Presenter: Chance Bainbridge

Authors: Chance Bainbridge, Douglas Portman

Title: SEX DIFFERENCES IN NUTRIENT-DEPENDENT BEHAVIOR IN C. ELEGANS

Abstract:
Animals must meet certain nutritional requirements by coordinating cues about nutrient availability in the environment with internal status. Often this is achieved through changes in foraging strategies that reflect current metabolic demands. Despite the ubiquitous requirement for nutrient intake, many animals show sexually dimorphic nutrient-dependent behaviors. However, the underlying mechanisms by which biological sex acts to regulate neuronal function to produce sex-specific responses to nutrient status is poorly understood. Past work from our lab and others indicates that C. elegans exhibit sexually dimorphic behavioral and neuronal responses to nutrient availability. Here I investigated sex differences in two nutrient-dependent behaviors in C. elegans. I recorded animals of both sexes in conditions that promote local to global search transition and satiety quiescence. Preliminary results show male worms exhibit nutrient-dependent strategies distinct from hermaphrodites in both cases. Using well established TRA-1 master sex regulation pathways to perform tissue-specific sex-reversals, I found sexual state of the nervous system is essential for these sex-specific nutrient-dependent behaviors. This approach will serve to generate a framework to understand the genetic and neuronal basis of sex-specific regulation of nutrient-dependent behaviors. Moreover, this approach provides an opportunity to explore potentially conserved mechanisms by which sex can regulate flexible neuronal and behavioral responses to nutritional status.