News

IEM Launches Clinical Immersion Program
The Institute for Engineering in Medicine is pleased to announce the successful launch of its new Clinical Immersion Program, in which groups of engineers from medical technology companies visited the University of Minnesota in September and October. During the week-long program, the participants observed numerous surgical procedures and learned about the many challenges and unmet clinical needs associated with treating patients with heart disease, cancer, and other very serious conditions.

Hosted by the Department of Surgery, the program seeks to help engineers become more effective in developing leading-edge medical technologies. Among the participants was Dr. Aditee Kurane, an R&D manager at St. Jude Medical. “We got to see so many aspects of the clinical setting that we had no previous exposure to – grand rounds, listening to detailed case preparation by the surgical residents and most importantly, a variety of surgical procedures where the surgeons were so accommodating and explained details of the procedures to help us truly understand what was going on,” said Dr. Kurane. IEM is currently organizing company groups for Spring 2016.

For more information, please email: iem@umn.edu.

3rd Edition of “Cardiac Anatomy, Physiology and Devices” Includes Six New Chapters; Now Available Online
The third edition of “Cardiac Anatomy, Physiology and Devices” edited by Dr. Paul Iaizzo, Professor of Surgery and IEM Associate Director for Education and Outreach, is recently available. This new edition includes six new chapters and contributions from a number of physicians and industry experts.

“The major impetus for this third edition was to update this resource textbook for interested students, residents, clinicians, and/or practicing biomedical engineers. A secondary motivation was to promote the expertise, past and present, in the areas of cardiovascular science at the University of Minnesota,” says Dr. Iaizzo, who adds that the third edition includes “state-of-the-art information on a variety of topics related to cardiac anatomy, physiology, and devices.” The handbook is now available on-line, and can be accessed through the following link.

Springer: Cardiac Anatomy, Physiology and Devices
**Timothy Church and Douglas Yee Discuss New Breast Cancer Screening Guidelines**

The American Cancer Society’s new guidelines for breast cancer screening encourage women to make the decision on when, and how often, to go in for testing. Under the new guidelines, women of average risk are recommend to be screened annually starting at age 45, and then every other year starting at age 55. As reported in a story by the “Minnesota Daily,” having annual exams at earlier ages could lead to false-positives. The co-author of the study that led to the new guidelines, Dr. Timothy R. Church, Professor of Environmental Health Sciences, and IEM Member, says “When you screen for any disease, the tests are not perfect, so sometimes they’ll indicate a disease is present when it isn’t.”

In another article on the topic in the University of Minnesota’s “Health Talk,” IEM Member Dr. Douglas Yee, Professor of Medicine and Pharmacology, Director of the Masonic Cancer Center and John H. Kersey Chair in Cancer Research, says “The new ACS guidelines are based on a systematic evidence review of breast cancer screening literature including randomized controlled trials, more recent observational studies, and simulations.” Dr. Yee notes, however, that the new guidelines are not appropriate for women at high-risk of breast cancer, such as those possessing the inherited BRCA mutation.

**Esther Krook-Magnuson Explores Optogenetics in Epilepsy**

Dr. Esther Krook-Magnuson, Assistant Professor of Neuroscience, MnDRIVE Neuromodulation Scholar, and IEM Member, is researching how brain activity during epileptic seizures can be altered using light, a technique known as optogenetics. As reported in the University of Minnesota’s Health Talk Publication, medication is unable to control seizures in as many as 40% of epilepsy patients, resulting in a need for other approaches. Optogenetics can potentially address this by targeting the specific groups of cells that cause the seizures and adjusting the activity within the cells. Dr. Krook-Magnuson says that “Optogenetics is the tool we’ve been waiting for.” Her research is supported by both MnDRIVE and the NIH.

