2021 ANNUAL CONFERENCE

Monday, September 27, 2021
McNamara Alumni Center
Welcome to the 9th Institute for Engineering in Medicine (IEM) Annual Conference!

As you know, the Mission of IEM is to turn science and engineering into medical practice. We fulfill this mission by fostering collaborations between engineering and biomedical faculty at the University of Minnesota and between University faculty and industrial colleagues. We have the privilege to represent more than 290 IEM faculty members from over 85 academic departments on campus, along with their students and collaborators.

Today’s event opens with welcome remarks from the Deans of the Medical School and the College of Science and Engineering followed by an overview of IEM from Director John Bischof. The Conference will continue with keynote talks by three distinguished University of Minnesota faculty who are highly invested in IEM’s mission.

After an acknowledgement of key industrial partners, we will break shortly to pick up lunch and then head either to our first-ever “hybrid” breakout sessions led by IEM pillars (for faculty) or the Student Career Development session (for students and postdocs). Faculty from Morgan State University in Baltimore and University of California Riverside will be joining some of these hybrid breakouts as a way to foster new collaborations. The Student session will feature a Q&A with a panel of scientists representing academia, industry, and other career paths.

A student poster session and competition highlighting research of IEM members and other University faculty will conclude the Conference. Winners of the poster competition will be announced at a later date.

This Conference is designed to offer rich opportunities to learn about IEM and cutting-edge work that advances medicine and engineering together. We hope that you enjoy the event, and we look forward to your continued interest and support. Please contact us at iem@umn.edu with ideas for improving IEM.

David Odde, Ph.D. (2021 IEM Annual Conference Chair)
Medtronic Endowed Associate Director, Strategic Research Initiatives,
Institute for Engineering in Medicine

John Bischof, Ph.D. (2021 IEM Annual Conference Co-Chair)
Director, Institute for Engineering in Medicine
ABOUT IEM

The Institute for Engineering in Medicine is an interdisciplinary organization that creates and supports research collaborations between engineers, scientists, and medical professionals at the University of Minnesota and provides research and partnership opportunities to the wider medical industry. With over 290 affiliated researchers representing 85 departments across the Twin Cities campus, IEM provides University faculty, students, and external partners with world-class resources to drive innovation in medicine and to find solutions for the great medical challenges of today and tomorrow.

ORGANIZATION

The new IEM Organizational Chart below captures the broad vision for the Institute’s engagement with the University, industry, and students in grades 6–12.
INSTITUTE for ENGINEERING in MEDICINE

IEM EXECUTIVE COMMITTEE

John Bischof, Ph.D.
Director, Institute for Engineering in Medicine,
Distinguished McKnight University Professor,
Carl and Janet Kuhrmeyer Chair, Mechanical
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of Genetics, Cell Biology, and Development

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McKnight Presidential Endowed Professor,
Minnesota Robotics Institute Director,
Distinguished McKnight University
Professor, Director of the Center for
Distributed Robotics and SECTTRA,
Department of Computer Science and
Engineering

Theresa Reineke, Ph.D.
Distinguished McKnight University
Professor, Department of Chemistry

Clarence Shannon IV, MD
Assistant Professor, Department of
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and Innovation, Medical School

Jerold Vitek, M.D., Ph.D.
Professor and Head, Department of
Neurology

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Vice President, Research and Development,
Recombinetics
### AGENDA

