THE ROCKEFELLER UNIVERSITY
Science for the benefit of humanity

Observing and Analyzing Courtship Behavior in Drosophila Melanogaster

By. Sophia Virkar

Goals

- Understand Lab Procedures and Protocols
- Get background information on fruit flies
- Observe courtship behavior in flies
  - Be able to identify different aspects of courtship
- Explore methods of automated behavior analysis
- Develop research questions
- Conduct experiment of our own

Chronology of the Virtual Internship

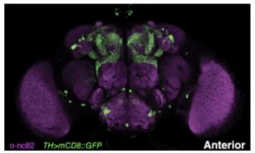
- Weeks 1-3
  - Getting background information
  - Reading scientific papers
- Weeks 4-6
  - Coding Graphs
  - Creating Experiment
  - Flies received
- Weeks 6-8
  - Preparing and Conducting Experiment
- Weeks 9-10
  - Discussions
  - Analysis

Learning Background Information and Reading Papers

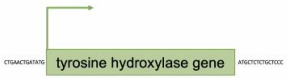
- Understanding Courtship Ritual
- Neurogenetics

neurogenetics

Goal: use the fly's genome as a tool – to examine the function of a gene through mutation or to access and experimentally manipulate a specific population of neurons



We know a protein is expressed in a specific neuronal population.



We can find the gene and hijack its expression machienary to insert tools into a marked population of neurons.

Transgenic fly line: tools coded in synthetic DNA driven by TH, the marker gene.

