News Stories

Hubert Lim is Principal Investigator for Team Awarded $9.7 Million NIH BRAIN Initiative Grant for Development and Translation of an Intracranial Auditory Nerve Implant

A $9.7 million dollar grant was awarded to the University of Minnesota by the NIH for a multi-institutional project involving several IEM Members including Lead Principal Investigator Dr. Hubert Lim, Associate Professor of Biomedical Engineering and Otolaryngology, and an Institute for Translational Neuroscience Scholar. The 5-year project, entitled “Development and Translation of an Intracranial Auditory Nerve Implant,” will build and evaluate the safety and design needs of a new type of intracranial auditory prosthesis that targets the auditory nerve between the cochlea and the brainstem in order to substantially improve hearing performance over the current standard of care: the cochlear implant. “The cochlear implant is considered one of the most successful neural prosthesis to date,” says Dr. Lim. “However, the field has not achieved substantial improvements in hearing performance for the past ~25 years. The success of our proposed auditory nerve implant could lead to a new generation of brain technologies and greatly advance the hearing prostheses field as well as opening up novel opportunities for treating other health disorders with our new implantable technology.” The research team includes several faculty from the University of Minnesota including Co-PI Andrew Oxenham, Professor of Psychology and Otolaryngology; Co-I Meredith Adams, Assistant Professor of Otolaryngology, Co-I Geoff Ghose, Associate Professor of Neuroscience, and IEM Members Co-I Stephen Haines, Professor of Neurosurgery, Co-I Luke Johnson, Assistant Professor of Neurology, and Co-I Sebahattin Cureoglu, Associate Professor of Otolaryngology.

Michael McAlpine Leads Team that 3D-Prints Prototype Bionic Eye

A team led by IEM Member Dr. Michael C. McAlpine, Benjamin Mayhugh Associate Professor of Mechanical Engineering, has 3D-printed a prototype bionic eye. It is the first time that light receptors have been fully 3D-printed onto a hemispheric surface, which is a significant advance toward a fully-functional bionic eye that can cure blindness. “We have a long way to go to routinely print active electronics reliably, but our 3D-printed semiconductors are now starting to show that they could potentially rival the efficiency of semiconducting devices fabricated in microfabrication facilities,” says Dr. McAlpine. “Plus, we can directly print a semiconducting device on a curved surface, which is challenging or impossible with conventional microfab.” Dr. McAlpine says that the inspiration for pursuing this application came from his mother, who is blind in one eye. “Whenever I talk about my work, she says, ’When are you going to print me a bionic eye?’” The research has been published in the journal Advanced Materials.

Researchers 3D-Print Prototype Bionic Eye | Scientists Figured out How to 3D-Print Bionic Eyes
David Wood is Co-Principal Investigator for Research Awarded $3 Million NIH Grant to Study New Technologies for the Treatment of Sickle Cell Disease

IEM Member Dr. David K. Wood, Associate Professor of Biomedical Engineering, is a Co-Principal Investigator of a collaborative project with colleagues at Emory and Georgia Tech to study new technologies for the treatment of sickle cell disease that has been awarded with a 4-year, $3 Million NIH grant. Dr. Wood’s team will lead the development of microfluidic technologies and analysis tools that will help elucidate the clinical relevance of blood viscosity, which is only vaguely understood in sickle cell disease. These studies will more precisely define what “viscosity” means in different parts of the circulation within a sickle cell disease patient. Working with Co-Principal Investigator Dr. Wilbur Lam, an Associate Professor at Georgia Tech and Emory Universities, and Co-Investigator Dr. Melissa Kemp, an Associate Professor at Georgia Tech, Dr. Wood's team will also study how viscosity changes in the context of blood transfusions and inform more patient-specific transfusion guidelines. Dr. Wood says that “we're using microtechnology, quantitative imaging, and computational modeling to put the clinical picture of sickle cell disease on a rigorous quantitative footing and to provide clinicians with new tools to improve patient care.”

