7-10-2019

Ouachita's Department of Biological Sciences promotes undergraduate research through AR-CURE workshop

Ouachita News Bureau
Ouachita Baptist University

Rachel Moreno Moreno

OUACHITA BAPTIST UNIVERSITY NEWS

For immediate release

Ouachita's Department of Biological Sciences promotes undergraduate research through AR-CURE workshop

By Rachel Moreno

July 10, 2019

For more information, contact OBU's news bureau at newsbureau@obu.edu or (870) 245-5208

ARKADELPHIA, Ark.—Ouachita Baptist University's Department of Biological Sciences recently hosted its third AR-CURE Synthetic Biology Workshop to share its innovative course-based research project with institutions seeking to conduct semester-long undergraduate research. The 2019 workshop, held June 16-19 on Ouachita's campus, was attended by 30 faculty members representing institutions in 17 states.

The Arkansas-Course Embedded Undergraduate Research Experience (AR-CURE) is an academic initiative developed by Ouachita's Department of Biological Sciences and is aligned with a national movement in science to incorporate more research into the undergraduate classroom. Having gained success with students building and analyzing synthetic genes in his research-based Genetics Laboratory course, Ouachita's Dr. Nathan Reyna pursued a four-year grant from the Arkansas Economic Development Commission (AEDC) and the National Science Foundation (NSF) to fund the dissemination of Ouachita's course-based research model to other institutions.

"Traditional science labs are a series of weekly, observation-type of lab experience, often referred to as 'Cookbook Labs,'" said Reyna, assistant professor of biology at Ouachita and director of AR-CURE. "We want to create labs that are true semester-long research experiences. … The AR-CURE project gives faculty a model they can use to modify how they approach teaching science."

The 2019 AR-CURE workshop, funded by NSF and the Arkansas Experimental Program to Stimulate Competitive Research (AR-EPSCoR), taught faculty participants the importance of course-based research and shared how to conduct Ouachita's Synthetic Biology project at their institutions. It also encouraged collaborators who had previously attended the workshop to share the challenges and triumphs of developing the project at their institutions.

"This workshop is unique in that Dr. Reyna is 'teaching the teachers,'" said Dr. Tim Knight, dean of the Patterson School of Natural Sciences and professor of biology. "His workshop is set up to help other faculty at other institutions do what we are doing in our Department of Biological Sciences."

Reyna led Ouachita's AR-CURE workshop along with co-director Dr. Ruth Plymale, associate professor of biology at Ouachita and holder of the J.D. Patterson Chair of Biology. One of Ouachita's primary goals with the workshop, Plymale said, "is to empower faculty from small or resource-limited schools to conduct authentic research with their students."

"Faculty apply to attend and are selected on various criteria, including if they are from a community college or minority-serving institution," she said.

According to Reyna, 11 institutions and almost 300 students participated in course-based research during the 2018-2019 academic year as a result of Ouachita's 2018 AR-CURE workshop. Reyna said he expects about half of this year's 30 workshop attendees to use Ouachita's Synthetic Biology project as their class Course-embedded Undergraduate Research Experience (CURE), while the other half will use the model to create their own CURE project.

Having transitioned all of her Ouachita classes to a CURE-based curriculum, Plymale provided insight during the workshop about how faculty might adapt their own courses and projects to be CURE-based.

"Course-based research extends the high-impact research experience to every student enrolled in a course, giving each student the opportunity to confront and overcome failure through working to solve a unique problem," Plymale explained. "In the Department of Biology, we utilize course-based research at the freshman and junior and senior levels because we firmly believe that science is a necessarily repetitive process.

"Just like making one good cake does not mean that you are a baker, having one good independent research experience does not make the student a scientist," she added. "The repeated research opportunities provided by course-based research are valuable in developing our students into scientists."

Another highlight of Ouachita's annual AR-CURE workshop is OBU students' involvement. This year, Jake Edmondson, a 2019 biology graduate from Benton, Ark., and three Patterson Summer Research Program senior biology students – Taylor Garner, a senior from Hensley, Ark.; Tiffany Koba, a senior from Benton, Ark.; and Cammie York, a senior from Glenwood, Ark. – helped facilitate the wet lab portion of the workshop.

"The guest faculty work through the student laboratory experience of creating a synthetic gene, and the students are invaluable as lab facilitators because they have completed the lab and can provide genuine insights into laboratory successes, struggles and lessons," Plymale said.

Additionally, Reyna and Plymale have worked to make their AR-CURE teaching opportunities available to Arkansas high schools. The week of June 11, Reyna and Plymale hosted 10 high school biology teachers on campus for a bioinformatics high school outreach project they are developing; bioinformatics is the use of computers to analyze biological data. In the spring of both 2018 and 2019, they also helped their biology students host a "Genome Hack-a-Thon" bioinformatics workshop for high school students.

"Our model is to train our students and then let them train others through our science education outreach projects," Reyna said. "The Genome Hack-a-Thon is a perfect example of this. On the day of the actual event, the students in our Bioinformatics class led the entire day's activities."

Since AR-CURE's initial start, "we continue to seek opportunities to broaden student participation in authentic science," Plymale said.

For more information about Ouachita's AR-CURE Synthetic Biology Workshop or the Department of Biological Sciences, contact Dr. Nathan Reyna at reynan@obu.edu or (870) 245-5240.

-30-

PHOTO AVAILABLE FOR DOWNLOAD https://obu.edu/news/2019/07/10/ouachitas-department-biological-sciences-promotes-undergraduate-research-ar-cure-workshop/