Eastern Connecticut State University biology professor Matthew Graham, left, holds a giant hairy scorpion recently. Graham, above, holds a jar of scorpions. Roxanne Pandolfi | Staff

Creepy, crawly study at ECSU

Researchers use scorpions to find new antibiotics

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CHRONICLE STAFF WRITER

WILLIMANTIC — Two Eastern Connecticut State University professors are working to bring the "winds of change" into the world of science and medicine.

Eastern biology professor Matthew Graham and colleague Barbara Murdoch are working closely with scorpions — not the German rock band Scorpions, but the arachnids — doing something nobody has ever done before.

They are testing bacteria, naturally found in the abdomens of scorpions, for their ability to develop new kinds of antibiotics.

Graham and Murdoch recently received a $10,000 grant from the NASA Connecticut Space Grant Consortium, which was matched by the university, to help jump start the research.

Murdoch said the total grant, including the match, came to a little more than $20,000, which is enough for the beginning stages.

"We need to find new sources for antibiotics," Murdoch said. "Most antibiotics that we have today come from bacteria. So, if you can find novel sources of bacteria, you can probably find antibiotics that will be effective at treating bacterial infections."

Graham, who specializes in scorpions, said the scary-looking creatures have been around for more than 400 million years.

This means, "there could be incredibly old species of bacteria hidden within scorpion guts and their bodies that haven't been explored yet," he said.

Murdoch said, having been around for so long, scorpions have been exposed to "all kinds of nasty things," which haven't affected them detrimentally.

"We think that there's probably a popula-

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tion of bacteria found in scorpions that gives that wonderful resilience," she said.

Graham said the research has three objectives — identifying which species of bacteria are in scorpions, finding novel antibiotics and training undergraduates.

Both Graham and Murdoch incorporate their research into their teaching.

In fact, this research idea came from a student, Murdoch said, who first worked on isolating bacteria from soil.

Then, she suggested using scorpions because "they are ancient."

That's how the project was born.

"Each year, 25,000 Americans die because our current antibiotics cannot kill their infections," Murdoch said in a press release. "Bacterial infections are a growing concern in space, too. As most antibiotics used today were isolated from bacteria, the discovery of new antibiotics requires the discovery of new bacteria."

As part of the research, Graham and Murdoch are pulling bacteria out of scorpions and extracting their DNA to see what genes they have.

Currently, they have nine scorpions to work with, brought in from California.

Murdoch said the bacteria they pulled out so far has nothing pathogenic that would kill them, but most are associated with food-borne illnesses.

The goal is to get to uncultured bacteria within scorpions.

Murdoch, who has done a lot of research on antibiotic resistance, said man is running out of antibiotics because pharmaceutical companies stopped producing new ones.

She said the project has been good, but another benefit is the grant allows for support from the University of Connecticut via assistant biology professor Nichole Broderick, who specializes in molecular and cell biology.

This allows them to use UConn resources as well.

"For us to have access to that facility is fantastic," Murdoch said.

Murdoch and Graham said the research they are doing has never been done before.

"The level of details that we will eventually get to will be unprecedented," Murdoch said.

And to get to the stage where they are now — being able to grow bacteria they extracted from scorpions — is already a huge achievement.

According to the release, the research contributed to NASA's goal of human space exploration because, under microgravity conditions, bacteria can grow quicker than on Earth.

This means creating new antibiotics "that pathogens haven't become resistant to is crucial to long-term manned space flight."

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