***Drosophila* male courtship is a robust, innate ritual**

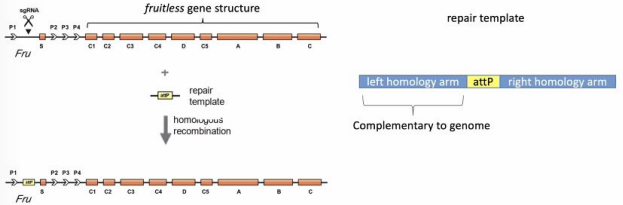
tap - assess female pheromones

chase – visually track female

sing – produce species-specific song by extending one wing

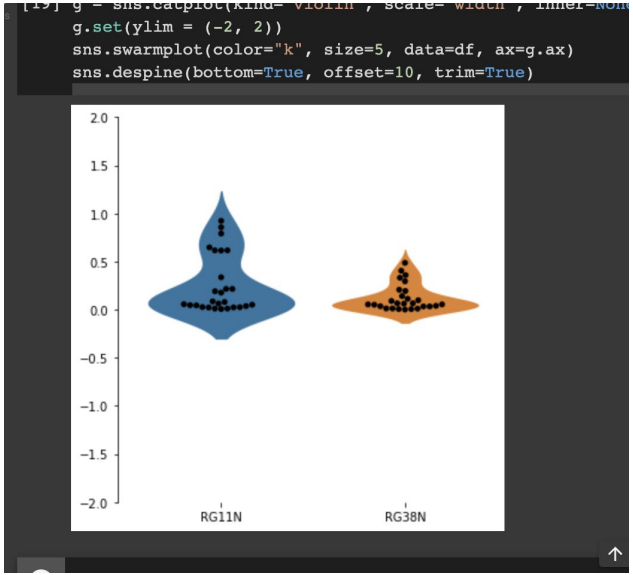
male's goal is to copulate

CRISPR targeting strategy for *fru* with homology directed repair

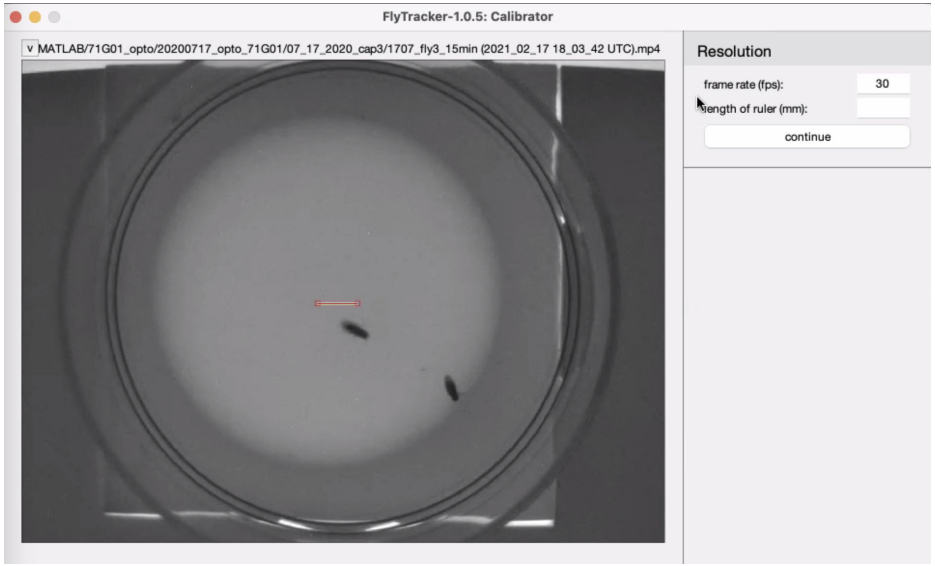


Coding Graphs in Collab and Fly Tracker

Google Collab: Using data collected from videos and graphing



Fly Tracker: Developed to track fly like objects as they moved around with a constant background



Getting Sent Flies

Drosophila Melanogaster

- Left: new batch
- Right: old batch
  - Observing behavior
    - Gravitaxis- sense of gravity
    - Crepuscular- sleep cycle
    - Food – yeast, molasses, agar

Creating and Conducting Our Experiment

Step 1:

- Formulate questions

Step 2:

- Create material list and procedure

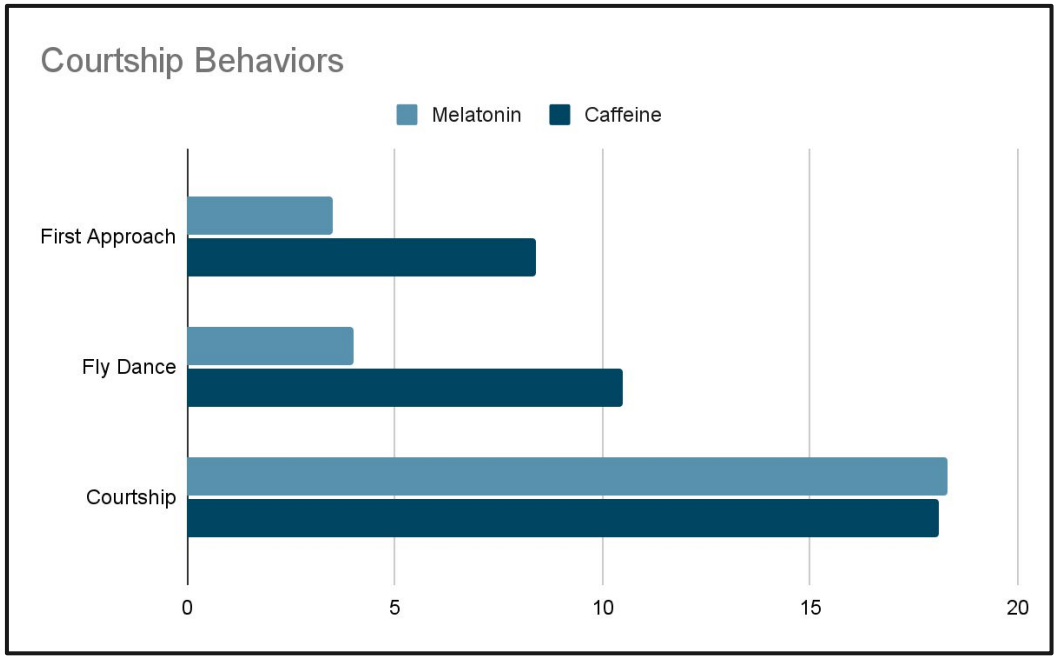
Step 3:

- Have Ms. Ryba modify procedure

Hypothesis

- If flies are given caffeine solutions then latency to courtship will decrease.
- If flies are given melatonin solutions then latency to courtship will increase.

Results of Our Experiment



Mistakes I Made and Things I Learned

Mistakes

- Lots of Coding Troubles
- Not completely knocking out my flies (with ice)
- Flies died

Lessons Learned

- Coding on Collab
- Analyzing Data
- Identifying and quantifying courtship behavior
- Improved technical skills through practice

Thank you

Ms. Ryba

Ruta Lab, Rockefeller University

Dr. Krug

Maya Warner