

BIOMEDICAL ENGINEERING

2022-2023 ANNUAL REPORT

RAJEN KILACHAND CENTER FOR
INTEGRATED LIFE SCIENCES & ENGINEERING

A YEAR OF EXCEPTIONAL PUBLISHING

BU BME Faculty continue to publish impactful research in top journals - page 2





2022-2023 ANNUAL REPORT

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ON THE COVER:

Rajen Kilachand Center for Integrated Life
Sciences and Engineering

OPPOSITE:

- 1) The 2023 Colburn Lecture in the new
BU Center for Computing and Data Science
2) BME PhD candidate in the Rajen
Kilachand Center for Integrated Life Sciences
and Engineering;
3) Research presentation in the 25th Annual
Undergraduate Research Symposium

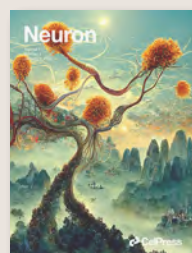
BU FACULTY SHINE IN TOP JOURNALS: A SAMPLING



John Ngo
Nature Biotechnology
Tension-tuned receptors for synthetic mechanotransduction and intercellular force detection



Edward Damiano
New England Journal of Medicine. NEJM
Multicenter, Randomized Trial of a Bionic Pancreas in Type 1 Diabetes



Brian DePasquale
Cell/Neuron
The centrality of population-level factors to network computation is demonstrated by a versatile approach for training spiking networks



Anna Devor et al.
PLOS Biology
Baseline oxygen consumption decreases with cortical depth



Mary Dunlop et al.
GEN Biotechnology
Deep Learning Concepts and Applications for Synthetic Biology



Mark Grinstaff et al.
Nature Communications
Synthesis of bioactive (1→6)- β -glucose branched poly-amido-saccharides that stimulate and induce M1 polarization in macrophages

Each year, the research of BU's BME faculty appears in dozens of peer reviewed journals - here are a few representative publications from the last year. For a full list, we encourage you to browse the websites of our faculty colleagues.



Ji-Xin Cheng
Nature Communications
Metabolic reprogramming from glycolysis to fatty acid uptake and beta-oxidation in platinum-resistant cancer cells



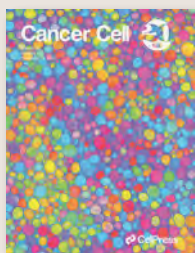
JAMA Network Open
Examination of SARS-CoV-2 In-Class Transmission at a Large Urban University With Public Health Mandates Using Epidemiological and Genomic Methodology



Mo Khalil
Science
Multidimensional control of therapeutic human cell function with synthetic gene circuits



Liangliang Hao et al.
Nature Nanotechnology
CRISPR-Cas-amplified urinary biomarkers for multiplexed and portable cancer diagnostics



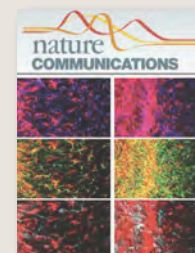
Mo Khalil, Wilson Wong, John Ngo
Cancer Cell - Cell press
High-performance multiplex drug-gated CAR circuits



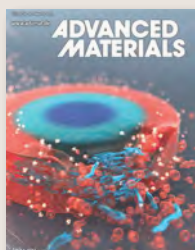
Catherine Klapperich et al.
Microbiology Spectrum
Comparison of BinaxNOW and SARS-CoV-2 qRT-PCR Detection of the Omicron Variant from Matched Anterior Nares Swabs



John Ngo (featured)
Nature Methods
SynNotch tuned for tension



Timothy O'Shea
Nature Communications
Lesion environments direct transplanted neural progenitors towards a wound repair astroglial phenotype in mice



Timothy O'Shea et al.
Advanced Materials
Trehalose-Guanosine Glycopolymers Direct Adaptive Glia Responses in CNS Injury



Bela Suki, Ken Lutchen, et al.
Science Advances
Multiscale stiffness of human emphysematous precision cut lung slices



Adriana Tomic
Nature Communications
Omicron BA.1/BA.2 infections in triple-vaccinated individuals enhance a diverse repertoire of mucosal and blood immune responses



Kavon Karrobi, Mark Grinstaff, Hadi Nia, Darren Roblyer
Nature Biomedical Engineering
In vivo multiscale measurements of solid stresses in tumors reveal scale-dependent stress transmission

BME Department 2022-2023

Faculty

In fiscal year 2023 the BME Department faculty search added three new faculty that will start in the next year. Assistant Professors Samagya Banskota, Miguel Jimenez and Matthias Stangl will start January 1, 2024. At the end of FY 2023, the BME Faculty numbered 42 making the department one of the largest in the country in terms of primary faculty.

