

Scarlet

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Program aimed at next generation of researchers

Teens experience collegiate science

BY TROY FEDDERSON, UNIVERSITY COMMUNICATIONS

A second-year UNL program is introducing high-end science to high school students across Lincoln and preparing to expand into other Nebraska school districts.

Through a series of three experiments - including the crime lab-like replication of DNA and the eerie green glow of plasma DNA injected into *e. coli* - the Center for Biotechnology Outreach Program is designed to pique interest and draw students to the field of science at an earlier age.

The project is funded through a \$100,000 EPSCoR grant from the National Science Foundation. Those funds are a portion of a four-year, \$6 million NSF Infrastructure grant awarded in 2004.

"I had a separate grant that allowed undergraduates to have some research exposure," said Mike Fromm, primary investigator on the grant and director of UNL's Center for Biotechnology. "The results of that made it clear to me that we need to get students started sooner. Get them interested in science in high school rather than as juniors or seniors in college, allowing them to take the proper coursework."

The outreach program is organized by Sarah Zulkoski-Benson, a UNL graduate who worked in the science industry before returning to education.

"This has been an amazing project to work on," Zulkoski-Benson said. "For me, I really missed the personal contact that I wasn't getting in the science industry. And, now I get to go out, work with teachers and see these students get excited about science."

Five Lincoln Public Schools teachers participated in the program during the 2004-05 academic year. Those teachers selected three experiments - pGlo Bacterial Transformation, Restriction Enzyme Digestion and Analysis of Lambda DNA, and a PV92/PCR Bioinformatics kit - all of which conform to district curriculum and have the potential to provide students with exciting results.

"All of these labs are designed to fit in a 50-minute class period," Zulkoski-Benson said. "These are not new kits we've developed. They are research brands that we have modified to fit the needs of the teachers. They are what works best for the students."

In the first year, Zulkoski-Benson said, the three modules reached 745 students. Five of those students earned university credit for participating in a six-week course during summer 2005.

During the summer, Zulkoski-Benson also organized three professional development sessions for four new Lincoln Public School teachers and 13 Northern Tier teachers. The Northern Tier includes schools in Niobrara, Verdigre, Orchard, Clearwater, Ewing, Elgin, Wheeler Central, Stuart, Spencer-Naper and Lynch.

"I have a bit of a personal contact up there, but our plan has been to expand this program outside of Lincoln," said Zulkoski-Benson, explaining that her father is principal at Verdigre. "But, the Northern Tier was a logical choice because they have a great communications system set up."

The Northern Tier also has a delivery van which can shuttle the experiments between UNL and their individual school sites.



LAB RESULTS - Sarah Zulkoski-Benson (far right) shows Lincoln Southeast students the results of their PCR lab experiment on Oct. 26 in the Beadle Center. Photo by Troy Fedderson/University Communications.



HANDS ON LESSON - Sarah Zulkoski-Benson, science outreach coordinator for the Center for Biotechnology, explains to Andrea Beyersdorf, Lincoln Southeast senior, how to deliver a DNA sample into gel used to create a DNA stain. Below, Lincoln Southeast students conduct an experiment in the Beadle Center on Oct. 26. Photo by Troy Fedderson/University Communications.

"That kind of made the Northern Tier a home run," said Zulkoski-Benson.

Items in the kits include adjustable micropipettors, gel electrophoresis equipment, thermal cycler PCR equipment, mini-centrifuges, vortexes, mini-incubators, and hot water baths.

The outreach program has also brought high school students to the Beadle Center. On Oct. 26, 29 students from Lincoln Southeast completed the PCR bioinformatics lab in the Beadle Center facilities. Along with working in a UNL lab, the students saw actual research in progress, interacted with a number of university researchers and some finished the day by sitting in on Ruma Banerjee's "Genes, Greens and Disease" lecture.

"In my experience, I've never seen students more focused or engaged and wanting to do good," Zulkoski-Benson said of those who have taken part in the program.

Now, Zulkoski-Benson aims to keep expanding the program while working to attract more funding in the future.

"When we received the grant, this type of program was a novel idea," Zulkoski-Benson said. "We are hoping to expand this into Omaha, but our next step is to create an authentic research experience in the classroom."

She is working with Lincoln Northeast science teacher John Snoozy on that project which is to begin in the spring. Snoozy

worked with Zulkoski-Benson and other UNL researchers for eight weeks over the summer, helping to develop the new project.

"I learned more in that two-month time period than in all my past degree studies put together," Snoozy said. "This is a phenomenal program and a tremendous opportunity for both teachers and students to learn. I've recommended it to every teacher I know."

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