making under uncertainty with applications to chronic diseases including cancer and cardiovascular disease. He completed his Ph.D. in Management Science at McMaster University, his M.Sc. in Physics at York University, and his B.Sc. in Chemistry and Physics at McMaster University in Hamilton, Ontario, Canada.

Dr. Raj Ratwani:

From Task Interruptions to Electronic Health Records: Understanding Emergency Physician Stress and Workflow

Abstract: Many physicians are facing increased stress and burnout, with emergency physicians facing particularly challenging work environments. Two commonly described stressors in emergency medicine include task interruptions and increased time using electronic health records (EHRs) due to poor usability. In this talk I will (1) provide context on how interruptions and poor EHR usability impacts cognitive performance, and (2) describe methods for capturing physician workflow and measuring physiological response to identify common stressors. Implications for emergency medicine workflow and for advancing human factors methods will discussed.

Bio: Raj Ratwani, PhD, is the Director of MedStar Health's National Center for Human Factors in Healthcare, part of the MedStar Institute for Innovation, and is an Assistant Professor of Emergency Medicine at Georgetown University's School of Medicine. His research career is focused on improving the safety, efficiency, and quality of healthcare through the application of human factors and applied psychology. Specific areas of expertise include memory and perception, human error, and data visualization. He holds a doctoral degree in human factors and was a postdoctoral fellow at the U.S. Naval Research Laboratory in the Artificial Intelligence section.

Dr. Ratwani has authored over fifty peer-reviewed publications and his work has been published in JAMA and other high impact factor journals. He has been invited to give numerous talks in human factors, innovation, and patient safety. His work has been funded by the Agency for Healthcare Research and Quality (AHRQ), the National Institutes of Health (NIH), The Pew Charitable Trusts, and several other agencies and foundations. In addition to his research he has focused on optimizing health information technology for frontline clinicians and advises on safety and technology policies. He is currently a member of the 21st Century Cures Act Health Information Technology Advisory Committee and has testified in front of the U.S Senate Health, Education, Labor and Pensions Committee.

In association with the regional conference of the society of academic emergency medicine (SAEM)

FEBRUARY 22-23, 2019

PROGRAM

8:30am-8:45am:	Introductions
8:45am-9:30am:	Tom Borg, PhD, MUSC: Extracellular Matrix in Heart Development and Regeneration
9:30am-10:15am:	Arash Kheradvar, MD, PhD, UC Irvine: Mitochondrial Transplantation for Cardiac Diseases
10:15am-10:30am:	Break and networking
10:30am-11:15am:	Brian Denton, PhD, University of Michigan: Data Analytics for Optimal Detection of Metastatic Prostate Cancer
11:15am-11:45am:	Poster time
11:45am-12:30pm:	Lunch
12:30pm-1:15pm:	Raj Ratwani, PhD, MedStar Health: Understanding Physician Stress, Workflow, and Task Interruptions
1:15pm-1:30pm:	Wrap-up/transitioning to SAEM program

ABSTRACTS & BIOS

Dr. Thomas Borg:

Extracellular Matrix in Heart Development and Regeneration

Abstract: Importantly, cardiovascular disease continues to be number one cause of death in the western world. However, treatment of cardiovascular disease by pharmacology has only marginally reduce affect this problem. Understanding basic principles of tissue interaction in the development of the heart are critical to understand the normal physiology of the heart. The commitment and interaction of various cell types and the extracellular environment in the development of the heart provides the basic framework for understand the response of the heart to both normal and pathophysiological signals in the adult. In addition, these principles are critical to future strategies for therapies addressing cardiovascular disease including regeneration.

Bio: Dr. Borg has received a BS and MS from Colorado State University and a Ph.D. from the University of Wisconsin in 1969. He has held academic appointments at North Dakota State University, University of South Carolina and the Medical University of South Carolina as well as a research appointment in the department of Bioengineering at Clemson University. He has received numerous academic awards including Carolina Distinguished Professor from the University of South Carolina, Governor's Award in Science and is a Fellow in the American Association for the Advancement of Science. His scientific studies have been funded continuously from 1979 from grants from the NIH, AHA and private foundations. He has over 140 scientific contributions in a wide variety of scientific journals.

