IEM

2021-2022

ANNUAL REPORT

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Director's Message

John Bischof
IEM Director

The past year was one of restoration in academia. Many inched back into in-person work as the disruptions of the pandemic eased and a sense of near-normalcy returned.

While we, too, resumed programs previously halted by COVID-19, I am proud to say our focus at IEM went beyond just returning to normal. IEM faculty and staff found opportunities to rethink, expand, even create programs that further our mission of merging engineering and medical science to improve medical technology and clinical care.

Our decisive progress during these past few years is a testament to the culture within IEM. What drives us is a shared understanding that the work we do is important because it fuels the discovery of new knowledge, improves people's health and quality of life, and broadens the engineering in medicine ecosystem across Minnesota and beyond.

IEM's faculty leadership team embraces this vision, and I'm very excited that Alena Talkachova, professor of Biomedical Engineering, is now helping Strategic Research Initiatives have even more impact in the world of engineering in medicine. I'm excited that the leadership is also tackling challenges related to the resources and space IEM needs to support faculty, students, and industry collaborators in their lines of inquiry.

In the pages to follow, you will read about the new research center and training program within IEM and the promise each of them holds to make unique contributions to science and technology. You will also see evidence of our continued commitment to building a broader interdisciplinary biomedical research culture across the University. Externally, we continue to grow our collaborations with both academic partners and leaders in industry.

The future holds enormous potential. I see mounting interest and new possibilities in a number of fields. Data science, for one: the scramble to figure out how to utilize all the medical data we generate poses both important questions and huge opportunities. I also anticipate the inventions that investigators will dream up in the Bakken Medical Devices Center in the coming year and after its relocation to the upcoming Health Discovery Hub. Our enhanced outreach efforts will inspire students of all backgrounds to become part of the next generation of experts in engineering, medicine, and other STEM fields.

We have successfully turned challenging times over these past few years into moments of change and opportunity. Now, the task at hand is to keep this momentum going and bring to life the ambitious ideas we have set forth.

From the Deans

Jakub Tolar
Medical School Dean

"The world of medicine needs more engineering." Everyone agrees with that statement, but not many know how to bring engineers and medical professionals together. IEM's amazing Clinical Immersion program brought a record number of industry scientists and engineers into our hospital to drive innovation, and IEM's Professional Education and Outreach pillar had a similarly successful year connecting University faculty with industry professionals and vice versa.

The next iteration of IEM's Bakken Medical Devices Center is underway, along with new high-impact "engineering in medicine" research enterprises propelled by IEM's Center Accelerator program. It's safe to say that IEM knows how to bring medicine and engineering together, which is why the Medical School is proud to support all of its efforts.

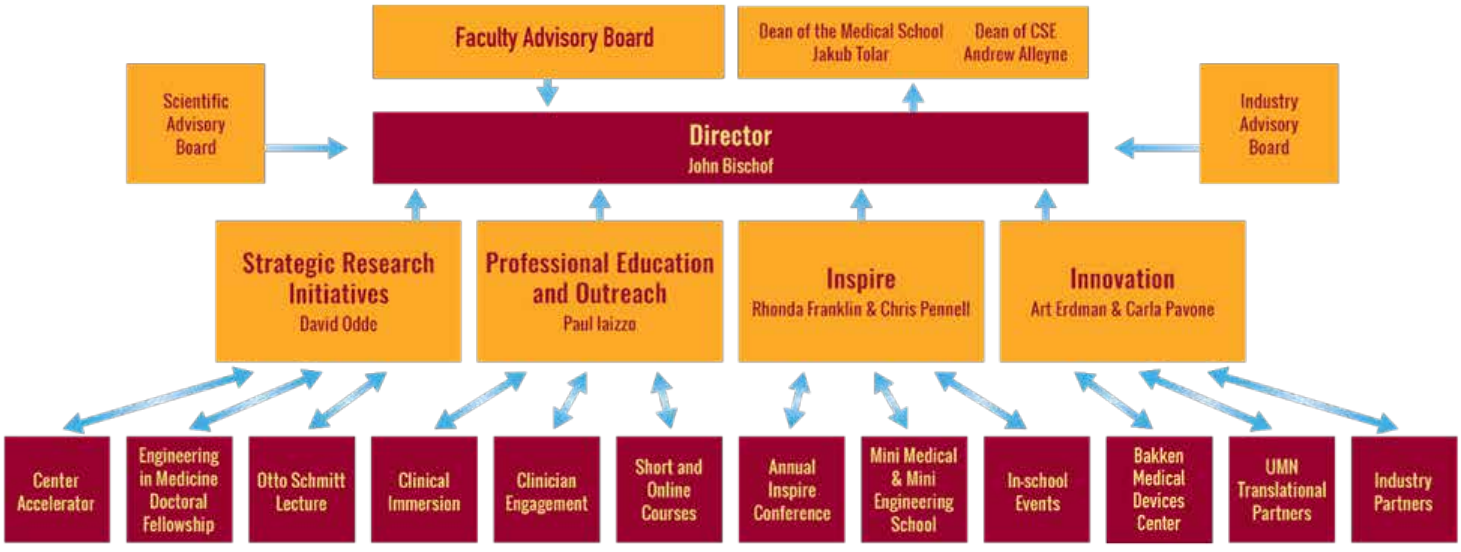
Andrew Alleyne
College of Science and Engineering Dean

Minnesota has a great legacy of combining medicine and engineering to develop groundbreaking medical technologies that impact millions. But legacies don't sustain themselves, and that's why IEM is so important. As this report shows, IEM has been the "activation energy" for many successful "engineering in medicine" teams, and it has great plans to do even more. I look forward to all the new connections IEM will make between the College of Science and Engineering, the Medical School, industry partners, and other institutions to drive scientific discovery and innovation across several medical fields.

