REPPERGER RESEARCH INTERN PROGRAM

RESEARCH PROJECT #: AFRL-RHB-27-03

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

PROJECT DESCRIPTION: Have you ever wondered how the microbes in your mouth affect your exhaled breath? The USAF conducts a substantial amount of research on exhaled breath and wants you to help find out. This project will allow you to learn complex sample preparation techniques, operate high-end mass spectrometry instrumentation, and analyze data in a dynamic laboratory setting. The data acquired through this project will contribute to broader USAF efforts related to the use of 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.
2. Learn to operate high-end mass spectrometry instrumentation and analyze data to advance project goals.

ACADEMIC LEVEL: Master's; Undergraduate; Doctoral
DISCIPLINES NEEDED: Biochemistry, Biology, Chemistry
RESEARCH LOCATION: Wright-Patterson Air Force Base, Dayton, Ohio
RESEARCH MENTOR: Sean Harshman, Ph.D.
Cancer Biology/Immunology, The 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 who support the Air Force mission through research and core capabilities involving mass spectrometry and biochemical analyses. My research focuses on biomarker discovery using noninvasive or minimally invasive biological sources to predict the physiological state of Airmen and Guardians. I have mentored more than a dozen high school, undergraduate, and graduate students and postdoctoral researchers in the laboratory. I hold adjunct status at Wright State University, where I lecture on proteomics in the Biochemistry Department's Systems Biology course. I serve on the editorial board of the *Journal of Breath Research* and am a 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 laboratories of Dr. Curt Grigsby and Dr. Jennifer Martin, where I led contract personnel supporting biomarker discovery efforts within the 711th Human Performance Wing. In 2021, I transitioned to my current government civilian position as the Analytical Chemistry Team Lead.

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