

## INTRODUCTION

*Drosophila melanogaster* is a model organism for the genetic analysis of the neural circuitry for feeding behaviors. For a quantitative measure of behavioral output, a high resolution system is necessary, which will allow an analysis of temporal patterns of feeding behaviors in freely moving flies. Video recording and fly tracking gives us the opportunity to create a high-throughput automatic analysis of feeding patterns. In this project, we look at the influence of sugar concentration on feeding patterns of *D. melanogaster*.

## METHODS

Nine male flies aged for 5 days were starved for 22-24 hrs. They were then placed in a dish with nine drops of 1% agar (25µl each). In the agar, each plate had 1, 10, or 50 mM sucrose. A camera recorded the behavior of the flies for 10 min. From the videos not only did we calculate the overall time spent, but we also quantified features such as the length of every individual feeding bout. We then examined behavioral patterns such as the number of agar drops visited by a fly with less than a 0.5-sec pause between each.

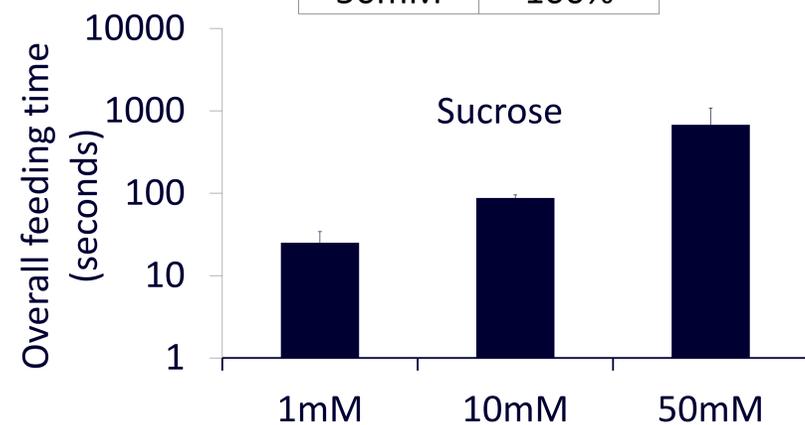


Figure 1: Set-up for recording fly feeding behavior

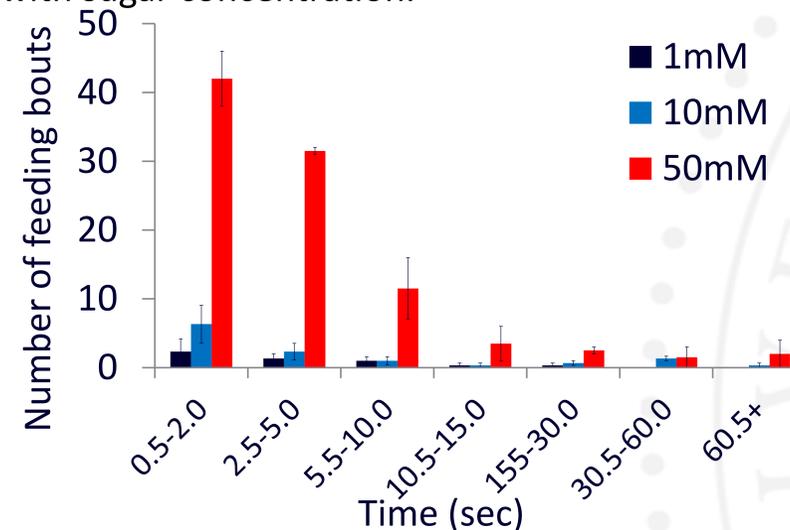
## RESULTS

Percentage of flies that fed for more than 5 sec

1mM	44%
10mM	100%
50mM	100%

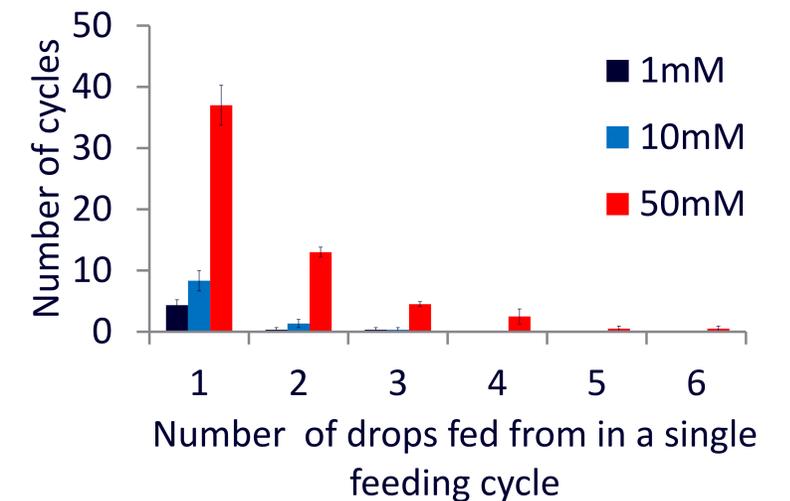


We looked at the overall feeding time for all 9 flies. When sucrose concentration was increased, flies fed for a longer period of time overall. This agrees with previous findings that total consumption increases with sugar concentration.



While the total time spent feeding increased with sugar intensity, each individual feeding bout remained at ~2 secs on average. We note that a few flies fed for over 2-min at 50mM sucrose.

## FEEDING CYCLES



We defined a feeding cycle as at least one visit of at least 0.5 sec followed by a gap of at least 0.5 sec after the last drop visited. Most flies fed from one agar drop before retreating to the side. With an increase in sucrose concentration, flies were more likely to feed from multiple agar drops in a continuous cycle.

## CONCLUSION

- Flies fed for a longer overall time with higher sucrose
- Flies fed in 2-sec bouts on average
- Flies visited more drops in a feeding cycle when sucrose concentration increased
- Video imaging would be useful for genetic analysis of feeding circuits

## ACKNOWLEDGEMENT

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## REFERENCES

Montell, Craig "A taste of the *Drosophila* gustatory receptors" *Current Opinion in Neurobiology* Vol. 19 (4) Aug. 2009 pgs. 345-353