DEPARTMENT OF BIOLOGICAL SCIENCES  
COLLEGE OF ARTS AND SCIENCES 

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN  

APPLICATION DEADLINE: 03/01/2017  

PROJECT TITLE: Dynamics between stress and viviparity in cockroaches  

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Project Description

During reproduction, mothers must balance their investment with the requirements of their developing and growing offspring. Underlying the delicacy of this balancing act is the degree of relatedness between a mother, her current offspring, and their future siblings; this drives each individual to prioritize its own needs at the potential expense of limiting resources available for the other. Under most conditions, mothers are able to successfully provide for offspring while maintaining her own needs and ability to provide for future progeny. However, this balance can be destabilized by factors such as maternal age or abiotic and biotic stresses such as resource availability. While this conflict occurs in all animals, whether they reproduce by laying eggs (oviparity) or giving live birth (viviparity), mother-offspring conflict is expected to be greatest in viviparous animals. In cockroaches, there exists a gradient of reproductive strategies, ranging from egg laying, to those that internally hold eggs until near hatching, to true viviparity where mothers harbor eggs that hatch internally and are born alive. Therefore, cockroaches represent an exceptional system in which mother-offspring conflict can be studied along this transition from oviparity to viviparity. This project will involve examination of basic physiology, basic molecular techniques, RNA-seq analyses, metabolomics, and epigenetic studies.