

Sample Reading Guide

Article: Demir, E., & Dickson, B. J. (2005). Fruitless splicing specifies male courtship behavior in *Drosophila*. *Cell*, 121(5), 785-794.

Background: Thus far in this course, we have considered morphogenetic switches. This article explores a different type of genetic switch: behavioral switch genes. The study uses fruit flies as a model. Read the sections titled ‘Sex Determination’ ‘*Drosophila* Genetic Toolkit’ and ‘*Drosophila* as a model for studying Neurobiology and Behavior’ from the [model organism primer](#). The authors use transgenic flies, so make sure to review readings from the previous class sessions where we discussed this approach.

Part 1: Answer the questions in the space provided. Email the instructor a copy of your responses by XXX.

Describe the overarching question that the authors wish to address. Define the specific question that the authors investigate.	
Why did the authors select the fruitless gene for this study?	
Describe the overarching approach employed by the authors. Outline the key steps of their methodology.	
Describe the four mutant fru alleles generated in the study.	
Describe the specific outcomes associated with the introduction of each allele in male flies	fru^+ fru^C fru^F fru^M $fru^{(del)tra}$
Describe the specific outcomes associated with introduction of each allele in female flies	fru^+ fru^C fru^F fru^M $fru^{(del)tra}$
How do the specific outcomes described above support the author's conclusion?	

Part 2: Discussion Questions

- How might you use a different approach to answer the same research question? Briefly summarize an alternate study using other approaches we have discussed in this course.
- What are some open questions about the role of *fruitless* in flies? How might you address this question?
- Courtship behavior in fruit flies is a complex trait. Yet, a single gene can act as a “switch” to turn it on and off. How can you explain this?
- What features would you look for when selecting a model organism to study complex behavioral traits?