The teams that come out of such efforts – along with the innovative educational and mentoring programs from the Inspire pillar – will keep Minnesota's legacy of first-class engineering in medicine alive for years to come.

IEM Organization

2021-2022 saw only one change in the IEM organizational chart: we changed the name of the "Executive Committee" to the "Faculty Advisory Board" to better reflect its role. Otherwise, the organizational changes put in place over the past two years, culminating in the addition of the Innovation Pillar in 2020-2021, have proven to be effective. As the following pages show, IEM's Pillar leads are the driving force behind IEM's work. They are leading several successful (and growing) programs, but also thinking of new ways for IEM to support transdisciplinary collaboration in medicine and engineering, build connections between academic research and industry, and inspire new generations to launch careers in STEM. In other words, stay tuned – this organizational chart will likely expand in the years to come.



Strategic Research Initiatives

IEM's Strategic Research Initiatives (SRI) helps unite engineering and biomedical research to transform technology and address today's medical challenges.

We support faculty through our Center Accelerator as they form large, multi-disciplinary research teams to investigate and address complex problems. This support helps teams develop their research programs and apply for center-level funding and large training grants.

For accomplished graduate students, we offer the Doctoral Fellowship program, which funds research and outreach to transform an area of medicine through innovative engineering.

To inspire the University community, SRI sponsors the Otto Schmitt Distinguished Lecture Series. These lectures invite national opinion leaders in research, industry, and government to foster discussion around grand challenges for engineering in medicine.

Center Accelerator

IEM Doctoral Fellowship

Otto Schmitt Distinguished Lecture Series

David Odde
SRI Director

Alena Talkachova
SRI Assistant Director

Michael Lotti
SRI Program Manager

Amanda Hayward
SRI Assistant Program Manager

Center Accelerator

1 New Research Center

1 New Training Grant

In 2021-2022, the Center Accelerator helped University of Minnesota teams submit grants worth more than

$190M

The Center Accelerator helps multidisciplinary medical and engineering teams prepare and apply for center-level funding and large training grants to address significant medical challenges. This past year was, due to the timing of federal grants, more about writing and assembling proposals than actually launching centers. The Center Accelerator team, led by Michael Lotti, helped put together over $190M worth of grant proposals. Most of these are still pending, however, so look for updates on our website and in the 2022-2023 Annual Report. We're proud of the two new initiatives that began this year:

The Center for Multiparametric Imaging of Tumor Immune Microenvironments (C-MITIE), led by Professor of Biomedical Engineering Paolo Provenzano, is using innovative microscopy and data analysis to better understand how brain and pancreatic tumors thwart immune responses. The program, which is part of IEM's Cancer Bioengineering Initiative (see the next page), includes collaborations with the University's Masonic Cancer Center and the University of Wisconsin-Madison's Carbone Cancer Center.

The Translational Neuromodulation Training Program, led by Professor of Biomedical Engineering Matt Johnson, will train postdoctoral fellows and resident/fellowship-stage clinical associates to advance neuromodulation technologies toward commercialization. The program will feature mentorship from University professors and industry leaders.

Paolo Provenzano

Matt Johnson

IEM Center Updates

IEM centers bring together faculty expertise, dedicated resources, and key academic and industry collaborators to pursue groundbreaking research and development with high potential for real-world impact.

John Bischof
Director

Advanced Technologies for the Preservation of Biological Systems (ATP-Bio)

Nearly two years since its launch, the NSF Engineering Research Center ATP-Bio is quickly moving toward its goal of developing and deploying breakthrough bioengineering technology to preserve biological systems such as cells, tissues, organs, and whole organisms.

In the past year, ATP-Bio advanced the ability to store pancreatic islets for potential diabetes treatment and made significant progress in cryopreserving and rewarming whole organs for transplantation. Outside the medical sphere, ATP-Bio is making headway on the preservation of aquatic and insect species, including fruit flies (which are very important for genetics research) and coral larvae (for restoration of reefs near Hawaii and Australia).

In the next year, we will capitalize on new funding to expand animal model research of liver and kidney preservation, develop new methods for preserving composite living materials such as hands, and expand the preservation of key insect species to labs and storage facilities outside of ATP-Bio.

David Odde
Director

Cancer Bioengineering Initiative (CBI)

CBI was launched in 2016 to help more cancer treatments reach the market. About 95 percent of new therapies for solid tumors fail during clinical trials. CBI aims to integrate and engineering approach into the clinical trial process to double the success rate of clinical trials in the next 10 years.

Two new grants have laid the foundation for CBI's next five years. The first grant, led by CBI Director David Odde, aims to develop a computer-based tumor simulator to guide experiments around new immunotherapies for the most common type of pancreatic cancer as well as glioblastoma, which affects the brain and spinal cord. The second grant, led by Professor of Biomedical Engineering Paolo Provenzano (see previous page), aims to analyze the mechanisms that prevent immunotherapy from working as well in solid tumors as in other forms of cancer and find ways to overcome these barriers.

In 2022-2023, we will focus on expanding and diversifying the faculty team, creating working groups, and setting the stage for more multidisciplinary approaches to clinical questions.

John Osborn
Director

Minnesota Consortium for Autonomic Neuromodulation (MCAN)

It was a productive year for MCAN, which brings together scientists in academia, industry, and the clinic to treat diseases linked to dysfunction of peripheral "autonomic" nerves to organs.

