UC San Diego
UC San Diego News Center

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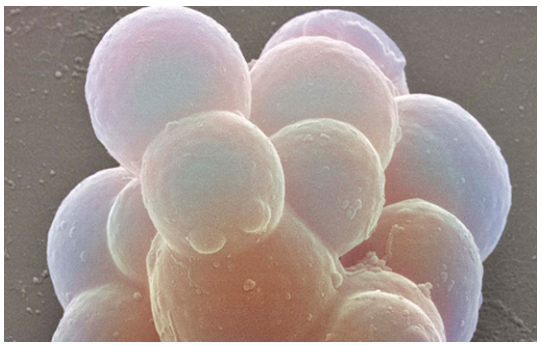
CIRM Funds Six UC San Diego Stem Cell Researchers

The governing board of the California Institute for Regenerative Medicine (CIRM) has announced that six investigators from the University of California, San Diego Stem Cell Research program have received a total of more than $7 million in the latest round of CIRM funding. This brings UC San Diego's total to more than $128 million in CIRM funding since the first awards in 2006.



Human stem cells, false color.

UC San Diego scientists funded by the newly announced CIRM Basic Biology Awards IV include Maike Sander, MD, professor of Pediatrics and Cellular and Molecular Medicine; Miles Wilkinson, PhD, professor, Division of Reproductive Endocrinology; Gene Yeo, PhD, MBA, assistant professor with the Department of Cellular and Molecular Medicine and the Institute for Genomic Medicine; George L. Sen, PhD, assistant professor of cellular and molecular medicine; David Traver, PhD, associate professor with the Department of Cellular and Molecular Medicine and Ananda Goldrath, PhD, associate professor in the Division of Biological Sciences.

Sander was awarded nearly $1.4 million for her proposal to define and characterize the key transcription factors necessary to promote maturation of human embryonic stem cell (hESC)-derived pancreatic progenitors into mature insulin-secreting beta cells. The loss of pancreatic beta cells in type 1 diabetes results in the absence of insulin secreted by the pancreas. The goal of this work is to enable scientists to one day produce an unlimited source of transplantable beta-cells for patients with diabetes.

Wilkinson's grant of $1.36 million will allow his lab to develop and test induced pluripotent stem cells (iPS cells) from patients with genetic mutations in a component of the pathway that results in intellectual disabilities. Many of these patients also have autism, attention-deficit disorders or

schizophrenia. Directed towards understanding fundamental mechanisms by which all stem cells are maintained, his research has the potential to impact non-psychiatric disorders as well.

A grant of almost $1.4 million will fund Yeo's research to help decode the mechanisms that underlie the single most frequent genetic mutation found to contribute to neurodegenerative diseases amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease) and frontotemporal dementia (FTD). Yeo will generate iPSCs and differentiated motor neurons derived from patients with these mutations, then use genome-wide technologies to analyze these and normal cells and test strategies to rescue mutation-induced defects in iPSC-derived motor neurons.

Sen received a grant of just over $1 million to investigate how tissue specific stem and progenitor cells exist to replenish both healthy, normal tissue and for regeneration from a wound. Disease and aging deplete stem and progenitor cells, impeding the body's ability to regenerate itself. Sen's work aims to better understand the mechanisms of self-renewal and differentiation in epidermal (skin) stem cells. Imbalanced growth and differentiation of epidermal cells can lead to a variety of human skin disorders, including psoriasis and cancer.

Traver, who was awarded a CIRM grant of more than $1.3 million in collaboration with Thierry Jaffredo of the Université Pierre et Marie Curie in Paris, studies hematopoietic stem cells. HSCs are rare, multipotent stem cells that give rise to all blood cell types, including red blood and immune cells. Traver's lab investigates the genes and signaling pathways used by vertebrate embryos to create the first HSCs. An understanding of this developmental process has implications for producing restorative stem cell-based therapies for diseases like leukemia and congenital blood disorders. Currently, medical treatments using HSCs are hampered by cell shortages and finding compatible matches between donors and recipients.

Goldrath's $1.16 million grant will help develop strategies to induce immunological tolerance to hESC-derived tissues and cells. Immune-mediated rejection of hESC-derived tissues remains a significant barrier to the promise of regenerative therapies. She proposes a novel approach to promote long-term acceptance of hESC-derived tissues by exploring the molecular pathways and immune cell types that mediate the induction of immune tolerance and pursuing additional targets that halt rejection of tissue grafts derived from these stem cells. If successful, this would increase the potential reach of cellular therapies by decreasing the undesirable side effects of generalized immune suppression.

The CIRM Basic Biology Awards are designed to fund investigations into the basic mechanisms underlying stem cell biology, cellular plasticity, and cellular differentiation. These awards will also fund the development and use human stem cell based models for exploring disease. According to CIRM, “studies supported by these awards will form the foundation for future translational and clinical advances, enabling the realization of the full potential of human stem cells and reprogrammed cells for therapies and as tools for biomedical innovation.”

CIRM was established in November 2004 with the passage of Proposition 71, the California Stem Cell Research and Cures Act. The statewide ballot measure provided $3 billion in funding for stem cell research at California universities and research institutions and called for the establishment of an entity to make grants and provide loans for stem cell research, research facilities, and other vital research opportunities.
