News

Record Participation at The IEM Annual Conference and Retreat
The 2015 IEM Annual Conference and Retreat, was successfully held at the McNamara Alumni Center on the University of Minnesota’s Twin Cities Campus on Monday, September 21st, attracting over 400 participants from both engineering and health sciences community, including members of industry. Attendees experienced captivating talks from nationally recognized keynote speakers on discovery, innovation, education, and interdisciplinary collaboration between engineering and medicine. The retreat offered rich opportunities for networking and discussions of collaborations. Over 80 faculty and industrial colleagues presented their R & D programs in 6 breakout sessions, followed by a highly engaged poster session featuring work of more than 100 University of Minnesota faculty, research programs, and students. 19 students and postdocs won poster awards (see below for a complete list).

“The high level of excitement we have experienced and the record number of participants and presenters indicate a need to enhance interdisciplinary collaborations across disciplines between medicine and health sciences and engineering, as well as between academia and industry. I am very pleased that IEM has played a positive role in fostering such collaborations.” Said Dr. Bin He, IEM director.

2016 IEM Conference and Retreat will be held on September 26, 2016. SAVE THE DATE.

IEM Inducts Inaugural Class of Industrial Fellows
At the 2015 IEM Annual Conference and Retreat, the inaugural class of IEM Industrial Fellows, were inducted. These talented individuals will serve to foster greater collaboration between University of Minnesota and the medical devices and life sciences industry. Specifically, the IEM Industrial Fellows will explore and pursue collaborative research initiatives, communicate industry needs to University of Minnesota faculty and faculty expertise to industry. They will also participate at IEM events, which will serve as forums from which many of these collaborations will evolve. The IEM Industrial Fellows are nominated by IEM faculty members who work closely with industry, and are selected by the IEM Executive Committee. Being selected as an IEM Industrial Fellow represents a professional recognition.

2015 Class of IEM Industrial Fellows:
Dr. Cynthia Thatcher Clague, Medtronic
Dr. Timothy Denison, Medtronic
IEM Weekly Seminar Series to Build Collaborations
IEM’s 2015-2016 Seminar Series kicked off with Dr. Charlie Johnson, Professor of Physics and Astronomy, University of Pennsylvania, delivering the seminar, “Graphene-enabled Nano/Bio Hybrids for Chemical Detection and Medical Diagnostics.” The following week Dr. Michael McAlpine, Associate Professor of Mechanical Engineering and IEM Member, presented, “3D Printed Bionic Nanomaterials.” Both seminars attracted overflow audiences of faculty members, students, and members of industry, as well as other participants who have an interest in these innovative technologies. The IEM Seminar Series was launched in the Spring semester of 2015 to facilitate interdisciplinary collaboration among members of academia and industry in an informal and collegial environment. The seminars commonly occur during the fall and spring semesters on Tuesdays, at 4-101 NHH, unless otherwise noted. Pizza and soda will be served for attendees, and it is recommended that you arrive early to secure seating.

Upcoming IEM Seminars

Bob Tranquillo Receives 2015 TERMIS-AM Senior Scientist Award
IEM Member Dr. Robert Tranquillo, Distinguished McKnight University Professor and Head of the Department of Biomedical Engineering, received the 2015 Senior Scientist Award from the Tissue Engineering and Regenerative Medicine International Society-Americas (TERMIS-AM). The award “is based on an individual’s significant contributions to the tissue engineering and regenerative medicine field.” Dr. Tranquillo, who was presented with a plaque during the 2015 TERMIS World Congress held earlier this month in Boston, says that this award “reflects the dedicated effort and ingenuity of many excellent students and lab staff over the years.”

TERMIS AM 2015 Awardees

Kelvin O. Lim Awarded R01 Grant for Research on Drug Abuse Relapse
IEM Member Kelvin O. Lim, M.D., Drs. T.J. and Ella M. Arneson Land-Grant Chair in Human Behavior; Professor and Vice Chair of Research, Department of Psychiatry, and his colleagues were recently awarded an NIH R01 grant “Functional Connectivity Changes during Early Recovery as a Marker for Relapse.” The $2.6 Million grant will fund functional magnetic resonance imaging research to measure biomarkers that can identify individuals who have a high risk of drug relapse. This research had previously been supported by IEM seed funding, which Dr. Lim says, “supported the formation of an interdisciplinary faculty group of clinicians, engineers and neuroscientists that helped us refine our ideas and strategies for using noninvasive neuromodulation to therapeutically alter brain networks.”

Jay Kokate Featured in Star Tribune for Innovative Stent
IEM Industrial Fellow Dr. Jay Kokate was featured in the Star Tribune for his work in developing Boston Scientific’s Eluvia stent to treat peripheral artery disease (PAD), a condition that affects more than 200 million people, globally. The stent, which could ultimately help prevent the amputations of the legs and feet of many diabetic patients, is coated with the drug paclitaxel, which is combined with a polymer to
allow for its slow release, to prevent the re-narrowing of vessels in which it is placed – a common issue with stents. “We wanted to make sure that it was a sustained release for at least six months to a year,” says Dr. Kokate. That slow release is believed among people at Boston Scientific to be the reason that 94% of patients in a clinical trial of the Eluvia stent avoided having to return to the hospital to have their arteries reopened within nine months of having it implanted.

