Male Drosophila melanogaster experience larger increases in sucrose sensitivity than females when starved

An organism’s behavioral response due to physiological changes depends on sex and different internal states. Previous data have shown that hunger induces an increase in behavioral sensitivity to sucrose in Drosophila melanogaster, but sex differences in sensitivity to sucrose in fed or starved states have not been published. A combination of independent student researchers in Fall 2019 and Spring 2020 and students in a Fall 2020 CURE course have utilized the labellar proboscis extension response (PER), a food seeking behavior, to measure the sucrose sensitivity in male and female Drosophila melanogaster when fed and starved. During Fall 2020, when comparing different groups’ analyses in class there was a discrepancy in data collection and analysis such that different conclusions were drawn from the same raw video-recorded data. Thus, this semester, we sought to re-analyze the data from Fall 2020 and create a training guide for collecting PER data to combat this variability. After reanalyzing and combining the data with the previous semesters’ data, we’ve found that male flies have a larger increase in sucrose sensitivity upon starvation than female flies. Upon further inspection of the video-recorded data collected in Fall 2020, we also found that the labellar PER assays may have included tarsi stimulation as well as labellar stimulation. Given that tarsal sensilla are sexually dimorphic, this may contribute to our findings. Future experiments specifically using the tarsal PER assay are warranted.