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 275 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.

IEM uses Facebook, Twitter, Instagram, 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 STAFF

Stephanie Scott - Administrator
Teresa Walbon - Executive Assistant
Michael Lotti - Program Consultant, Senior Editor
Elica Gardner - Program Project Specialist

Alicia Buehler - Clinical Immersion Program Intern
Hannah Pichman - Director Office Support Student Intern
Michael Hameister - Graphic Designer
Dear Minnesota High School Students,

Welcome to the University of Minnesota!

We are excited to host you at our second Institute for Engineering in Medicine Inspire Conference. We indeed hope to inspire you to a career in science, technology, engineering, and math (STEM). Why? So that you can perform research, treat and cure diseases, and improve the delivery of healthcare in this country and around the globe.

The theme for the 2019 Inspire Conference is Cancer. The morning talks will focus on the basics of cancer, and the afternoon talks will focus on efforts to study and treat cancer and on career paths in these areas. The lunch talks will be delivered by physicians who treat patients with ovarian and pancreatic cancer, two of the most challenging forms of the disease.

We are confident that these talks and stories will inspire you. We hope you consider a career in STEM to improve healthcare and benefit society!

Regards,

John C. Bischof, Ph.D.
Director, Institute for Engineering in Medicine

Ken Rosen (IEM Inspire Program Director)
Director of Industry and Outreach Programs, Institute for Engineering in Medicine

Rhonda Franklin, Ph.D. (IEM Inspire Program Co-Director)
Professor, Department of Electrical and Computer Engineering

Christopher Pennell, Ph.D. (IEM Inspire Program Co-Director)
Associate Professor, Department of Laboratory Medicine and Pathology
Associate Director for Community Engagement and Education, Masonic Cancer Center
**Welcome Remarks—Memorial Hall**

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<thead>
<tr>
<th>Time</th>
<th>Plenary Talk</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>9:40am - 9:45am</td>
<td>IEM Inspire Conference Opening and Welcome</td>
<td>John Bischof, Ph.D.</td>
</tr>
<tr>
<td>9:45am - 9:50am</td>
<td>Masonic Cancer Center Welcome</td>
<td>Douglas Yee, M.D.</td>
</tr>
<tr>
<td>9:50am - 9:55am</td>
<td>Medical School Welcome</td>
<td>Jakub Tolar, M.D., Ph.D.</td>
</tr>
<tr>
<td>9:55am - 10:00am</td>
<td>College of Science and Engineering and Inspire Welcome</td>
<td>Rhonda Franklin, Ph.D.</td>
</tr>
<tr>
<td>10:00am - 10:15am</td>
<td>Introduction to Cancer and Morning Breakouts</td>
<td>Christopher Pennell, Ph.D.</td>
</tr>
<tr>
<td>10:15am - 10:20am</td>
<td>Conference Welcome and Overview of the Day</td>
<td>Yoji Shimizu, Ph.D. (Master of Ceremonies)</td>
</tr>
</tbody>
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**Morning Breakout Sessions: The Basics of Cancer**

<table>
<thead>
<tr>
<th>Room*</th>
<th>Breakout 1A</th>
<th>Breakout 1B</th>
<th>Breakout 1C</th>
<th>Breakout 1D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heritage Gallery</td>
<td>Using Vaccines for the Prevention and Treatment of Cancer</td>
<td>HPV Vaccine: How it’s Preventing Cancer and Saving Lives</td>
<td>The Tumor Microenvironment: The Importance of Non-Tumor Cells in Cancer Progression</td>
<td>Cancer’s Arch Nemesis: The Naked Mole Rat</td>
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<td></td>
<td>Sara Hamilton Hart</td>
<td>Sara Bolivar Wagers</td>
<td>Kaylee Schwerfeger</td>
<td>Patrice Witschen</td>
</tr>
<tr>
<td>Johnson Great Room</td>
<td>Cancer 101</td>
<td>Doing Something about Cancer</td>
<td>When It’s a Good Idea to Go Looking for Trouble – Screening for Cancer</td>
<td>Finding and Treating Cancer Early</td>
</tr>
<tr>
<td></td>
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<td>Erik Faber</td>
<td>Abbie Begnaud</td>
<td>Carlos Perez-Kerkvliet</td>
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<tr>
<td>Ski-U-Mah</td>
<td>The Tumor Microenvironment: The Importance of Non-Tumor Cells in Cancer Progression</td>
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<tr>
<td>Thomas H. Swain</td>
<td>When It’s a Good Idea to Go Looking for Trouble – Screening for Cancer</td>
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</tbody>
</table>