MCAN expanded to 28 faculty spanning basic research, clinical, and engineering departments at the University and Mayo Clinic in Rochester. MCAN also established several new partnerships with industry. Two projects related to treating hypertension were funded, and several large NIH grants were submitted.

We are planning the first MCAN one-day workshop for this fall and will also play a key role in the 2023 Neuromodulation Symposium, which will focus in part on autonomic neuromodulation therapies.

Engineering in Medicine Doctoral Fellowship

Engineering in Medicine doctoral fellows are accomplished graduate students who promise to be future leaders in driving medical advances through engineering. They also serve as IEM ambassadors at events such as the IEM Annual Conference and the Inspire Conference. The fellowships support their doctoral dissertation research for one year.

IEM Doctoral Fellowship Criteria

The applicant must

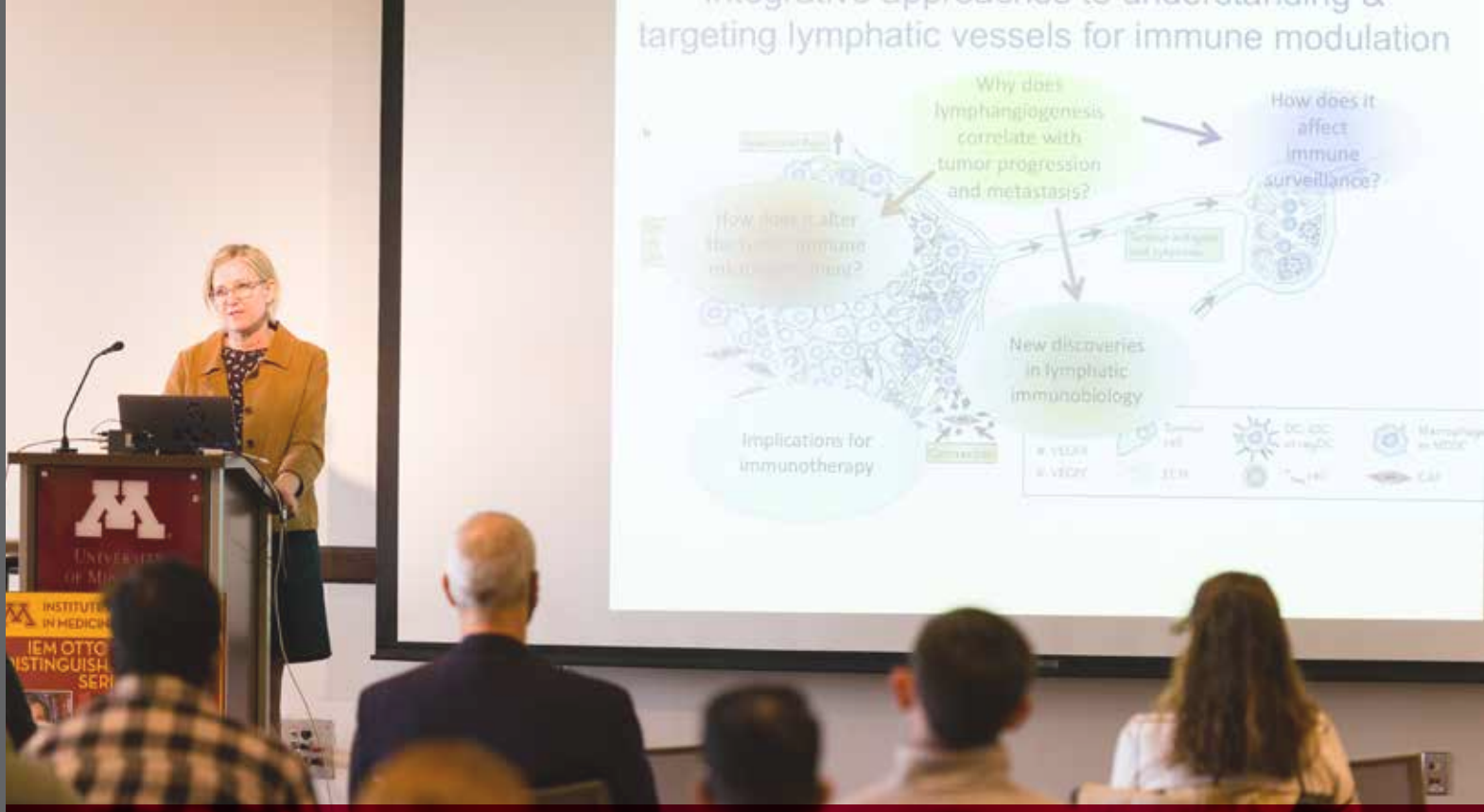
- be a PhD student in good standing in an IEM member's lab
- have completed all required coursework
- have a dissertation topic that is directed to transforming an area of medicine through highly innovative engineering
- incorporate collaboration with at least one IEM member from the Medical School and one from CSE. (Exceptions for faculty in CBS, CFANS, and CLA are considered.)

Lulu Ge
Electrical and Computer Engineering

Studying the putative effect of transcranial magnetic stimulation on human cognitive control with hyperdimensional computing

Ali Nouriani
Mechanical Engineering

Home-based individualized analysis of postural instability in Parkinson's patients



IEM Otto Schmitt Distinguished Lecture Series

Each year, we host a distinguished leader from academia, industry, or government to give the annual Otto Schmitt Lecture to address a challenge for engineering in medicine. In addition to the lecture, the speaker meets with student and faculty groups to share developments in the field and establish connections for potential collaborations.

