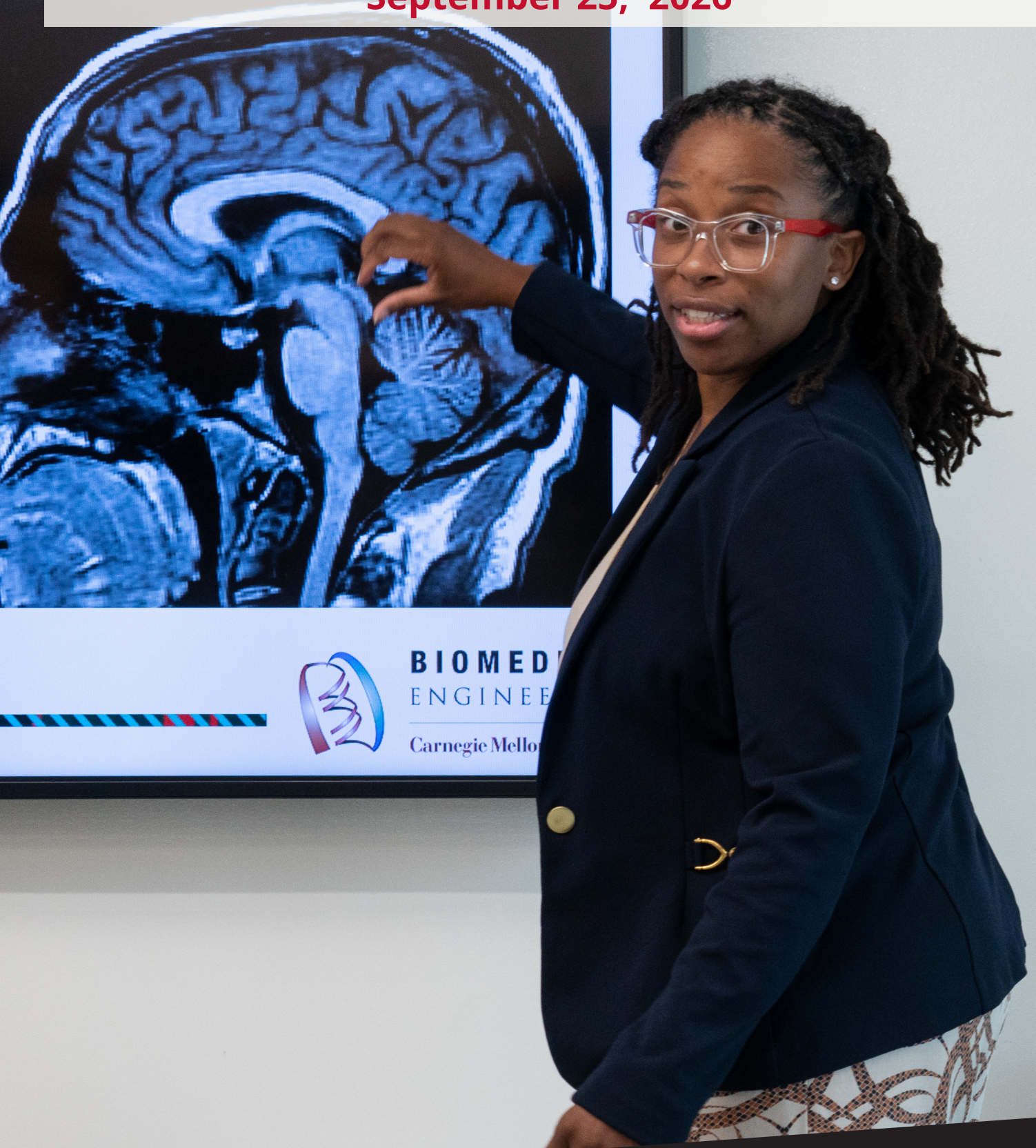


Eighth CARNEGIE MELLON FORUM ON BIOMEDICAL ENGINEERING

September 25, 2026



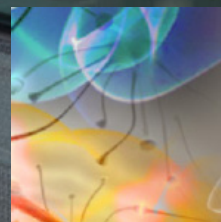
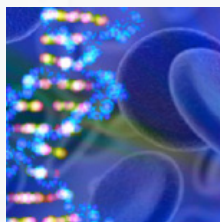
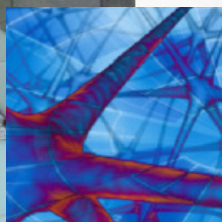
Carnegie Mellon University