<table>
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<tr>
<th>Time</th>
<th>Event Description</th>
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<tr>
<td>8:30 - 9:00 am</td>
<td>Networking&lt;br&gt;Continental-style Breakfast available in The Commons</td>
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<tr>
<td>9:00 - 9:05 am</td>
<td>Welcome Remarks&lt;br&gt;<strong>Jakub Tolar, MD, Ph.D.</strong> (Dean, Medical School) and <strong>Mostafa Kaveh, Ph.D.</strong> (Dean, College of Science &amp; Engineering)</td>
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<td>9:05 - 9:30 am</td>
<td>State of the Institute for Engineering in Medicine&lt;br&gt;<strong>John Bischof, Ph.D.</strong>&lt;br&gt;Director, Institute for Engineering in Medicine</td>
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<td>9:30 - 10:10 am</td>
<td>Distinguished Keynote Talk&lt;br&gt;<strong>Evolution of Deep Brain Stimulation: Role of Technology</strong>&lt;br&gt;<strong>Jerrold Vitek, MD, Ph.D.</strong>&lt;br&gt;Professor and Head, Department of Neurology, University of Minnesota</td>
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<td>10:10 - 10:50 am</td>
<td>Distinguished Keynote Talk&lt;br&gt;<strong>Innovation + Culture Change = New Opportunities</strong>&lt;br&gt;<strong>Carla Pavone, Ph.D.</strong>&lt;br&gt;Associate Director, Gary S. Holmes Center for Entrepreneurship, Carlson School of Management, University of Minnesota</td>
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<td>10:50 - 11:05 am</td>
<td>Coffee Break</td>
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<td>11:05 - 11:45 am</td>
<td>Distinguished Keynote Talk&lt;br&gt;<strong>Fostering Collaborations between Engineering and Medicine</strong>&lt;br&gt;<strong>Timothy Schacker, MD</strong>&lt;br&gt;Vice Dean for Research, Medical School&lt;br&gt;Director, Program in HIV Medicine&lt;br&gt;University of Minnesota</td>
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<tr>
<td>11:15 - 11:45 am</td>
<td>IEM AWARDS&lt;br&gt;2020-2021 IEM Engineering in Medicine Doctoral Fellowship Recipients&lt;br&gt;- <strong>Mathew Rynes</strong>&lt;br&gt;- <strong>Gaura Saini</strong>&lt;br&gt;2021 Industrial Fellows Inductees:&lt;br&gt;- <strong>Farzad Azimpour, M.D., V.P. of Strategic Innovation, Advanced Technology, Edwards Lifesciences</strong>&lt;br&gt;- <strong>Roxanne Gil, Engagement and Education Scout, Medtronic</strong></td>
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<tr>
<td>12:00 - 12:15 pm</td>
<td>Lunch Break&lt;br&gt;Return with your lunch to one of the IEM Pillar Breakout Session rooms</td>
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12:00 - 1:30 pm

IEM PILLAR BREAKOUT SESSIONS:

REMOTE ATTENDEES WILL JOIN THE DISCUSSIONS VIA ZOOM LINKS AVAILABLE AT IEM.UMN.EDU.

STRATEGIC RESEARCH INITIATIVES

Health Disparities and Cancer Research
Valerie Odero-Marah, Ph.D., MSc, Professor, Executive Director of the Center for Urban Health Disparities Research and Innovation (Morgan State University)
David Odde, Ph.D, Associate Director of IEM and lead of Strategic Research Initiatives (University of Minnesota)

PROFESSIONAL EDUCATION & OUTREACH

Paul Iaizzo, Ph.D., Medtronic Endowed Associate Director, Professional Education and Outreach, Institute for Engineering in Medicine

INNOVATION

Art Erdman, Ph.D., IEM Co-Director, Innovation Pillar, Richard C. Jordan Professor, Morse Alumni, Distinguished Teaching Professor of Mechanical Engineering
Carla Pavone, Ph.D., IEM Co-Director, Innovation Pillar, Associate Director, Gary S. Holmes Center for Entrepreneurship

STUDENT CAREER DEVELOPMENT

Moderators: Suhasa Kodandaramaiah, Ph.D., Benjamin Mayhugh Assistant Professor, Mechanical Engineering
Alexander Opitz, Ph.D., Assistant Professor, Biomedical Engineering

1:30 - 3:00 pm

STUDENT & POSTDOCTORAL POSTER SESSION & COMPETITION*

IMPORTANT NOTE: Posters must be up on the designated poster panel by 1:15pm, and at least one author must be in attendance from 1:30-3:00pm. For posters in the Poster Award Competition, the first non-faculty author must be present 1:30-3:00pm.

* Awards will be announced at a later date.

3:00 pm

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THE MCNAMARA ALUMNI CENTER
200 SE Oak St, Minneapolis, MN 55455
DISTINGUISHED KEYNOTE SPEAKERS

JERROLD VITEK, M.D., PH.D.
Professor and Head, Department of Neurology, University of Minnesota

Dr. Jerry Vitek is the Head of the Neurology Department, Director of the Neuromodulation Research Program, and Center Director of the University of Minnesota Udall Center of Excellence for Parkinson’s Research. He previously served as the Neuromodulation Research Center Director at the Lerner Research Institute of the Cleveland Clinic Foundation developing functional surgery and deep brain stimulation (DBS) techniques for the treatment of neurological disease. Dr. Vitek has also held faculty positions at Emory University and The Johns Hopkins University, where he assisted in the development of the functional neurosurgery programs and conducted research on the pathophysiology of movement disorders and mechanism(s) underlying the beneficial effects of DBS.

