Research Interests:

Metabolic Syndrome (MetS) is increasingly prevalent within our society and is an established risk factor for the development of many chronic diseases including type 2 diabetes, cardiovascular disease, cancer, and others. Specifically, MetS is a collection of conditions including increased blood pressure, high blood sugar, obesity, and dyslipidemia. Growing evidence suggests that exposures contribute to chronic diseases and that individuals with these chronic diseases respond more robustly to exposures. We hypothesize that MetS-associated dysregulation of lipids contributes to exacerbated inflammatory responses following exposures. Further, we hypothesize that commonly prescribed statins, which modulate lipids, will decrease susceptibility. Our current study, uses a human-relevant nanoparticle exposure to evaluate pulmonary inflammation in a mouse model of diet-induced MetS. A lipidomics approach was employed to mechanistically investigate the role of disease-associated lipid dysregulation in susceptibility to exposures. A detailed understanding of common subpopulation susceptibility to environmental and occupational exposures is necessary for the development of comprehensive public health policy and understanding of disease progression.