Explore Frontiers in Biomedical Engineering

The Carnegie Mellon Forum on Biomedical Engineering brings together researchers, students, clinicians, and industry leaders from around the world to share groundbreaking discoveries and advance the future of healthcare. Hosted annually by the Department of Biomedical Engineering at Carnegie Mellon University, the Forum provides a dynamic platform for scientific exchange and collaboration.

Each year, the program features keynote lectures by world-renowned experts and an interactive virtual poster competition that highlight cutting-edge research across a broad range of topics from cellular engineering and neurotechnology to medical devices and global health innovations. The Forum offers opportunities for students to showcase their work, gain valuable feedback, and connect with peers, mentors, and potential collaborators.

At its heart, the Carnegie Mellon Forum on Biomedical Engineering is more than a conference — it is a community dedicated to advancing science and engineering for the benefit of human health worldwide



Program

Friday, September 25

Carnegie Mellon Forum on Biomedical Engineering

08:45 – 09:00 AM**Welcome Remarks****Keith Cook, Ph.D.**

The David Edward Schramm Professor and Head
Biomedical Engineering
Carnegie Mellon University

09:00 – 09:30 AM**Keynote Talk: Lighting up the Gut-Brain Connection: From Mechanisms to Models to Modulation****Kristen Smith-Edwards, Ph.D.**

Assistant Professor of Physiology
Mayo Clinic

Moderator: Pulkit Grover, Ph.D.

Angel Jordan Associate Professor
Electrical & Computer Engineering, Biomedical Engineering
Neuroscience Institute
Carnegie Mellon University

09:30 – 10:00 AM**Keynote Talk: Empowering Biomedical Discovery with AI Scientists****Marinka Zitnik, Ph.D.**

Associate Professor of Biomedical Informatics
Harvard University

Moderator: Michelle Li, Ph.D.

Assistant Professor
Department of Biomedical Engineering
Carnegie Mellon University

10:00 – 10:15 AM**BREAK****10:15 – 10:45 AM****Keynote Talk: Regenerative Transplantation: A Paradigm Shift****Giuseppe Orlando, M.D., Ph.D.**

Professor, Transplant Surgery, Surgery (Winston-Salem)
School of Medicine
Wake Forest University

Moderator: Dr. Xi (Charlie) Ren

Associate Professor
Department of Biomedical Engineering
Carnegie Mellon University

10:45 – 11:15 AM**Best Abstract Talk: Tracking Flow of Attention in Visual Circuits Across the Brain****K.C. Jacobson, B.S.**

