

NEWS RELEASE

January 5, 2012
FOR IMMEDIATE RELEASE
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WNMU BIOLOGY PROFESSOR AWARDED \$273,000 NSF GRANT

Research funds will establish permanent molecular research lab on campus

Silver City, NM – Biology Professor Dr. Manda Clair Jost has been awarded a competitive research grant from the National Science Foundation (NSF) that will bring more than a quarter of a million dollars to Western New Mexico University over a period of three years. The award will fund an original research project exploring the ecological, evolutionary, and molecular interactions between spider-wasps in New Mexico and the spiders they hunt in order to feed their own offspring. It will also fund the creation and equipping of a new shared-use molecular biology lab facility at WNMU for both faculty and student research.

“Most people have seen the big black wasps known as tarantula hawks,” said Jost. “But what many people don’t know is that there may be up to a hundred different species of these wasps in New Mexico, each with their own specialized venoms that help them paralyze the spiders they prey on.”

The project will involve collaboration between Jost and WNMU chemistry professors Dr. Shawn White and Dr. Mahesh Pattabiraman. One aspect of the project involves determining the molecular structures of wasp venom molecules using the new mass spectrometry equipment acquired by the WNMU Natural Sciences Department in 2011 through a grant from the Freeport McMoRan Copper & Gold Foundation.

“This new NSF grant isn’t just about wasps and spiders,” said Jost. “It’s about cross-disciplinary collaboration, putting our new mass spec equipment to good use, and raising the capacity and standards of scientific research at WNMU. Most significantly, it will allow us to build a new, permanent molecular research lab in Harlan Hall, and give students some of the first opportunities for molecular research and training that WNMU has ever offered.”

Over the 3-year course of the project, a rotation of up to six selected Natural Sciences students will participate each semester in paid research training, fieldwork, data collection, and travel to scientific conferences to present their findings.

“The development of the research laboratory associated with this grant will allow

students the opportunity to develop a wide range of molecular biology techniques used to compare organisms,” said Dr. Jeffrey Hill, Natural Sciences Department Chair. “More importantly this lab will allow undergraduate students to be involved in research of the kind required for advanced graduate degrees and widely used by land management agencies like the Forest Service.”

Spider-wasps, which belong to the wasp family Pompilidae, possess chemically simple venoms that are used to paralyze spiders such as tarantulas, wolf-spiders, and orb-weavers, which are then kept alive and used as food provisions for the wasps’ own parasitic larvae. Wasp venoms are specialized to interact with the spiders’ nervous systems, and it is believed that some spiders may have evolved partial or complete resistance to wasp venoms, prompting the wasps in turn to evolve more effective venom toxins – a process that biologists call an “evolutionary arms race”.

Perhaps the best-known spider-wasp is the large local species *Pepsis formosa*, the “tarantula hawk”, which in 1989 was declared the official New Mexico state insect as a result of a campaign led by elementary school students in Edgewood, NM.

Located in Silver City, New Mexico, Western New Mexico University has served the people of the state of New Mexico and its surrounding areas as a comprehensive, regional, rural, public coeducational university since 1893 and caters to a student body diverse in age, culture, language and ethnic background.

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