

Microbiome Changes as Markers of Exposure and Stress in Firefighters

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Firefighters have been identified to be at a higher occupational risk for several health disorders such as cancers, cardiovascular problems, respiratory disorders, diabetes etc. Firefighters are regularly exposed to smoke and heat involving inhalation of toxic chemicals such as PAHs and particulates as well as stressful work environment. All these factors have the potential to alter the consortium of human microflora (microbiome). In this investigation, we hypothesize that fire-associated exposure may cause stress and gut microbiome perturbations in firefighters which may interact with other prevailing physiological stress factors thereby increasing the risk for occupational diseases. We propose to compare the gut microbiome of firefighters from their fecal samples using 16S rRNA gene-based nextgen sequencing and identify the microbiome constituents associated with occupational PAH exposure. We will further correlate the microbiome changes with the exposure data and other metadata collected using a study questionnaire. Completion of the study is expected to identify specific gut microbiome constituents and changes associated with the firefighters. Further analysis will provide insights into role of microbiome dysbiosis in predisposing firefighters to occupational health risks.



University of Cincinnati 18th Annual Pilot Research Project Symposium October 5-6, 2017



Pilot Research Training Program (PRP) Overview

Welcome to the University of Cincinnati Education and Research Center's (ERC) 18th Annual Pilot Research Project (PRP) Symposium on October 5-6, 2017, held in the Medical Sciences Building Kresge Auditorium. The purpose of the PRP is to increase the research capacity of research trainees and young investigators in occupational health and safety and to encourage those in related disciplines to pursue occupational health and safety research.

Under the administrative direction of Dr. Amit Bhattacharya, research proposals are solicited and peer-reviewed annually by qualifying faculty and graduate students from the University of Cincinnati and the following PRP partnering institutions – Air Force Institute of Technology, Bowling Green State University, University of Toledo – Health Science Campus, Central State University, Purdue University, University of Kentucky, Western Kentucky University, Eastern Kentucky University, Murray State University, Ohio University and Kentucky State University.

At this symposium, the 2016-17 awardees will be presenting the results of their research and the 2017-18 awardees will make poster presentations of their proposed work. The keynote speaker on Thursday, October 5, 2017 is Dr. Carri Casteel from the University of Iowa College of Public Health, presenting on "Public Health Approach to Workplace Violence Prevention in Small Businesses."

The University of Cincinnati's Education and Research Center is one of 18 such centers funded by the National Institute for Occupational Safety and Health (NIOSH) nationally. Dr. Tiina Reponen serves as the director of the ERC, which is based in the University's Department of Environmental Health within the College of Medicine. The purpose of the ERC is to train professionals in the didactic and research skills necessary to lead the occupational safety and health disciplines. Results of research are translated into action through an outreach program and shared with professionals and practitioners in the region via continuing education.

Since 1999, the PRP program has allocated over \$1.3 million to support 230 pilot research projects. These projects have served as a catalyst in bringing over \$39 million in additional research support to the region from sources independent of the PRP program, such as, the National Institute for Occupational Safety and Health (NIOSH), National Institutes of Health (NIH), United States Department of Agriculture (USDA), National Science Foundation (NSF), and the Centers for Disease Control and Prevention (CDC). Additionally, the PRP has brought 51 new investigators from other fields of expertise to the area of occupational safety and health research.

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