SAMPLE 1

Scholarship Development Project

Long term goals

The lab overarching goal is to address key questions related to epilepsy and other neurological phenomena. Our primary focus lies in understanding the mechanisms of endogenous inhibitory restraint and spontaneous seizure termination. We aim to unravel how the brain prevents the spread of seizures across cortical tissue and how seizures naturally come to an end. Additionally, we have a goal to elucidate the fundamental mechanisms underlying a phenomenon called cortical spreading depolarization. This event is characterized by a slow wave of glial and neuronal depolarization, followed by a period of neuronal suppression. Cortical spreading depolarizations often occur after seizures in the brain and are likely responsible for post-ictal depressions on EEGs in clinical settings. Intriguingly, these depolarizations are considered to be the cellular correlate of migraines. By utilizing optogenetic tools and electrophysiology, we have made an intriguing discovery: a novel and exciting method to induce cortical spreading depolarizations in both *ex vivo* and *in vivo* preps. This newfound approach will enable us to gain fresh insights into these events and their connections to both seizure termination and migraines.

Goals to be completed by December 2023

- Have two submitted/published manuscripts, with at least one that includes BYU student authors.
- Submit an NSF grant application.
- Demonstrate spreading depolarizations in zebrafish brain preparations.
- Build my acute rodent model of status epilepticus in my lab at BYU.

Strategies for scholarly productivity

- Set aside dedicated lab time each week (minimum 10 hours).
- Set aside dedicated time to work on manuscripts each week (minimum 5 hours).
- Dedicate time weekly to staying current on the literature in my field (minimum 2 hours).

Evaluate my success

- Report weekly to my mentor on my completion of these strategies.
- Keep a log, tracking my time in each area weekly.
- If I accomplish strategies at 80%, I will consider that successful.

Scholarship Development Project Final Report

- I had four manuscripts submitted for publication in 2023 with one published and the other three still pending. One of the the submitted publications has 3 BYU student authors. This goal was completed.
- I did submit the NSF grant in 2023.
- We were able to successfully demonstrate spreading depolarizations in zebrafish brain in the lab!

- This goal is still a work in progress, most likely due to quality of the acute brain slice preparations and student training on using the equipment. We have a new brain slice cutter that should alleviate most of the problems we have faced.

Citizenship Development Project **Goals to**

be completed by December 2023

- Have lunch with a different faculty member in my department monthly.
- Enhance communication between the graduate committee, their mentors, and the current graduate students.
- Meet monthly with Dr. Suli, Dr. Shepherd, Dr. Mizrachi, and Drs. Dixon/Dallon to evaluate our ongoing collaborations.
- Be active with my department and committee meetings/assignments.

Evaluate my success

- Report monthly to my mentor on my completion of these strategies.
- Keep a log of completion.
- 80% completion will be considered successful.

Citizenship Goals Final report

- This goal was completed! I only have a few department members to go. I plan to continue this in the New Year, starting with the faculty members I have not had lunch with yet.
- This goal was also completed, where we organized a few meetings and presentations for both the faculty and the students to help them understand the milestones for the program. We will continue these presentations in 2024.
- This goal was partial completed, where I did meet with Drs Suli and Shepherd weekly! However, I only meet with Drs. Mizrachi, Dixon, and Dallon once during the Fall semester. These meetings were not really needed monthly, but I will strive to have them monthly in 2024 as this is good to keep the working moving forward.
- I completed this goad fully I would say. I attended all my department and committee meetings and had many assignments which were all completed.

Teaching grant request

I would like to request a reMarkable tablet for use in both my Neuro601 and Neuro205 classes. This tablet is designed as an e-notebook, ideal for note-taking, displaying research articles, and drawing. It will serve as a versatile tool for my classes, enabling me to illustrate complex biological processes in real-time, both in the classroom and during office hours with my students.

The tablet is equipped with a casting feature, allowing me to project my notes, research articles, and drawings onto the screen during class or office hours. This functionality makes it an exceptionally effective teaching device. While I have a colleague in my department who utilizes an iPad in a similar manner, I believe the reMarkable tablet will better suit my overall needs.

I am confident that this tablet will enhance my ability to explain concepts in real-time to the entire classroom and to individual students during office hours. Additionally, the device seamlessly syncs with Microsoft OneDrive and Google Drive, facilitating the automatic upload of my notes and drawings to the cloud for later review by students.

The reMarkable tablet, along with the pen and case, is priced at $557.00 before tax. If the teaching grant is awarded, I intend to supplement this award with other funds to purchase the tablet for my teaching needs, including my lab classes such as Neuro449R and Cell295R, where I service about 20 undergraduate and graduate students.