

Undergraduate interns conduct real-world scientific research

2:37 p.m., June 25, 2009----Fifty undergraduate students and their faculty mentors, representing the University of Delaware, Delaware State University, Delaware Technical & Community College and Wesley College, gathered at the Delaware Biotechnology Institute in Newark on June 8 to begin their summer research.

The students are sponsored by Delaware's IDeA Network of Biomedical Research Excellence (INBRE) and Experimental Program to Stimulate Competitive Research (EPSCoR), which are funded by the National Institutes of Health and the National Science Foundation, respectively.

In Delaware, INBRE is focused on cultivating biomedical research personnel, while EPSCoR seeks to improve Delaware's natural environment.

"Our programs, built on a partnership among six institutions -- research institutions and clinical care settings -- provide an opportunity for students with diverse interests," said Jeanette Miller, assistant director of the Delaware Biotechnology Institute, who coordinates the summer internship programs. "We are able to tailor the internship to the student's long-term career interests, be that graduate school in science and engineering, medical school or a job in the private sector."

INBRE students work in academic settings, as well as at Christiana Care and Nemours/Alfred I. duPont Hospital for Children.

"As a group, they are involved in research at the bench, as well as in looking at clinical outcomes, and field studies in the area of environmental science," said Miller.

INBRE intern Rachael Latshaw is a University of Delaware senior majoring in biological sciences. Her project for Anja Nohe, assistant professor of biological sciences at UD, focuses on the protective effects of Vitamin D on hormone-dependent cancers. "Research appeals to me as an invaluable opportunity to learn about the root of information and data we have today," said Latshaw. "I applied for the internship because the research was directly related to my career goal to become a physician."

Brian Mahon, a Wesley College junior majoring in biological sciences, is conducting experiments involving organic solvolysis of specific compounds with Malcolm D'Souza, a Wesley College chemistry professor, for his INBRE internship.

"I expect to get more lab work experience from this internship and to have the opportunity to have my name on a published paper," said Mahon, who ultimately hopes to work in industry, researching new medications to treat diseases.

Many of the INBRE and EPSCoR internships are as multidisciplinary as that of Mahon.

EPSCoR intern Syrena Taylor, a freshman at Delaware State University whose major focuses on wildlife and fisheries management, is interested in working as a marine mammalogist, specifically in the rehabilitation and rescue of marine mammals and other large marine life along the Atlantic Coast.

"I'm working with Dr. Christopher Heckscher, an assistant professor of environmental science at DSU, to band and place geolocators on veery thrushes," Taylor said.

Some interns travel to a different academic institution for their internships.



INBRE and EPSCoR interns and their mentors spent the afternoon of June 8 at the Delaware Biotechnology Institute.

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Eric Wommack, associate professor of plant and soil sciences at UD, has two EPSCoR interns in his lab this summer -- Bill Kress, a sophomore in UD's Department of Civil and Environmental Engineering, and Mara Hyatt, a Delaware Tech sophomore majoring in biotechnology. Kress and Hyatt are working with Jennifer Clarke, a senior biology major at Lincoln University, to explore the diversity and ecology of unknown and novel viral genes across marine and soil environments.

"Through their summer research efforts, these interns will provide significant understanding of genes that are highly abundant and active in natural environments yet completely unknown to science," said Wommack.

Because INBRE internships focus on human health and EPSCoR internships on environmental science, some students have found a way to combine the two experiences, like Shannon Carter, a senior biology major at Wesley College, who has been an INBRE intern for two summers and is now an EPSCoR intern. Carter is working with Keka Biswas, assistant professor of biology and environmental sciences at Wesley College.

"My project deals with environmental microbiology," said Carter, who wanted to link environmental and human health in her internship and plans to become either a physician's assistant or pursue a graduate degree in medical microbiology.

Tayyaba Toseef is an EPSCoR intern working with Princy Mennella, assistant professor of biology at Delaware State University.

"Dr. Mennella's research deals with the effects of progesterone, a hormone, on the development of the fetal brain," said Toseef. "My project is designed to analyze the effects of progesterone at specific times during development."

Many of the interns view their summer experiences as formative part of their undergraduate education that will lead them toward the future.

Kathleen DeWoody, a junior chemical engineering major at the University of Delaware, is working for Maciek Antoniewicz, a professor of metabolic engineering at UD, for her EPSCoR internship. DeWoody and graduate student Aditi Swarup are culturing HB8 and HB27 cells aerobically to determine the metabolic pathway under which they operate, in order to maximize ethanol production.

"After we determine the metabolic pathway for the cells, we will genetically re-engineer the cells so that they can grow in anaerobic conditions," said DeWoody. "This is essential because growing cells aerobically is very costly on a large scale, so growth under anaerobic conditions is optimal."

DeWoody hopes to earn her master of business administration degree and work in industry, and expects to gain skills from working in a laboratory that go beyond scientific discovery.

"Working in a lab requires thinking skills not taught in the classroom," she said. "When an experiment isn't working, there is no procedure or explanation you can look at to justify your results. It is up to the experimenter to determine what is happening and why it is happening."

Monique Kinard, a senior biology major at DSU, shares DeWoody's philosophy. "I expect to get great things out of this internship, like working with other students as a team or individually, learning different techniques in the lab, an idea of what I really want to do with my life, and even more practice at my presentation skills," she said. Kinard's EPSCoR internship is with Cynthia vanGolen, assistant professor of biological sciences at Delaware State.

Aaron Gibson hopes to become an academic and regards his EPSCoR internship as a critical part of his developing career. "Experience in planning and executing experimental procedures and then presenting the results to peers is being considered as a larger and larger part of one's academic credentials," said Gibson, a senior biology major at DSU who is examining the alkaloids extracted from various medicinal plants with Arthur Tucker, co-director of Delaware State's Claude E. Phillips Herbarium.

Miller emphasized both internship programs' emphasis on diversity. "We are committed to building a demographically diverse cohort of students," she said. "Science should look like society."

NSF EPSCoR sponsors a summer undergraduate research seminar series for the interns. This summer's seminars include a research ethics seminar and panels about working as an environmental scientist in academia, attending graduate school and working in industry.

"The seminar series is designed to bring the interns together in the spirit of multidisciplinary collaboration," said Miller. "A major thrust of academic research these days is partnerships, so we seek to cultivate alliances among this next generation of scientists."

Miller added that another objective of the internship program is to truly prepare undergraduate interns for their careers. "Students in INBRE and EPSCoR are Delaware's brain trust," she said. "We want to help them decide what they would like to do in life and help them achieve their goals."