

Seven at UC San Diego Receive Stem Cell Funding from California Institute for Regenerative Medicine (CIRM)

Dr. Leon Thal of UC San Diego honored with naming of statewide SEED grants

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More than two years after voters approved a \$3 billion program to fund stem cell research in California, the state has approved the first grants focused solely on human embryonic stem cell research. Seven of those grants, totaling almost \$4.4 million, have been awarded to researchers at UCSD.

The 29-member Independent Citizens Oversight Committee (ICOC), governing board of the California Institute for Regenerative Medicine (CIRM), today approved 72 grants totaling approximately \$45 million over two years, to researchers at 20 academic and non-profit research centers throughout the state. The Scientific Excellence through Exploration and Development (SEED) grants were selected from among 231 applications totaling more than \$138.3 million from 36 California institutions.

The ICOC also voted to name these grants in honor of Leon J. Thal, M.D., professor and chair of UCSD's Department of Neurosciences, who died last month in a plane crash. Thal, who was also director of UCSD's Shiley Marcos Alzheimer's Disease Research Center, was one of the world's leading experts on Alzheimer's disease and a Governor's appointee to the ICOC.

"UCSD will apply these funds to advance the promising research that we believe will lead to effective new therapies for some of today's most vexing diseases," said Marye Anne Fox, Chancellor, UC San Diego. "We also appreciate the ICOC's recognition of our colleague Leon Thal. This is a fitting tribute to an individual whose dedication to improving the care of patients through research was an inspiration."

"I am delighted to see that CIRM recognizes the promise of the work proposed by my excellent colleagues," said Larry Goldstein, Ph.D., director of UCSD's Stem Cell Program. "This is a wonderful endorsement of the outstanding quality of the stem cell research at UCSD, and the future prospects for our work to benefit the people of California."

The ICOC approved Leon J. Thal SEED grants to the following UCSD researchers:

Anirvan Ghosh, Ph.D., professor of biology in UCSD's Division of Biological Sciences, will receive \$612,075 for a research project to determine if forebrain neurons can be generated from human embryonic stem cells. Several neurological disorders, such as Alzheimer's disease, are characterized by loss of forebrain neurons. Scientists believe cell replacement might provide a therapeutic strategy if they could generate neurons that had the same properties as the cells that are lost. While scientists have previously generated neurons from embryonic stem cells, Ghosh's project seeks to specifically generate forebrain neurons from embryonic stem cells and determine if they can make connections with existing neurons in the brain.

Sylvia Evans, Ph.D., professor of pharmacology at UCSD's Skaggs School of Pharmacy and Pharmaceutical Sciences, will receive \$609,999 for her research with human embryonic stem cells aimed at developing therapies for heart failure and cardiac pacemaker dysfunction. To repair of human heart, it is important to study human

cardiac progenitors and to define pathways required to grow and differentiate them utilizing human cells as a model experimental system. Evans' lab will create special lines of human embryonic stem cells that become fluorescent when they adopt the cardiac progenitor, heart muscle, or pacemaker state, with the aim of obtaining sufficient numbers of specific cell types for cardiac therapy.

Catriona Jamieson, M.D., Ph.D, assistant professor of hematology-oncology in the Department of Medicine at UCSD's School of Medicine and director of the Stem Cell Research Program at UCSD's Moores Cancer Center, will receive \$642,500 for her work with cancer stem cells derived from human embryonic stem cells. Compelling studies suggest that human cancer stem cells (CSC) arise from aberrantly self-renewing, tissue-specific stem or progenitor cells which are responsible for cancer propagation and therapeutic resistance. Human embryonic stem cells can provide a potentially limitless source of tissue-specific stem and progenitor cells *in vitro*, so represent an ideal model system for generating and characterizing human cancer stem cells. This research harbors tremendous potential for developing life-saving therapy for patients with cancer by providing a platform to rapidly and rationally test new therapies.

Cornelis Murre, Ph.D., professor of biology in UCSD's Division of Biological Sciences, will receive a \$538,211 grant to generate long-term multi-potential human hematopoietic progenitor cell lines from human embryonic stem cell cells. If successful, the strategy would create cells that could be used to readily generate specific hematopoietic cell types, such as lymphocytes or dendritic cells, on a large scale for cell-based therapeutic approaches.

Shu Chien, M.D., Ph.D., professor of bioengineering in UCSD's Jacobs School of Engineering and professor of medicine in UCSD's School of Medicine, will receive \$638,140. Dr. Chien and his colleagues have developed an array system (with thousands of combinations) that allows the rapid determination of the optimum physical and chemical conditions that direct the differentiation of stem cells into specific cell types. The ability to control stem cell differentiation to desired cell types is crucial for the use of human embryonic stem cells for regenerative medicine, and hence the results of this study will be valuable for almost all types of stem cell research.

Bing Ren, Ph.D., of the Ludwig Institute for Cancer Research, San Diego Branch (based at UCSD) and assistant professor in UCSD's Department of Cellular and Molecular Medicine, will receive \$691,489 to provide a foundation for analysis of the mechanisms that control the production of stem cell proteins, which in turn would help in the design of new ways to manipulate the stem cells so they can differentiate toward specified cell types. The knowledge base resulting from this research will directly support the effort by Ren and other California researchers to investigate the mechanisms of stem cell biology, and design new stem cell therapies.

Binhai Zheng, Ph.D., assistant professor of neurosciences in UCSD's School of Medicine, will receive \$642,361 to apply genetically modified human embryonic stem cells to study basic functions of human genes in spinal cord development and to develop therapeutic intervention for spinal cord injury.

The Leon J. Thal Scientific Excellence through Exploration and Development Grants are intended to bring new ideas and new investigators into the field of human embryonic stem cell research, and offer an opportunity for investigators to carry out studies that may yield preliminary data or proof-of-principle results that can then be extended to full-scale investigations.

In March 2006, UCSD joined with The Burnham Institute for Medical Research, the Salk Institute for Biological Studies and The Scripps Research Institute to establish the San Diego Consortium for Regenerative Medicine. The alliance is designed to marshal the intellectual resources of four world-leaders in life sciences research, bringing scientists from each institution together to develop and conduct joint research and training programs in stem cell research.

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