Graduate Program

The BME PhD Program awarded 26 degrees in AY22-23, bringing our total PhD degrees awarded to 422 since the program began in 1991. 65 MS degrees were awarded, as well as 27 MEng degrees. Our graduate programs enrolled 255 students (179 PhD students; 5 MD/PhD; 43 MS; 28 MEng).

Graduate student recruitment: In the fall 2022 we matriculated 102 new graduate students (36 PhD, 32 MS, 20 MEng and 14 LEAP). Our applicant pool continues to be competitive with other top tier Biomedical Engineering Programs. In the 2022 - 2023 recruiting season, we received 1,182 applications (PhD, MS and MEng).

Undergraduate Program

The BME Undergraduate Program awarded 177 Bachelor of Science degrees and enrolled 602 students in AY 22-23.

Research

In FY 2023 the BME faculty was awarded \$49,878,135 in extramural funds available for expenditure during the year. They expended \$47,182,403. This translates to about \$1.4M per research active faculty member in new funding and \$1.3M per research active faculty member in expenditures. The faculty submitted 139 research proposals for \$178M.

Our faculty is comprised of world renowned scientists and engineers who work across every scale of biology and in a wide spectrum of bioengineering subspecialties. Their research is driven by advancing fundamental understanding of biology and physiology in health and disease and then translating these principles to new technologies that impact the human condition and the practice of medicine. The research laboratories of the research active faculty members are listed on our web site (<http://www.bu.edu/bme/research/labs/>) and they also participate in 8 interdisciplinary research centers that are directed by BME faculty: Bioengineering Technology and Entrepreneurship Center (BTEC), Biological Design Center (BDC), Biomolecular Engineering Research Center (BMERC), Center on Forced Displacement (CDF), NSF Engineering Research Center in Cellular Metamaterials (CELL-MET), Nanotechnology Innovation Center (BUNano), Neurophotonics Center (NPC), and Precision Diagnostics Center (PDC).



“As biomedical engineers, it's our calling in the world to improve human health. That's what drives every single person here.”

