

STEM Scholars 2019 ASC Projects

Row 3

Research Group	Dutton
-----------------------	--------

Project Title	The role of voltage-gated ion channels in sexual behavior
----------------------	--

Research Question, Hypothesis, or Conjecture	To determine if mutations in voltage-gated ion channels result in altered sexual behavior in mouse models of epilepsy.
---	--

Project Description	Approximately 30% of patients with epilepsy report experiences of sexual dysfunction (SD), including lack of arousal, erection issues, and/or orgasmic disorders. As a result, these dysfunctions affect 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. Aberrantly 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. Our collaborator has generated mouse models of epilepsy for the ion channels Nav1.1 (gene name Scn1a) and Nav1.6 (gene name Scn8a). Both models recapitulate many of the behavioral aspects of the human disorders. 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. In order 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 analyze the lordosis response. This project will be done in collaboration with Dr. Andrew Escayg at Emory University. Quality data generated will be used in the manuscript currently in preparation, providing students the opportunity for publication.
----------------------------	--

Introductory References	
--------------------------------	--

Project Timeline (weekly)	Wk 1 - Introduction to animal behavior WK 2 - Score videos from Scn1a mutants (~ 30 hrs) WK 3 - Score videos from Scn1a mutants (~ 30 hrs) WK 4 - Score videos from Scn8a mutants (~ 30 hrs) WK 5 - Score videos from Scn8a mutants (~ 30 hrs) Wk 6 - Data analysis Wk 7 - Data analysis, poster /presentation preparation Wk 8 - Poster / presentation finalization
----------------------------------	---

Expected Learning Outcomes	<ol style="list-style-type: none">1. Students will be able to collect, organize, analyze, and interpret data.2. Students will be able to properly handle and care for rodents in laboratory settings.3. Students will have an understanding and be able to identify sexual behavior in rodents.4. Students will be able to describe the general structure/function of various ion channels in mammalian nervous tissue and understand its importance.
-----------------------------------	--

Research Team This project is in collaboration with Dr. Andrew Escayg at Emory University. Data collection will be handled by Dr. Dutton in his laboratory. The students will be present but will not handle the animals independently. Scoring and data analysis will take place at Agnes.

PI Last Name Dutton

PI FirstName Stacey

PI Email sdutton@agnesscott.edu

Department Biology / Neuroscience Program

Mentor2 First Name

Mentor2 Last Name

Mentor2 Email

4 or 8 Week Project 8 weeks

Project Dates Jun 1 - Jul 31, 2019

of full-time student positions requested (1-3) 1-2

Novice Requirements Students should have taken BIO 110 and BIO 111 at a minimum.

Advanced Requirements None are required

Recommended Preparation
