AUGUST SPOTLIGHT

Rachel Foguth, PhD, Laboratory of Dr. Jason Cannon

Rachel got her B.S. in biochemistry at Benedictine College in 2015 during which she had summer internships at University of Texas Medical Branch studying exogenous vs. endogenous activation of the aryl hydrocarbon receptor and University of Nebraska Lincoln where she studied the interaction of alpha synuclein and manganese, two factors thought to play a role in causing Parkinsonism. She recently defended her PhD from Dr. Jason Cannon’s laboratory where she studied the potential neurotoxic effects of chemicals found in your diet or the environment. During her graduate career, she had an internship at Cook Biotech as a Toxicology/Biocompatibility Specialist Intern where she assisted with ensuring compliance for nonclinical laboratory studies. When not in the lab, Rachel enjoys giving back to the community, she has participated in teaching fourth graders science experiments, discussing what it is like to be a graduate student studying toxicology to high school students, and participating in the Health Sciences Graduate Student Organization as vice-president and president.

Neurological disorders are a major public health concern due to prevalence, severity of symptoms, and impact on caregivers and economic losses. While genetic susceptibility likely has a role in most cases, exposure to toxicants can lead to neurotoxicity, including potentially developmental origins of adult disease or increased risk of disease onset. My research in Dr. Jason Cannon’s laboratory focuses on the potential neurotoxicity of two classes of dietary toxins/toxicants, heterocyclic aromatic amines (HAAs) and per- and polyfluoroalkyl substances (PFAS). HAAs are formed in charred or overcooked meat, coffee, tobacco, and other foods. PFAS are largely used in making household materials. Discharge from manufacturers and usage has led to PFAS presence in drinking water, along with detection in >99% of human serum and detectable accumulation in the brains of various wildlife.

Unfortunately, there is little research on the effects of exposure to these compounds on the brain, especially during development. Therefore, my research focused on determining effects of HAAs or PFAS on neurotransmitters in the brain in various model systems. Overall, this research shows that toxins/toxicants humans are exposed to over their whole lives through their diet and contaminated water can cause neurotoxicity, potentially leading to or increasing risk of disease states.