

UC San Diego Receives \$15.4 Million to Establish New Center for Systems Biology

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The National Institute of General Medical Sciences has awarded \$15.4 million to the University of California, San Diego, to establish a center for the study of systems biology, a relatively new branch of science that maps interactions between regulatory molecules in order to understand how complex biological systems work.

The UC San Diego Center for Systems Biology will focus on interactions involved in cells' responses to stress, said director Alexander Hoffmann, professor of chemistry and biochemistry in the Division of Physical Sciences.

Researchers at the new center will analyze interactions among all of the genes and proteins within a cell in response to potentially harmful changes in the environment, then test the functions of specific genetic "circuits" involved in the response by recreating them in isolation using synthesized genes.

Hoffmann, whose research focuses on signaling networks involved in inflammation, immunity and stress, will share leadership of the center with two co-directors, both trail blazers in their respective fields, to form a unique team of national leaders in this emerging field:

Trey Ideker, chief of genetics at the UC San Diego School of Medicine, member of UCSD's Institute for Genomic Medicine and professor of medicine and bioengineering, pioneered the use of genomics to construct network models of cellular processes and disease. He has recently developed algorithms for analyzing responses to agents that damage DNA, among other work.

Jeff Hasty, director of the BioCircuits Institute and professor of biology and bioengineering, is one of the founders of a field now called synthetic biology, which engineers novel genetic systems that range in complexity from simple genetic circuits to entire synthetic genomes.

"This new center will be a model of innovation and collaborative research," said Chancellor Marye Anne Fox. "Together, these leaders will work across disciplines to forge a new and unique approach that will contribute to our understanding of stress."

The synergy between experts in different fields is expected to push systems biology in new directions.

"A major goal of the research program at the UC San Diego center is to link two research approaches, functional genomics and synthetic biology, to derive insights into human health and disease," said Sarah Dunsmore, who manages several of the national centers at NIGMS. "If successful, this will be a novel and major advance for the systems biology field."

The new program builds on other major campus initiatives in systems biology, including the BioCircuits Institute, which will house two of the core facilities for the center, and the interdisciplinary program in Bioinformatics and Systems Biology, Hoffmann said. "The center plants a systems biology flag onto the UC San Diego campus."

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