
Tissue Collection for Accelerating iPSC Research in Cardiovascular Diseases

Grant Award Details

Tissue Collection for Accelerating iPSC Research in Cardiovascular Diseases

Grant Type: Tissue Collection for Disease Modeling

Grant Number: IT1-06596

Project Objective: Recruit 680 patients with dilated cardiomyopathy (DCM), hypertrophic cardiomyopathy (HCM), and control cases for CIRM iPSC Repository.

Investigator:

Name:	Joseph Wu
Institution:	Stanford University
Type:	PI

Disease Focus: Heart Disease

Award Value: \$1,291,832

Status: Closed

Progress Reports

Reporting Period: Year 1

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Reporting Period: Year 2

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Reporting Period: NCE Year 3

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Grant Application Details

Application Title: Tissue Collection for Accelerating iPSC Research in Cardiovascular Diseases

Public Abstract: Heart failure is a very common and chronic condition defined by an inability of the heart to pump blood effectively. Over half of cases of heart failure are caused by a condition called dilated cardiomyopathy, which involves dilation of the heart cavity and weakening of the muscle. Importantly, many cases of this disease do not have a known cause and are called "idiopathic" (i.e., physicians do not know why). Over the past 2 decades, doctors and scientists started realizing the disease can cluster in families, leading them to think there is a genetic cause to the disease. This resulted in discovering multiple genes that cause this disease. Nonetheless, the majority of cases of dilated hearts that cluster in families do not have a known genetic cause. Now scientists can turn blood and skin cells into heart cells by genetically manipulating them and creating engineered stem cells called "induced pluripotent stem cells" or iPSCs. This approach enables the scientists to study what chemical or genetic changes are happening to cause the problem. Also because these cells behave similar to the cells in the heart, scientists can now test new medicines on these cells first before trying them in patients. Here we aim to collect tissue from 800 patients without a known cause for their dilated hearts (and 200 control individuals) to help accelerate our understanding of this debilitating disease and hopefully offer new and better treatments.

Statement of Benefit to California: Heart failure is a significant health burden in California with rising hospitalization and death rates in the state. We have a very limited understanding of the disease and so far the existing treatments only slow down the disease and the changes that happen rather than target the root cause. By studying a subgroup of the dilated cardiomyopathy patients who have no identified cause, we can work on identifying genetic causes of the disease, some of the biology happening inside the heart cell, and provide new treatments that can prevent the disease from happening or progressing. Improving the outcome of this debilitating disease and providing new treatments will go a long way to helping a large group of Californians lead healthier and longer lives. There are estimates that the US economy loses \$10 billion (not counting medical costs), because heart failure patients are unable to work. Hence new knowledge and developments gained from this research can go a long way to ameliorating that cost. Finally, heart failure is the most common chronic disease patients in California are hospitalized for. This research targets over half of those admissions. If this research is able to cut the hospitalization rate even by 1%, this would translate to millions of dollars in savings to the state. Continuing to invest in innovation will make our state a hotbed for the biotechnology industry, which in turn advances the state's economic and educational status.

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