University of Rochester School of Medicine and Dentistry

The Neuroscience Graduate Program

Presents:

MaKenna Cealie

In a Thesis Proposal

Advisor: Ania Majewska, PhD

Effects of Developmental Ethanol Exposure on Cerebellar Microglia and Purkinje Cells

Fetal alcohol spectrum disorders (FASD) are the most common cause of non-heritable, preventable mental disability. It occurs in almost 5% of births in the U.S., leading to a wide range of cognitive, behavioral, and physical impairments. There is no known cure for FASD, and its mechanisms remain unclear.

I will be investigating the cerebellum, as this unique structure is affected in FASD. Deficits in behaviors related to the cerebellum, such as impaired motor coordination and learning, have been discovered after developmental ethanol exposure (Servais et al., 2007; Topper et al., 2015). The changes in behavior may arise from ethanol's effects on the cellular level. Studies in rodents have found reductions in the number of the neurons that are the sole output of the cerebellum, Purkinje cells, as well as microglia, the immune cells of the Central Nervous System, after developmental ethanol exposure (Goodlett et al., 1990; Kane et al., 2011; Topper et al., 2015). Additionally, ethanol has been shown to alter Purkinje cell excitability and firing (Servais et al., 2007; Zamudio-Bulcock et al., 2014). Microglia, on the other hand, display a phenotype associated with immune activation and release pro-inflammatory factors after developmental ethanol exposure (Topper