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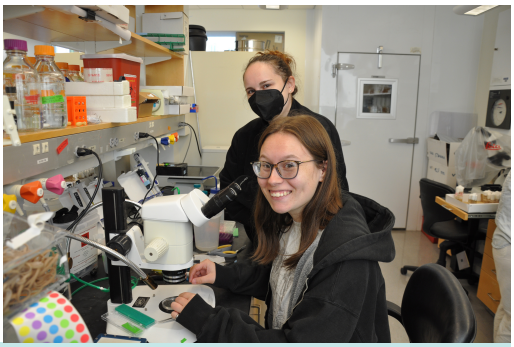
Project: Comparing synaptic development and maintenance pathways in larvae versus those in older adult Drosophila neuromuscular junctions.

Keywords: Drosophila Melanogaster, aging, neuromuscular junction, active zones, adult versus larvae



Payton with her mentor, Jessica Sidisky.
Photo courtesy of Mandana Sassanfar

This summer, I was a MSRP student in the Littleton lab where I worked under the supervision of Postdoctoral researcher Jessica Sidisky. I conducted an adult GAL4 motor neuron driver screen using known larval drivers to see if the same driver could be used in the adult ventral abdominal muscles. To do this, known larval drivers that are known to target type one and type two motor neurons were used and aged into adulthood. Common dissection techniques were used to be able to isolate the abdominal muscles. The preps were then fixed in paraformaldehyde and subjected to immunostaining for the muscle tissue and the neuronal membrane. The staining of the muscle tissue allows for verification of location while looking at the prep under confocal microscopy. As the driver has an RFP tag attached to the specific gene of interest, when using a blue light, the tag is excited and RFP can be seen. Using the RFP and the staining of the neuronal membrane, it was possible to determine if the driver was effective in the ventral abdominal muscles if the two overlapped in imaging. I found two drivers were successful in this region of the adult fly, (GMR65E07)-GAL4 and (GMR57F07)-GAL4. (GMR57F07)-GAL4 was a driver created for the DH31 gene, diuretic hormone 31 involved in courtship of the fly, and was thought to light up in type two boutons. (GMR65E07)-GAL4 was a driver created for the DH44 gene, involved in several processes, and was thought to light up in glia. Specific antibodies for type two boutons and glia will be used to stain the drivers to test if the hypothesized locations of expression were correct.

Payton presenting at the MSRP Poster Session.
Photo courtesy of David Orenstein

MSRP Poster Session, August 2023.
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