2 T cell epitopes for vaccine development and specific TCRs for adoptive T cell therapy.

Investigator:

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

Disease Focus: COVID-19, Infectious Disease, Respiratory Disorders

Human Stem Cell Use: Adult Stem Cell

Award Value: \$126,692

Status: Active

Grant Application Details

Application Title: Stem cell-based rapid identification of SARS-CoV-2 T cell epitopes and T cell receptors for therapeutic use

Public Abstract:**Research Objective**

We will identify SAR-CoV-2 T cell epitopes for vaccine development and specific TCRs for adoptive T cell therapy using a stem cell-based platform to generate specialized dendritic cells in vitro.

Impact

New methods to rapidly identify T cell epitopes would greatly accelerate development of vaccines and TCR-based therapeutics, and in the setting of COVID-19 is an area of urgent unmet medical need.

Major Proposed Activities

- Adaptation of hematopoietic stem cell-based cDC1 platform to SARS-CoV-2
- Capture and TCR sequencing of SARS-CoV-2 reactive T cells
- Cloning of SARS-CoV-2 reactive TCRs and construction of a TCR reporter cell line library
- Epitope mapping by peptide-MHC functional screen
- Tetramer construction and convalescent validation cohort
- Data dissemination and translational planning

Statement of Benefit to California:

The threat of the COVID-19 pandemic to the health of California citizens and the economy of the state is incalculable. While new treatments for established disease are vital, prevention of the viral infections is the only realistic solution to ongoing suffering and societal dislocation. Our proposed research builds on our ability to generate specialized immune cells in the lab from blood forming stem cells and to use them to discover the viral antigens that have highest potency for vaccines.

Source URL: <https://www.cirm.ca.gov/our-progress/awards/stem-cell-based-rapid-identification-sars-cov-2-t-cell-epitopes-and-t-cell>