Boston Scientific’s Eluvia Stent Shows Promise Treating Peripheral Artery Disease

Poster Winners in 2015 IEM Conference and Retreat

The posters were divided into one of IEM’s five research themes – Cardiovascular Engineering, Cellular and Molecular Bioengineering, Medical and Biological Imaging, Medical Devices and Neuroengineering, and also into a separate group, Postdoctoral Posters; the students/postdocs were judged by a competition panel on the quality and presentation of their works. The winners of this year’s sessions are as follows:

**Cardiovascular Engineering**
1st Place - Jay Reimer, et al.
Pediatric Tubular Pulmonary Heart Valve from Decellularized Engineered Tissue Tubes
2nd Place - Mengen Zhang, et al.
Engineering Skeletal Muscle Tissue Constructs Using Human Induced Pluripotent Stem Cell
3rd Place - Kanchan Kulkarni, et al.
Real-Time Feedback Based Control of Cardiac Restitution using Optical Mapping

**Cellular and Molecular Bioengineering**
1st Place - Sofie O’Brien, et al.
A Systems Analysis of Dual Signaling Control of Conjugative Drug Resistance Transfer in Enterococcus Faecalis
2nd Place - Geneva Doak, et al.
A Microfluidic Model of Tumor Heterogeneity to Study Evolution of Chemoresistance
3rd Place - Alexandra Crampton, et al.
Rapid Generation of Collagen Microtissues to Study Cell Matrix Remodeling

**Medical and Biological Imaging**
1st Place - Kai Yu, et al.
In Vivo Monitoring of Tumor Growth in a Mouse Cancer Model Using High-resolution Electrical-conductivity Contrast Imaging
2nd Place - Yicun Wang, et al.
Magnetic Resonance based Electrical Properties Tomography with Multi-channel Transmission and Total Variation Constrains
3rd Place - Oliver Dannberg, et al.
Comparison Between Gaussian and Bessel Beam Illumination for Scanning Thin-Sheet Laser Imaging Microscope (sTSLIM)

**Medical Devices**
1st Place - Yiru Wang, et al.
Thermal Contrast Amplification Bioassay Technology
2nd Place - Patricia Maglalang, et al.
Thermal Contrast Amplification Bioassay Technology
3rd Place - Yulong Li, et al.
Fully-Depleted Silicon-on-Insulator Devices for In Vivo Radiation Cancer Therapy
**Neuroengineering**

1st Place - tie - Abbey Holt, et al.
*Phasic Burst Stimulation: A Closed-Loop Approach to Deep Brain Stimulation for Parkinson’s Disease*

1st Place - tie - Julia Quindlen, et al.
*A Multiphysics Model of the Pacinian Corpuscle*

2nd Place - Kate Frost, et al.
*Patient Enrollment Difficulties in Trial of Primed rTMS for Acute Stroke in U.S.*

3rd Place - Elisabeth Moore, et al.
*V4 LFP Signals Predict and Affect Behavioral Reliability in Non-human Primates During Shape Detection Task Training*

**Post Docs**

1st Place - Hattie L. Ring, et al.
*In Vivo Quantification of Iron Oxide Nanoparticle Biodistribution Using Positive T1 Contrast*

2nd Place - Giuseppe Cataldo, et al.
*Targeting Putative Mu Opioid/Chemokine Receptor Type 5 Heteromers Potently Attenuates Nociception in a Murine Model of Chemotherapy-induced Peripheral Neuropathy*

3rd Place - Marie-Elena Brett, et al.
*Droplet-Based Three Dimensional Cell Migration Assay with Flow Cytometrey Based Automated Analysis*

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**Announcements**

**IEM Clinical Immersion Program – Call for Participation**

Cost: $5,000/week (Funds will be used to support research programs for Surgical residents)

The Institute for Engineering in Medicine (IEM) Clinical Immersion Program for Non-Clinicians is tailored toward professionals within the medical device community looking to move outside of the design suite and into the surgical suite — an environment where their products are used on a day-to-day basis.

Participants in the program will undertake a week-long course observing various surgeries, while receiving formal training in a clinical setting on processes, policies, and procedures relating to a variety of healthcare situations. A minimum of 5 participants are needed per rotation, with a maximum of 8. Once registration is full, teams will be placed on a waiting list for future rotations. Private groups can be arranged for companies seeking to send full teams. Please contact the Institute for Engineering in Medicine for questions relating to the program, or inquiries about tailoring the program to meet specific goals. Registration for the 2015 Fall semester is full. Interested industrial colleagues are invited for Spring 2016 programs (weeks of Feb 22 and May 2).

For information on registration and availability please contact:

IEM office
(612) 624-8483
dm@umn.edu
www.iem.umn.edu
Grant Funding Applications Open for Scientific, Translational, and Clinical Regenerative Medicine Research

Regenerative Medicine Minnesota (RMM) is proud to announce that applications are now open for research grant funding opportunities in regenerative medicine. Since the Minnesota Legislature allocated resources to fund this program last year, RMM has been very successful in distributing millions of dollars to researchers, medical professionals, educational camps for young people interested in the healthcare field, universities, and biobusinesses that spur development and interest in regenerative medicine research. In total, RMM is accepting applications in the following areas:

- Discovery Science
- Translational Research
- Clinical Trials
- Educational Programs
- Biotechnology/Biobusiness Development
- Clinical Care

As of Sept. 1, applications are being accepted for Discovery Science, Translational Research, and Clinical Trials with submissions due by Nov. 1 at midnight (12 a.m. CST). Applications will be accepted for the categories of Educational Programs, Biotechnology/Biobusiness Development, and Clinical Care starting on Jan. 4 of next year. Prospective applicants can click here to download materials with further instructions on how to complete and submit all documents, questions, and proposals.

Grant Funding Applications Open Scientific Translational and Clinical Regenerative