Francis Shen Discusses Need for Better Detection and Defining of Concussions, As Super Bowl Brings Attention to Issue

IEM Member Dr. Francis X. Shen, Associate Professor of Law, discussed the need for better detection and understanding of concussions with the Huffington Post as part of the publication’s showcase on Twin Cities’ researcher’s efforts to address the prevalence and consequences of concussions. Dr. Shen directs the Shen Neurolaw Lab, which seeks to improve law and policy related to advances in brain science. “There is a great interest in continuing to promote concussion awareness and education, but at the same time, there is an awareness that providing information simply isn’t enough. Athletes, coaches, and parents are learning more but the evidence isn’t clear as to whether we are seeing enough changes in practice,” says Dr. Shen. “We need more data and more objective methods for defining and detecting concussions. We need better measures and data of concussions, and not just wait until symptoms show up.”

How Minnesota is Helping to Solve the Concussion Epidemic

Bob Tranquillo Receives Translational Research Award from Regenerative Medicine Minnesota

IEM Member Dr. Robert T. Tranquillo, Professor and Department Head of Biomedical Engineering, received the Translational Research Award from Regenerative Medicine Minnesota (RMM), a 10-year, $43.6 million funding initiative established in 2014 by the Minnesota Legislature for the development of regenerative medicine-based clinical applications. As reported in Twin Cities Business, Dr. Tranquillo was awarded an RMM grant for his ongoing work in cardiovascular tissue engineering. The goal of this new research is to develop tissue-engineered vein valve, an “off-the-shelf” implantable device. If successful, it will be the first prosthetic vein valve available to treat patients suffering from ulcers due to chronic venous insufficiency.

Commercially-Promising Stem Cell Research Projects Land State Funding

Hubert Lim Awarded Two DARPA Translational Grants in collaboration with Bryce Binstadt and Erik Peterson

IEM Member Dr. Hubert H. Lim, Associate Professor of Biomedical Engineering and Institute for Translational Neuroscience Scholar, was awarded two translational grants from DARPA. The first grant, “UltRx - Ultrasound Prescriptions,” is a $1.13 million continuation of a grant awarded to Medtronic and University of Minnesota to support research on the use of neuromodulation, and its resulting impact on the immune system, to treat a variety of diseases by targeting peripheral nerves and end-organs. “This project is for the development of noninvasive ultrasound stimulation technologies and algorithms for activating or modulating the vagus nerve-to-spleen pathway to treat inflammation disorders,” says Dr. Lim. The initial clinical application would be to treat rheumatoid arthritis. Dr. Lim is collaborating on the project with Dr. Bryce A. Binstadt, Associate Professor of Pediatrics, and Dr. Sarah Offutt from Medtronic.

The second grant, for $730,000, is to support a project entitled “UltRx (Ultrasound Prescriptions) Early Feasibility Study in Humans,” a clinical trial of using ultrasound of the spleen to treat rheumatoid arthritis. “This project seeks to perform a pilot clinical trial in humans of noninvasive ultrasonic stimulation targeting the spleen to provide a non-drug approach for arthritic treatment,” says Dr. Lim. “The effort seeks to build upon evidence from animal studies in the DARPA UltRx Project that have shown noninvasive ultrasound stimulation can delay and reduce behavioral symptoms of rheumatoid arthritis.” Dr. Lim is collaborating with Dr. Erik J. Peterson, Associate Professor of Medicine, Division of Rheumatic and Autoimmune Diseases.

IEM 3D Printing Core Developing a Life-Changing Exo-shell for Celebrity Sea Turtle

IEM’s 3D Printing Core is helping to advance medicine not only for humans but also a famous sea turtle. Davis Fay, the Core’s Manager and Mechanical Engineering graduate student, has been leading a team using the Core’s 3D capabilities to develop an exo-shell for Seemore, who suffered a cracked shell from being struck by a boat off the Florida coast 8 years ago, an injury
that makes it difficult for her to dive underwater. “It’s a fascinating engineering challenge,” said Mr. Fay, whose design team has used a 3D reconstruction of Seemore’s outer anatomy to create a device that is strong, lightweight, and conformal to her existing shell. “Our 'exo-shell' will make adjusting Seemore’s buoyancy both more precise and more comfortable than the current method,” says Mr. Fay. The IEM 3D Printing Core is directed by IEM Executive Committee Member, Dr. William K. Durfee, Professor of Mechanical Engineering, and serves as an interdisciplinary resource to bring the benefits of additive manufacturing and three-dimensional medical modeling to the University of Minnesota clinical community.

**A Shell-Upgrade for Seemore the Sea Turtle**

U. of M. Students Release Video of CT Scans that Will Help them Design Prosthetic for Injured Sea Turtle

IEM 3D Printing Core

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**Registration Open for 6th Annual Neuromodulation Symposium, April 12th & 13th at the McNamara Alumni Center**

Registration is open for the 6th Annual Neuromodulation Symposium, to be held on Thursday and Friday, April 12th & 13th at the Graduate Hotel on the University of Minnesota’s East Bank campus. This is an outstanding conference for those working to advance neuromodulation therapies through high-impact science and engineering. Symposium participants will hear about the latest discoveries and innovations in brain science, DBS, TMS, tDCS, tACS, FUS, optogenetics, and associated engineering methods such as devices/modeling/imaging. The Minnesota Neuromodulation Symposium attracts trainees and working professionals from academia, clinical practice, industry, and government. Last year over 500 attendees participated in the Symposium, with excellent representation from industry.

**Call for Abstracts**

In addition to attending the plenary sessions, registrants are invited to participate in the Symposium’s poster session (Day 2). Original contributions are welcome in any area of neuromodulation identified above. Abstract submissions (one page including one figure) will be peer-reviewed. Those receiving the highest scores will be invited to present as an oral talk or in the plenary Highlight Talk session. All students/postdocs presenting a poster will be eligible for to compete for travel awards and for first-, second-, and third- place prizes for the poster competition. Please visit our website for details.

**Travel Awards**

Up to 10 travel awards will be offered to students/postdocs whose poster abstracts receive highest scores. Awards include complimentary registration and reimbursement of allowable travel expenses (up to $750/$1250 (USD) for domestic/international travelers).

**Deadline of Abstract Submission:** February 2, 2018 (Submission site open at [http://neuromodulation.umn.edu/abstract-submission/](http://neuromodulation.umn.edu/abstract-submission/))

Visit the [Minnesota Neuromodulation Symposium website](http://neuromodulation.umn.edu) to see a full list of the confirmed plenary speakers and schedule of events.