Chicago Biomedical Consortium Receives Funding

CONTACTS: Sharon Butler, University of Illinois at Chicago, at (312) 355-2522 or sbutler@uic.edu John Easton, University of Chicago, at (773) 702-6241 or jeaston@uchospitals.edu Megan Fellman, Northwestern University, at (847) 491-3115 or fellman@northwestern.edu

FOR RELEASE: Jan. 10, 2005

SEARLE GRANT STIMULATES NEW COLLABORATIVE INITIATIVE AMONG CHICAGO-AREA UNIVERSITIES

EVANSTON, Ill. --- The successful sequencing of the human genome has spawned an even more challenging area of large-scale scientific study: proteomics -- the study of all proteins encoded by the approximately 20,000 to 25,000 genes found in humans. Proteins are the workhorses of the human body, carrying out the processes essential to life. But they also are a major factor in disease, making proteins an important target of drug therapies.

To help position Chicago as a leader in the emerging field of proteomics, the Searle Funds at The Chicago Community Trust have awarded a $1.5 million grant to the Chicago Biomedical Consortium (CBC) for the Proteomics/Bioinformatics Demonstration Project. Under the leadership of scientists at Northwestern University, the University of Chicago and the University of Illinois at Chicago (UIC), this first initiative of the consortium brings together experimentalists, instrumentalists and informaticians to apply new technology and new analytical techniques to addressing the basic questions of proteomics. As it fosters collaborative research and new partnerships, the CBC is expected to transform how research and training are carried out across the Chicago area. It is anticipated a successful demonstration project will lead to significantly greater grants.

"Proteomics is the new frontier for molecular biology and medicine," said Richard I. Morimoto, John Evans Professor of Biology and Northwestern's CBC liaison. "It is a shift to wellness. If we can understand proteins and their interactions, we can use proteins to tell us how a person's health is at the molecular level -- long before symptoms appear. By listening to these important messages we can take action before disease progresses and tailor drugs to meet individual needs."

Healthy proteins form bone and muscle, fight infection and control metabolism. Unhealthy proteins cause trouble in the cell. Scientists today can investigate the nature and properties of a single protein in isolation, but the key to understanding human function, both normal and abnormal, lies in

the complex interactions that occur among proteins in response to each other and to their environment. Since the human body is made up of tens of trillions of cells and each cell contains a trillion or more proteins, scientists seeking to understand this complexity face a research challenge of enormous magnitude.

Through the CBC's research collaboration and its Proteomics/Bioinformatics Demonstration Project, Chicago-area scientists will have access to tools essential for meeting this challenge: a Fourier Transform Mass Spectrometer (FTMS), which is the world's most powerful tool for studying the structures of proteins and other biomolecules, and the computing power and other means for analyzing the massive amounts of data the spectrometer will produce. Few facilities in the country have such specialized capabilities for proteomics research. The FTMS will take the three institutions' existing facilities to state of the art.

"Science is becoming more collaborative -- more and more of the extraordinary discoveries are now made by teams," said Jonathan Silverstein, assistant professor of surgery at the University of Chicago, director of the University of Chicago Hospitals' Center for Clinical Information and Chicago's CBC liaison. "Our consortium taps this expertise of teams wherever the players are, and this enables us to do important interdisciplinary research that one university couldn't accomplish alone. We need scientists to come to the city of Chicago for all it has to offer, not just for one institution."

Sited at UIC, the FTMS will be available to researchers all across the city -- not just those from Northwestern, Chicago and UIC -- to reveal patterns of single proteins and protein complexes and allow scientists to examine and compare the proteomic configurations of normal cells with those of cells afflicted by diseases and disorders.

Breakthroughs in understanding proteins promise to contribute to the diagnosis and treatment of cardiovascular and neurodegenerative diseases and cancer. For example, proteins that go awry and interfere with the normal functioning of neurons are typical in diseases such as Alzheimer's and Parkinson's. Problems in protein-to-protein interactions can lead to cancer, heart failure, susceptibility to infection and immune system disorders such as lupus or rheumatoid arthritis.

"Studying proteins in more advanced life forms is very complicated," said Brenda Russell, professor of physiology and biophysics at the University of Illinois at Chicago and UIC's CBC liaison. "In a human, one gene might make 50 different protein forms, and those proteins can be chemically changed

and modified in various ways. In a disease such as heart failure, there are subtle changes that alter protein structure and function, resulting in an inability of the heart to pump blood efficiently. The FTMS will enable us to identify these subtle changes and provide information important in the diagnosis and treatment of major killers such as heart disease."

The CBC expects the FTMS to be in place and usable by summer of 2005. Before then, scientists at Northwestern, UIC and Chicago will be establishing research teams and developing the computational resources to analyze the large amounts of anticipated data -- a necessity if the data are to be meaningful and yield new biological knowledge.

Beyond its expected scientific yields, this inaugural project of the CBC will benefit scientists and the public of the Chicago region in many ways. First, the planning process has brought together scientists and institutional leaders from the three universities in a common effort that will breed excellence in future centers and programs. Second, by establishing proteomics and informatics as the initial target, the consortium has emphasized the value of making high-resolution scientific instrumentation and interactive tools and resources accessible to a wide range of users. Third, the activities of the CBC will create collective resources and intellectual excitement that will attract faculty and students to the region and help retain them.

"We are very grateful to the Searle family and The Chicago Community Trust for their generous gift," said Lawrence B. Dumas, provost of Northwestern University. "Their support of the Chicago Biomedical Consortium will help make Chicago a leader in and destination for biomedical research."

"The important and growing field of proteomics will advance our understanding of the myriad proteins encoded by the human genome and their complex interactions within the cell," said Michael Tanner, provost of the University of Illinois at Chicago. "These interactions lie at the heart of human health and disease. The knowledge Chicago-area scientists gain will give us new insight into the molecular dynamics of normal human physiological function and into the root causes of a wide range of diseases."

"One sign of progress in a scientific discipline is the expansion of effort and technology necessary to come up with genuinely novel and significant results," said Richard Saller, provost of the University of Chicago. "We have seen this in physics since the days of the Manhattan Project, and the CBC collaboration is a good example of 'big science' moving into the realm of biology, pulling together resources from three universities."

The Chicago Biomedical Consortium has established an unprecedented city-wide collaboration in the biomedical sciences. During two years of strategic planning under a grant from the Searle Funds at The Chicago Community Trust, the CBC has sponsored two city-wide symposia and numerous meetings among scientists and administrative leaders. Plans are under way to host a conference this spring on practical proteomics to prepare scientific teams to use the FTMS in support of their research.

As demonstration of institutional commitment, each of the three universities will contribute an additional $150,000 to the Proteomics/Informatics Demonstration Project for a total budget of nearly $2 million.

1/10/05