



Master's Thesis Projects available to investigate the neuronal regulation of glucose homeostasis

Overview of the working group

The nervous systems of animals utilize a wide variety of chemicals for neuronal communication. These include amino acids, biogenic amines, and neuropeptides amongst others. Neuropeptides are by far the most diverse, and control a range of essential physiological processes including feeding, metabolism, sleep, stress, reproduction, development and locomotion. Our working group is interested in understanding how neuropeptides mediate their effects. Specifically, we are interested in discovering and characterizing novel neuropeptides that regulate insulin signaling and glucose homeostasis in the fruit fly *Drosophila melanogaster*. Unraveling these pathways in *Drosophila* by utilizing the power of relatively simpler nervous and endocrine systems will provide a framework for understanding dysregulation of glucose homeostasis in humans which is linked to diabetes, obesity and other metabolic disorders. We utilize multiple approaches in our lab including standard molecular techniques, CRISPR/Cas9, *Drosophila* genetics, behavioral analyses, optogenetics and calcium imaging. We are also developing cutting-edge genetic tools to study neuropeptide function in *Drosophila*.

Project

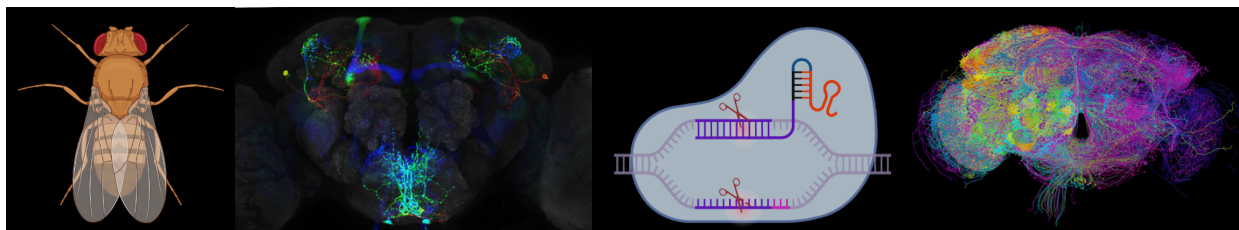
We have several on-going projects in the lab and the student will have the flexibility to learn different techniques depending on their interest and future goals. Examples of projects include generating CRISPR/Cas9 mutants for different neuropeptides, recording and analyzing the behavior of mutant flies, labelling and imaging neurons using conventional light microscopy, and developing new genetic tools using molecular techniques.

Recent publications:

<https://doi.org/10.1098/rsob.220174>

<https://doi.org/10.1371/journal.pgen.1009425>

<https://doi.org/10.1371/journal.pgen.1007767>



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