- John A. White, BME Department Chair

BU BME 2022-2023

42 Primary Faculty

184 PhD Students

602 Undergraduates

70 Courses Taught

\$50 MILLION
Research Funding



ADMINISTRATION

CHAIR

Dr. John A. White

VICE CHAIR

Dr. Muhammad Zaman

ASSOCIATE CHAIR FOR GRADUATE PROGRAM

Dr. Mary Dunlop

ASSOCIATE CHAIR FOR UNDERGRADUATE PROGRAM

Dr. Irving Bigio

DIRECTOR OF BME MASTER'S PROGRAMS

Dr. Mario Cabodi

DIRECTOR OF PHD PROGRAM ADMISSIONS

Dr. Darren Roblyer

DIRECTOR FOR MASTER'S PROGRAM ADMISSIONS

Dr. Kamal Sen

DIRECTOR

Matthew Barber

ASSOCIATE DIRECTOR

Christen Bailey

ASSISTANT DIRECTOR, FINANCE & ADMINISTRATION

Crystal Kelley

BME DEPARTMENT STAFF

ADMINISTRATIVE

Stefanie Salguero, *Administrative Assistant to the Chair*

Stephanie Johnson, *Senior Program Coordinator*

Alexa LaCroix, *Senior Program Coordinator*

Lyn Markey, *Design and Communications*

Dr. Joshua Finkelstein, *Executive Director, BDC*

ACADEMIC

Inna Gerzon, *Master's Programs Administrator*

John Benducci, *Undergraduate Program Administrator*

FINANCIAL

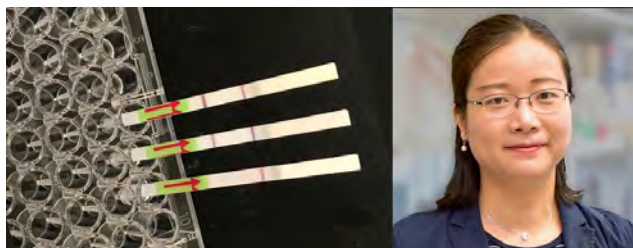
Kyle Best, *Financial Administrator*

Katie Eno, *Financial Manager*

Irene Orzechowski, *Financial Manager*

Laura Prusaitis, *Financial Manager*

Tara Sorrentino, *Financial Manager*



Assistant Professor Liangliang Hao won a Faculty Starter Grant in Translational Medicine from the **Pharmaceutical Research and Manufacturers of America (PhRMA) Foundation**. Her proposal develops a rapid point-of-care test to predict the efficacy of some cancer treatments. The novel paper-based cancer diagnostic will bring tumor monitoring to under-resourced areas, and harnesses the activity of proteases to identify biomarkers that will predict the tumor's response to treatment.



Professor Mark Grinstaff, along with **Professor Xue Han** and an international team of scientists and engineers, has developed a synthetic nanoparticle in the battle against NAFLD, a prevalent liver disease that afflicts roughly a quarter

of the global population. The convergent team sought to understand how fat is metabolized in and removed from the liver cell, with the aim of replicating that process with synthetic nanoparticles.

Assistant Professor Erica Pratt

was appointed **Moorman-Simon Interdisciplinary Career Development Professor**. The Professorship recognizes a promising junior faculty member who is emerging as a future leader within their field. Pratt combines engineering, chemical biology, and oncology with the emerging field of liquid biopsy to develop novel, minimally invasive methods for detecting, characterizing, and ultimately treating multiple forms of cancer.



Professor Chris Chen has been elected to the **National Academy of Inventors** 2022 class of Fellows, the highest professional distinction accorded solely to academic inventors. In recognition of a career filled with patents and inventions, the NAI has honored Chen for his work to pioneer cures for heart attacks, liver disease and more. Both an MD and a PhD, he has a track record of "outstanding contributions to innovation".

A \$1M endowment was established to cover the annual cost of project supplies at BU's Engineering maker spaces. Since the College opened cutting-edge makerspaces eight years ago, student use of them has been strong and getting stronger. These spaces provide students with the "technological expertise & hands-on experience for what's next," says alum Daniel Maneval (BME).



The **US Food and Drug Administration (FDA)** has cleared **Professor Edward Damiano's** iLet Bionic Pancreas for Type 1 Diabetes. Damiano developed the wearable and automated device in his BU Lab 20 years ago. The pocket-sized device combines an insulin infusion pump with algorithm-controlled dosing decision software. The commercial approval marks a massive milestone, offering renewed hope to the almost 2 million Americans with this chronic disease.

The Boston University Center on Forced Displacement

seeks to address the global refugee crisis. The new, university-wide center has the mission to improve the lives of and give voice to displaced people around the world. Cofounder



Muhammad Zaman (professor and vice chair, BME) is joined by an outstanding team of interdisciplinary researchers, scholars, practitioners and students, bringing in talent from across the University with research projects spanning the arts to medical technology.

PhD student Hasini Weerathunge was awarded the **ASHFoundation New Century Scholars Doctoral Scholarship**. This prestigious award supports strong doctoral candidates pursuing a teacher-investigator career. Hasini will use this scholarship to complete her doctoral research investigating the effects of auditory and somatosensory feedback in laryngeal and articulatory motor control in speakers with Parkinson's disease.



