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Analyzing Behavior in Flies modeling Frontotemporal Dementia

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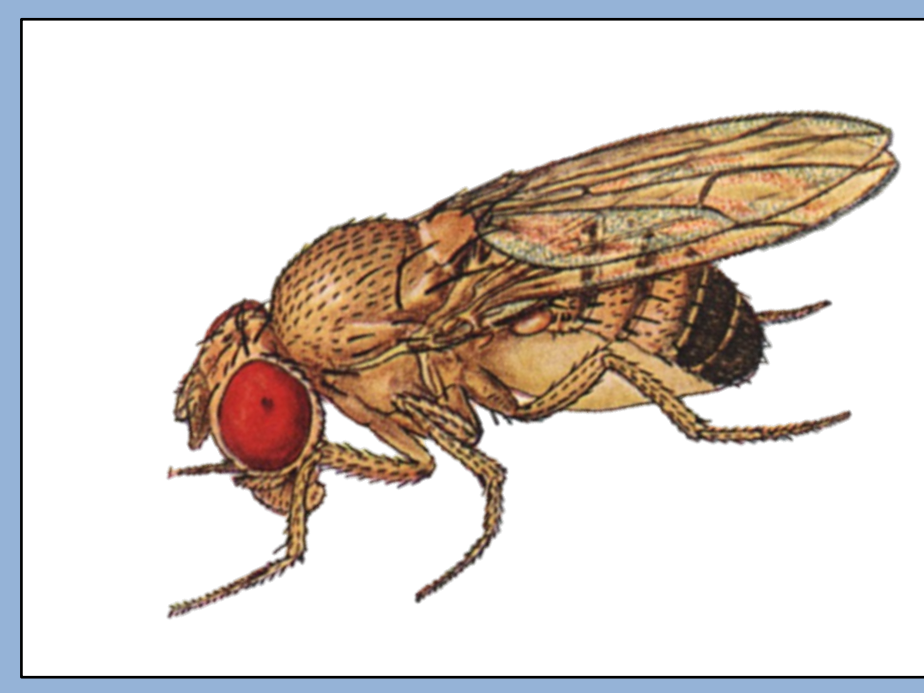
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The Effect of FTD on *Drosophila* Cognitive and Motor Function

