2021_SSP Faculty Projects

Row 6

Research Group	Dutton
Project Title	**Characterization of female sexual behavior in an epilepsy rodent model.**
Research Question, Hypothesis, or Conjecture	What is the role of the voltage-gated ion channel Scn1a in female sexual behavior? Are female sexual dysfunction and epilepsy co-morbid?
Project Description	Approximately 30% of patients with epilepsy report experiences of sexual dysfunction (SD), including a lack of arousal, erection issues, and/or orgasmic disorders. As a result, this dysfunction affects their sexual relationships and, ultimately, their quality of life. Of particular interest are voltage-gated ion channels. These proteins are present in the plasma membrane of cells and organelles, regulating the flow of ions. Aberrant functioning ion channels are responsible for a class of neurological disorders called “channelopathies.” They are primarily caused by genetic mutations and can be found in disorders such as epilepsy, migraines, periodic paralysis, and pain. In addition, ion channels also serve as important targets for many clinically used drugs. My lab has the Genetic Epilepsy with Febrile Seizure Plus (GEFS+) mouse model that contains a gain-of-function mutation in the voltage-gated ion channel gene Scn1a. This model recapitulates many of the behavioral aspects of the human disorder. To date, very little information is available on the role of voltage-gated ion channels on sexual behaviors and how alterations in their function can lead to a SD. To evaluate this potential relationship, we will examine sexual behaviors in mouse models of epilepsy. Specifically, we will record both WT and mutant animals during sexual intercourse and characterize the number of intromissions, approaches, and analysis of the lordosis response. Quality data generated will be used in the manuscript currently in preparation, providing students the opportunity for publication. The progress of this project has been severely delayed due to the pandemic. This experience will be different from courses because the students will be contributing to data that is being prepared for publication. In that, the need for quality data is higher, and therefore a greater sense of ownership is given to the student. In addition, the students (pandemic considering) will have direct handling with rodents, which is currently a limited experience at the college.
Introductory References	Moore G, Ngozi Z, Burgess C, Weber A, Dutton S. Exploration of Ion Channels in the Clitoris: a Review. Current Sexual Health Reports. 2019;11(3):167-75. 10.1007/s11930-019-00206-x.
Project Timeline (weekly), during June 1 - July 31	WK1 - Background and complete online mouse training courses (CITI Training) WK2 - Paradigm training WK3 - WK 6 - Experimental weeks WK7- Data analysis and graph construction WK - Final presentation preparation Each week will include a group lab meeting and individuals meetings.
Expected Learning Outcomes	1. Students will be able to collect, organize, analyze, and interpret animal behavior. 2. Students will be able to properly handle and care for rodents in laboratory settings. 3. Students will have an understanding of sexual behavior in rodents. 4. Students will be able to describe the general structure/function of various ion channels in mammalian nervous tissue.
Research Team	My research team consists of me and other students at the college.

& Environment	Depending on availability, my senior research student often participates in the summer program to provide additional support for the students.
Department	Biology/ Neuroscience
4 or 8 Week Project	8 weeks
# of full-time student positions requested (1-3)	2
Minimum Requirements (for research novices)	BIO 110-111
Requirements for Advanced students	NA
Recommended Preparation (but not required)	
Modification for Remote Research (IF needed)	The project is adaptable to being remote if needed. Considering the project consists of behavioral observations that will be recorded and scored, if needed I can set up the paradigms and record. The students can then score the videos, and analyze the data.