

DEPARTMENT OF BIOLOGICAL SCIENCES
COLLEGE OF ARTS AND SCIENCES

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

FOR APPLICATION YEAR: 2025

PROJECT TITLE: Hormonal control of development

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Project Description

Our lab uses frog metamorphosis to understand how hormones control post-embryonic development in all vertebrates, including humans. Tadpoles require thyroid hormone and stress hormone to transform into froglets during metamorphosis, which is a process comparable to the water to land transition that occurs during birth in mammals and hatching in birds. We use frogs with CRISPR-induced mutations in hormone signaling to determine how hormones coordinate the numerous morphological and physiological changes required for survival during the metamorphic transition. UPRISE students working in the lab will use tadpoles with different mutations to study how these mutations affect the regulation of genes, plasma hormone levels, and timing of developmental events underlying the profound developmental changes of metamorphosis. Depending on the projects available and interest of the students, UPRISE participants will learn genetic mutation analysis, bioinformatics, hormone treatments, growth and development studies, animal husbandry, and gene expression analysis, all while interacting with graduate students and working in a positive and informative laboratory setting. Animal training to care for and use animals will be provided under the IACUC animal use protocol 24-07-08-01.