We were grateful to return to an in-person lecture in October 2021. Dr. Melody Swartz, William B. Ogden Professor of Molecular Engineering and deputy dean for faculty affairs at the University of Chicago, spoke on "Immunoregulatory Roles of Lymphatic Vessels in Cancer and Opportunities for Immunoengineering."

In the spring of 2023, we will host Dr. Richard Kuntz, retired senior vice president and chief medical and scientific officer at Medtronic. Far from actually retired, Dr. Kuntz is actively collaborating with several organizations – including the University of Minnesota – to drive advances in medical devices and digital health technology.

2021-2022

"Immunoregulatory roles of lymphatic vessels in cancer and opportunities for immunoengineering"

Melody Swartz

William B. Ogden Professor of Molecular Engineering and Deputy Dean for Faculty Affairs. University of Chicago

2022-2023

"The Future of Digital Health"

Richard Kuntz

Senior Vice President and Chief Medical and Scientific Officer Medtronic. Retired

Professional Education & Outreach

Clinicians, professors, and medical companies turn to our Professional Education and Outreach programs to bring their engineering in medicine to the next level. We were excited that these programs returned to in-person events this year.

Our reinvigorated MD/MS Fellows program has already expanded, now giving three medical students each year a chance to study biomedical engineering and benefit from experiences in research, product design, and business development. Meanwhile, our short course and Innovation Workshop were both well-attended.

We continue to expand and cement our interactions with industry leaders as we welcome their professionals for courses, clinical immersions, and speaking opportunities. These partnerships broaden the reach of IEM and amplify our unique contribution to the medical innovation ecosystem in Minnesota and beyond.

- Clinical Immersion
- Clinician Engagement
- Short Courses
- MD/MS Fellows
- Industrial Fellows

Paul Iaizzo
PEO Director

Anna Budde
PEO Assistant Director

Will Durfee
PEO Co-Director of Clinician Engagement

Neville Williams
PEO Support Intern

Clinical Immersion

Ken Rosen
Head of Industry & Outreach Programs

The Clinical Immersion program, managed by Ken Rosen, invites industry professionals from leading health care technology companies to see their devices in action. Groups spend 2-5 days "immersed" in clinical settings, learning from University clinicians how their devices are being used and how they can be improved.

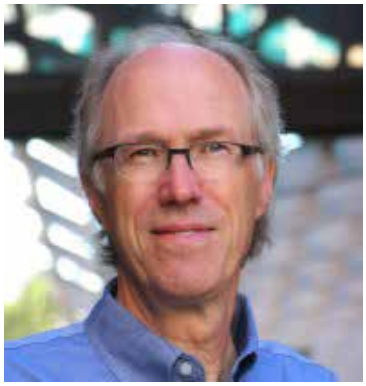
We performed a dozen immersions over the course of 2021-2022, outpacing the previous year and expanding into new clinical areas such as pediatric cardiology, interventional endoscopy, and obstetrics and gynecology. Interest in the program boomed as the severity of the pandemic ebbed. The growing participation from companies based outside of Minnesota demonstrates how broadly this program influences medical device design and patient care.

In the coming year, we aim to continue to expand the frequency of immersions. We will also add immersions focused on electrophysiology and cardiac intensive care.

Short Courses

After two years of virtual-only courses, we were glad to offer a full in-person, hands-on short course on advanced cardiac physiology and anatomy. Over 150 students (110 from industry) met on campus in January for lectures, small group discussions, demonstrations, and participation in a human anatomy laboratory. We will offer this course again in January 2023, and we aim to expand our short course offerings throughout 2023.

Clinician Engagement



Will Durfee
PEO Co-Director of
Clinician Engagement

Doctors often have good ideas for innovations that can help patients, but they lack the time and expertise needed to shepherd them from concept to commercialization. The Clinician Engagement program connects busy University clinicians to the University's exceptional innovation ecosystem. This year, the program facilitated over 40 projects.

One project began when Dr. Piet de Groen (Division of Gastroenterology) saw a need for a new way to track the location of an endoscope during a colonoscopy. Engineering and business students in the New Product Design and Business Development course investigated market opportunities, invented and tested new tracking technologies, and presented a business case for a new product.

