News Stories

Michael McAlpine & Ann Parr Discuss with Star Tribune Development of 3-D Printing Method for Repair of Spinal Cords
IEM Members Dr. Michael C. McAlpine, Benjamin Mayhugh, Associate Professor of Mechanical Engineering and Dr. Ann M. Parr, Assistant Professor of Neurosurgery, discussed with the Star Tribune a novel method they developed to 3-D print scaffolds and stem cells that can eventually repair injured spinal cords. "No one has been able to print those stem cells in 3-D printed scaffolds where they differentiate into active neurons using a 3-D printer," says Dr. McAlpine. "We were able to print neuronal stem cells at 75% viability — basically, they stay alive — and successfully differentiate into functional neurons." Dr. Parr says that restoring even a limited amount of function could be very valuable to the approximately 17,000 people who annually suffer from spinal cord injuries in the U.S. "There’s a perception that people with spinal cord injuries will only be happy if they can walk again," says Dr. Parr. "In reality, most want simple things like bladder control or to be able to stop uncontrollable movements of their legs. These simple improvements in function could greatly improve their lives."

Kathryn Cullen Coauthors Study Showing that Ketamine can be a Potential Therapy for Treatment-Resistant Depression in Adolescents
Dr. Kathryn R. Cullen, Associate Professor and Division Chief, Child & Adolescent Psychiatry, and IEM Member, is the coauthor of a study showing that ketamine, a synthetic compound, can be used as a potential therapy for adolescents who suffer from treatment-resistant depression. The study, "Intravenous Ketamine for Adolescents with Treatment-Resistant Depression: An Open-Label Study," which was published in the Journal of Child and Adolescent Psychopharmacology, showed that adolescents between the ages of 12 and 18 and for whom two previous treatments of antidepressants were not effective, experienced an average of a 42.5% decrease in the Children's Depression Rating Scale when treated with ketamine. Dr. Cullen collaborated with IEM Member Dr. Kelvin O. Lim, Professor of Psychiatry, who has previously published results demonstrating a significant impact of ketamine on treatment-resistant depression in veterans.
Brenda Ogle Coauthors Study Showing Key Mechanism of Breast Tumor Metastasis

IEM Member Dr. Brenda M. Ogle, Professor of Biomedical Engineering, is coauthor of a study showing, for the first time in living animals, a link between breast tumor metastasis and hybrids formed between healthy cells and cells of the primary tumor. The study, "Breast tumor cell hybrids form spontaneously in vivo and contribute to breast tumor metastases," was published in the journal *APL Bioengineering*. "When hybrids form, cytoplasmic and nuclear material of two cells are forced to reorganize into one cell, which is a potent means to generate cellular heterogeneity," says Dr. Ogle. "Cellular heterogeneity of this type in a tumor can make the tumor challenging to treat and heterogeneity can also give rise to cellular subpopulations that are better poised to metastasize than some of their unfused counterparts," says Dr. Ogle. “Instead of creating many different therapies to target different tumor cell types, it might be possible to quell heterogeneity at the source by limiting hybrid formation in the tumor.” As reported in *Medicine News Line*, Dr. Ogle hopes that the results of this study will lead to additional research on the formation of hybrids, which could then lead to the development of drugs that prevent hybrid formation and thereby improve outcomes of current anti-tumor therapies and limit tumor metastasis.

Documenting a Link Between Tumor Hybrids and Metastasis for the First Time In Vivo

Jazmin Camchong Awarded NIH Grant to Study Neuromodulation & Cognitive Training as Treatment for Relapse in Alcohol Use Disorder

An NIH grant has been awarded to IEM Member Dr. Jazmin Camchong, Assistant Professor of Psychiatry, to study the use of neuromodulation and cognitive training in treating relapse in alcohol use disorder (AUD). The project, “Effects of Neuromodulation and Cognitive Training on Brain Networks Associated with Relapse in Alcohol Use Disorder,” seeks to integrate brain stimulation, cognitive training, and neuroimaging techniques to investigate whether brain networks associated with subsequent relapse can be modified to support abstinence. Dr. Camchong says that the study is especially crucial, given the rates of relapse in people with AUD. “This award will allow me to conduct important research, converging my previous neuroimaging findings with novel treatment interventions to target underlying neural alterations associated with alcohol use disorder to support abstinence,” says Dr. Camchong. The grant will provide $764,000 over the project’s 5-year length.