Georgia Institute of Technology

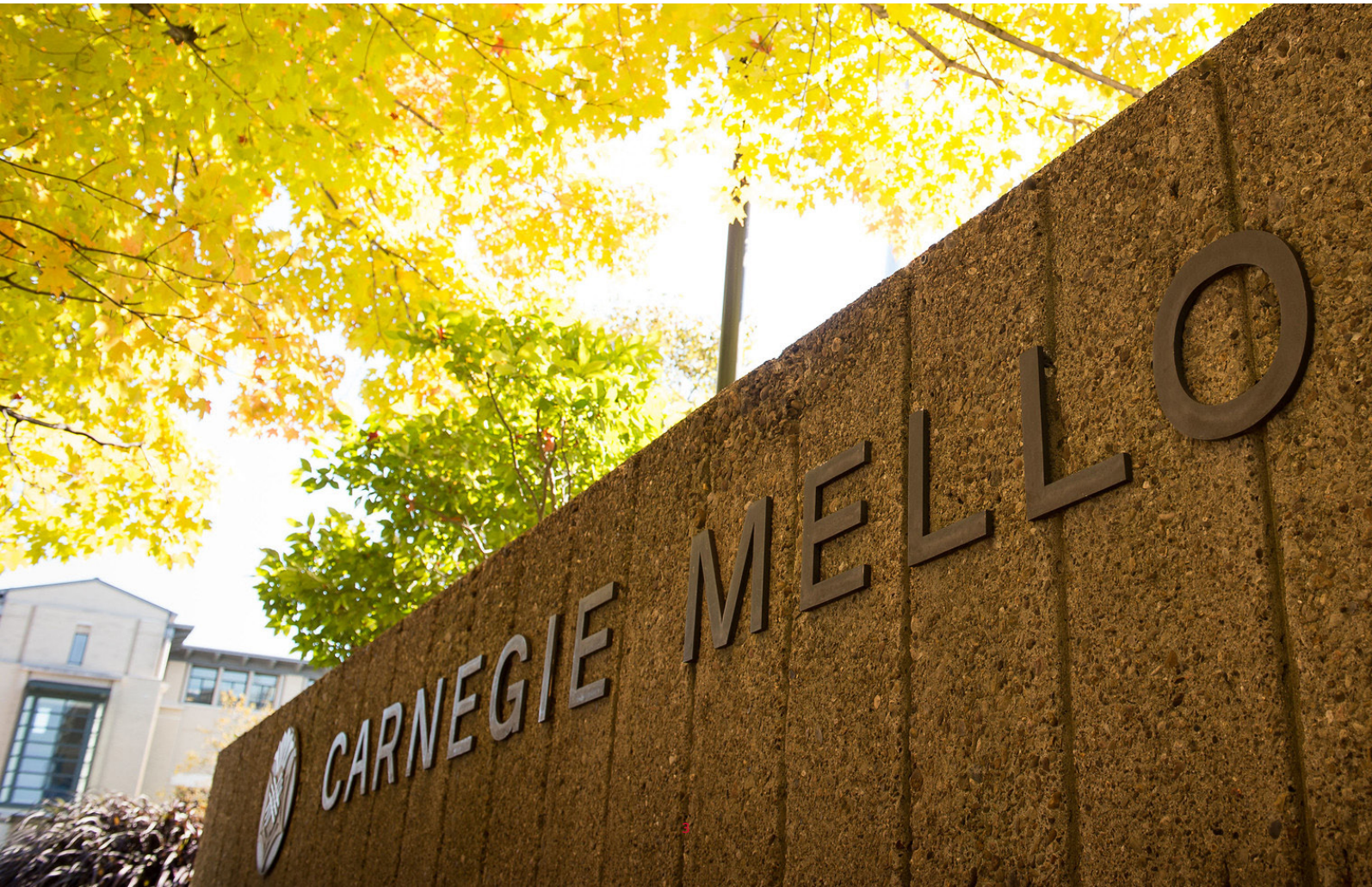
Moderator: Constance "Robbie" Robbins, Ph.D.

Research Scientist
Department of Biomedical Engineering
Carnegie Mellon University

11:15 – 11:45 AM	Keynote Talk: Innovative neuromodulation strategies for central and peripheral neural systems Kevin Otto, Ph.D. The Dane A. Miller Professor and Head Department of Biomedical Engineering Purdue University Moderator: Dr. Steven M. Chase Professor Department of Biomedical Engineering Carnegie Mellon Neuroscience Institute Carnegie Mellon University
11:45 – 12:15 PM	Keynote Talk: Breaking Barriers and Building Community Claire Riordan, M.S. Education and Public Engagement Manager Rinn Medical Devices Centre Moderator: Keith Cook, Ph.D. The David Edward Schramm Professor and Head Department of Biomedical Engineering Carnegie Mellon University
12:15 – 1:00 PM	LUNCH BREAK
1:00 – 1:30 PM	Keynote BIO-INSYNC: Biointegrated Implantable Systems for Cell-Based Sensing and Therapy Burak Ozdoganlar, Ph.D. Ver Planck Endowed Chair Professor of Mechanical Engineering Prof. of Biomedical Eng., Materials Sci. & Eng., and the Neuroscience Institute Associate Director, Engineering Research Accelerator of the College of Engineering Moderator: Keith Cook, Ph.D. The David Edward Schramm Professor and Head Department of Biomedical Engineering Carnegie Mellon University
1:30 – 2:00 PM	Keynote Talk: Beyond Anatomy: Engineering the Future of Functional Cardiopulmonary Imaging Andreas Fouras, Ph.D. Managing Director and Chief Executive Officer 4DMedical Moderator: Dr. Jason Szafron Assistant Professor Department of Biomedical Engineering Carnegie Mellon University

