

BIOLOGICAL SCIENCES  
MCMICKEN COLLEGE OF ARTS AND SCIENCES

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: 03/01/2018

PROJECT TITLE: The genetic and morphological basis for cave animal diversity

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**Project Description**

In our lab, we study a cave-dwelling fish that has adapted to the harsh underground environment. As a consequence of life in surroundings marked by total darkness and starvation, these animals have evolved extreme characteristics. These include the complete loss of eyes, albinism and fragmented facial bones. We use an approach called hybrid genetic mapping to determine the genes affected during their evolutionary history.

For this project, we will extend our studies by asking whether a variety different phenotypes (e.g., eye loss, pigmentation loss, more taste buds, more lateral line receptors) are caused by the same " or different " genes. This will involve wet lab experiences in which the student will observe fish specimens and carefully record/measure differences among them. It will also include computer-based analyses designed to integrate large amounts of genetic and transcriptome data with trait measurements. Finally, this project may involve gene manipulation strategies, where particular genes will be "knocked down" to determine the role(s) they play in generating cave-associated phenotypes.

Our lab is a welcoming and collaborative environment in which we currently have a doctoral-level graduate student, a post-doctoral fellow, a research technician and four long-term undergraduate students. Therefore, our past WISE/REWU fellows have enjoyed excellent intellectual and logistical support for being trained and carrying out their research activities.