

# REPPERGER RESEARCH INTERN PROGRAM

RESEARCH PROJECT #: AFRL-RHB-26-10

## Evaluation of the Impact of the Oral Microbiome on Exhaled Breath Data

**PROJECT DESCRIPTION:** Have you ever wondered about how the microbes in your mouth effect your exhaled breath? The USAF conducts large amounts of exhaled breath research and wants you to find out. This project will allow you to learn complex sample techniques, high end mass spectral instrumentation, and data analysis within a dynamic laboratory setting. The data acquired within this project will contribute to larger overall efforts by the USAF relating to using exhaled breath for human performance monitoring.

**LEARNING OBJECTIVES:** Under the guidance of a mentor, participants will 1) Learn to conduct independent research in a dynamic laboratory setting, and 2) Learn to run high end mass spectral instrumentation and analyze data to progress toward project goals.

**ACADEMIC LEVEL:** Masters; Undergraduate; Doctoral

**DISCIPLINES NEEDED:** Biochemistry, Biology, Chemistry

**RESEARCH LOCATION:** Wright-Patterson Air Force Base, Dayton, Ohio

**RESEARCH MENTOR:** Sean Harshman, PhD  
Cancer Biology/Immunology, Ohio State University, 2013



I am a Research Scientist and the Analytical Chemistry Team Lead in the Biotechnology Branch within the Air and Space Biosciences Division of the 711th Human Performance Wing (711HPW/RHBBA). I lead a diverse team of scientists and engineers supporting the mission of the Air Force through research and core functionality utilizing mass spectrometry and biochemical analyses. My research focuses on biomarker discovery utilizing non-invasive or minimally invasive biosources to predict the physiological state of Airmen and Guardians. I have mentored over a dozen high school, undergraduate, and graduate students and post-docs within the lab. I hold adjunct status at Wright State University providing lectures on proteomics within the Systems Biology course of the Biochemistry Department. I am on the editorial board of the Journal of Breath Research and am a standing member of the International Association for Breath Research and the American Society for Mass Spectrometry. Following my graduate studies at The Ohio State University, I joined the Air Force as a

contract researcher, in the labs of Dr. Curt Grigsby and Dr. Jennifer Martin, leading the contract personnel supporting biomarker discovery efforts within the 711th Human Performance Wing. I ultimately transitioned to my current position as a government civilian, as the Analytical Chemistry Team Lead, in 2021.

*Photo courtesy of the U.S. Air Force Research Laboratory*