BU BME Seminars 2022-23

Ed Boyden, PhD *Massachusetts Institute of Technology*
Tools for Analyzing and Controlling Biological Systems

Miguel Jimenez, PhD *Massachusetts Institute of Technology*
A Cultural Renaissance: Microbial devices as sensors, medicine and beyond

Adam Stevens, PhD *University of California, San Francisco*
Programming Multicellular Interactions and Organization using Synthetic Cell Adhesion Molecules

Justin Riddle, PhD *University of North Carolina*
Leveraging Causal Tools From Cognitive Neuroscience for Personalized Psychiatry

Tina Liu, PhD *Harvard University*
Developing Next-generation Diagnostic Tools Using Tandem CRISPR Nucleases

Karna Gowda, PhD *University of Chicago*
How Does Nature Build Metabolic Factories?

Vayu Maini Rekdal, PhD *University of California Berkeley*
Harnessing microbial metabolism for human health, flavor, and sustainability

Nova Pishesha, PhD *Cerberus Therapeutics*
Exploiting Antigen Presentation Pathways for Precision Immune Engineering

Mingbo Cai, PhD *University of Tokyo*
Deciphering Neural Activity and Human Learning Process with Computational Models

Sara Molinari, PhD *Rice University*
De novo Engineered Living Materials from Bacteria

Noelle Stiles, PhD *University of Southern California*
Restoring Sight to the Blind: Effects of Plasticity and Multimodality

Kun-Hao Yun, PhD *University of Southern California*
Sustainable Bio-inspired and Engineered-living Materials: From Fundamental Mechanics to Novel Applications

Matthias Stangl, PhD *University of California, Los Angeles*
Multi-Modal Neuroimaging Of Human Cognition and Real-World Behavior

Stephanie Noble, PhD *Yale University*
From Fundamental Principles Towards Precision Neuroscience

Jessica Stark, PhD *Stanford University*
Targeting Sugars for Immunotherapy in Cancer and Beyond

Maria Eugenia Inda, PhD *Massachusetts Institute of Technology*
Illuminating inner Depths: Engineering living materials to monitor transient gastrointestinal biomarkers in real-time

Samagya Banksota, PhD *Nvelop Therapeutics*
Engineering Genetically Encoded Systems for Delivery of Therapeutics

Robert Langer, PhD (Colburn Lecture) *Massachusetts Institute of Technology*
Controlling the Release of Large Molecules from Biomaterials

BME Distinguished Seminars

Guillermo Oliver, PhD *Northwestern University*
The Lymphatic Vasculature in the 21st Century: Novel Functional Roles in Homeostasis Disease

Xiaojing Gao, PhD *Stanford University*
Mammalian Synthetic Circuits as Medicine

Catie Chang, PhD *Vanderbilt University*
Functional MRI of Intrinsic Brain Dynamics and Physiological States

William Ratcliff, PhD *Georgia Institute of Technology*
Exploring the Origin of Multicellularity in Real Time: What We've Learned from 5,000 Generations of Laboratory Evolution

Warren C. W. Chan, PhD *University of Toronto*
Nanoparticle Delivery to Solid Tumors



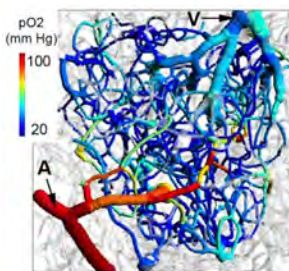
A multidisciplinary team of BU engineers is helping build a next-generation bioreactor to turn food scraps into greener, cleaner manufactured products. **Schmidt Futures** and the **US Department of Defense** have awarded a \$3 million grant to a research consortium including BME **Professors Mo Khalil, Douglas Densmore** and ECE **Asst. Prof. Rabia Yazicigil**, as part of a federal push to make domestic biomanufacturing safe, sustainable and economically viable.



Assistant Professor Hadi Nia was awarded **NIH Director's prestigious New Innovator Award (DP2)** for his groundbreaking lung research technology. The award supports creative, early career investigators who propose innovative, high-impact projects in the biomedical, behavioral or social sciences. The award will empower Nia to pursue novel models and tools to image the lung in real time and at cellular resolution. He

will probe the links between the physics, biology, and immunity of the lung, in both sick and healthy specimens.

With a goal of developing therapies to treat tendon injury in older adults, **Assistant Professor Brianne Connizzo** has been studying the role of inflammation in chronic tendon disease, using a novel rotator cuff tissue model. The prestigious and competitive **American Association of University Women (AAUW) Research Publication Grant** will allow her to continue a study on how aged tendons can be inflammation resistant. The AAUW is one of the world's largest sources of funding for female scientists.