Kelvin Lim is Principal Investigator of Project Awarded $2.79 Million by NIH to Study Thalamocortical Connectivity in Cognitive Training

The NIH has awarded a $2.79 Million grant to fund research on Thalamocortical Connectivity in Cognitive Training led by IEM Member Dr. Kelvin O. Lim, Professor of Psychiatry, and Dr. Angus W. MacDonald, Professor of Psychology, who are the Multiple Principal Investigators on the project. The research project, entitled “Increased thalamocortical connectivity in tDCS-potentiated generalization of cognitive training,” will use neuroimaging and cognitive testing to understand how transcranial direct current stimulation (tDCS), a safe and non-invasive neuromodulation technique, when combined with cognitive training affects thalamocortical circuitry in individuals with and without schizophrenia. The results of the research will broaden the understanding of how tDCS affects brain circuitry, which is critical to the design and application of effective interventions. “There is a tremendous need in the field for new treatments for schizophrenia and other psychiatric disorders,” says Dr. Lim. “We are excited about this new research project and are hopeful that it will provide us with the knowledge to develop this next generation of treatments.”

Tim Kowalewski is Principal Investigator on Project Awarded $1.977 Million by NSF to Study Soft Robotics

IEM Member Dr. Timothy M. Kowalewski, Assistant Professor of Mechanical Engineering, in collaboration with Dr. Andrew W. Grande, Assistant Professor of Neurosurgery, is the Principal Investigator of a project awarded $1.977 Million from the NSF for research entitled “EFRI C3 SoRo: Strong Soft Robots-Multiscale Burrowing and Inverse Design.” The project seeks to accomplish two tasks: to create “a millimeter-scale patient-specific soft robot catheter for neurovascular and cardiovascular applications, where the robots can gently move through blood vessels without requiring risky surgery, blocking blood flow, or injuring the patient,” and to create “a meter-scale robot that intelligently burrows underground, with force levels much higher than previously attained by soft robots.” To achieve these results, the team will need to address the challenges of making a robot that is flexible enough to travel through a patient’s vasculature, but still apply enough force for an effective intervention. “This is a strong first step in realizing our vision of a neuro-surgical robotics center at UMN.” says Dr. Kowalewski.
Announcements

IEM Seeking 100 Undergraduate & Graduate Students to Serve as Student Ambassadors at High School Inspire Conference on Friday, November 16th
IEM is seeking to recruit 100 undergraduate and graduate students to serve as Student Ambassadors at the inaugural high school Inspire Conference, to be held on Friday, November 16th at the McNamara Alumni Center. The conference will seek to inspire high school students to consider careers in using STEM to research, treat and cure diseases, and for healthcare delivery. Each Ambassador will spend two and a half hours, during a morning (9:00-11:30 A.M.) or afternoon shift (11:30 A.M.-2:00 P.M.), hosting a group of 8 students and their chaperone from a particular school, sitting with them during talks, guiding them between Memorial Hall and breakout session rooms, facilitating Q&A and sharing with the high school students their own pathway from high school to becoming a student at the University of Minnesota. Food and drinks will be available to the Ambassadors. Please contact Ken Rosen krosen@umn.edu for more information.

Registration Open for IEM-Organized Mayo UMN Biosensing and Nanotechnology Symposium
The University of Minnesota, Institute for Engineering in Medicine, and the Mayo Clinic are pleased to present the Mayo UMN Biosensing and Nanotechnology Symposium October 11 - 12, 2018 at the DoubleTree by Hilton Hotel in Rochester, Minnesota. This symposium will focus on biosensors and nanotechnology for disease monitoring and diagnosis with emphasis placed on convergence and integration of biosensing and clinical communities. The scientific program will be organized around diseases/biological systems: cancer, neuroscience, and diabetes. It will also include poster presentations, a commercialization panel and breakout sessions placing engineers, scientists, and clinicians in smaller groups based on interests. The symposium will create a forum for faculty, clinicians, members of industry, and trainees to exchange ideas in this exciting and developing field. For more information, please see link: http://biosensenanotech.umn.edu/ | Registration

Registration Open for the Earl E. Bakken Surgical Device Symposium 2018: Technological Advances in Organ Transplantation at Graduate Minneapolis
Registration is open for the 11th Annual Earl E. Bakken Symposium, which will be held on Friday, October 12th at Graduate Minneapolis.
Target Audience: This course is ideal for cardiothoracic and transplant surgeons, surgical residents, cardiologists, nephrologists, gastroenterologists, fellows, physician assistants, other health professionals, as well as medical device developers, informaticians and anyone else interested in understanding technology and its impact on transplantation and the future of the field.
Course Directors: Kenneth Liao, MD and Paul Iaizzo, PhD. Information on this year’s event is posted at the Bakken Symposium Website. There will be a book signing for “The Blue Zones Of Happiness: A Blueprint For A Better Life” following the event. Books are available for purchase at the UMN Bookstore.

