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South Carolina EPSCoR Division Awards Faculty Competitive Research Grants

Winthrop University

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Quick Facts

- The grants will be implemented in spring of 2015.
- This is Evans-Anderson's third EPSCoR grant.



Grossoehme

ROCK HILL, SOUTH CAROLINA — The **South Carolina EPSCoR faction** has awarded three Winthrop University faculty members with grants to expand the importance of research in the sciences and engineering at state institutions.

This particular track of the EPSCoR (Experimental Program to Stimulate Competitive Research) grant's mission is to expand research access, collaborative research between state institutions and underrepresented minority students and faculty in the STEM disciplines, according to the website.



Evans-Anderson

Assistant Professor of Chemistry Nick Grossoehme, Associate Professor of Biology Heather Evans-Anderson and Associate Professor of Chemistry Maria Gelabert will implement the grants in spring 2015.

Here's a closer look at their research projects:

*Congenital heart disorders are the most prevalent lethal birth defects, and cardiovascular disease is the leading cause of mortality in adults, according to the Centers for Disease Control and Prevention and the Children's Heart Foundation. One common feature of both pediatric and adult heart disease is a change in how genes are expressed and regulated in cells of the heart, which has profound impacts on a wide variety of cellular functions.



Gelabert

The EPSCoR grant will allow Grossoehme, Evans-Anderson and chemistry student **Mikala Smith** to explore one potential pathway that cells use to control gene expression. Specifically, they will use a variety of biochemical and bioinformatic techniques to identify what proteins are influenced by FoxO, a regulatory gene that has been linked to heart development in vertebrates. (Evans-Anderson has explored this in her research in 2008 and 2012).*

Smith, of Spartanburg, South Carolina, has worked on the project throughout the past year. In spring 2015, she will split her time between Grossoehme and Evans-Anderson's labs, during which she'll be exposed to and learn about the advantages of a wider variety of scientific techniques. Additionally, the grant will allow Smith to visit the bioinformatics facility at the Medical University of South Carolina (MUSC) in Charleston.

Grossoehme said they are very excited about the opportunities the grant gives them.

“We are able to take this research project to the next level by working with the bioinformatics experts at MUSC,” he said. “More importantly, this grant allows Mikala to build on the skills and knowledge that her current undergraduate research experiences have afforded her. These experiences are paramount to developing the technical abilities and confidence to be competitive for the best jobs and graduate programs upon graduation from Winthrop.”

In addition to her research, Smith is part of the sophomore **EagleSTEM** cohort and an active tutor for University College’s **Academic Success Center**.

Follow the project’s progress on Evans-Anderson’s lab website.

*Crystal growth from water-based solution is an important problem for a variety of technologies, including nanotechnology and biomineralization, noted Gelabert. Within the broad goal of understanding how aqueous chemistry affects crystal shape and size, the grant will help Gelabert and two chemistry students—**Jessica Zinna** and **Danielle Thibault**—investigate two biominerals: calcite and hydroxyapatite. Using computer modeling and synthetic tools, they will study aqueous chemistry within the context of crystal growth control and development of fundamental knowledge.

“Both of these materials are heavily studied for fundamental reasons, such as how mollusk shells grow or how global warming is affecting ecology of coral reefs, but also for growth of artificial bone,” Gelabert said. “Fundamental work accomplished here might serve to better understand other, entirely different, chemical systems requiring control of aqueous chemistry for synthetic fabrication.”

Zinna, of West Columbia, and Thibault, of Rock Hill, have worked on this research since summer of 2014 as part of the SURE program. They will present at the SURE program next year and plan to publish in the Journal of Crystal Growth and/or similar publications.

Zinna and Thibault are both EagleSTEM scholars and peer tutors. They are founding members of Alpha Chi Sigma chemistry fraternity; Zinna is president while Thibault is the treasurer.

For more information, contact Nicole Chisari at smithne@winthrop.edu.

**Citation: Evans-Anderson, H. J., Alfieri, C. M. & Yutzey, K. E. Regulation of cardiomyocyte proliferation and myocardial growth during development by FOXO transcription factors. Circ. Res. 102, 686–694 (2008) PMID 18218983. AND Sengupta, A., Chakraborty, S., Paik, J., Yutzey, K. E. & Evans-Anderson, H. J. FoxO1 is required in endothelial but not myocardial cell lineages during cardiovascular development. Dev. Dyn. 241, 803–813 (2012) PMID 22411556.*

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