UC San Diego Receives Two Major Biomedical Informatics Grants

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Researchers at the University of California, San Diego School of Medicine, led by Lucila Ohno-Machado, MD, PhD, chief of the Division of Biomedical Informatics in the Department of Medicine, have received two federal grants totaling more than $25 million to develop new ways to gather, analyze, use and share vast, ever-increasing amounts of biomedical information.

The first grant for $16.7 million over five years will create a national center for biomedical computing called iDASH. The center will be charged with developing novel algorithms, open-source tools and computational infrastructure and services so that scientists nationwide can share anonymized data essential to large-scale studies and medical progress. Funding comes from the National Heart, Lung and Blood Institute, the National Human Genome Research Institute, the National Library of Medicine, the National Institute of General Medical Sciences and the common fund from the Office of the Director of the National Institutes of Health.

iDASH, which stands for Integrating Data for Analysis, Anonymization and Sharing, is one of five National Centers for Biomedical Computing awarded in this funding cycle, joining related centers at Columbia University in New York City, Brigham and Women's Hospital (an academic center affiliated with Harvard Medical School in Boston) and Stanford University. iDASH was the only new center awarded by the NIH in a competitive process that involved proposals from seven existing centers, plus a large number of other aspiring institutions.

"This new center and effort is a way to democratize science, to bridge the computational divide between institutions like UC San Diego with its deep, extensive computational expertise and infrastructure, such as the San Diego Supercomputer Center (SDSC) and the California Institute for Telecommunications and Information Technology (CalIT2), both of which are playing key roles in the new center, and institutions lacking these resources," said Ohno-Machado. "The idea is to create new systems and methods that give researchers everywhere access to information that can help push science forward by making optimal use of data and algorithms."

According to Ohno-Machado, iDASH not only affords the nation with a great resource to share privacy-protected data, but also coordinates talent from several departments, organized research units, and schools at UC San Diego, catalyzing the integration of quantitative and biomedical/behavioral sciences across campus, with involvement of multiple researchers from the Schools of Medicine, Pharmacy, and Engineering.

Three "driving biological projects" address biomedical problems from the molecular to individual to population levels:

Jane Burns, MD, professor of pediatrics, will investigate the role of environment and genetics on the development and treatment of Kawasaki Disease, a rare condition affecting the cardiovascular system of children.

Grace Kuo, PharmD, MPH, associate professor of clinical pharmacy, will lead UC San Diego in a national collaborative effort to monitor the safety of new anti-coagulation medications. Partner institutions are led by Frederick Resnic, MD, MS (Brigham and Women's Hospital), and Michael Matheny, MD, MPH (Vanderbilt University).

Greg Norman, PhD, adjunct professor of family and preventive medicine and CalIT2, will work on a wireless monitoring system to profile sedentary behavior and develop interventions to prevent obesity and cardiovascular disease.

Faculty from the Computer Science Department and scientists from SDSC and CalIT2, as well as collaborators at San Diego State University are involved in several key aspects of this project.

The other R01 research grant is for $8.3 million over three years and is also a transformative initiative. The SCAlable National Network for Effectiveness Research (SCANNER) complements the ideas and goals of the iDASH grant, making it easier to integrate data from health care systems.

SCANNER, led by Ohno-Machado at the SDSC, will create certified computational systems and architecture necessary to securely exchange health information collected at the point of care, so that the same data can be used for comparative effectiveness research. For example, researchers will be able to assess the added value of a new medication like *dabigatran*, which could replace the popular drug *warfarin* in the management of anticoagulation. Or they might measure the value added by pharmacist participation in therapy management.

Creating a scalable, sharable framework through research that combines computer science, engineering and health sciences is a good example of the type of innovative scholarly work in biomedical informatics that puts UCSD side by side with the best academic institutions in the country.

The grant is part of the American Recovery and Reinvestment Act of 2009 and funded by the Agency for Healthcare Research and Quality, Department of Health and Human Services. It involves partners in both academia and industry, among them San Francisco State University, Charles R. Drew University in Los Angeles, Vanderbilt University/Tennessee Valley VA, Brigham and Women's Hospital/Harvard University, RAND Corporation, and Resilient Networks. By involving health care institutions serving diverse populations as well as interdisciplinary academic and industrial partners in the development of an architecture for secure information exchange, SCANNER takes effective steps into creating a national network for health care and biomedical research data exchange.

Biomedical informatics has become well-recognized by the NIH as an independent, scholarly field of research, collaboration and training. Ohno-Machado said these two grants recognize UC San Diego's role as a major player in biomedical informatics and will add to other significant informatics achievements by the university in the past year, including structuring the informatics resource of UCSD's $37.2 million Clinical and Translational Science Award, the informatics component of the Medical Educational Partnership Initiative with collaborators in Mozambique, and the Global Health Informatics training grant that involves Portuguese-speaking countries like Brazil and Mozambique.

"These achievements should come as no surprise, given the rich environment for high technology in San Diego," said Ohno-Machado. "This is a perfect venue for developing and advancing the future of biomedical informatics."

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