HWI, UB receive $3 million in funding

Research to develop new, high-speed methods to find molecular structure of proteins

By LOIS BAKER
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The Hauptman-Woodward Medical Research Institute (HWI) and UB have received grants totaling $3.13 million to develop new, high-speed methods to determine the molecular structure of proteins.

The funding is part of a $25 million center grant awarded to the Northeast Structural Genomics (NESG) Consortium composed of researchers from UB, HWI, Cornell University, Columbia University, Yale University, University of Toronto, Ontario Cancer Institute, Pacific Northwest National Laboratories and Rutgers University, home to the principal investigator on the project, Gaetano T. Montelione.

The consortium was established in response to the National Institutes of Health's Protein Structure Initiative, funded through the National Institute of General Medical Sciences (NIGMS). The initiative aims to capitalize on discoveries generated by the Human Genome Project.

The NESG Consortium is one of seven pilot research centers in structural genomics, a new field dedicated to determining gene function by defining the protein structure encoded in a gene's DNA sequence. The NIH initiative aims to target proteins from various model organisms, including the fruit fly, yeast, roundworm and certain human proteins.

The consortium will use both X-ray crystallography and nuclear magnetic resonance (NMR) spectroscopy to determine protein structures. Knowing the molecular structure of proteins is essential for designing new drugs to treat, prevent and cure disease.

At Hauptman-Woodward, George DeTitta, HWI executive director and CEO, who also is a UB research professor, and Joseph Luft, HWI senior research scientist, will receive $1.75 million over the next five years for their work in crystal-growth methods and techniques. It will use a
newly developed, high-throughput robotics laboratory that will allow researchers to obtain crystals for X-ray structural analysis for a large number of different proteins in a short time. The new laboratory was established through funding from the John R. Oishei Foundation, making Hauptman-Woodward scientists among the first to use this method of crystal production.

"It is projects like these that exemplify how critical initial support can be," DeTitta said. "The funding from the Oishei Foundation provided the infrastructure for the lab and also gave us another great opportunity to work with talented colleagues, including Tom Szyperski at the University at Buffalo."

Thomas Szyperski, associate professor of chemistry, and his team will receive $1.38 million over the next five years for research using NMR spectroscopy to establish protein structures. Approximately $1 million was awarded through the NIH center grant for the UB work, with the additional $385,000 contributed by the National Science Foundation.

"The center grant supports the purchase of a so-called cryogenic NMR probe, which will increase the sensitivity of our spectrometer by a factor of 3 or more, thus reducing measurement time of molecular structures about 10-fold," Szyperski said. "This will enable us to solve protein structures by NMR in an unprecedented rapid fashion.

"Such investments ensure that our research group-and thus UB's high-field NMR center-will successfully participate in the leading-edge endeavor of structural genomics, which will contribute to lay the foundations of this century's biomedical research," he said.