*See venue map on page 6
Lunch Session: Physician Overviews of Common Cancers—Memorial Hall*

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<thead>
<tr>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>11:50am - 11:55am</td>
<td>Introduction to Clinician Cancer Talks</td>
<td>Yoji Shimizu, Ph.D.</td>
</tr>
<tr>
<td>11:55am - 12:10pm</td>
<td>Ovarian Cancer: A Disease that Whispers</td>
<td>Melissa Geller, M.D., M.S.</td>
</tr>
<tr>
<td>12:10pm - 12:25pm</td>
<td>Pancreatic Cancer Overview</td>
<td>Edward Greeno, M.D.</td>
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Afternoon Breakout Sessions: Pathways to Future Careers

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<th>Breakout 2C</th>
<th>Breakout 2D</th>
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</thead>
<tbody>
<tr>
<td>Heritage Gallery</td>
<td>What Inspires Me: How do Breast Cancer Cells Sense Stress?</td>
<td>Breaking Barriers in the Fight Against Cancer</td>
<td>Using Biomaterials to Treat Cancer</td>
<td>Cancer Solutions Across Medical Devices</td>
</tr>
<tr>
<td></td>
<td>Carol Lange</td>
<td>Kianna Elahi-Gedwillo, Boston Scientific</td>
<td>Samira Azarin</td>
<td>Bruce Forsyth, Boston Scientific</td>
</tr>
<tr>
<td>Johnson Great Room</td>
<td>Engineering in Oncology: from Engineering Principles to Novel Therapies</td>
<td>Using CRISPR to Find Cancer Cures</td>
<td>Mechanics of Brain Cancer Cell Migration</td>
<td>“Traffic Jams” Can be Good Too! How Embolics and “Noes” Positively Impact Your Life</td>
</tr>
<tr>
<td></td>
<td>Paolo Provenzano</td>
<td>David Largaespada</td>
<td>David Odde</td>
<td>Jasmin Flowers, Boston Scientific</td>
</tr>
<tr>
<td>Ski-U-Mah</td>
<td>How Cells Use Mechanical Forces to Communicate</td>
<td>The Difference Between Learning and Growing</td>
<td>Cancer Immunotherapy Using Engineered Immune Cells</td>
<td>Genetic Engineering to Understand and Cure Cancer</td>
</tr>
<tr>
<td></td>
<td>Wendy Gordon</td>
<td>Ewnet Gebrehiwot, Boston Scientific</td>
<td>Branden Moriarity</td>
<td>Adrienne Watson, Recombinetics</td>
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<tr>
<td>Thomas H. Swain</td>
<td>3D Bioprinting Applications for Cancer</td>
<td>Targeting Genomic Instability in Cancer Therapy</td>
<td>Protein Engineering for Targeted Diagnostics and Therapeutics</td>
<td>Saving the World with Precision Genome Engineering</td>
</tr>
<tr>
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<td>Angela Panoskaltsis-Mortari</td>
<td>Hai Dang Nguyen</td>
<td>Ben Hackel</td>
<td>Perry Hackett</td>
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Wrap-Up Session—Memorial Hall*

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>1:40pm - 1:50pm</td>
<td>Reflections</td>
<td>Yoji Shimizu, Ph.D.</td>
</tr>
<tr>
<td>1:50pm - 2:00pm</td>
<td>Next Steps</td>
<td></td>
</tr>
</tbody>
</table>

* See venue map on page 6

For more resources go to the following link: https://www.iem.umn.edu/high-school
WELCOME REMARKS

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

Douglas Yee, M.D.
Professor
Division of Hematology, Oncology and Transplantation
Department of Medicine
Director, Masonic Cancer Center

