

Project Title: Environmental Impact on Puberty and Reproductive Function

Project Mentor: Dr. Greg Fraley

Project Description:

This research project tests the hypothesis that environmental factors associated with food availability change the development of adult reproductive function. In female animals, puberty and reproduction can be prevented by small changes in food availability, whereas males appear to be less susceptible. It is plausible that environmental factors such as the time of weaning, food availability, or food type (fat vs. protein vs. carbohydrate) alter neural mechanisms that regulate puberty and reproduction. The neural mediator (brain connections) between nutritional status and reproduction is not known. Galanin-like peptide (GALP), appears to have a primary role in the regulation of reproduction; furthermore, GALP gene activity is solely regulated by metabolic signals. GALP may be an important mediator between nutrition and reproduction, and thus a central target for metabolic signals that are responsible for governing the timing of the onset of puberty

The aims of this research are to 1) to determine the effects of altered nutritional environments alter the ontogeny of GALP gene expression, 2) to determine the role of hypothalamic GALP in regulating reproductive development, and 3) to understand the neural mechanisms underlying the sex differences in the timing of the onset of puberty. Students involved with this research may get to participate in the development of hypotheses, experimental design, data acquisition, data analysis, and scientific writing. Students will likely combine behavioral, histological and molecular biological approaches to understand how internal and external environmental factors alter biological systems involved with reproductive development. This combination of techniques illustrates the interdisciplinary aspects to neuroscience.