

Regional

Undergrads inspired by ability to do research

One of the most exciting experiences college students can have is to participate in research projects. Such an experience not only teaches students about the methodologies used by different disciplines, but also helps them to develop skills such as critical thinking, problem solving and communication – skills applicable to just about any career. While it's usually only graduate students who get this opportunity, Southern Illinois University Edwardsville has an innovative program called Undergraduate Research and Creative Activities (URCA) that allows undergraduates to work with faculty on research.

I had the opportunity to interview two SIUE undergraduates who just completed the URCA experience. They were Brad Denby, a native of Maryville, Ill., who is finishing two bachelor's degrees, one in physics and one in mathematics, and Morgan Sturgeon, a native of Springfield, Ill., who is majoring in biology. They said that they became involved in doing research through different paths. For Sturgeon, she talked with a couple of her professors who suggested she should go to graduate school.

"I talked with one of my professors I had in freshman year and she had an opening in her lab, so I thought I would try it out and see if this is what I want to do," Sturgeon said. "I am really glad I did because it is what I want to do now. I have been working in the lab for about a year and a half and that is pretty much why I started, just to try it out." For Denby, he said that he heard from a couple of people who had been involved in the undergraduate research and who had good experiences.

"I worked with some of the professors and it was a really great experience, especially to be able to do research as an undergraduate," he said. "It allowed me to do things that you can't normally do when taking classes or even independent studies. You get to work on problems or areas of interest that maybe you wouldn't normally get to explore."

Denby worked with algorithms, which mathematicians use to solve problems.



Photo by Michel Nathe

Brad Denby (left) and Morgan Sturgeon being interviewed for Segue by Aldemaro Romero Jr.

"Dr. McKinney, being a computer science professor, and I, having a minor in computer science, we wanted to take an algorithm and rework it so it could be applied to a wider range of problems and the research program was sort of a perfect fit for that."

Sturgeon, on the other hand, worked on biological problems under Faith Liebl, a professor in the department of biological sciences. "She is interested in proteins called glutamate receptors, which

are located in your central nervous system. They are really important for learning and memory. The faster the signals go, the more you learn. Also with a lot of neurodegenerative diseases, like Alzheimer's, they find that there is a decrease in glutamate receptors," Sturgeon explained. "So we want to understand the mechanisms underlying those glutamate receptors and how they get to where they are supposed to be."

For that study, Sturgeon used the fruit

fly. "Their neuro-muscular junction, where their nerve touches their muscle, has glutamate receptors just like the central nervous system in humans and their glutamate receptor proteins are 95 percent similar to ours," she said. "So it makes them a perfect model system. They are easy to take care of, easy to dissect, and you can do a lot of experiments on them."

Part of Denby's research utilized what is called parallel computing. "It is something that has gotten more and more

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popular lately, because one way you can use parallel computing in your computer or even in your cell phone nowadays is with a special chip, video and graphics processors," he explained. "They are built to do parallel processing."

"Over the past few years, companies have sort of been wising up to that and how these video and graphics processors can be used for things other than videos and graphics. They can be used to solve problems and to do scientific computing. So parallel programming and parallel computing has gotten a lot cheaper," Denby said. "The algorithm that we were implementing just so happens to be really well suited to increase its speed if you program it in a parallel manner."

If both Sturgeon and Denby end up becoming college professors, they think that this experience will really help them to better teach students an important component of any research endeavor – patience. "When helping students get into research, I tell them that it is really fun," said Sturgeon. "As for getting them interested, for me it was just kind of natural, but talking about all the exciting things that you can discover that would be a good way too."

"If I were trying to get undergraduates into research I would want to make sure that I am supportive and help them realize that research often doesn't turn out the way that you would expect," said Denby. "A lot of the time it takes longer than you would expect, and you need to make them understand that mistakes happen and it may not turn out like you originally thought, but you're still going to learn a lot."

Aldemaro Romero Jr. is the Dean of the College of Arts and Sciences at Southern Illinois University Edwardsville. His show, "Segue," can be heard every Sunday morning at 9 a.m. on WSIE, 88.7 FM. He can be reached at College_Arts_Sciences@siue.edu.