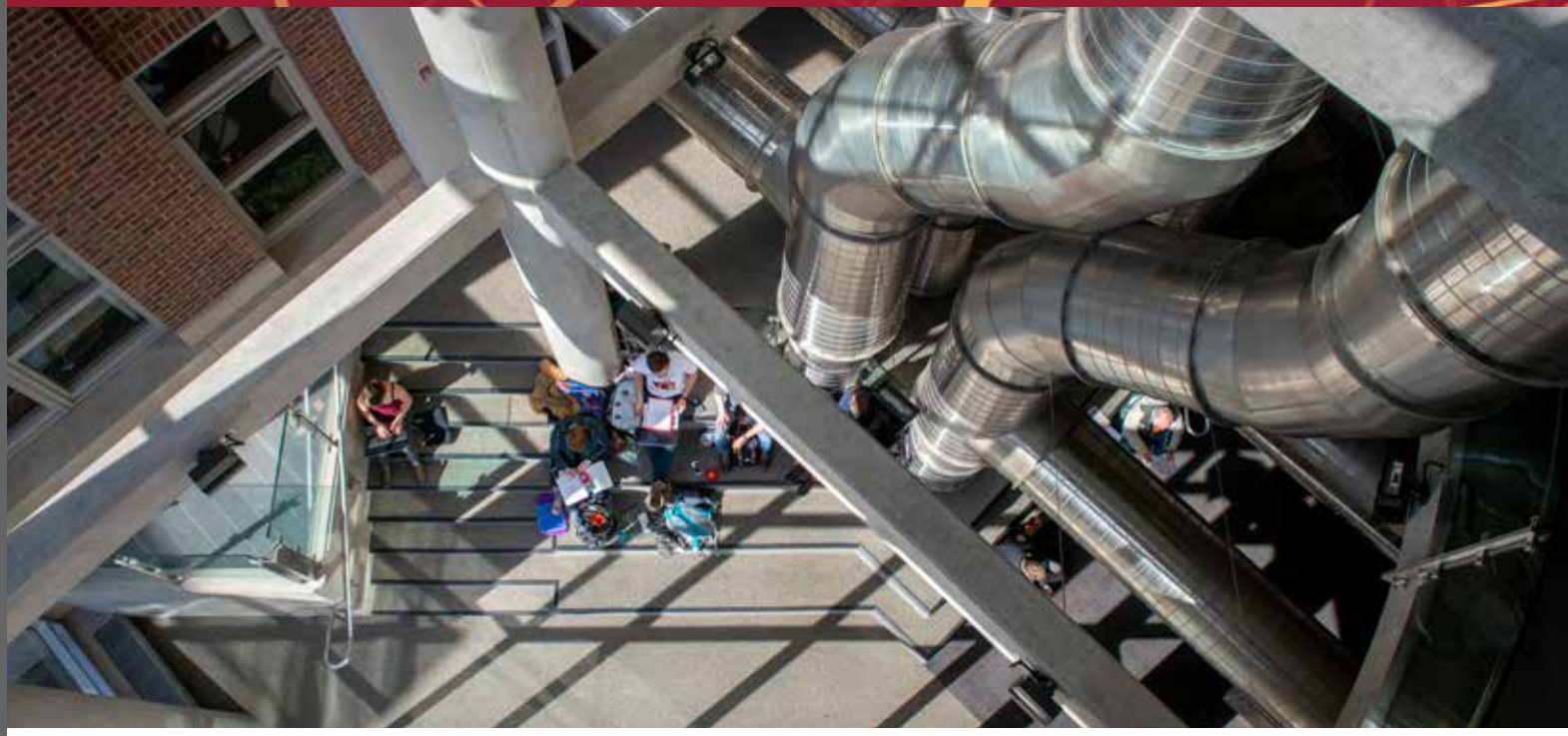
Another project grew out of Dr. Tina Slusher's (Department of Pediatrics) desire to find a low-cost way to measure irradiance in phototherapy when treating jaundice in newborns. Mechanical engineering students came up with a creative solution that they anticipate will cost one-third as much as existing irradiance meters.

In the coming year, we will broaden our outreach to clinicians within the M Health Fairview system and identify innovation ambassadors in each Medical School department to find opportunities to address unmet clinical needs.

IEM Clinician Engagement Program

FIND THE PROBLEM	INVENT THE SOLUTION	IMPLEMENT AND TEST
Physicians often know their clinical needs	*They often have solutions to address those unmet needs*	*Typically, physicians do not have time to implement*
EARLY CONCEPTS	**PROOF OF PRINCIPLE**	**READY FOR TRANSLATION**
Undergraduate Engineering Senior Design Project (BME, ME, ECE)	Bakken Medical Devices Center Innovation Fellows Program	Corporate partnerships (e.g., Medtronic, Boston Scientific, 3M)
Graduate Course - New Product Design and Business Development	Bakken Medical Devices Center 3D Printing and Prototyping (MedWorx)	Tech Comm (Patenting, Licensing, Start-ups)
MILI Project Valuation Lab Course	Faculty and University resource engagement (seed funding)	
CTSI and Early Tech Comm Evaluation	CTSI and ESS animal and clinical testing	
Bakken Medical Devices Center Student Intern Team		

Industrial Fellows



The Industrial Fellows program recognizes individuals in industry who have helped IEM achieve its mission and who serve as informal IEM ambassadors. In 2020–2021, we began quarterly meetings with our 25+ Industrial Fellows via Zoom to gain their insights on how to enhance the University's and the state's innovation ecosystems. Many formal and informal projects have emerged, including collaborative research, internship opportunities, and classroom visits. Moving forward, we aim to work with IEM's Industry Advisory Board (see p. 25) to enhance University-industry collaborations in each pillar.

Our Industry Fellows inductees for 2021-2022 were Farzad Azimpour of Edwards Lifesciences and Roxanne Gil of Medtronic.

Farzad Azimpour
Senior Vice President. Advanced Tech. Edwards Lifesciences

Roxanne Gil
Engagement & Education Program Manager. Surgical Innovations. Medtronic

MD/MS Fellows

SCOTT D. AND SUSAN D. AUGUSTINE BIOMEDICAL ENGINEERING RESEARCH FELLOWSHIP

The Augustine Fellowship allows University of Minnesota Medical School students to devote a year to courses and a research project – in between their second and third years of the Medical School curriculum – for a MS in biomedical engineering. The research project is carried out under the guidance of a faculty member in the College of Science and Engineering or the Medical School. Courses include intensive training in new product development and biomedical commercialization. With the help of Dr. Clarence Shannon IV, the Medical School's associate dean of strategy and innovation, IEM has expanded the program to three fellows each year.

Clarence Shannon IV

Scott Augustine

The Augustine Fellowship program is funded by an endowment begun by Dr. Scott D. Augustine and his wife, Susan D. Augustine. Scott Augustine is an alumnus of the Medical School, the founder of two medical device companies and two non-profits, the holder of over 115 medical device patents, and a practicing anesthesiologist.