Dr. Arash Kheradvar:

Mitochondrial Transplantation in Cardiomyocyte Inspired by Symbiogenesis

Abstract: Mitochondrial diseases occur due to malfunction of the mitochondria. These micro organelles possess their own DNA (mtDNA), which encodes some of their components and defines a genetic system entirely distinct from the cell's nuclear genome. Mitochondria are responsible for cellular energetics, and their malfunction leads to cellular injury and eventually cell death. Defects in energy metabolism and cell function are common to all mitochondrial disorders. The combined results of the epidemiological data on childhood and adult mitochondrial disease suggest for every 5,000 births in the U.S., one individual has an inherited mitochondrial disease, which is most likely an underestimate. Accordingly, mitochondrial impairment plays an important role in cardiomyocytes and in the heart, among other tissues and organs.

Despite significant advances in management of cardiac patients, currently there is no cure for mitochondrial cardiomyopathies, and medication is limited to the use of a vitamin cocktail that usually has only minor positive effect in managing the disease.

From an evolutionary perspective, the eukaryote mitochondrion is believed to have evolved from a small, autotrophic bacterium that was engulfed by a larger primitive, heterotrophic, eukaryotic cell.

Inspired by mitochondria's endosymbiosis theory of origin, and the vital role it plays in the cell bioenergetics, we have been recently interested in mitochondrial transplantation as a radically different approach for treatment of mitochondrial cardiomyopathy through repairing and rejuvenating the cardiomyocytes' mitochondria. In this lecture, I will discuss about our recent studies denoting the feasibility of autologous, non-autologous and interspecies mitochondrial transplantations as well as the bioenergetic consequences post-transplantation.

Bio: Arash Kheradvar, M.D., Ph.D., FAHA is a Professor of Biomedical Engineering, and Medicine at the University of California, Irvine. His research interests are focused on heart valve engineering, cardiac tissue engineering, cardiac fluid dynamics, and novel cardiac imaging technologies. He is the author of over than 50 journal articles and the lead inventor of 45 issued and pending patents in cardiovascular area, mainly on heart valve technologies and imaging modalities. Dr. Kheradvar received M.D. from Tehran University of Medical Sciences in 2000 and a Bioengineering Ph.D. from Caltech in 2006. He is an elected Fellow to the American Heart Association by two councils of Cardiovascular Radiology and Intervention, and Cardiovascular Surgery and Anesthesia. More information about Kheradvar Research Group can be found at: http://kheradvar.eng.uci.edu/

Dr. Brian Denton:

Data Analytics for Optimal Detection of Metastatic Prostate Cancer

Abstract: We used data-analytics approaches to develop, calibrate, and validate predictive models, to help urologists in a large state-wide collaborative make prostate cancer staging decisions on the basis of individual patient risk factors. The models were validated using statistical methods based on bootstrapping and evaluation on out-of-sample data. These models were used to design guidelines that optimally weigh the benefits and harms of radiological imaging for detection of metastatic prostate cancer. The Michigan Urological Surgery Improvement Collaborative, a state-wide medical collaborative, implemented these guidelines, which were predicted to reduce unnecessary imaging by more than 40% and limit the percentage of patients with missed metastatic disease to be less than 1%. The effects of the guidelines were measured post-implementation to confirm their impact on reducing unnecessary imaging across the state of Michigan.

Bio: Brian Denton is a Professor and Chair of the Department of Industrial and Operations Engineering at University of Michigan, in Ann Arbor, MI. He is also a Professor in the Department of Urology and a member of the Cancer Center at University of Michigan. Previously he was an Associate Professor in the Department of Industrial & Systems Engineering at NC State University, a Senior Associate Consultant at Mayo Clinic, and a Senior Engineer at IBM. He is past president of the INFORMS Health Applications Section and he served as Secretary on the INFORMS Board of Directors from 2012 to 2015. He is also Past President of INFORMS. He has served on several editorial boards including the INFORMS Journal on Optimization, IISE Transactions, M&SOM, Interfaces, Operations Research, and Medical Decision Making. His current research interests are in mathematical optimization models for decision

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