2:00 – 3:00 PM Pre-recorded Slide Presentations

3:00 – 3:15 PM Announcement of Awards



**Dr. Keith Cook**

The David Edward Schramm Professor and Head
Biomedical Engineering
Carnegie Mellon University

Dr. Cook is the David Edward Schramm Professor and Department Head of Biomedical Engineering at Carnegie Mellon University (CMU). At CMU, he also serves as the Director of the Bioengineered Organs Initiative and the Transforming Transplant initiative. Prior to his appointment at CMU, Dr. Cook was a Research Associate Professor in Biomedical Engineering and Surgery at the University of Michigan. As a student, Dr. Cook obtained a BSE in both Mechanical Engineering and Engineering Science from Michigan and an MS and Ph.D. in Biomedical Engineering from Northwestern University. Dr. Cook's research focuses on the application of biomedical engineering to the treatment of lung disease. His primary research focus is the development of permanent replacement lungs for destination therapy. This work extends into computational modeling and device design, development of novel biomaterials and new drug approaches to reduce blood coagulation within these devices, and in-vitro and in-vivo biomaterials and artificial lung testing. His research also focuses on design and biofabrication of tissue-based lungs. Dr. Cook is a fellow of the American Institute for Medical and Biological Engineering (AIMBE).

**Andreas Fouras, Ph.D.**

Managing Director and Chief Executive Officer
4DMedical

Dr. Andreas Fouras is the Founder, Managing Director, and Chief Executive Officer of 4DMedical (ASX:4DX), a medical technology company based in Australia and the United States. 4DMedical has developed X-ray Velocimetry (XV) Lung Ventilation Analysis Software, based on the company's proprietary XV Technology, which enables new levels of non-invasive, quantitative imaging and analysis of lung function.

Completing a Masters and PhD, and then rising to the position of Professor of Mechanical and Aerospace Engineering and Director of the Laboratory for Dynamic Imaging, Dr. Fouras was recognised by various accolades from a wide range of premier research bodies including the National Health and Medical Research Council and the American Asthma Foundation.

INVITED SPEAKERS



Giuseppe Orlando, M.D., Ph.D.

Professor, Transplant Surgery, Surgery (Winston-Salem)
School of Medicine
Wake Forest University

Dr. Orlando is an Associate Professor of Surgery at the Wake Forest School of Medicine, in Winston Salem, North Carolina. He is also an attending kidney and pancreas surgeon at Atrium Health Wake Forest Baptist Medical Center and a scientist specializing the bioengineering, regeneration and repair of the kidney and endocrine pancreas at the Wake Forest Institute for Regenerative Medicine (WFIRM).

Dr. Orlando received his MD, degree in general surgery and PhD from Tor Vergata University of Rome, Italy. He specialized in kidney and liver transplantation in Rome, Paris, France (Liver Unit, Paul Brousse Hospital) and Brussels, Belgium (General Surgery and Liver Unit, Catholic University of Leuven). In 2008, he was awarded the Marie Curie International Outgoing Fellowship by the European Commission and he thereafter relocated to Winston Salem (WFIRM) and Oxford, UK (Transplant Research Immunology Group), to specialize in transplant immunology and regenerative medicine (2008-2011). He has been at the Wake Forest School of Medicine since 2011.



Kevin Otto, Ph.D.

The Dane A. Miller Professor and Head
Department of Biomedical Engineering
Purdue University

Dr. Kevin Otto received his BS in Chemical Engineering from Colorado State University and his MS and PhD in Bioengineering from Arizona State University. He completed research fellowships at the University of Michigan focused on brain-machine interfaces and implantable devices before joining Purdue University as a member of their faculty from 2006–2014. He later served as Senior Associate Chair of the University of Florida BME Department from 2020–2023. He returned to Purdue in 2024 as the Dane A. Miller Head and Professor of Biomedical Engineering.

