

Moores UCSD Cancer Center Creates Bioinformatics Center

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As new biomedical technologies emerge, medical research, particularly cancer-related research, is becoming more and more information intensive. To analyze and integrate massive amounts of complicated data so that it is useful to cancer patients and their physicians, the Moores Cancer Center at University of California, San Diego is creating a major center for bioinformatics.

This initiative is designed to speed research by developing sophisticated new tools for storing, retrieving, analyzing and making sense of data, and, ultimately, to enhance clinical care by applying the resulting information.

With advanced computing technology and appropriate statistical methods, for example, it would be possible to predict which patients would most likely respond to particular treatments, based on their genetic and molecular profile. And by analyzing the massive amount of follow-up data routinely collected on patients, researchers could more easily assess the likelihood of favorable outcomes associated with a particular procedure as these data are collected over time.

The Cancer Center has named Nicholas J. Schork, Ph.D., a respected expert in quantitative genomics and UCSD Professor of Psychiatry and Biostatistics, to lead the effort.

"Professor Schork is a leading figure in the quantitative analysis field. He brings to this new position relationships with the many groups across the campus involved in computational or statistical analysis, relationships with related industry, and tremendous energy and organizational skills, all of which are pivotal to successfully mounting this kind of initiative," said Dennis Carson, M.D., director of the Moores UCSD Cancer Center.

"I am delighted to have been asked to lead this endeavor at the Cancer Center," Schork said. "It is the beginning of an effort that will grow to serve the entire UCSD campus."

Campus partners in this initiative include UCSD's School of Medicine and the Skaggs School of Pharmacy and Pharmaceutical Sciences, the Division of Biological Sciences, the California Institute for Telecommunications and Information Technology (Calit2), the San Diego Supercomputer Center, the Center for Human Genetics and Genomics, faculty from the departments of mathematics and bioengineering, and other campus departments and resources.

"Medical research is moving into an era that is information intensive," Schork said. "For example, with genomic DNA sequencing we may be dealing with 3 billion bits of data for an individual, or if we're imaging an organ such as the brain, or a tumor, we may have 70,000 different locations on those organs or tumors to consider as sites that could be defective for each patient in a study."

According to Schork, analyzing this information and making it useful is a challenge, but UCSD is perfectly positioned to become a national leader in this effort.

"UCSD is home to a number of sophisticated resources that carry out computational or statistical analysis and other kinds of quantitative research. We just need to bring our varied and dispersed talents together," he said. "For example, UCSD recently launched the Information Theory and Applications Center, based at Calit2. Its faculty members are developing methodologies to understand how signals can be received and sent using wireless technologies, and are using sophisticated computational techniques to decipher the signals. Those people have extensive math and statistical skills that, if applied to a problem in, for example, medical imaging or genomics could result in major advances to the field."

Schork is also co-leader of the Cancer Center's Cancer Genetics Research Program, joining the program's existing leader, Richard Kolodner, Ph.D., and co-director for the School of Medicine's Center for Human Genetics and Genomics.

Founded in 1979, the Moores UCSD Cancer Center is one of just 39 centers in the United States to hold a National Cancer Institute (NCI) designation as a Comprehensive Cancer Center. As such, it ranks among the top centers in the nation conducting basic, translational and clinical cancer research, providing advanced patient care and serving the community through outreach and education programs.

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