Jakub Tolar, M.D., Ph.D.
Dean
Vice President for Clinical Affairs
Medical School

Rhonda Franklin, Ph.D.
IEM Inspire Program Co-Director
Professor
Department of Electrical and Computer Engineering

Christopher Pennell, Ph.D.
IEM Inspire Program Co-Director
Associate Professor
Department of Laboratory Medicine and Pathology
Associate Director for Community Engagement and Education, Masonic Cancer Center

Yoji Shimizu, Ph.D.
Professor and Harry Kay Chair, Department of Laboratory Medicine and Pathology
Abbie Begnaud, M.D.
Assistant Professor
Division of Pulmonary, Allergy, Critical Care and Sleep
Department of Medicine

Erik Faber
M.D./Ph.D. Trainee
Medicinal Chemistry Graduate Program

Sara Hamilton Hart, Ph.D.
Assistant Professor
Department of Laboratory Medicine and Pathology

Carlos Perez-Kerkvliet
M.D./Ph.D. Trainee
Microbiology, Immunology, and Cancer Biology Graduate Program

Kaylee Schwertfeger, Ph.D.
Associate Professor
Department of Laboratory Medicine and Pathology

Sara Bolivar Wagers
M.D./Ph.D. Trainee
Microbiology, Immunology, and Cancer Biology Graduate Program

Patrice Witschen, D.V.M.
Ph.D. Trainee
Comparative and Molecular Biosciences Graduate Program
LUNCH SESSION KEYNOTE SPEAKERS

Melissa Geller, M.D., M.S.
Associate Professor and Division Director,
Gynecologic Oncology, Department of
Obstetrics, Gynecology and Women’s Health

Edward Greeno, M.D.
Professor
Division of Hematology, Oncology and
Transplantation, Department of Medicine
Chief of Cancer Care, Masonic Cancer Center
AFTERNOON BREAKOUT SESSION SPEAKERS

Samira Azarin, Ph.D.
Assistant Professor
Department of Chemical Engineering and Materials Science

Kianna Elahi-Gedwillo, Ph.D.
Senior R&D Engineer in Interventional Oncology
Boston Scientific

Jasmin Flowers, B.S., M.S.
Process Engineer
Boston Scientific

Bruce Forsyth, Ph.D.
Research Fellow, Corporate Research
Boston Scientific

Ewnet Gebrehiwot, B.E., M.Eng.
Senior R&D Engineer
Boston Scientific

Wendy Gordon, Ph.D.
Assistant Professor
Department of Biochemistry, Molecular Biology, and Biophysics

Ben Hackel, Ph.D.
Associate Professor
Department of Chemical Engineering and Materials Science

Perry B. Hackett, Ph.D.
Professor
Department of Genetics, Cell Biology and Development
AFTERNOON BREAKOUT SESSION SPEAKERS

Carol Lange, Ph.D.
Professor
Division of Hematology, Oncology and Transplantation
Department of Medicine

David Largaespada, Ph.D.
Director, Brain Tumor Program
Associate Director for Basic Sciences
Masonic Cancer Center
Professor, Department of Pediatrics, Genetics, Cell Biology, and Development

Branden Moriarity, Ph.D.
Assistant Professor
Department of Pediatrics

Hai Dang Nguyen, Ph.D.
Assistant Professor
Department of Pharmacology

David Odde, Ph.D.
Associate Director, Strategy and Innovation, Institute for Engineering in Medicine,
Medtronic Professor for Engineering in Medicine,
Professor, Department of Biomedical Engineering

Angela Panoskaltsis-Mortari, Ph.D.
Vice Chair for Research and Professor
Department of Pediatrics
Director, University of Minnesota 3D Bioprinting Facility, Director, Cytokine Reference Laboratory, Associate Director, TLI Program (CTSI)

Paolo Provenzano, Ph.D.
Associate Professor
Department of Biomedical Engineering

Adrienne Watson, Ph.D.
Vice President of Research and Development, Recombinetics
2019 IEM Industrial Fellow
Institute for Engineering in Medicine

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