Dr. Otto has served as PI on several multidisciplinary, multi-investigator research projects including a 4-year NIH Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Program U01, and two separate DARPA Programs, a 4-year Targeted Neuroplasticity Training (TNT) Program and a 3-year Reliable Neural Interface Technologies (RE-NET) Program. He has mentored more than 56 graduate and postdoctoral trainees and over 115 undergraduate students. His honors include multiple teaching, mentoring, service, and research awards. He is a Fellow of BMES and AIMBE, a Senior Member of IEEE, and has served on numerous editorial and advisory boards.

INVITED SPEAKERS



O. Burak Ozdoganlar, Ph.D.

Ver Planck Professor
Department of Mechanical Engineering
Carnegie Mellon University

Dr. Burak Ozdoganlar studies neural probe development and evaluation and in situ endogenous sensor development. He has co-authored more than 55 archival journal articles, and more than 75 conference articles. He is currently an associate technical editor for ASME J. Manufacturing Science and Engineering. Previously, he served as an associate editor for Society of Manufacturing Engineers (SME) J. Manufacturing Processes. Since 2008, he has been a member of the Scientific Committee of North American Manufacturing Research Institution of SEM.

The research in Ozdoganlar's Multiscale Manufacturing and Dynamics Laboratory focuses on manufacturing science and engineering, with an emphasis on micro- and nano-manufacturing. His research synergistically combines theoretical, numerical and experimental analyses, with the aim of gaining fundamental understanding of multiscale manufacturing processes, resulting in cutting-edge applications in medical, bio-medical, energy, robotics, and aerospace fields.



Claire Riordan, M.S.

Education and Public Engagement Manager
Rinn Medical Devices Centre

Claire Riordan has over 20 years experience in Communications and Science Engagement in corporate and higher education environments in Ireland, New Zealand and Australia.

She holds a Masters in Science Communication, has a background in filmmaking and a demonstrated history of working in communications, consultation and public and patient engagement in the medical device industry and a variety of research environments internationally. Claire's strong creative and collaborative focus is shown through her work with academics, industry partners, community groups, policymakers and government departments.

INVITED SPEAKERS



Kristen Smith-Edwards, Ph.D.

Assistant Professor of Physiology
Mayo Clinic

Dr. Kristen Smith-Edwards received her B.A. in Integrative Physiology, Neurosciences at University of Colorado at Boulder and received a Ph.D. in Neuroscience from the University of Wyoming. She is currently an Assistant Professor of Physiology at Mayo Clinic. As a researcher, Dr. Smith-Edwards, is focused on the neural pathways of the gut-brain axis that regulate colon function in healthy and diseased states.

Dr. Smith-Edwards and her research team utilize approaches in preclinical models to understand how enteric, autonomic and sensory neurons, as well as non-neuronal target cells in the bowel, work together to mediate motility, inflammation and abdominal pain. Dr. Smith-Edwards and her research team's long-term goals are to determine the neural mechanisms underlying GI disease and develop new therapeutic strategies that modulate neural activity to treat GI dysfunction.



Marinka Zitnik, Ph.D.

Associate Professor of Biomedical Informatics
Harvard University

Dr. Marinka Zitnik is an Associate Professor in the Department of Biomedical Informatics at Harvard Medical School, Associate Faculty at the Kempner Institute for the Study of Natural and Artificial Intelligence at Harvard University, Associate Member at the Broad Institute of MIT and Harvard, and Affiliated Faculty at the Harvard Data Science Initiative. Her lab is pioneering AI systems informed by geometry, structure, and symmetry, grounded in scientific knowledge. The overarching goal of her lab is to lay the foundations for AI that contribute to the scientific understanding of therapeutic design and genomic medicine or acquire such understanding autonomously.

MAYO CLINIC



Mayo Clinic's nationally recognized organ transplant programs have been providing high-quality patient care for over 50 years. Across three major campuses in Florida, Minnesota, and Arizona, Mayo Clinic is currently the largest organ transplant provider in the United States.