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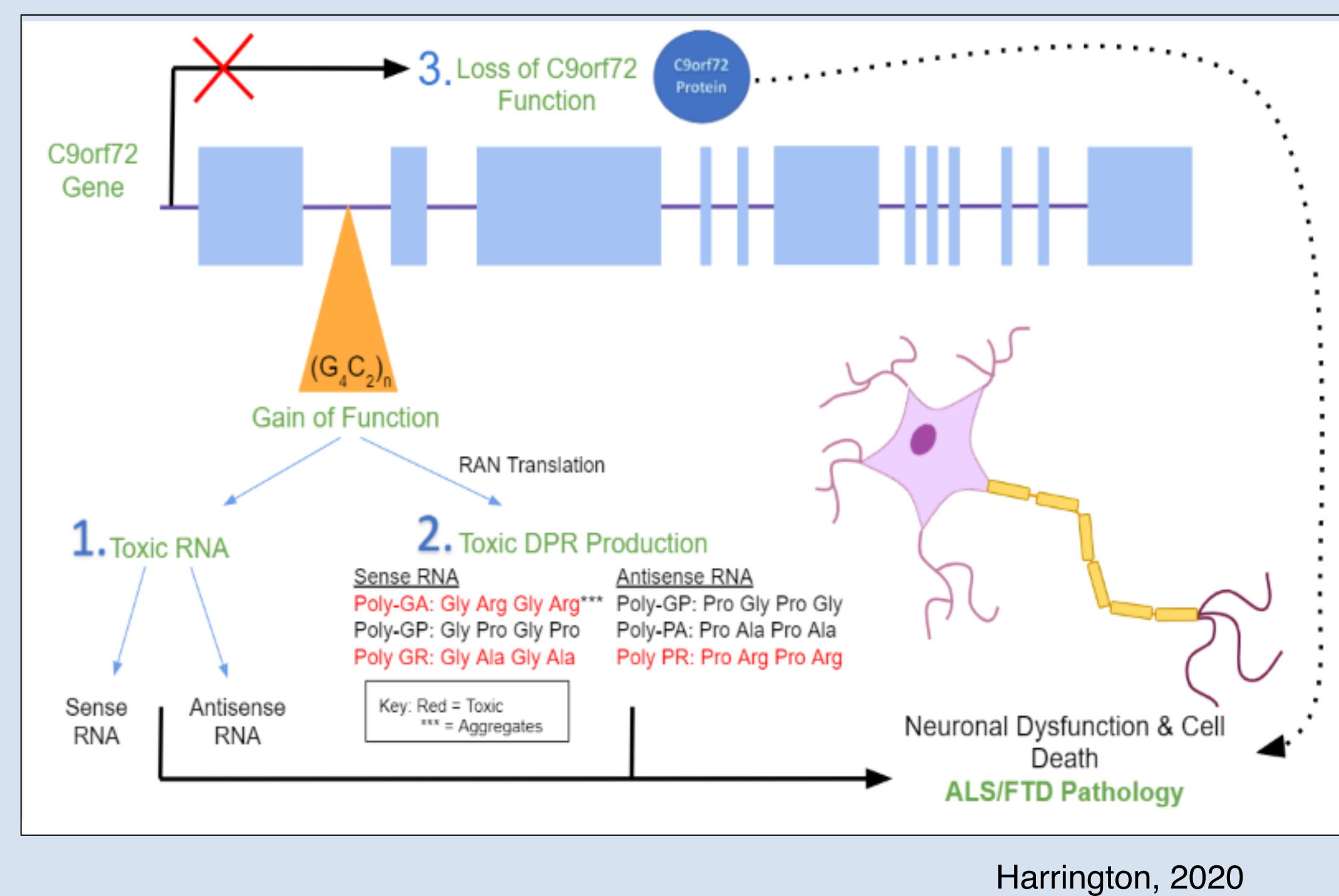