> **"Having graduated from the program, I now feel confident that I can identify problems routinely encountered in the clinical environment and work with other healthcare professionals to design and implement engineering-based solutions."**
>
> – Dr. Ranveer Vasdev, MD/MS alumnus

2021 Awardees

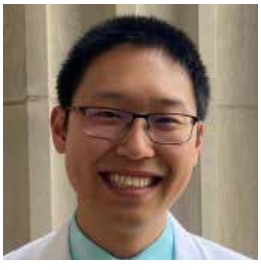
Tyler Gathman
Chemical Engineering

Puram Vikram
Neurosurgery

2022 Awardees

Amr El-Bokl
Visible Heart® Labs

Luke Sabal
Neurosurgery



Andrew Wang
Visible Heart® Labs

Inspire

IEM's Inspire Program shows students in grades 6-12 and in college how combining the strengths of engineering and biomedical research can solve complex health problems. We aim to inspire these students to pursue careers in the STEM fields. We also aim to build mentorship programs and ways for teachers to access professional development credits.

This year, following interruptions from the pandemic, we were excited to return to in-person programs like our Inspire Conference, which focused on nervous system diseases. That said, we are also aiming to make STEM experiences more accessible to students, which means having plenty of virtual options.

In 2022-2023, we will continue to have conversations and build partnerships with educators, industry, and organizations that can both support students' access to Inspire programming and build interest in STEM fields among students from diverse backgrounds.

Inspire Conference

InspireTalks

Rhonda Franklin
Inspire Co-Director

Chris Pennell
Inspire Co-Director

Ken Rosen
Head of Industry & Outreach Programs

Inspire Conference

The fourth annual IEM Inspire Conference, held in November 2021, explored the early detection and treatment of nervous system diseases. While limiting capacity as a pandemic precaution, we were still able to accommodate more than 160 students from 13 high schools, with another 20 students joining virtually.

Dr. Yoji Shimizu led the program, and Dr. Kelvin Lim delivered the keynote on rewiring the brain to treat substance abuse. The students heard from science, engineering, and clinical faculty members about their efforts to address brain and neurological conditions. They also learned from industry and academic professionals how to pursue a career in these fields.

The focus of the 2022 Inspire Conference will be diabetes.

InspireTalks

InspireTalks is a new program that connects academic and industry experts with diverse classrooms to inspire students to consider STEM career paths. The idea for the program came from a Minneapolis Southwest High School student, who felt the Inspire Conference talks she participated in should reach students in their classrooms, not just on the University campus.

A total of eight InspireTalks took place: six at Minneapolis Southwest High School, one at Minneapolis Roosevelt High School, and one at Higher Ground Academy in St. Paul. The technology already present in the schools made it easy for University faculty and residents to discuss their work and career paths over video calls.

We plan to expand the program in the coming years, possibly by adding multi-school webinars.

HIGHER GROUND ACADEMY

SOUTHWEST HIGH SCHOOL

ROOSEVELT HIGH SCHOOL

Inspire 2022-2023 and Beyond

We are in the process of developing new outreach programs to inspire students to pursue careers in STEM fields. These programs will launch in the next few years:

Inspire STEM Career Hub

We envision a "one stop shop" for STEM-related career guidance and opportunities for high schoolers, undergraduates, graduate students, and postdocs. This digital space would allow users to navigate between subjects of interest, such as recorded talks from the Inspire Conference and information on careers. Students will be able to use the platform to communicate with IEM experts, arrange for mentoring, or sign up for on-campus events. We have mocked up what this STEM Career Hub would look like and are now in the development phase.

Inspire Mentorship Network

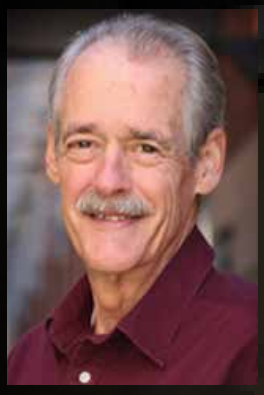
We are building a community of peer, near-peer, and professional mentors for students pursuing STEM careers. Meetings with several philanthropic and industry groups in the Twin Cities are helping us strengthen our connections with students of different backgrounds and bring them access to opportunities through IEM.

Innovation

IEM's Innovation Pillar continues to take shape. Our aim is to support scientists, clinicians, and engineers transforming cutting-edge discoveries and developments into innovative health technologies. This pillar gives us an opportunity to refine programs that existed previously, such as the Innovation Fellows program at the Bakken Medical Devices Center, while also developing new programs.

In the past year, we focused on advancing our strategic planning as we learned from peer institutions and formed stronger connections with the innovation infrastructure across the University. These efforts will result in more commercialization education and mentoring to University students and researchers, along with expanded training, research, and commercialization collaborations with industry partners. We will also continue to manage conferences, meetings, seminars, and workshops related to innovation and commercialization, such as the Innovation to Impact event series.

Bakken Medical Devices Center



Art Erdman
Innovation Co-Director

Carla Pavone
Innovation Co-Director

Bakken Medical Devices Center

The year was filled with new beginnings for the Bakken Medical Devices Center (BMDC) as COVID-19 restrictions eased, leadership changed, and the Innovation Pillar began to establish a vision for the future that includes BMDC.

The makerspace labs and meeting rooms returned to action following the pandemic shutdown, welcoming students, clinicians, Innovation Fellows, and many others. We also provided tours to multiple groups from within the University as well as several groups of international medical technology companies who were exploring options for establishing a US presence.

