

OTOLARYNGOLOGY (MAIN), BME (SECONDARY)
COLLEGE OF MEDICINE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE students

FOR APPLICATION YEAR: 2025

PROJECT TITLE: VortexPAP

Liran Oren
College of Medicine
6307, MSB
Cincinnati, OH 45267
oren1@ucmail.uc.edu
513-558-0073

Project Description

Background: Obstructive Sleep Apnea (OSA) is a widespread condition affecting roughly one billion people worldwide. This disorder leads to repeated airway blockage during sleep, causing disrupted breathing, low oxygen levels, and poor sleep quality. These disturbances can lead to serious health issues like cardiovascular diseases, diabetes, and daytime fatigue, which increases accident risk. The standard treatment for OSA, Continuous Positive Airway Pressure (CPAP), involves using a mask to keep the airway open with continuous airflow. Unfortunately, many patients find CPAP masks uncomfortable and often abandon treatment, which leaves their OSA unmanaged and health risks unmitigated.

Our research aims to explore which patient populations benefit most from VortexPAP, a new technology that can open the airway without using a mask. By investigating different factors such as age, gender, OSA severity, and personal comfort preferences, we aim to determine the characteristics of individuals who are more likely to adhere to this new therapy. This information will help guide the design of larger clinical studies and refine the device for real-world use.

Your research activities will include supporting various aspects of this study:

- Participant Screening and Data Collection: Assist in gathering demographic, physiological, and sleep data from participants, which will help analyze how different groups respond to VortexPAP.
- Data Analysis and Reporting: Work with the team to analyze patterns in treatment adherence and comfort levels across different populations. You will help identify factors that predict success with VortexPAP compared to standard CPAP.
- Supporting Protocol Development: Collaborate with the team on refining

study protocols, including simplifying participant instructions and improving data tracking methods for use in future clinical studies.

Expected Learning Outcomes: You will gain hands-on experience with clinical research processes, learn about sleep science and medical devices, and develop skills in data collection and analysis. This project will provide insight into translational research, where laboratory findings are applied to real-world patient care, and the innovative design of medical devices tailored to meet patient needs.

Your contributions will be crucial in shaping a device that could improve the lives of many individuals with sleep apnea who are currently unable to tolerate CPAP.