

NMSU Biology Major Traveling to the Philippines

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The Honors College at New Mexico State University recently awarded its \$5,000 Scholarship For International Research.

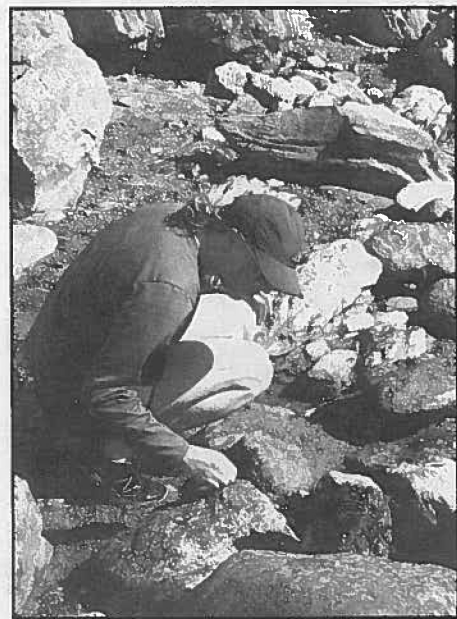
Kira Turnham, 21, is a junior biology major at NMSU. She received the award on March 20, after submitting a proposal wherein she outlined plans to study a particular species of squid and their symbiotic bacteria in the Philippines.

"The Philippines are where the squid and bacteria I'm researching are from," she said.

This squid, called *Euprymna albatrossae* or bob-tailed squid, utilizes its symbiotic bacterium, *Vibrio fischeri*, in order to create bioluminescence, or the emission of light from within an organ in the squid (called the light organ). This allows the squid the ability to detect predators, as well as be a more effective predator itself.

"In return the bacteria get a place to live and nutrients and stuff," Turnham said, adding the relationship between the squid and the bacteria is symbiotic.

In September 2014, Turnham was accepted as a research scholar for the Howard Hughes Medical Institute. Through this foundation, Turnham works in the lab of Michele Nishiguchi, NMSU Regents professor of biology.



Nishiguchi's research lies primarily in the field of marine biology. She has been to the Philippines in 2010, 2011 and 2013 for the purpose of researching this squid and its bacterium.

Nishiguchi first met Turnham during a

five-day field course for invertebrate zoology, BIOL 466, in Catalina, Calif. After this, Turnham said she wanted to apply for the HHMI program and asked Nishiguchi to be her mentor.

"I have always loved marine biology, so that was initially what got me interested in Dr. Nish's lab," Turnham said.

Nishiguchi notified Turnham of the honors scholarship and encouraged her to apply.

Turnham said the time during which she and Nishiguchi constructed her proposal was "interesting."

"Because I really got to know my own project, and I had to make sure that I could explain what was going on and what my goals were for the project," Turnham said. "But also explain it in a way that other people who weren't in my discipline could understand."

Nishiguchi said the species of bacterium her lab works on is harmless, but there are many others in the same genus that "are nasty" bacteria.

"*Vibrio cholerae* is also a (genus) *Vibrio*, as well," Nishiguchi said.

Nishiguchi said studying this particular species of squid and this particular species of bacterium can help in understanding multiple, more complicated bacteria.

"If you have a simpler model (such as harmless bacterium to study), then you might be able to answer some simple questions, and say, 'Okay, now we can go on to some bigger ones, because we know the basics,'" she said.

By further studying this genus, Nishiguchi said, Turnham's research can help identify where *vibrio* reservoirs reside in the ocean. Further, Nishiguchi said studying symbiotic (and in this case, beneficial) bacteria can increase understanding of how humans benefit from certain species or communities.