Registration Open for Medical Industry Leadership Institute Inaugural Convene Conference
The Medical Industry Leadership Institute at the Carlson School of Management is excited to announce Convene, a new conference on October 3rd, that will explore the intersection of healthcare and data science. It will bring together perspectives from university research and the thriving medical industry community. Featuring speakers from Boston Scientific, Carrot Health, Medtronic, McKesson, University of Minnesota, etc. For more information, please see link: https://carlsonschool.umn.edu/conferences/convene
Register today at z.umn.edu/MILIConvene under the Faculty/Staff rate!

Registration Open for MIN-CORPS Fall 2018 Innovation Value Proposition Design Workshops
Registration is open for MIN-CORPS Fall 2018 Innovation Value Proposition Design Workshops for grad students, postdocs, research scientists and faculty exploring the market potential of specific innovations, typically out of University labs. Three options:
• Science & Engineering: Oct 4, 18, Nov 1, 15
• Medical: Oct 10, 17, 31, Nov 7
Open Positions

NIH Seeking Ph.Ds. for Full-Time Positions in Neurotechnology, BRAIN & SBIR Programs

The National Institutes of Health (NIH), National Institute of Neurological Disorders and Stroke (NINDS) is seeking highly motivated and enthusiastic candidates for several full-time positions to administer extramural projects in neurotechnology and neural engineering in the areas of development, translation, clinical trials, dissemination, and/or commercialization of technologies for understanding the brain and treating brain disorders. These positions will be heavily involved in one or more trans-NIH initiatives, including the HEAL (Helping to End Addiction Long-term), BRAIN (Brain Research through Advancing Innovative Neurotechnologies), SPARC (Stimulating Peripheral Activity to Relieve Conditions), and SBIR/STTR programs.

For all positions, candidates should have a doctoral degree with expertise in biomedical engineering, bioengineering, neuroscience, clinical research in neurology, or related discipline, and may require postdoctoral or professional experience managing research studies and working in teams. Interested applicants can contact BRAIN-Jobs@mail.nih.gov with CV and cover letter as well as to request more information. However, formal applications are only accepted through USAJobs, with several being filled through “Health Scientist Administrator” opportunity announcements that will be open from 9/17-9/26 as detailed in the following links. Several other NIH positions are available and may also be filled through these or future targeted job announcements in the coming weeks.

**** Delegated Examining (this is for applicants who are NOT current government employees): ****

- Health Scientist Administrator (Scientific Review Officer and Program Officer), GS-0601-12/13/14 – DE
  - [https://www.usajobs.gov/GetJob/ViewDetails/510850800](https://www.usajobs.gov/GetJob/ViewDetails/510850800)
- Health Scientist Administrator (Program Officer), GS-0601-15 – DE
  - [https://www.usajobs.gov/GetJob/ViewDetails/510847700](https://www.usajobs.gov/GetJob/ViewDetails/510847700)
- Supervisory Health Scientist Administrator (Scientific Review Officer and Program Officer), GS-0601-15 – DE
  - [https://www.usajobs.gov/GetJob/ViewDetails/510849400](https://www.usajobs.gov/GetJob/ViewDetails/510849400)

**** Merit Promotion (for current Government Service employees): ****

- Health Scientist Administrator (Scientific Review Officer and Program Officer), GS-0601-12/13/14 - MP
  - [https://www.usajobs.gov/GetJob/ViewDetails/510851200](https://www.usajobs.gov/GetJob/ViewDetails/510851200)
- Health Scientist Administrator (Program Officer), GS-0601-15 – MP
  - [https://www.usajobs.gov/GetJob/ViewDetails/510848600](https://www.usajobs.gov/GetJob/ViewDetails/510848600)
- Supervisory Health Scientist Administrator (Scientific Review Officer and Program Officer), GS-0601-15 – MP
  - [https://www.usajobs.gov/GetJob/ViewDetails/510849800](https://www.usajobs.gov/GetJob/ViewDetails/510849800)