**Kalpna Gupta Researching Effectiveness of Cannabis for Pain**

Dr. Kalpna Gupta, Professor of Medicine, Hematology, Oncology and Transplantation, and co-chair of the IEM Cellular and Molecular Bioengineering Theme, is performing research funded by the state of Minnesota on the effectiveness of cannabis in addressing intractable pain. As reported in the Minnesota Daily, the Minnesota Department of Health is determining whether to recommend use of medical marijuana, in addition to the nine conditions that already qualify patients for use of the drug in Minnesota. The clinical trial includes 35 patients who receive either a vaporized form of the drug or a placebo. All of the patients will randomly receive each during the study to determine the effectiveness of cannabis in treating their pain. Dr. Gupta noted that the approvals for her research from various federal and state (California) organizations were obtained without any blockade.”

**Xiang Cheng Awarded Packard Fellowship**

IEM Member Dr. Xiang Cheng, Assistant Professor of Chemical Engineering and Materials Science, has been awarded a Packard Fellowship for Science and Engineering. Dr. Cheng is among 18 people from the U.S. to receive this honor, given to "the most innovative scientists and engineers" as reported in CEMS News. The fellowships "provide early-career scientists with flexible funding and the freedom to take risks and explore new frontiers in their fields.” Dr. Cheng says that his laboratory "aims to design 'smart' fluids, where the properties of fluids (e.g. viscosity) can be controlled by external factors such as light, shear
forces and electromagnetic fields. These smart fluids can be used in many industrial circumstances such as lubricants, coating fluids et al.” The Packard Fellowship grant will provide Dr. Cheng with $875,000 over 5 years to support his research.

CEMS News: Cheng Awarded Packard Fellowship

Announcements

Bin He to Present “Mapping and Interfacing with the Human Brain”
December 3, 2015, 7:00 PM
Continuing Education and Conference Center, St. Paul campus
Series Pass: $80, Individual Tickets: $20
Headliners, the University of Minnesota’s popular current event series, returns this fall for its tenth season with new opportunities to meet with University experts as they share firsthand knowledge of today’s most intriguing stories—medical breakthroughs, culture clashes, social trends, foreign affairs, and more! Hear the Who, What, Why, and How from an insider’s point of view, and then ask questions and share your insights in a moderated Q&A.

Mapping and Interfacing with the Human Brain
There are currently more than two million people in the United States who suffer from various degrees of paralysis, including those who are robbed of speech and mobility because of neurodegenerative diseases. But what if there was a way for these people to regain function by controlling artificial limbs, wheelchairs, or other devices—with their minds? Sound far-fetched? Thanks to the work of Dr. Bin He, his students, and collaborators, that day may be closer than you think.

Registration for this event can be made by phone, 612-624-4000, on site, or online.

Registration Open for Advanced Cardiac Physiology and Anatomy Course, January 4th–8th
The Advanced Cardiac Physiology and Anatomy course will be offered January 4-8, 2016 on the Minneapolis East Bank campus. Produced by the University of Minnesota’s Department of Integrative Biology and Physiology, and led by Dr. Paul Iaizzo, IEM Associate Director for Education and Outreach, this course is specially designed for biomedical engineers, including both basic science and clinical aspects. Unique features of the course include lectures on basic cardiac anatomy, physiology, associated clinical topics, and live demonstrations. Additionally, the course contains daily laboratory experiences where small groups of students are guided through detailed dissections of the human cadaver chest wall, thoracic cavity, and heart. For more information and to register, visit the course website: http://physiology.med.umn.edu/short-courses/phsl-5510/index.htm

SAVE THE DATE: 2016 Minnesota Neuromodulation Symposium
The 4th Annual Minnesota Neuromodulation Symposium will be held April 14-15, 2016 in The Commons Hotel. Organized by the IEM, this Symposium has attracted international leaders in academia, industry and government to discuss state of the arts, current trends and grand challenges in the field of Neuromodulation. It has also attracted considerable presentations of cutting edge research in deep brain stimulation, noninvasive neuromodulation and related technological development. The Symposium will start from 2:00PM of April 14, 2016. Save the Date.