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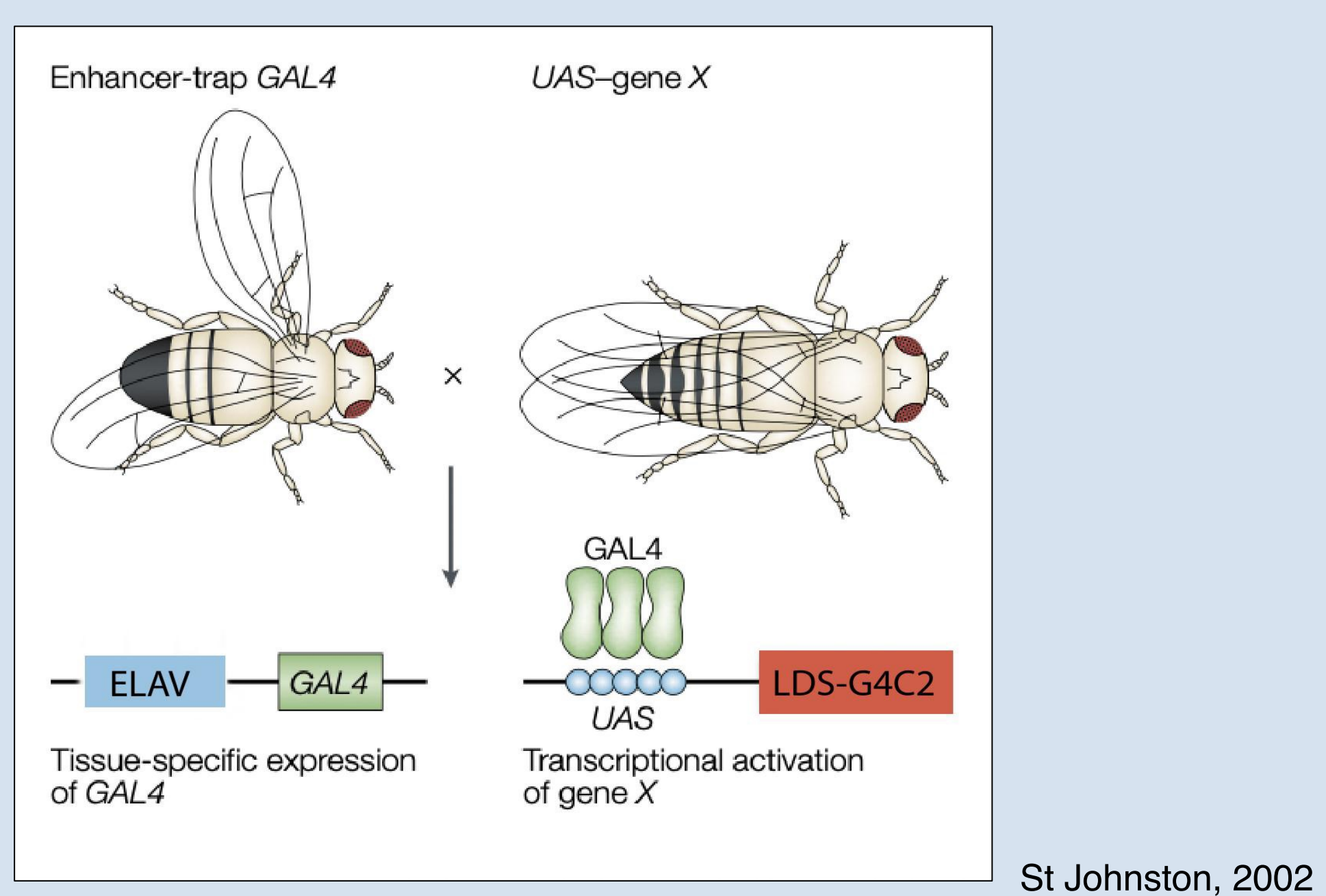
Abstract

