

DEPARTMENT OF INTERNAL MEDICINE
COLLEGE OF MEDICINE

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: 03/01/2020

PROJECT TITLE: Making Gas to Remove Gas (and Save Tissue!)Kevin J. Haworth, PhD
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<http://med.uc.edu/intmed/research/labs/haworth-lab>**Project Description**

Our laboratory is investigating a novel therapy for reperfusion injury, a type of injury that happens when blood is returned to tissue after a lack of blood flow (such as occurs after intervention for a heart attack). One of the primary causes of reperfusion injury is oxidative stress (e.g., superoxide and hydrogen peroxide) formed by dysfunctional cells. We are studying the use of ultrasound for converting perfluorocarbon droplets into gas microbubbles that can scavenge dissolved oxygen. We hypothesize that by reducing the amount of oxygen in blood we can reduce oxidative stress and thereby reduce tissue injury. We have demonstrated this effect in buffers and cell culture. This R01-funded project would systematically investigate the ability to scavenge oxygen from whole blood. The presence of hemoglobin modifies the scientific problem significantly from our past studies in buffers. This research area has many potential directions ranging from biological effects to mechanical system characterization to developing mathematical models of oxygen scavenging. Students from all areas of science are welcome to the project. Past undergraduates on this project have used their research to present at regional and national conferences.