Innovation Fellows: Nine clinicians and engineers participated in the Innovation Fellows Program, a full-immersion educational and product development program for medical device creation. These fellows learned to identify and solve unmet medical needs through exercises, case studies, and project work guided by Dr. Danny Sachs. They also collaborated with University faculty and industry professionals to develop plans to bring their products to market, attract investment, and help patients at scale. In June, project teams pitched their novel solutions for chronic pain, diabetes, sepsis, and renal failure to program advisors and colleagues. The Innovation Fellows program will go on hiatus for one year as we revamp the program and focus it more on moving ideas to commercialization.

2021-2022 Bakken MDC Innovation Fellows

Morgan Boes, Sergei Grishankov, Beth Groenke, Youssef Hamade, Jessica Holst-Wolf, Kelly Landsman, Keith Leland, Sandy Liu, and Joe Weber

Leadership: The leadership team of Director Will Durfee and associate directors Angela Panoskaltsis-Mortari and Matt Johnson continued the track record of innovation and commercialization previously managed by longtime director Art Erdman. In addition to maintaining ongoing BMDC operations, this leadership team is

1) planning for BMDC's relocation to the Health Discovery Hub, a 275,000 square foot facility scheduled to open in September 2025;

2) developing a new Innovation Fellows program; and

3) leading the search for a new BMDC director, who will begin some time in 2023.

Will Durfee
BMDC Interim Director

Matt Johnson
BMDC Associate Director

Angela Panoskaltsis-Mortari
BMDC Associate Director

IEM Innovation Week

Moving from a virtual-only Innovation Week in 2021 to hybrid events in 2022 was a joyful challenge. Participants were obviously delighted with in-person interaction, while the IEM staff juggled the in-person and virtual logistics of five events for only the second time. The week was a success, paving the way for more events and in-person interaction during Innovation Week 2023 (April 17-21).

Design of Medical Devices Conference (DMD)

It's one of the largest medical device conferences in the world, and it still attracts speakers, companies, students, and many others from every corner of the globe. Over 700 participants enjoyed dozens of sessions, a poster competition, and presentations by Matthew Cooper (Chief Medical Officer at 3M Health Care) and Geoff Martha (CEO of Medtronic). More than 100 participants literally kicked off the week with the 5k/10k Fun Run. We aim to be back at 1000+ participants (our pre-COVID-19 numbers) in 2023 and beyond.

Minnesota Neuromodulation Symposium

Over 300 scientists, engineers, clinicians, industrial practitioners, entrepreneurs, and students participated in plenary sessions, panel discussions, and training focused on new neuromodulation technologies and advances in treating mood disorders and memory loss. The 2023 Symposium will focus on autonomic neuromodulation therapies and technologies.

Medical Device Security 101

The University's Center for Medical Device Cybersecurity hosted this full-day event for the second year in a row. Sponsored by MedCrypt and chaired by Boston Scientific's Dan Lyon and Ken Hoyme, the symposium featured several speakers who shared perspectives on advances and challenges in making medical devices secure.

Innovation Workshop

A highlight of DMD, the Innovation Workshop covers essentials of medical technology innovation. Led by Paul Iaizzo and Will Durfee, the all-day in-person Workshop featured nine speakers from academia and industry and over 70 participants.

IEM Career Mixer

This event remained virtual by popular demand from both students and companies. The virtual format allowed for more scheduled, in-depth interviews and discussions that lay strong foundations for further networking and possible employment. Five companies and 85+ students participated – numbers that we aim to significantly increase in 2023.

Save the Date

IEM Innovation Week 2023: April 17-21

IEM Annual Conference

The 2021 IEM Annual Conference was a true hybrid event, with “in-person” and “virtual” participants just about even. The format allowed for extensive participation from faculty and students from Morgan State University, during both the morning and afternoon pillar-based breakout sessions. Morgan State, a Historically Black University in Baltimore, Maryland, is an institution with growing research and educational partnerships with IEM faculty. The poster session, which attracted 59 entries, was entirely in-person.

Jerrold Vitek
Head, Department of Neurology
Director, Neuromodulation Research Center
Director, Udall Center of Excellence for Parkinson's Research

Carla Pavone
Associate Director, Gary S. Holmes Center for Entrepreneurship
Director, Minnesota Innovation Corps

Timothy Schacker
Vice Dean for Research, Medical School
Director, Clinical Translational Research Services, Clinical and Translational Science Institute

IEM Advisory Boards

IEM has three advisory boards that provide guidance to IEM leadership and promote IEM within the University and with local and national organizations. Members of the Scientific Advisory Board are national biomedical engineering leaders at academic institutions across the United States. The Faculty Advisory Board is composed of eminent University of Minnesota faculty from the Medical School, the College of Science and Engineering, and the College of Biological Sciences. The Industry Advisory Board is comprised of leaders in prominent biomedical companies.

Scientific Advisory Board

Guillermo Aguilar, PhD
Department Head, James and Ada Forsyth Professor, J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University

Warren Chan, PhD
Professor, Institute of Biomaterials and Biomedical Engineering and Terrence Donnelly Centre for Cellular and Biomolecular Research, University of Toronto

Naomi Chesler, PhD
Director, Edwards Lifesciences Center for Advanced Cardiovascular Technology, University of California, Irvine

Claudia Fischbach-Teschl, PhD
Director, Physical Sciences Oncology Center on the Physics of Cancer Metabolism; Professor, Meinig School of Biomedical Engineering, Cornell University

