Enhanced Capture of Microbeads for Water Treatment

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In micro total analysis systems, detection of pathogens and isolation of biomolecules by immunoassays is essential for point-of-care diagnostics. Magnetophoretic separation, which uses magnetic microbeads coated with specific epitopes to entrap target pathogens, is a common method used in microfluidic platforms. However, the difficulty with these platforms is efficient capture of microbeads.

The purpose of this study is to analyze a microfluidic device that utilizes electroosmotic flow and flow switching to increase capture efficiency in a portable chip device. Electroosmotic flow enables easy switching through the changing of voltage between two electrodes to increase the amount of time beads spend under the influence of the magnetic field, thereby increasing the capture effectiveness. This project will analyze the capture efficiency of the system using fluorescently tagged microbeads, as well as characterize the secondary capture of bacteria in a sample.

This device will be used to analyze water systems and determine the concentration of bacteria in a water system through the use of beads coated with epitopes targeted to specific bacteria. This technology is a unique platform that allows for rapid and accurate analysis in a portable device that can be used in on site, point of care situations.

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Main Menu:

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Pilot Research Training Program (PRP) Overview

Welcome to the University of Cincinnati Education and Research Center's (ERC) 16th Annual Pilot Research Project (PRP) Symposium on October 8-9, 201Welcome to the University of Cincinnati Education and Research Center's (ERC) 17th Annual Pilot Research Project (PRP) Symposium on October 13-14, 2016, held in the Auditorium of Proctor Hall, College of Nursing. 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 from 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 2015-16 awardees will be presenting the results of their research and the 2016-17 awardees will make poster presentations of their proposed work. The keynote speaker on Thursday, October 13, 2016 is **Anita Schill, PhD, MPH, MA**, Senior Science Advisor to the Director and Co-Manager for the Total Worker Health® Program with the National Institute for Occupational Safety and Health (NIOSH), will deliver the keynote address on "**Advancing Well-Being Through Total Worker Health.**"

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 222 pilot research projects. These projects have served as a catalyst in bringing over $34 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 47 new investigators from other fields of expertise to the area of occupational safety and health research.

Return to Main Menu