Frontotemporal dementia (FTD) is one of the most common forms of early onset dementia. This neurodegenerative disease has various symptoms such as loss of emotion/empathy, impaired judgment, mobility issues, loss of social skills, and other behavioral, motor and cognitive issues. This disease affects more than 50,000 American, and there is no specific treatment plan available. The purpose of our research project is to observe the affect FTD has on behavior and learning skills, using fruit flies as our model system. We will genetically alter flies and collect those harboring the mutant gene expressed in FTD. These flies, as well as control flies, will be placed into containment tubes and their activity will be monitored. Conducting this research will allow for better understanding of how FTD affects specific behaviors and may potentially also be used to test if new treatments are effective at altering behaviors and learning.

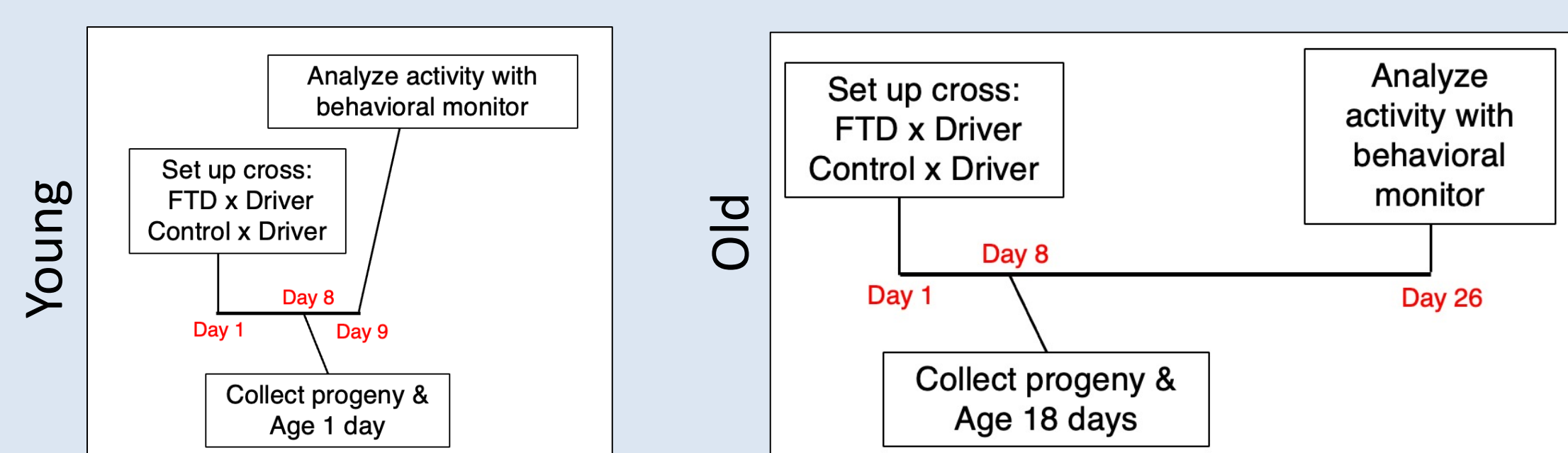
FTD Background



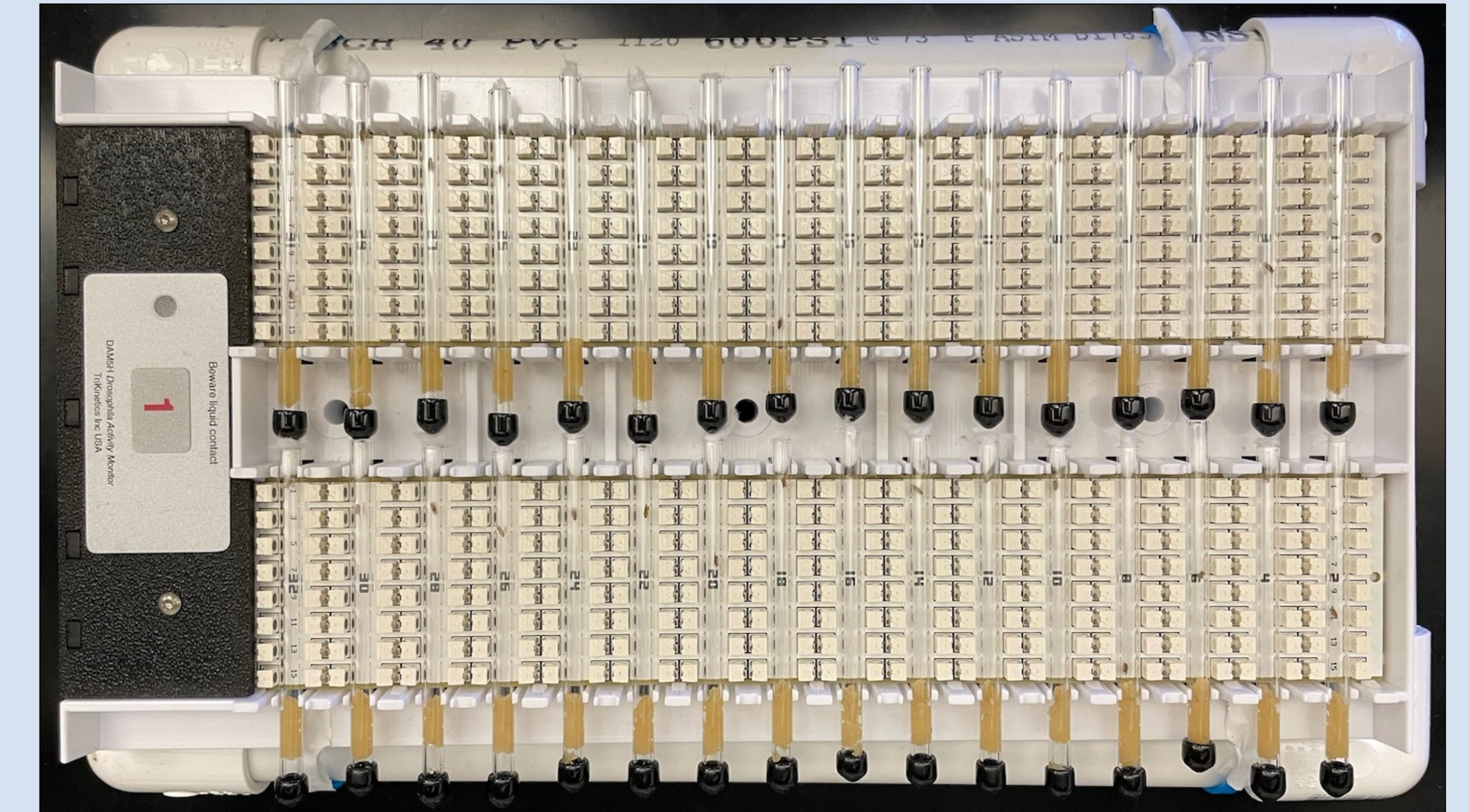
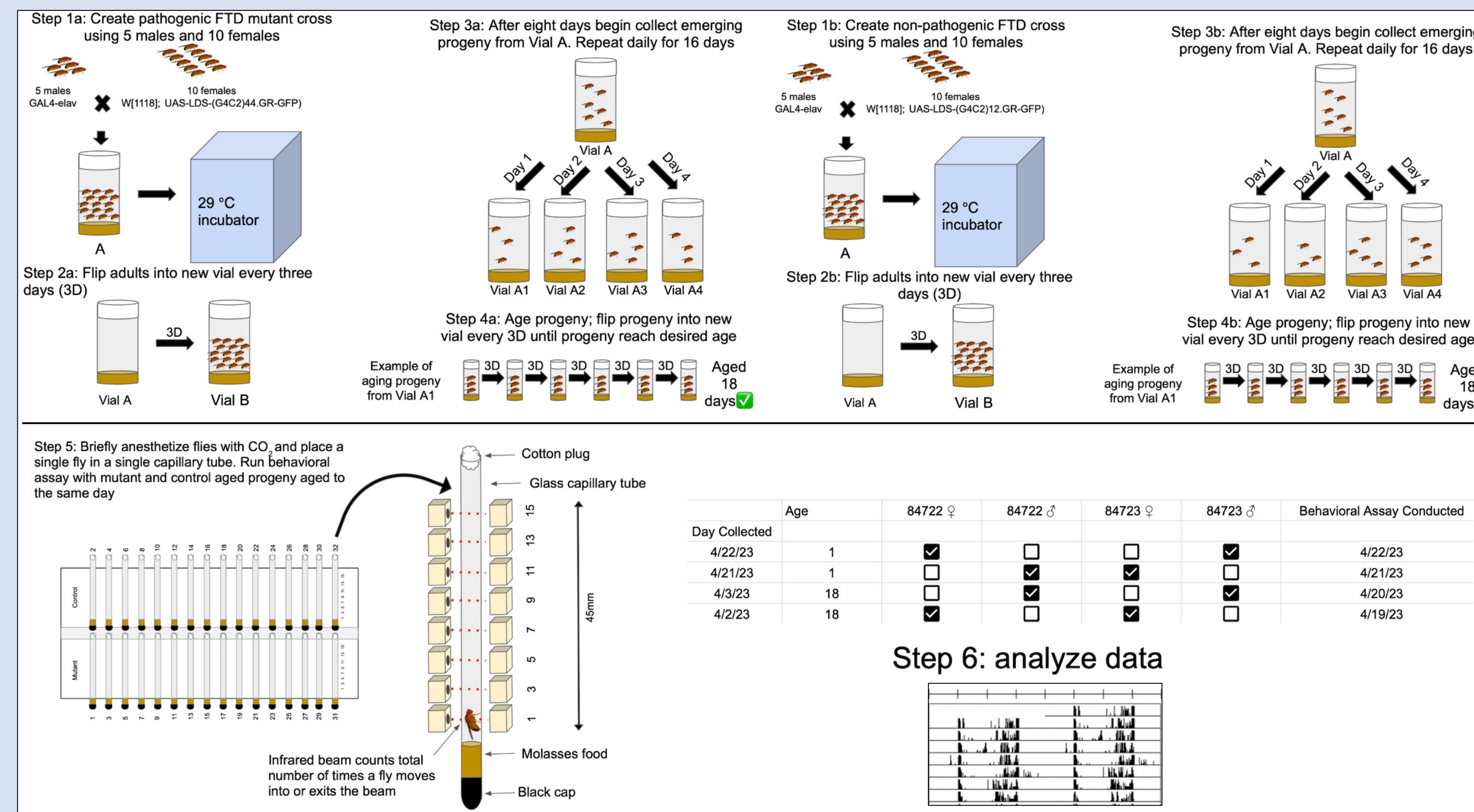
GAL4-UAS Expression System