Joseph Zasadzinski Part of Team that has Developed Novel Gene Editing Technique

IEM Member Joseph A. Zasadzinski, Professor of Chemical Engineering & Materials Science, and Dr. Jeong Eun Shin, a postdoctoral student advised by Dr. Zasadzinski, were part of a research team that has developed a new way of editing genes, that is much more effective than current gene editing techniques in overcoming the barriers of a cell’s defense mechanism against the introduction of gene-editing proteins. It works by coating the outsides of hollow, gold nanospheres with the gene-editing protein, then releasing that protein from the spheres, at the right time and right place in the cell, by applying pulsed near-infrared light, which sets the proteins free to seek the right spot in the cell’s nucleus to edit the gene. The new technique is estimated to be 100 to 1,000 times more efficient than methods currently used for gene editing, and can be used for basic research that determines a cell’s function and therapeutic applications for fixing defects in cells. The research, “Light-Triggered Genome Editing: Cre Recombinase Mediated Gene Editing with Near-Infrared Light,” was published in the journal *Small*, and led by Dr. Norbert O. Reich of the University of California - Santa Barbara.

Better Genome Editing Developed >
Announcements

Registration Open for IEM Annual Conference & Retreat, Monday, September 24, 2018, at the McNamara Alumni Center

Registration is open for this year’s Institute for Engineering in Medicine (IEM) Annual Conference and Retreat will take place on Monday, September 24, 2018, at the McNamara Alumni Center on the University of Minnesota’s Twin Cities campus. The event will open with plenary keynote talks by nationally recognized leaders, followed by lunch. In the afternoon, there will be breakout sessions for IEM faculty members to discuss research centers and collaboration opportunities relating to our thematic strengths. A poster/networking session will be held that will highlight IEM faculty member research and their groups included in the program. The retreat and conference will offer rich opportunities to develop collaborations and how to responsively apply for IEM seed grants. In addition, the 2018 IEM Industrial Fellows will be inducted during the morning plenary session. More information about the 2018 conference coming soon. [IEM Events Page >]

Call for Posters for IEM Conference & Retreat to Graduate and Postdoc Students

The poster session is from 3:00PM – 5:00PM. The poster registration deadline is **August 30**. Poster Session benefits include:

1. Chance to present your work at a scientific meeting venue
2. Chance to view the work of other biomedical focused labs on campus
3. Awards for best posters in 5 themes ($) (more than 15 awards to be given)*
4. Payment by IEM to print your poster**

*Please indicate your interest in participating in the Poster Award Competition when registering your poster, by submitting your poster abstract in the registration link.

**Please contact scot0353@umn.edu to obtain the account number for you to use for on-campus poster printing, for up to $80.00 per presentation poster.

Registration Open for IEM-Organized Mayo UMN Biosensing and Nanotechnology Symposium, October 11-12, 2018 at the DoubleTree by Hilton Hotel, Rochester, Minnesota

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, diabetes. It will also include poster presentations, a commercialization panel and breakout sessions placing engineers, scientists, and clinicians into 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. [IEM Events Page >]

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 following the event. Books are available for purchase at UMN Bookstore.

Registration Open for Medical Industry Leadership Institute Inaugural Convene Conference

Medical Industry Leadership Institute at 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. Here is more info: https://carlsonschool.umn.edu/conferences/convene Register today z.umn.edu/MILIConvene Faculty/Staff rate!