

CIRM Awards \$2.6 Million to Two UCSD Researchers to Help Answer Fundamental Questions in Stem Cell Biology

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Two scientists at the University of California, San Diego School of Medicine have each received \$1.3 million grants from the California Institute for Regenerative Medicine (CIRM) for stem cell research. The grants were part of \$28 million in new funding announced today for 16 Basic Biology II Awards that will seek answers to fundamental questions about stem cell biology. One Leadership Award was also announced.

The Basic Biology II Awards went to UC San Diego and eight other non-profit institutions, plus one for-profit organization. The funding, which follows 12 similar awards given in 2009, is intended to establish a foundation for future translational and clinical advances.

"Understanding the fundamental questions in stem cell biology and the development of innovative approaches to their differentiation is essential to bringing new stem cell therapies to patients," said Alan Trounson, CIRM president.

Even as researchers press forward in their search for new or possible applications of human stem cells in regenerative medicine, they are limited by the lack of an efficient, effective and stable way to create the necessary quantities of cell types needed for therapeutic use.

Dong-Er Zhang, PhD, a professor of pathological sciences and biological sciences at the Moores UCSD Cancer Center, has received a \$1.3 million CIRM grant to identify new approaches that could increase the production of therapeutically useful blood cells from both human embryonic stem cells and from induced pluripotent stem cells derived from the patients themselves.

"Currently, bone marrow transplantation is the best way to cure many blood-related disorders, such as sickle cell anemia, thalassemia and blood cancers like leukemia," Zhang said. "Unfortunately, the limiting factor in transplantation and transfusion treatments is the lack of matched donors."

Zhang's funded work will examine how specific factors that control gene expression promote blood cell formation, expansion and differentiation from stem cells. The goal is to better understand the processes of stem cell differentiation and how to more effectively control them.

The potential benefits of using a patient's own stem cells to repair or replace damaged or dying cells and tissues is indisputable. For one thing, the problem of immune rejection is much reduced. Rapid progress is pushing regenerative medicine closer to reality, but many questions and issues remain to be resolved.

Among them is the role of YAP, a transcription co-activator molecule that indirectly helps stimulate gene expression. Too much or too little YAP, however, measurably and often adversely impacts the functioning of stem cells.

Kun-Liang Guan PhD, a professor of pharmacology at the Moores Cancer Center, has been awarded \$1.3 million to investigate the function of YAP in human embryonic stem cells, and how it might be better regulated to improve the production of stem cells for therapeutic use.

"This project will help us understand the basic biology of stem cells and may provide candidates for future drug development," Guan said. The grants to Zhang and Guan boost total CIRM funding for UCSD projects to more than \$68 million since the first awards were given in 2006.

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