

# Understanding Motivational Drives Using Fruit Flies

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## INTRODUCTION

The Crickmore Lab, located in Boston Children's Hospital, is part of the F.M. Kirby Neurobiology Center wherein the focus of research is mainly developmental neurobiology. At the Crickmore Lab, the goal is to understand motivational states and the internal circuitry responsible for such behaviors. Using mating drive in male flies (*Drosophila melanogaster*) as a model, they study how sexual motivation is produced and driven by the brain. This is important because even though our motivational choices define who we are as individuals, sometimes they can often spiral out of control causing addictions and other behavioral disorders.

## OUTCOMES

While I was on co-op, the project I was working on gained a lot of momentum as we were able to identify a certain kinase – CamKII, which plays a key role in regulating sexual motivation in male flies. This experience also exposed me to the larger scientific community comprised of several different kinds of research, which has helped me to understand scientific literature and research methods better. One of the outcomes that I consider as a personal achievement was that I was able to overcome my fear of public speaking and present my research to a room full of neuroscientists. Through this experience, I saw a manifestation of what neuroscience is like in the real world, which would have never been possible in a classroom setting, and for that I am grateful.

## REFLECTIONS

Through this experience, I gained an appreciation for neuroscience and research. Although this was a neurobiology lab, the research had various clinical applications to it. For instance, understanding the motivational circuitry could be instrumental in understanding various disorders such as autism, schizophrenia, depression, and OCD. This opportunity also helped me understand and visually see how various genes work together in driving a circuit related behavior. Even though we did not work with humans, this experience taught me how to be patient and understand the complexity of research. It also taught me the skillset and confidence needed to perform tasks independently. Having said that, this experience also made me aware of my personality and my likes and dislikes, and helped me realize that it was not a profession fit for me. I prefer being at the front end of directly working with and helping humans. Thus, it made me certain of my future goals and helped me outline the next steps of my journey.



## ACTIVITY

As a research assistant, I was responsible for setting up crosses using flies of different genotypes, collecting the male flies from those crosses and conducting motivation experiments on them or recording their copulation duration and scoring the videos using MATLAB. My duties also included collecting virgin flies and monitoring the incubation period of the offspring. Along with these daily tasks, I also attended various scientific talks by other scientists in the field and participated in journal club discussions.