At all campuses, there are also established regenerative medicine programs with advanced infrastructure in biomanufacturing and broad expertise in regenerative medicine products including induced pluripotent stem cells (iPSCs). This leads to a unique environment of collaboration between transplant clinicians and regenerative medicine scientists. This enables scientific discoveries to be efficiently translated into its patient-centered, progressive transplant practice. This connection, in turn, will accelerate innovative approaches for organ dysfunction, failure and transplantation spectrum.

Learn more at

www.mayoclinic.org

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Effects of Red Blood Cell Derived Extracellular Vesicles on Monocyte Phenotype

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BME Academic Programs at CMU

Graduate Programs Overview

Ph.D. Program

The Ph.D. program is designed to nurture the next generation of leaders in biomedical engineering for the university and industry. Flexible degree requirements allow the student to balance breadth and depth, and to develop a research plan best suited to their career goal.

Ph.D. students start thesis research soon after matriculation. A rigorous review system monitors the progress to facilitate timely completion in 4-5 years for students without an M.S. degree, and in as short as 3 years for students with a relevant M.S. degree. All Ph.D. students are supported with full financial aid that covers tuition and stipend. The Department also participates in a joint M.D.-Ph.D. Program with the University of Pittsburgh School of Medicine.

M.S. Program

The M.S. program, built upon the interdisciplinary, collaborative culture of Carnegie Mellon University, provides an ideal opportunity for career advancement in biomedical engineering or transitions from other disciplines into biomedical engineering.

The large degree of flexibility and a wide choice of research advisors allow M.S. education to be tailored according to the student's professional goals, from R&D in biotechnology, healthcare, to university faculty. Students may choose between the traditional BME M.S. - Research program and the accelerated BME M.S. - Applied Study program. If choosing the BME M.S. - Applied Study program, a practicum course can provide opportunities for clinical exposure at local hospitals. It may also be combined with programs in Engineering & Technology Innovation Management to form a dual M.S. program. Students wishing to enter Carnegie Mellon's Ph.D. program in Biomedical Engineering must reapply and compete with the general pool of Ph.D. applicants.

M.S. in Artificial Intelligence Engineering - Biomedical Engineering (MSAIE-BME)

Artificial Intelligence (AI) no longer just lives in the digital realm of social media and e-commerce – it has also become a critical part of physical technologies in healthcare, transportation, communication, manufacturing and more. In Biomedical Engineering, AI has the potential to transform healthcare with a wide range of applications. Biomedical AI can help a doctor diagnose a disease, determine its optimal treatment, and predict the patient's prognosis. Biomedical technologies such as brain-computer interfaces, neuroprosthetics and medical imaging have been enriched by the application of AI and machine learning techniques to biological signal analysis and image processing. Biomedical AI can thus be used to improve the quality and length of life.

The MS program in Artificial Intelligence Engineering in Biomedical Engineering offers students the opportunity to gain mastery of AI and Biomedical Engineering domain expertise while learning how to integrate AI/machine learning approaches with engineering design and system analysis to develop effective solutions in biomedical engineering.

CMU BME Research Areas:

- ▢ Biomaterials & Nanotechnology
- ▢ Cardiopulmonary Engineering
- ▢ Cell & Tissue Engineering
- ▢ AI & Computational Biomedical Engineering
- ▢ Medical Devices & Robotics
- ▢ Neural Engineering
- ▢ Biomechanics
- ▢ Biomedical Imaging

Undergraduate Programs Overview

Major in Biomedical Engineering

Biomedical engineering education at Carnegie Mellon University reflects the belief that a top biomedical engineer must be deeply trained in both a traditional engineering practice and biomedical sciences. The unique additional major program leverages extensive collaborations with sister departments in the College of Engineering and with major medical institutions in Pittsburgh. This collaborative approach, combined with a rigorous engineering education, confers unique depth and breadth to the education of Biomedical Engineering graduates

Additional Major in Biomedical Technology

Biomedical Technology is for students from non-engineering majors who want Biomedical Engineering training beyond the BME minor. The requirements for the Biomedical Technology additional major program consist of the core, the tracks, and the capstone design course. The core exposes students to basic facets of biomedical engineering to lay a foundation. The tracks allow students to build depth in a specific aspect of biomedical engineering. The capstone design project engages students in teamwork to develop real-world applications.



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**BIOMEDICAL
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Carnegie Mellon University

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