Alexander Revzin, PhD
Professor of Biomedical Engineering, Mayo Clinic

Faculty Advisory Board

Michael Garwood, PhD
Professor, Radiology

Tom Hays, PhD
Professor and Head, Genetics, Cell Biology and Development

David Largaespada, PhD
Professor, Pediatrics

Tay Netoff, PhD
Professor, Biomedical Engineering

Brenda Ogle, PhD
Professor and Head, Biomedical Engineering

Nikolaos Papanikolopoulos, PhD
Director, Minnesota Robotics Institute; Professor, Electrical and Computer Engineering

Theresa Reineke, PhD
Professor, Chemistry

Clarence Shannon IV, MD
Assistant Professor, Anesthesiology

Jerrold Vitek, MD, PhD
Professor and Head, Neurology

Industry Advisory Board

J. Fernando Bazan, PhD
Principal, 4th & Aspen Life Sciences Consulting

Achin Bhowmik, PhD
Chief Technology Officer & Executive Vice President of Engineering, Starkey

Matthew M. Cooper, MD, MBA, FACS, FCAMA
Chief Medical Officer, Medical Solutions Division & Global Director Safety, 3M Health Care Business Group

Dominique Seetapun Davidow, PhD
Staff Quality Assurance Scientist, Beckman Coulter Diagnostics

Liza Davis, MS
Vice President of Research and Development, Boston Scientific

Sebastian Eriksson Giwa, PhD
CEO, Sylvatica Biotech. Cofounder of Osmium Health, Sylvatica Biotech, and Organ Preservation Alliance

Ed Hedblom, PharmD
Director, Evidence and Access, 3M Health Care

David M. Knapp, PhD
Vice President of R&D, Vascular, Boston Scientific

Tim Laske, PhD
Vice President of Research and Business Development - AF Solutions, Medtronic

Sean O'Neil
Vice President Technology, Optum

Erik Scott, PhD
Director of Advanced Development, Bakken Fellow, Technical Fellow, Medtronic

Mark Stevenson, MBA
Vice President of Strategic Development, Veranex

Eric Varghese, MS
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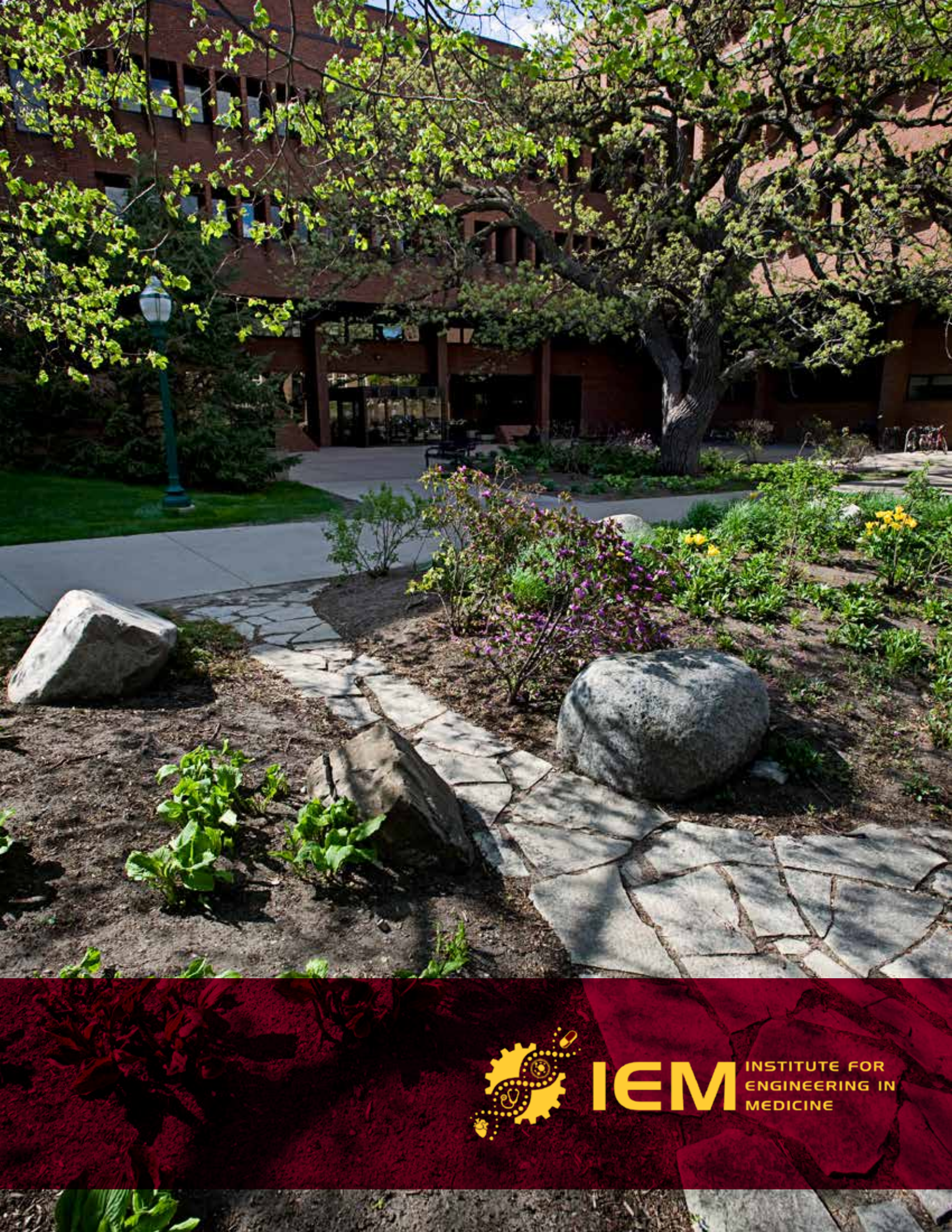
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