

## Unique Graduate-Level Research Conducted at Mesa Community College

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For the past two years, under a grant provided by the National Science Foundation, MCC chemistry faculty Timothy Minger, Valentina Nedelkova and John Zikopoulos have been designing and implementing laboratory activities to extract, purify, and study organic molecules from desert plants using scientific instrumentation to analyze chemical compounds.

Over the summer, under the guidance of Dr. Zikopoulos, the honors students further researched the components of the oils found in jojoba and chia plants, native plants with a traditional place of importance in Hispanic and Native American cultures.

"This exceptional group of students extracted and analyzed the oil from the seeds of the Jojoba plant and Chia seeds for antimicrobial properties," reported Zikopoulos. "We are investigating a new way to deliver antimicrobials using naturally occurring substances." The new method could be used medicinally or in skin care products.

When asked about the experience, MCC student Jose Flores said, "I always wanted to do research, it's what motivated me to come to MCC."

Dawn O'Brien, a military veteran student and long-time horticulture aide volunteer at the Desert Botanical Garden, was eager to learn in the lab.

"It's like a puzzle to figure out," she said. "I'm working toward a biochemistry degree and plan to go to medical school. I liked having individual time with the instructors."

All three professors involved in the grant said it is a very rare experience for community college students to conduct graduate-level research, and that they want to continue to provide opportunities for outstanding organic chemistry students to participate.

"This novel work was possible because the students were willing, eager even, to dedicate their time over the summer," Zikopoulos noted. Looking forward, Spencer Hall, one of the student researchers, says he will use the experience to enhance his abilities as a future post-secondary instructor

A grant from the [National Science Foundation](#), awarded in 2012, "Organic Chemistry and Native Plants of the Sonoran Desert: A New Model for the Undergraduate Laboratory" (NSF grant 1140887), made this research possible through the provision of the NMR spectrometer necessary for the new inquiry-based labs and chemical research.

Project progress is being evaluated by M. Jean Young & Associates of Tucson, as specified in the grant, using formative and summative assessments. Project objectives include isolating and identifying materials from native plants; providing hands-on training for students in key organic laboratory instrumentation for analysis and purification of plant materials; introducing students to a variety of applications of the compounds found in plants, e.g., medicinal, agricultural and other contexts; and encouraging student participation in independent study outside the lab classes.

### About Mesa Community College

Mesa Community College provides outstanding transfer and career and technical programs, workforce development, and life-long learning opportunities to residents of the East Valley area of Phoenix, Arizona. MCC excels in teaching, learning and empowering its more than 40,000 students who attend annually to succeed in a local and global community. Mesa Community College is one of ten colleges that comprise the Maricopa County Community College District.




Science Research Team at Mesa Community College

“ This exceptional group of students extracted and analyzed the oil from the seeds of the Jojoba plant and Chia seeds for antimicrobial properties. --Dr. Zikopoulos ”

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