Activity Study Timeline

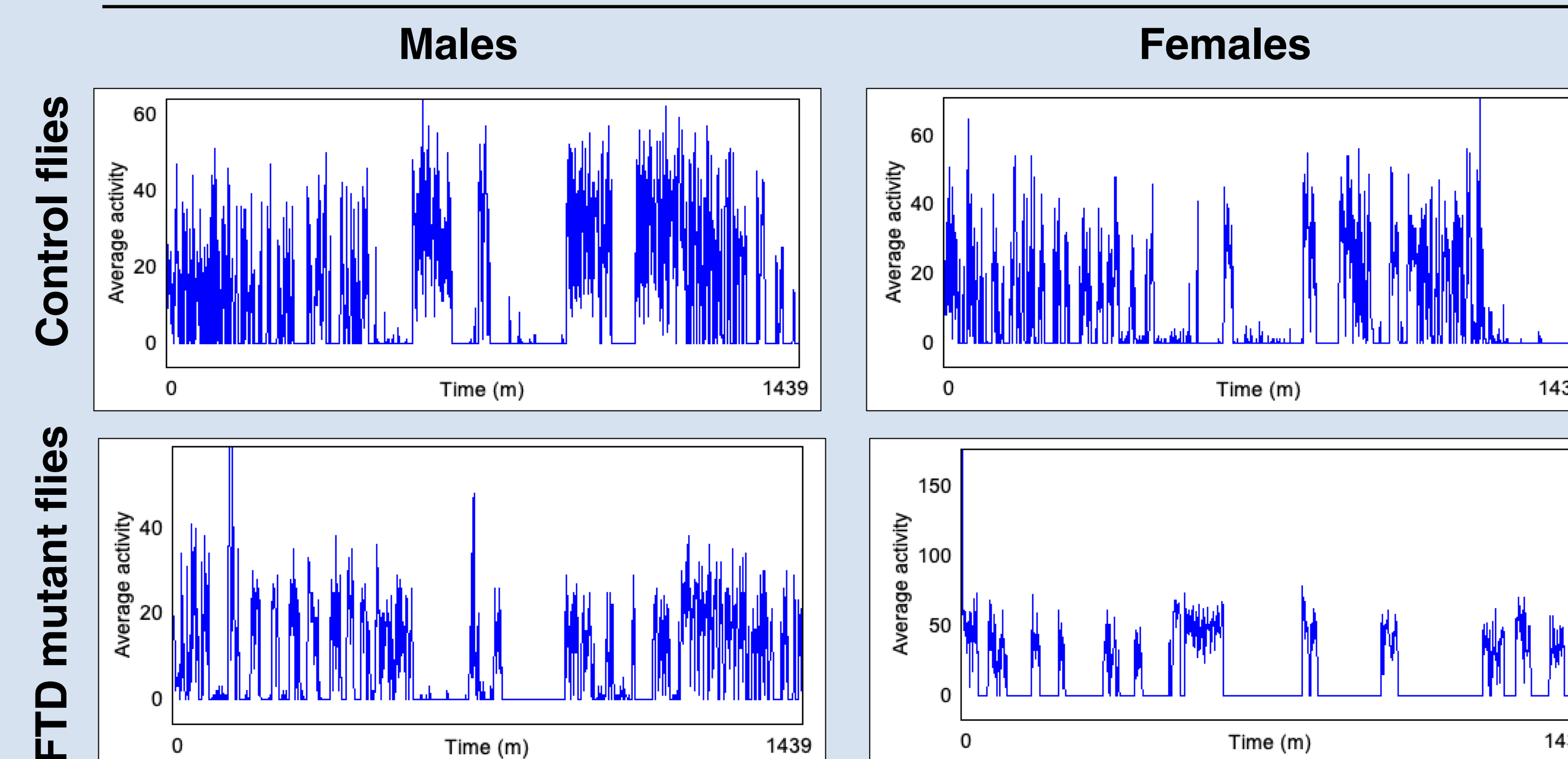


Experimental Design



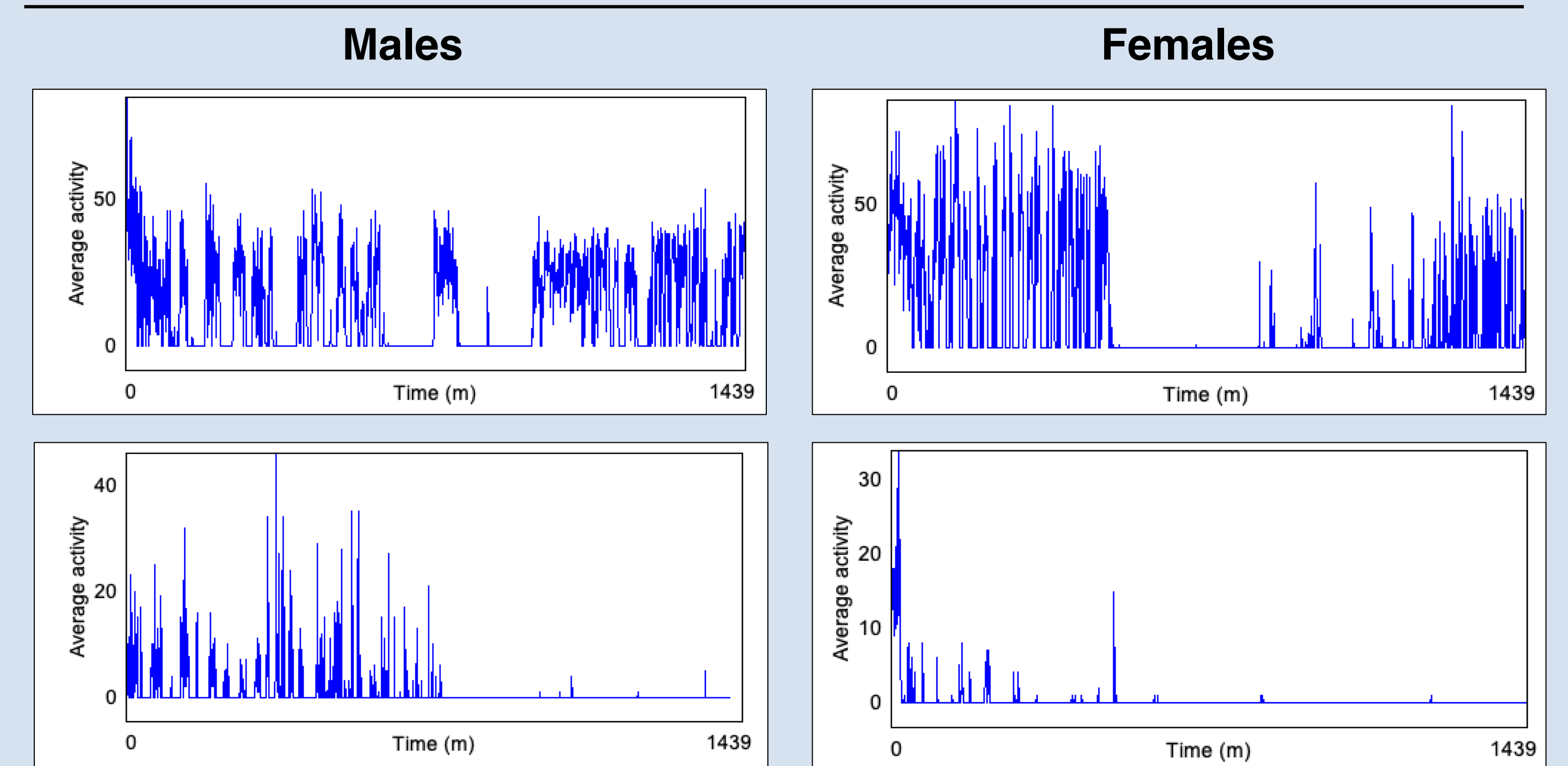
Results of Activity Monitoring (data is of one representative for each group)

YOUNG (1-day old)



young females: n=11, young males: n= 11, for both control and FTD flies

OLD (18-days old)



old females: n=16, old males: n=9, for both control and FTD flies

Conclusions

- Control flies are more active than FTD mutant flies, overall.
- Older FTD mutant flies are less active than young FTD mutant flies.
- Young males in both groups are more active than young females.
- Older flies are generally less active than young flies in both groups, except for old control females.

Future Directions

- Repeat these experiments with additional biological replicates.
- Investigate sleeping pattern changes.
- Conduct odor-taste learning assays to investigate the effect of the olfactory system on memory.
- Conduct a maze experiment to investigate the effect of reward on memory and learning.

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Acknowledgements

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