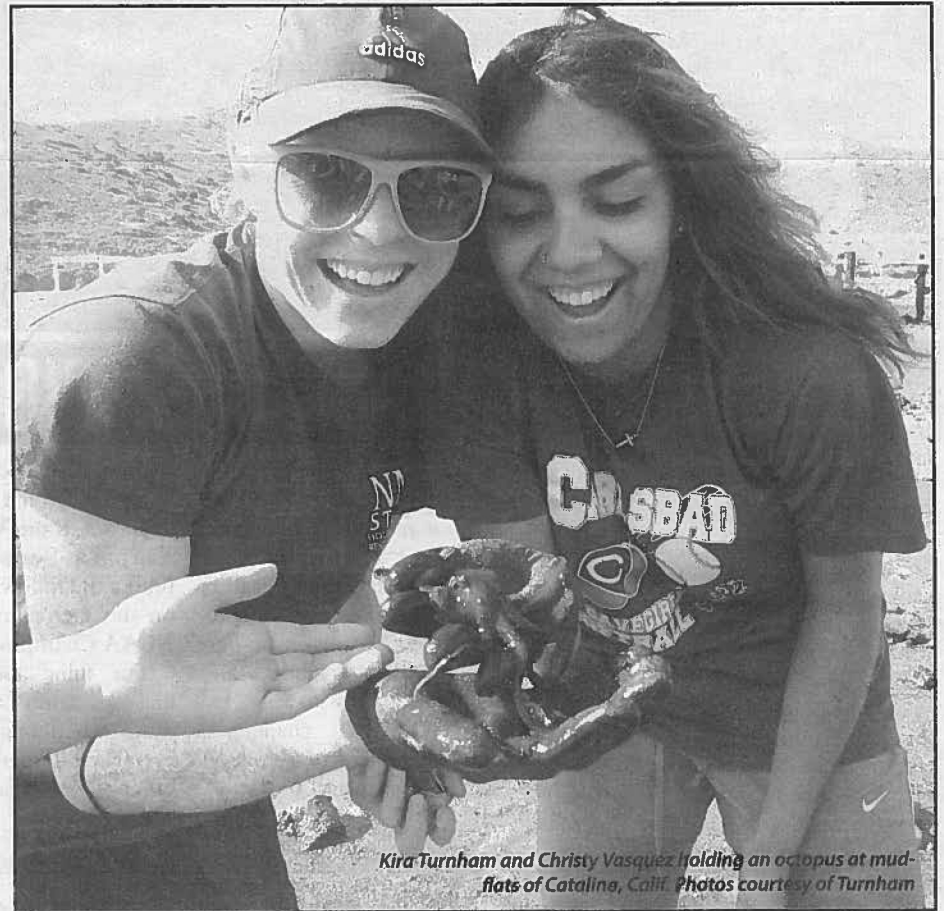
Turnham outlined how she intends to spend her time in the Philippines.

"I'll be spending 10 days (each) on three islands," she said. "I will be working with local fisherman, they'll be collecting the squid, and then I'll take the squid back to the laboratories at the universities that I'm working at, and I will be isolating the bacteria and preserving both the squid and the bacteria for further analysis."

Turnham said the local fishermen will be paid for these squid.

The universities Turnham will be working at are Silliman University on Negros Island, the University of San Carlos in Cebu and Western Philippines University on Palawan Island.

"I'll also be working at a laboratory, the



Kira Turnham and Christy Vasquez holding an octopus at mudflats of Catalina, Calif. Photos courtesy of Turnham

Southeast Asian Fisheries and Development Center (SEAFDEC)," Turnham said.

Turnham estimated the writing of the proposal took about a week, but gathering the rest of the submission materials took about a month. After submitting the proposal, Turnham said she "was a little nervous."

Turnham was on a triathlon trip during spring break when Nishiguchi called her to say she had received the award.

"I was very, very excited," said Turnham.

Turnham said receiving the scholarship was "a huge honor."

"To be representing not only NMSU but the United States in another country is fantastic and I feel very lucky that I get to do that," she said.

Turnham will be staying in the Philippines from the middle of May until mid-June. She will live in university- and SEAFDEC-provided housing. Her only previous international experience was a trip to Mexico. She said the prospect of going to stay in another country is "nerve-racking."

"But it's definitely an experience I want to experience," she said.

Turnham said her family is very supportive, despite her mother's nervousness.

"She's also excited," Turnham said. "She

knows it's a really good opportunity."

Professionally, Turnham said her time in the Philippines will provide her with many benefits.

"My honors thesis will be written about (the trip), I'm going to be an author on a couple of papers and then, obviously, going to graduate school I think this is going to be a real helping factor for a competitive application," she said, as well as developing contacts at each of the universities.

Turnham also said she sees many personal benefits.

"I think that experiencing a whole other culture that's completely different from what I know is really going to broaden my horizons and make me realize what a big world we live in, and I think it'll open up a lot of opportunities and desires to travel more," she said.

Nishiguchi said Turnham has "a passion" for marine biology.

"I can't remember not liking the ocean," Turnham said. "I am enthralled by anything marine."

Turnham said she hopes to go on to graduate school to earn her doctorate in marine biology, perhaps eventually becoming a professor.