Saeed Alqahtani is a third-year Ph.D. student in the School of Health Sciences. He received his Master’s in Toxicology from Colorado State University in 2018 and in the Fall of 2018, joined the Shannahan laboratory. The Shannahan laboratory investigates toxicity associated with environmental and occupational exposures in susceptible subpopulations.

Saeed’s research focuses on understanding how individuals with underlying diseases such as metabolic syndrome (MetS) respond to inhalation exposure of engineered nanomaterials. The majority of toxicity assessments of nanoparticles have been performed in healthy scenarios and may not translate to prominent human subpopulations who suffer from various pre-existing conditions. MetS is increasingly prevalent within our society, and growing evidence suggests that individuals with these chronic diseases, such as MetS, respond more robustly to exposures. To date, the mechanisms responsible for this susceptibility are unknown. MetS is associated with dyslipidemia which may alter the regulation of inflammation following exposures. Saeed’s overall hypothesis is that MetS-associated dysregulation of lipids contributes to exacerbated inflammatory responses following exposures due to alterations in specialized pro-resolving mediators of inflammatory resolution. His current study uses a human-relevant nanoparticle to evaluate pulmonary inflammation in a mouse model of diet-induced MetS. Further, he is utilizing omega-3 fatty acid-derived precursors of specialized pro-resolving mediators as interventions to examine resolution pathways responsible for exacerbations of inflammation in MetS. His findings demonstrate that lipid dysregulation enhances acute inflammatory responses, and these exacerbations can be inhibited via supplementation with precursors of specialized pro-resolving mediators. Elucidation of these mechanisms of susceptibility will allow for the development of new therapeutic strategies and establishment of regulations that protect sensitive groups from exposures.