CARLA PAVONE, PH.D.
Associate Director, Gary S. Holmes Center for Entrepreneurship, Carlson School of Management, University of Minnesota

As Associate Director of the Holmes Center for Entrepreneurship and Program Director of MIN-Corps, Carla Pavone facilitates technology commercialization by designing and delivering education and coaching to University of Minnesota STEM students, faculty, and researchers interested in bringing their innovations to the market. She also teaches entrepreneurship, strategy and leadership courses, primarily at the MBA level. Dr. Pavone has a BA in biology from the University of Pennsylvania, an MBA from Harvard Business School, and a PhD in business administration from the Carlson School of Management. She has had three careers: in magazine and software publishing (primarily at start-ups), in financial services (mainly leading internal corporate start-ups and turnarounds) and in academia.
TIMOTHY SCHACKER, M.D.
Vice Dean for Research, Medical School
Director, Program in HIV Medicine
University of Minnesota

Timothy Schacker, M.D. is a professor of Medicine and Director of the Program in HIV Medicine at the University of Minnesota. He joined the faculty in 1996. Dr. Schacker received his M.D. from the University of Minnesota in 1986 and completed a residency in Internal Medicine at the Oregon Health Sciences University and Infectious Disease Fellowship at the University of Washington in 1993. He then joined the faculty of the University of Minnesota.

Dr. Schacker is interested in how HIV causes immune suppression and why antiretrovirals do not fully restore immunity. His group focuses on inflammatory damage in lymphatic tissues (the principal site of HIV infection) that results in fibrosis of the lymphatic structures required to maintain a normal population of CD4 cells. They are testing novel therapies to prevent and/or reverse this process and slow T cell depletion in HIV and improve their reconstitution after antiretroviral treatment has begun. He is also the principal investigator of a federally funded program of projects designed to determine barriers to HIV eradication. In addition, Dr. Schacker has established a collaboration with the Joint Clinical Research Center in Kampala, Uganda to study how constant exposure to common infections like tuberculosis, malaria, and helminthic infections affect rates of HIV transmission and progression.

IEM uses Facebook, Twitter, and LinkedIn to interact with IEM members, the University of Minnesota community, members of industry, and the scientific community.

To connect with IEM through social media:

- Facebook: @Institute.for.Engineering.in.Medicine
- Twitter: @UMNIEM
- Instagram: @umniem
- LinkedIn: Institute for Engineering in Medicine - University of Minnesota

If you have any questions, please connect with us at iem@umn.edu.

We look forward to engaging with you and your groups!
IEM PILLAR LEADERSHIP

John Bischof Ph.D., Director, Institute for Engineering in Medicine, Distinguished McKnight University Professor, Carl and Janet Kuhrmeyer Chair, Mechanical Engineering, Medtronic-Bakken Endowed Chair for Engineering in Medicine

Will Durfee Ph.D., Interim Director of Bakken Medical Devices Center, Director of Clinical Engagement, Institute for Engineering in Medicine, Professor and Director of Design Education, Department of Mechanical Engineering

Art Erdman, Ph.D., IEM Co-Director, Innovation Pillar, Richard C. Jordan Professor, Morse Alumni, Distinguished Teaching Professor of Mechanical Engineering

Rhonda Franklin, Ph.D., IEM Co-Director, Inspire Program, Abbott Professor for Innovative Education, Professor of Electrical and Computer Engineering

Paul Iaizzo, Ph.D., Medtronic Endowed Associate Director, Professional Education and Outreach, Institute for Engineering in Medicine

Matt Johnson, Ph.D., Bakken MDC Associate Director, Associate Professor, Department of Biomedical Engineering

David Odde, Ph.D., Associate Director of IEM and lead of Strategic Research Initiatives

Angela Panoskaltsis-Mortari, Ph.D., Bakken MDC Associate Director, Vice Chair for Research and Professor, Department of Pediatrics, Division of Pediatric Blood and Marrow Transplantation

Carla Pavone, Ph.D., IEM Co-Director, Innovation Pillar, Associate Director, Gary S. Holmes Center for Entrepreneurship

Chris Pennell, Ph.D., IEM Co-Director, Inspire Program, Abbott Professor for Innovative Education, Professor of Laboratory Medicine and Pathology

IEM STAFF

Katherine Lindsay - Administrative Director
Stephanie Stack - Administrator (currently on leave till December 2021)
Ken Rosen - Head of Industry & Outreach Programs
Teresa Walbon - Executive Assistant
Michael Lotti - Senior Editor, SRI Program Manager
Elica Gardner - Program Project Specialist
Oliver Yackel - Student Intern - Graphic Designer
Eli Wurster - Student Intern - Director Office Support
Emily Baude - Student Intern - Communications