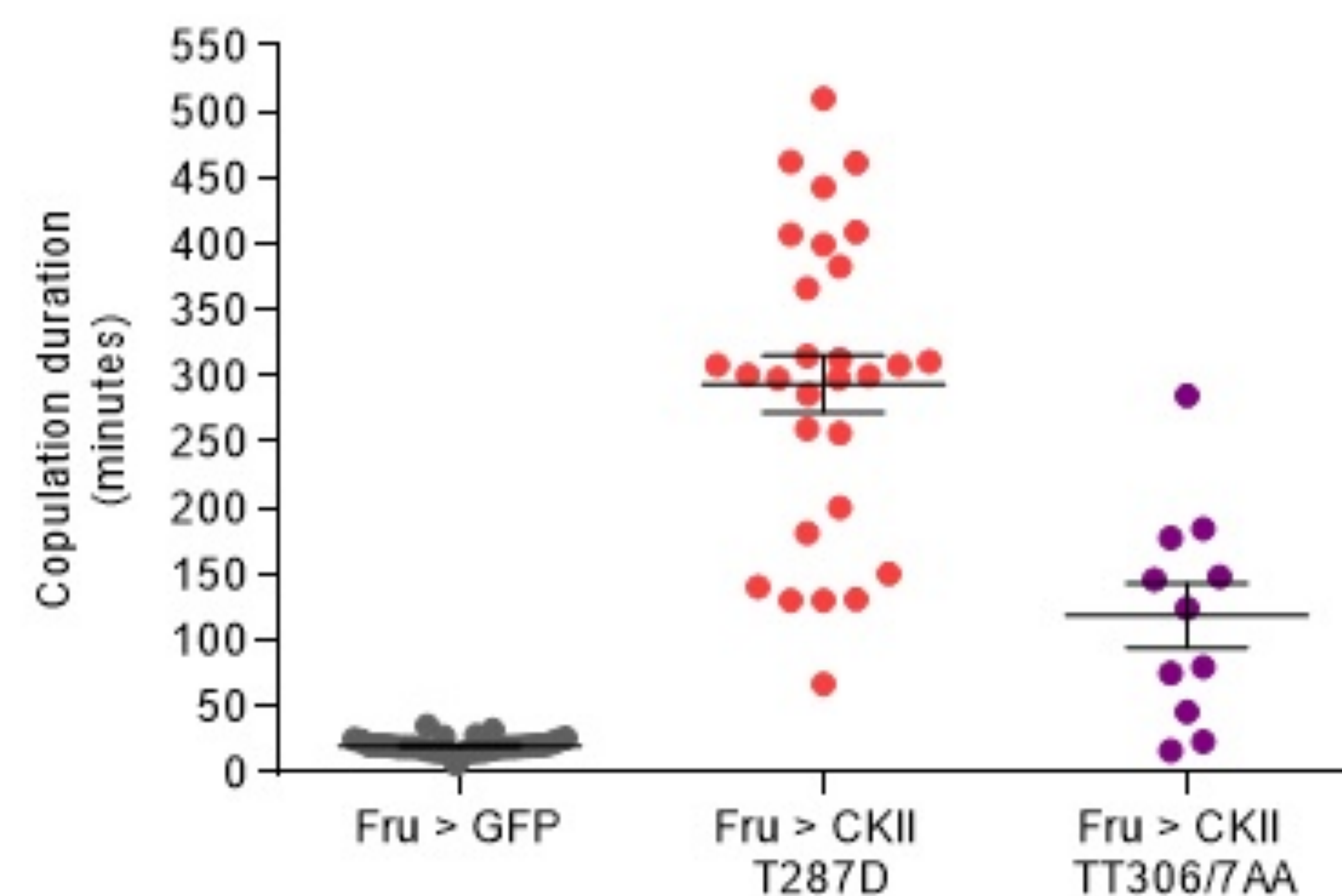


Figure 1: Data depicting copulation duration in Fru (gene) positive flies when CKII is activated.

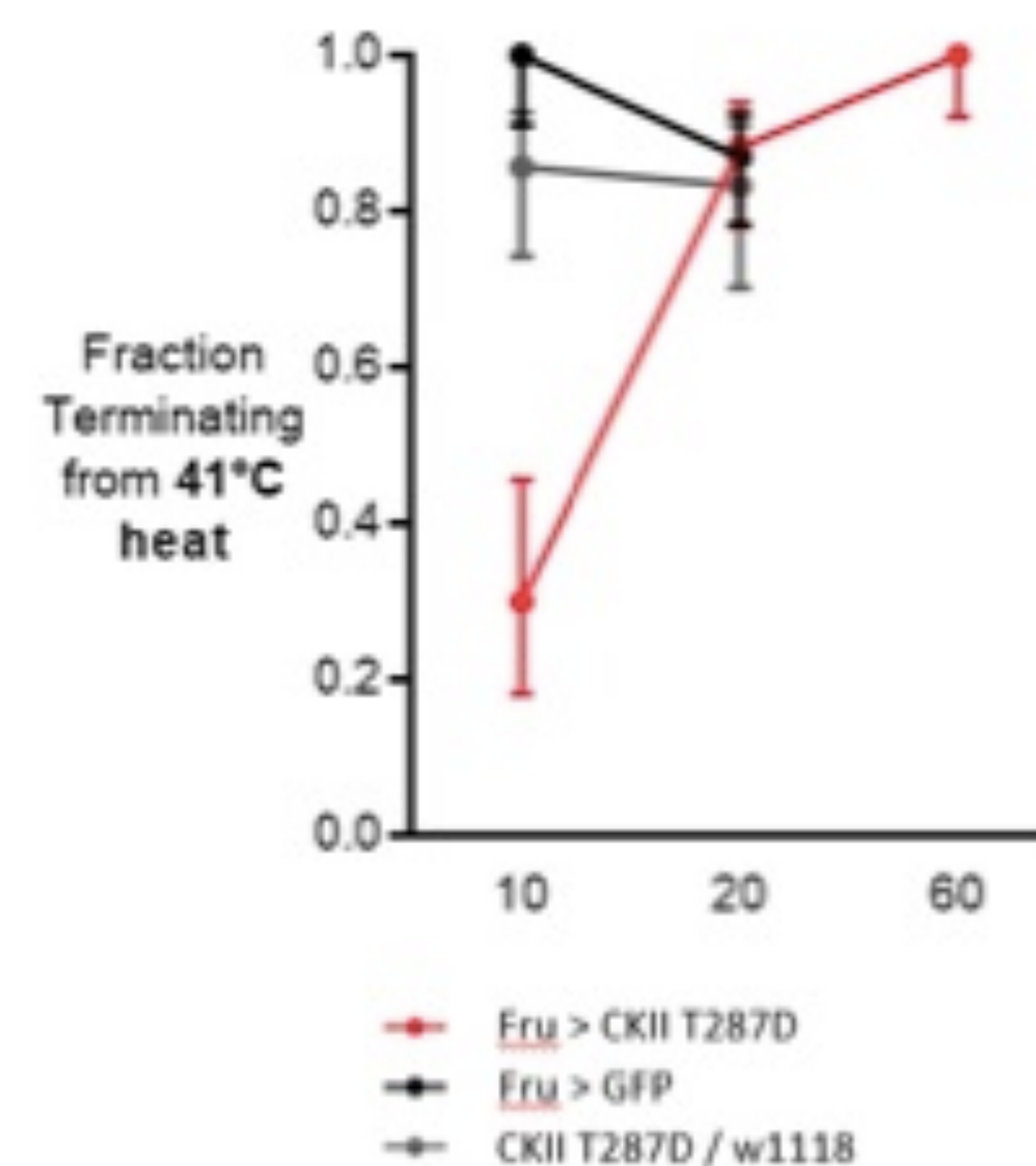


Figure 2: Data collected from motivation experiments when CKII is activated.

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