INDIANA UNIVERSITY EAST

Summer Research Scholars study projects ranging from biology to service-learning

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Richmond, Ind. — Indiana University East awarded six scholarships for the 2010 Summer Research Scholar Program. Undergraduate students receive $2,000 to conduct a research project under the supervision of a faculty mentor.

Funding for the program is provided by the Indiana University Office of the Vice Provost for Research and is matched by funds from IU East. The competitive program has expanded from the first single award given to now include up to six students each summer.

All recipients will present their research findings during the sixth annual Student Research Day in spring 2011.

Zachary Bishop, Connersville, Ind. "Sustaining Life." English major working with Jean Harper, assistant professor of English.

Bishop is spending the summer volunteering at an organic farm, Bruinslair Ecology Refuge, and is documenting its effects on his life.

"I'm volunteering for a vivacious couple in their early 60s in the beautiful Tahoe National Forest in Northern California. They own 160 acres of almost virgin forested property," Bishop said. "In addition to general maintenance on their cabins, labor in their garden, and clearing of mountain trails, I'm also helping them establish a fundraising event which will combine mountain biking with GPS treasure hunting (geocaching) in order to raise funds and environmental awareness."

Edward DeLaPaz, Richmond, Ind. "Pathways and Perceptions: The Community-Impact Assessment Project." Business major working with Ange Cooksey, director of service-learning and senior lecturer in Humanities.

DeLaPaz is developing a survey and tools to help study the impact service-learning is having on the local community. He is interested in this research project because he believes the tools he is developing would be useful to IU East and community organizations.

"I've been working in the education field for over eight years now and having tools to measure the impact of educational service-learning programs would be useful for not only IU East but for other organizations," DeLaPaz said. "This type of survey is also needed for the Carnegie Classification which IU East plans on applying for within the next few years. Also we are gathering a database of resources and other community impact surveys so that when future community surveys are conducted they will have a place to start."

Megan Eversole, Liberty, Ind. "Racial Formation and Meaning: A Local Examination of Race Views." Sociology major working with Denise Bullock, associate professor of sociology.

Eversole said her curiosity is driving her interest in her research project this summer. She said social justice and the dimensions of inequality have always been a central part of her search for knowledge.

"I think we all want to know more about the world around us, I specifically am interested in examining the subtle intricacies of racial meaning," Eversole said. "My intention with this project is to gain a better understanding about the way in which we create meaning in relationship to race. I think by understanding the social elements that influence us and our interpersonal interactions that create our individual realities, we can eventually establish a collective consciousness that embraces difference without fear."

Zachary T. Robbins, Williamsburg, Ind. "Lambda Red-Mediated Recombineering and Its Application." Biology major working with Hitesh Kathuria, assistant professor of chemistry.

Robbins is working on standardizing the recombineering protocol for high-copy number plasmids for use in plant systems as well as for mammalian cell culture systems. He said the two objectives of his research project are to study the role of various cis-acting promoter elements in the novel rice promoter OsiPP3 and to study the effect of point mutations in the functional domain of epigenetic regulator Cfp1.

"In our lab, we have already standardized the protocol for swapping DNA fragments of varying sizes into vectors for use in insect systems. We will now standardize the protocol for creating transgenic mammalian tissue cultures as well as transgenic Arabidopsis plants," Robbins said. "Together, all three protocols, will demonstrate that the recombineering system is a versatile method to create novel recombinant vectors."

Robbins said this technique has not yet been standardized for high-copy number plasmids. He added that by using recombineering he can potentially create recombinant vectors of any size, from any plasmid irrespective of the presence or absence of restriction enzyme sites.

"We can precisely 'cut' any DNA fragment using homology based recombination and integrate DNA of any size as long as both the ends have identical homology sequences. This tool can be exploited to create deletions at sites where no restriction sites exist. Point mutations can also be conveniently made to alter site specificity and disrupt cellular functions in order to elucidate the role of a certain domain in a protein," Robbins said.

Amber Surguy, Brookville, Ind. "Food-Borne Illness at Home." Biology and biotechnology major working with Kimberly Greer, assistant professor of biology.

Surguy's project will provide insight into household practices of food preparation and handling, and how those practices influence infectious health issues. This project is designed to determine how various food safety practices in the home affect bacterial exposures that may lead to food borne illnesses. To accomplish this goal, Surguy will survey local households regarding their leftover and condiment practices in the home and they will test food samples for the presence of potentially infective bacteria.

"Our hypothesis is that based on the type of food or condiment exposed to the open environment and the time length of exposure, the number of bacteria recovered will vary significantly," Surguy said.

Surguy expects that foods with higher surface area are expected to facilitate growth of more bacteria types. Secondly, foods with open air exposure are expected to facilitate growth of more bacteria compared to foods remaining at room temperature but within a sealed jar. Lastly, foods with the most time exposed to room temperatures are expected to house more bacteria types than those foods with less time exposure. "Numerous mandatory tests are practiced everyday in the food industry to make sure companies are not selling foods that will make people sick. Food borne illness is relatively common, and the food industry is highly regulated in attempts to protect consumers," Surguy said.

Hamid Zakaeifar, Richmond, Ind. "Aging as a Contributing Factor to Oxidative Cellular Resistance in Domestic Dogs." Nursing major working with Kimberly Greer, assistant professor of biology.

Zakaeifar said the purpose of his research is to investigate the cellular resilience to oxidative stress of small breed dogs and the gene expression of specific genes associated with longer life spans and aging.

"The project is a smaller part of a much larger canine aging study," Zakaeifar said. "The topic and laboratory experience allow me to look at genetics from beyond a textbook perspective, and will assist me in understanding the genetic risks involved with many diseases, such as Alzheimer's, heart disease, cancer, and diabetes, as well as educate individuals while providing care as a nurse in the near future. Also, I just really enjoy doing experiments in a lab."