

# Investigators present findings at Pilot Studies Colloquium

Posted on 12/13/16 at 02:26 pm



Pilot studies core director Steven J. Fliesler (left) looks on as Ruogang Zhao, Biomedical Engineering, addresses a question

Recipients of [the 2014-15 Translational Pilot Studies Program grants](#) presented the results of their investigations at a colloquium held in the Clinical and Translational Research Center (CTRC) in October. About 60 people turned out to hear six investigators from the project teams describe the work they've been able to accomplish after receiving awards of up to \$50,000 to advance their research projects.

Timothy Murphy, MD, Buffalo Clinical and Translational Science Award (CTSA) principal investigator and director of the CTRC, delivered the introductory address. He noted that the Translational Pilot Studies Program has provided \$600,000 in funding for 17 proposals since 2010, resulting in more than 40 publications and an additional \$7,967,754 in outside funding to pilot study investigators in the health sciences at UB and its Buffalo Translational Consortium partner institutions.

The awards, totaling approximately \$200,000, were made possible by broad-based contributions from the following offices:

- Office of the Vice President for Health Sciences
- Office of the Vice President for Research
- Roswell Park Cancer Institute (RPCI)
- Dean, School of Medicine and Biomedical Sciences
- Dean, School of Dental Medicine
- Dean, School of Pharmacy and Pharmaceutical Sciences
- Dean, School of Engineering and Applied Sciences
- Dean, School of Public Health and Health Professions
- Dean, School of Nursing

Director of the CTSA's Pilot Transitional and Clinical Studies Core Steven J. Fliesler, PhD, provided instructions and tips for filing a successful application for future pilot study awards. (Follow [the link here](#) for an online version of his presentation.)

Recipients of [the 2015-16 Translational Pilot Studies Awards](#) conducted poster presentations as part of the program.



The 2014-15 Translational Pilot Studies Program grants were awarded to:

#### **Mobilization of Hematopoietic Stem and Progenitor Cells in Patients with Myocardial Infarction**

Heart attacks and strokes are caused by ongoing inflammation and impaired tissue repair. One of the main goals in preventing heart attacks (MI) is identifying patients at high risk without performing invasive tests. Precursors of the blood system are known as hematopoietic stem cells (HSCs). HSC quantity and growth are negatively affected by the same factors that cause heart attacks and strokes. In this study we found patients with heart attacks had higher levels of inflammatory blood cell precursors and lower levels of regenerative stem cells circulating in the blood stream. The findings suggest hematopoietic progenitor quantity and composition may be useful to identify patients at high risk for future heart attacks.

*Lead investigator:* Thomas Cimato, MD, PhD, Dept. of Medicine, Jacobs School of Medicine and Biomedical Sciences and Roswell Park Cancer Institute. *Co-investigators:* Paul Wallace, PhD, Dept. of Flow and Image Cytometry, Roswell Park Cancer Institute, and Dept. of Pathology, Jacobs School of Medicine and Biomedical Sciences; David Zlotnick MD, Dept. of Medicine, Jacobs School of Medicine and Biomedical Sciences.

#### **Expression-Based Biomarkers in Cystic Fibrosis**

A major obstacle to improving care in cystic fibrosis (CF) is the inability to tell when a patient is about to experience a period of severe worsening of symptoms, called a cystic fibrosis pulmonary exacerbation (CFPE), which causes irreversible damage to the lung. This study uses RNA sequencing to identify RNA molecules that are clearly associated with infection in CF, and then uses those discoveries to determine whether the appearance of such molecules can provide the basis for treatment before a patient suffers a CFPE.

*Lead investigator:* James Jarvis, MD, Pediatrics, Jacobs School of Medicine and Biomedical Sciences. *Co-investigators:* Drucy Borowitz, MD, Pediatrics, Jacobs School of Medicine and Biomedical Sciences; Yijun Sun, PhD, Bioinformatics, Microbiology and Immunology, Jacobs School of Medicine and Biomedical Sciences, and Microbiology and Computer Science and Engineering, School of Engineering and Applied Sciences.

