COLUMBIA UNIVERSITY News

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NEW COLUMBIA UNIVERSITY CENTER AIMS TO ADVANCE NEXT GENERATION OF GENOMICS, PROTEOMICS RESEARCH

NIH Grant Will Establish Nation's Biomedical Computing Infrastructure

Center Will Collaborate with C_2B^2, Columbia's Analytical Core

New York, NY (Sept. 30, 2005) – Addressing the critical need for new ways to analyze the enormous amounts of data being generated by genomics and proteomics, Columbia University is establishing a National Center for Biomedical Computing with an $18.5 million, five-year grant from the National Institutes of Health.

Columbia's new center – the National Center for Multi-Scale Analysis of Genetic and Cellular Networks (MAGNet) – is part of a network of seven centers created by the NIH to begin developing the computational and scientific infrastructure as well as software and data management tools needed to leverage the vast core data generated in part by the Human Genome Project.

This grant is part of the NIH Roadmap for Medical Research. Of $235 million in grants for new and continuing Roadmap projects in 2005, Columbia has been awarded a combined total of nearly $50 million. Earlier this summer, Columbia received $25 million from the Protein Structure Initiative, another component of the NIH Roadmap. In June $9 million was awarded to James Rothman, Ph.D., director of the Judith P. Sulzberger, M.D. Columbia Genome Center and the Clyde and Helen Wu Professor of Physiology, for his work with the Molecular Libraries Screening Centers Network of the NIH Roadmap.

"These NIH Roadmap grants establish Columbia as one of the nation's major centers for computational biology and bioinformatics," said David Hirsh, Ph.D., executive vice president for research at Columbia University. "Biomedical research is moving away from small experiments on individual genes or proteins, to the simultaneous analysis of tens of thousands of genes and proteins and entire systems inside cells."

Computational Biology: New Tools for Rapid, High-Volume Data Assessment

"Computational biology, a new field of science, has the potential to revolutionize biology and the translation of biology into medicine," said MAGNet Director Andrea Califano, Ph.D., professor of biomedical informatics at Columbia University Medical Center. "The goal of the National Centers for Biomedical Computing is to make it easier for the wider scientific community to exploit the power of computers to address fundamental biological and biomedical challenges."

Among the seven centers, MAGNet has the unique goal of creating computational methods and tools to help solve one of the biggest challenges in biology: understanding how all the genes and proteins inside cells work together to implement specific biological processes.

Better Understanding of Molecular Interactions In Disease

"With approximately 20,000 genes in the human genome, there are trillions of possible interactions among genes and proteins within a cell. Exploring each one in the laboratory would take a very long time, even with current high-throughput methods," said Dr. Califano.

"Instead, we plan to use computers and new methods of systems biology to predict which proteins are interacting with each other and with DNA, and how these interactions change in disease. Eventually, this will have a major impact on how we understand a variety of human diseases, including cancer."

C_2B^2

MAGNet will be housed on the Columbia University Medical Center campus in the newly established Center for Computational Biology and Bioinformatics (C_2B^2). C_2B^2 researchers play a central role in MAGnet, as well as the Protein Structure Initiative of NIH Roadmap.

"I expect that a close synergy will evolve between the computational tools being developed in MAGnet and the analysis of the three-dimensional structure of the proteins that will be determined in the context of the Protein Structure Initiative, since C_2B^2 researchers will be engaged in both activities," said C_2B^2 Director and MAGNet co-Director Barry Honig, Ph.D., Investigator of the Howard Hughes Medical Institute and professor of biochemistry and molecular biophysics at the Columbia University Medical Center. "We also hope that C_2B^2 will enhance Columbia's leadership position in this important new scientific area."

C_2B^2 is an interdepartmental center which works towards catalyzing research between biology and the computational and physical sciences. It supports active research programs in areas such as computational biophysics and structural biology, the modeling of regulatory, signaling and metabolic networks, pattern recognition, machine learning, and functional genomics. The Center also sponsors a seminar program, as well as access to a range of software tools.

C_2B^2 is located at Columbia University Medical Center, but faculty members are based on both the Medical Center and Morningside Campuses of Columbia University. Center faculty have appointments in a broad range of departments including Biochemistry and Molecular Biophysics, Biomedical Informatics, Biological Sciences, Chemistry, Computer Science, Center for Computational Learning Systems, Applied Mathematics and Applied Physics and Electrical Engineering.

C_2B^2 and MAGNet capitalize on significant investments made by AMDeC, a not-for-profit consortium of thirty-five New York medical schools, academic health centers, and research institutions, to build bioinformatics resources for New York State researchers. AMDeC's Bioinformatics Core is housed within C_2B^2. MAGnet also leverages the interactions with two other AMDeC initiatives, the Microarray Research Center and the New York Cancer Project.

Additional information about the C2B2 and MAGNet Centers can be respectively found at www.c2b2.columbia.edu and at magnet.c2b2.columbia.edu.

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Columbia University was founded in 1754 as King's College by royal charter of King George II of England. It is the oldest institution of higher learning in the state of New York and the fifth oldest in the United States.

Columbia University Medical Center provides international leadership in basic, pre-clinical and clinical research, in medical and health sciences education, and in patient care. The medical center trains future leaders in health care and includes the dedicated work of many physicians, scientists, nurses, dentists, and public health professionals at the College of Physicians & Surgeons, the School of Dental & Oral Surgery, the School of Nursing, the Mailman School of Public Health, the biomedical departments of the Graduate School of Arts and Sciences, and allied research centers and institutions. Columbia University Medical Center researchers are leading the discovery of novel therapies and advances to address a wide range of health conditions. www.cumc.columbia.edu