Hauptman-Woodward Medical Research Institute Launches 2010 Research Intern Summer Program

The Hauptman-Woodward Medical Research Institute (HWI) has launched the 2010 Research Intern Summer Program. Students from schools throughout the United States have been selected to participate in the summer program.

HWI is pleased to have received funding for the summer program from the BlueCross Blue Shield of Western New York funds, the Buffalo Sabres Foundation, Erie County and the First Niagara Foundation. As a result of the generous gifts given by these businesses and organizations, the summer program has received more than $60,000 in corporate support.

The summer program is designed to help improve science literacy and to encourage young people to pursue science careers. HWI’s research scientists offer hands-on state-of-the-art experience in research. The experience helps the students make decisions about careers in health-related professions.

For the past 37 years, summer student apprentices have been selected from college student applicants who are permanent residents of Western New York. We are particularly interested in attracting talented students majoring in the sciences at the undergraduate, graduate or professional level, to complement their educational training with an experience in an HWI laboratory working under the supervision and guidance of a principal research scientist.

Each intern is involved in a scientific project using state-of-the-art equipment in the fields of molecular biology, methods development, crystal growth, and x-ray diffraction to find ways to prevent and treat diseases such as cancer, breast cancer, diabetes, AIDS, thyroid disorders, SARS and Alzheimer’s disease. Students must present their work in front of their mentors, members of the scientific staff, and other peer participants at the end of the program.

The following students will participate in this internship during the summer of 2010:

**Nitin Bansal** is working with Dr. Roopa Thapar on characterizing SLIP1, a protein in the translation initiation complex of histone mRNAs. Bansal is also working with Aishwarya Bhaskar and Patrick Itotia to purify mutant SLIP1 proteins, identify the protein-protein interfaces for SLIP1-binding proteins using biophysical techniques such as Fluorescence Polarization and Surface Plasmon Resonance (SPR) and attempt crystallization trials. He is a sophomore at the University of Pennsylvania.

**Kelly Lyons** is working with Dr. Barnali Chaudhuri in her lab. Lyons, a student at the College of the Holy Cross, is working on crystallization of a protein-DNA complex as a part of their ongoing project. Lyons and Chaudhuri are aiming to understand the mechanism of chromosome segregation in the deadly and infectious human pathogen mycobacterium tuberculosis.
Jeremy Roach is assisting Dr. Timothy Umland in his lab. Roach will be performing computational studies to virtually screen potential inhibitors against several newly identified antibiotic drug targets in gram-negative bacteria. These *in silico* studies will aid in the efforts to develop new classes of antibiotics effective against drug and multi-drug resistant strains of *Acinetobacter baumannii*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa*. Additionally, he is participating in developing a website that describes virus-host protein-protein interactions for SARS coronavirus and influenza A. He is a student at the University of North Carolina.

Jessica Nowak and Elizabeth Stewart will be assisting Dr. Vivian Cody in her lab. Nowak, a current student at Canisius College and a returning intern, will be working on the characterization (expression, purification, crystallization) of a new protein in the folate metabolic pathway as part of their AIDS-related drug design project. Stewart, a student from Wake Forest University and also a returning intern, will be working on the expression, purification and crystallization of mutants of the Pneumocystis carinii dihydrofolate reductase, the target enzyme in Cody’s AIDS-related drug design project.

Ryan Young and Erin Crawford are working with Dr. Andrew Gulick to study proteins that pathogenic bacteria use to make a molecule they need to acquire certain nutrients. Their projects will explore the way these proteins function and characterize the ability of certain chemicals to block the activity of these proteins, leading to new tools that can be used to further study these proteins. Young is a student at Hobart and William Smith Colleges and Crawford is a student at the State University of New York at Binghamton.

Chelsea Zale and Elliott Penna are assisting Joseph Luft in preparing and characterizing different chemical cocktails used by the high-throughput crystallization screening laboratory at HWI. Their work is central to the continued success of the high-throughput crystallization screening laboratory. The project will have a direct impact on the research of several hundred different investigators located at universities, research institutions and pharmaceutical companies throughout the world. Zale is a student at Duquesne University and Penna is a student at Lehigh University.

Sabrina Gill will be working in Dr. Daniel Gewirth’s lab. She will be carrying out structure function studies of hsp90 chaperones, correlating structural observations to functional roles in yeast. Gill is a student at Yale University.

Sean Bourne is a student at the Rochester Institute of Technology and is working with Dr. Christopher Goulah in his lab. He will be studying the catalytic mechanisms of a fatty acid dioxygenase from *Arabidopsis thaliana* by altering key amino acid residues in and around the substrate binding pocket and measuring how these mutations affect the capacity of the protein to bind and catalyze various fatty acid substrates. This project complements work being done in the lab on another protein, COX-2, a key pharmaceutical target due to its involvement in arthritic pain and inflammation.

Jacob Castiglia, a student at Canisius College, will be assisting Dr. Edward Snell in his lab. Castiglia will be analyzing crystal contacts for proteins contained within the protein data bank and cross referencing that with crystallization conditions to investigate possible predictive patterns.

Daniel Dykstra, a student from the State University of New York at Fredonia, is working in Dr. Michael Malkowski’s lab. Dykstra will be working on projects related to understanding the different substrate specificities exhibited by Cyclooxygenase-1 and -2.

Jeff Salerno is working with Joseph Luft in his lab. Salerno is a Physics teacher at Lake Shore High School who has been an active participant in the HWI summer internship program for many years. Salerno will be working with Elliott Penna and Chelsea Zale, formulating and characterizing 3,000 different chemical cocktails that are vital to the success of the high-throughput Crystallization Screening Laboratory. Through the HWI -more-
summer internship, Salerno gains practical, firsthand knowledge of a career in a research laboratory. He shares this experience with his students at Lake Shore High School, providing HWI with an opportunity for community outreach.

Jackie Sikora and Andrew Kauffmann are assisting Dr. L. Wayne Schultz in his lab. Sikora, a junior at Allegheny College studying Chemistry, is working on understanding how animal viruses mutate to infect humans. She will be developing a method to detect the interactions between virus and human proteins that facilitate the process nuclear transport. Kauffman, a sophomore at Canisius College studying Chemistry, is working on a project to develop new treatment for multi-drug resistant gram negative bacterial infections. He is developing an assay to detect the activity of an enzyme that is essential for bacteria to synthesize DNA. The assay will be used to test new compounds that inhibit the activity of this enzyme, halt DNA synthesis and therefore may act to kill bacteria.

ABOUT HWI
With more than 50 years of exceptional scientific research, HWI is an internationally-renowned independent, non-profit facility specializing in the area of fundamental biomedical research known as structural biology. HWI’s team of more than 75 staff members is committed to improving human health by studying the causes of diseases, as well as potential therapies, at their basic molecular level. HWI is located in the heart of the Buffalo Niagara Medical Campus in downtown Buffalo, New York, in a new state-of-the-art structural biology research center at 700 Ellicott Street. For more information, visit HWI’s website at www.hwi.buffalo.edu or call 716-898-8600.

-30-