NON-TECHNICAL ABSTRACT:

Diarrheal diseases caused by bacteria, viruses, and parasites rank fourth in fatality rate among all other diseases around the globe, causing at least 3 million deaths a year. Two species of bacteria from the same genus, *Vibrio cholerae* and *Vibrio parahaemolyticus* are culprits in causing bacterial diarrheal disease; albeit by quite different mechanisms. Of the two, *Vibrio cholerae* is the best known, as the causative agent of cholera, a water-borne disease that still causes significant illness and death worldwide. Illnesses due to *V. parahaemolyticus* typically result from the consumption of contaminated, raw, or under-cooked shellfish and are less wide spread, though increasing in prevalence in the past decade. The experiments in this proposal aim to compare the early immune response of human gut epithelial cells to both pathogens by quantifying the amount of hundreds of different genes that are potentially regulated by each bacteria. The gene expression patterns will be compared to determine what might be unique at the molecular level between the two organisms. These data will help shed light on how both bacteria cause the same type of disease, but with entirely different mechanisms. Ultimately, understanding the early immune response to bacteria such as these will be important for understanding how we can treat or prevent infections with these and similar organisms by rationally engineering vaccines or drugs.