Tox T32 Abstract:

Alzheimer's Disease (AD) is a common neurodegenerative disease whose pathogenesis has been tied to environmental conditions. There is mounting evidence that the gut microbiome is sensitive to environmental conditions and plays a role in AD. The gut microbiome influences the rest of the body via metabolites it produces, the most abundant being bile acids. Autopsy-based studies report increases in gut microbiome-derived bile acids in the cortex of individuals with AD. It is unknown what effect this may have on AD pathogenesis. I propose an investigation of the effects of two influential environmental conditions, nutrition and air quality, on gut bacterial bile acid metabolism. Nutritional influence on brain bile acid profile will be assessed by feeding mice a diet supplemented with a fermentable resistant starch and comparing them to an isocaloric control. Air quality influence will be assessed by studying a well-validated rat model of AD (TgF344-AD) that has been exposed to different components of traffic-related air pollution compared to rats exposed to filtered air. I hypothesize that changes in gut bacterial bile acid metabolism are the result of changes in the abundance of particular bacteria in the gut, which are sensitive to environmental conditions such as nutrition and air quality.