#### **Vibration-Powered Leadless Cardiac Pacemaker**

Two problems with current Cardiac Implanted Electrical Devices (CIEDs), including pacemakers, are: (1) the eventual failure of lead wires which run from the pulse generator to the heart muscle through blood vessels and (2) the necessity of replacing the power source (batteries) in CIEDs. This study tests a novel piezoelectric energy harvester which converts heartbeat vibrations to electrical energy to power a leadless pacemaker, thereby addressing both problems.

*Lead investigator:* Amin Karami, PhD, Mechanical and Aerospace Engineering, School of Engineering and Applied Sciences. *Co-investigator:* Vijay Iyer, MD, PhD, Medicine, Jacobs School of Medicine and Biomedical Sciences.

#### **Use of Cardiac MRI and Tissue Characterization to Identify the Morphology of Myocardial Scar and High-Risk Peri-Infarct Region**

The aim of this pilot study is to be able to identify patients at risk for life-threatening arrhythmias and to develop novel, prophylactic treatment strategies. The area of heart muscle affected by heart attack forms a scar. Recent studies show that lethal cardiac arrhythmias often originate in the region of the heart bordering this scar tissue. Magnetic resonance imaging (MRI) data from pig models of cardiac arrest will be used to explain what constitutes the “gray-signal” visualized by cardiac MRI of the scar tissue border region and whether this information can be used for future diagnosis and treatment.

*Lead investigator:* Umesh Sharma, MD, PhD, Cardiovascular Medicine, Jacobs School of Medicine and Biomedical Sciences. *Co-investigators:* John Canty, Jr., MD, Medicine, Jacobs School of Medicine and Biomedical Sciences; Gen Suzuki, MD, PhD, Medicine, Jacobs School of Medicine and Biomedical Sciences; Leslie (Lei) Ying, PhD, Electrical Engineering, School of Engineering and Applied Sciences.

#### **Biomarkers for Detection of Treatment Response and Disease Recurrence in Pancreatic Cancer**

This project brings together basic, translational and medical scientists from Roswell Park Cancer Institute and the University at Buffalo to improve pancreatic cancer treatment in two ways: One is to identify blood-borne markers released by cancer cells during re-growth after treatment and the second is to search for a hypothesized signature pattern of proteins that tumors release into the blood of patients responding to chemotherapy treatment. The project takes advantage of UB’s recent capital investment in cutting-edge technology that supports proteomics, a field that seeks to identify and quantify thousands of proteins in a biological sample.

*Lead investigator:* Robert Straubinger, PhD, Pharmaceutical Sciences, School of Pharmacy and Pharmaceutical Sciences. *Co-investigators:* Jun Qu, Pharmaceutical Sciences, School of Pharmacy and Pharmaceutical Sciences; Wen We Ma, Roswell Park Cancer Institute Dept. of Medicine; Elizabeth A. Repasky, Roswell Park Cancer Institute Dept. of Immunology. Presenter: Kevin Shen, Biochemistry, Jacobs School of Medicine and Biomedical Sciences.

#### **Human Fibrotic Microtissue Chips for Screening of Anti-Fibrotic Therapies**

Failure of existing in-vitro models has significantly delayed the development of anti-fibrotic therapies due to their limited capability to mimic the physiological condition of fibrotic tissues. The long-term objective of this project is to develop a microphysiological “fibrotic cardiac microtissue chip” device to enable early screening of anti-fibrotic therapies. A microtissue array allows hundreds of tissue samples to be tested simultaneously, significantly improving the throughput of drug screening. The research represents a substantial technological advancement over conventional tissue engineering approaches.

*Lead investigator:* Ruogang Zhao, PhD, Biomedical Engineering, School of Engineering and Applied Sciences. *Co-investigator:* Stylianos Andreadis, PhD, Biomedical Engineering, Jacobs

