

**Southwest Health Equity Research Collaborative  
PILOT PROJECT PROGRAM**

**PI: Emily Cope, PhD**

**Assistant Professor, Biological Sciences; PMI**

**Project Title: *“Addressing asthma health disparities through diet-based manipulation of the gut microbiome-airway axis”***

**Proposal Abstract:**

Recent studies associate gut microbial metabolism of dietary fiber into short chain fatty acids (SCFAs) to airway health, specifically in reducing allergic airway inflammation. However, no study has examined the effects of diet on airway health status in models that recapitulate at-risk populations. Asthma is a complex inflammatory disease of the airways and is increasing in prevalence across all populations. However, the burden of this disease is disproportionately shared among the economically disadvantaged. Health disparities in asthma prevalence and morbidity are highlighted in the Southwest, where metropolitan areas are surrounded by low-income rural communities. Since the increase in asthma incidence cannot be solely attributed to genetics, environmental exposures such as diet could be a major contributor. Disparities in health behaviors exist among the economically disadvantaged; intake of dietary fiber is significantly lower in low-socioeconomic status (SES) groups than high-SES groups. Since the increase in asthma prevalence has paralleled shifts toward a high-fat, low-fiber diet, we hypothesize that low-fiber diets contribute to mucosal inflammation via reduction of SCFAs. The goal of this study is to determine whether dietary fiber decreases airway inflammation and toward development of an accessible prebiotic therapeutic to augment current asthma treatment strategies in low-SES populations.