With a **National Institutes of Health BRAIN Initiative Grant Award**, a multi institution team led by **Professor Anna Devor** is leveraging neurophotonics to develop a technique for gathering information about neuronal circuits and their activity using functional MRI (fMRI), a noninvasive imaging method to measure and map brain activity.

With this technique, researchers expect to get a better understanding of how the brain works, and it may prompt faster diagnosis and ultimately more efficient treatment of Alzheimer's and other neurological diseases.

Primary Faculty



IRVING BIGIO

Professor, Biomedical Engineering;
Electrical & Computer Engineering; Physics; Medicine;
Associate Chair for Undergraduate Program
PhD, Physics, University of Michigan

Medical applications of optics, lasers and spectroscopy; biomedical optics and biophotonics; biomolecular dynamics; applied spectroscopy, especially to biomedical problems; nonlinear optics; quantum electronics and laser physics.



DAVID BOAS

Professor, Biomedical Engineering;
Electrical & Computer Engineering;
Director, Neurophotonics Center
PhD, Physics, University of Pennsylvania

Neurophotonics; biomedical optics; functional near infrared spectroscopy; microscopy methods; oxygen delivery and consumption; neuro-vascular coupling; physiological modeling.



CHRISTOPHER S. CHEN

Professor, Biomedical Engineering;
Materials Science & Engineering;
Director, Biological Design Center
MD, Harvard Medical School; PhD, Medical Engineering and Medical Physics, Harvard-MIT Health Sciences and Technology Program
Vascular, cardiac, and stem cell biology and engineering; mechanobiology; micro- and nanotechnology; biomaterials cell adhesion and extracellular matrix.



JI-XIN CHENG

Professor, Biomedical Engineering; Electrical & Computer Engineering;
Chemistry; Physics; Materials Science & Engineering;
Moustakas Chair Professor in Photonics and Optoelectronics
PhD, Chemical Physics, University of Science and Technology of China
Molecular spectroscopic imaging technologies; label-free microscopy; medical photonics; neurophotonics; cancer metabolism; photonics for infectious diseases.



BRIANNE CONNIZZO

Assistant Professor, Biomedical Engineering
PhD, Bioengineering, University of Pennsylvania
Aging; orthopaedic and soft tissues; mechanobiology; multiscale biomechanics; extracellular matrix assembly and remodeling.



EDWARD DAMIANO

Professor, Biomedical Engineering
PhD, Applied Mechanics, Rensselaer Polytechnic Institute
Integrated cellular and extracellular biomechanics; biofluid dynamics; microhemofluidics; microcirculation; vestibular biomechanics; non-Newtonian rheology; closed-loop blood-glucose regulation.



CHARLES DELISI

Dean Emeritus, College of Engineering
Professor, Biomedical Engineering; Physics;
Metcalf Professor of Science and Engineering
PhD, Physics, New York University
Developing and applying computational/mathematical methods, and high throughput experimental methods for inferring the structure and function of protein networks.



BRIAN DEPASQUALE

Assistant Professor, Biomedical Engineering
PhD, Neurobiology and Behavior, Columbia University
Machine learning; computational neuroscience; theoretical neuroscience.



ANNA DEVOR

Professor, Biomedical Engineering
PhD, Hebrew University of Jerusalem, Israel
Cellular and systems-level neuroscience; microscopy; physiological underpinning of noninvasive imaging.



MARY DUNLOP

Associate Professor, Biomedical Engineering,
Associate Chair for Graduate Programs
PhD, Mechanical Engineering, California Institute of Technology
Understanding how microorganisms use feedback to respond to changes in their environment, studying naturally occurring examples of feedback to understand their implications for survival in changing conditions, and engineering novel, synthetic feedback control systems.



MICHAEL ECONOMO

Assistant Professor, Biomedical Engineering
PhD, Biomedical Engineering, Boston University
Systems neuroscience; motor control; long-range neural circuits; computational neuroscience, neurotechnology.



SOLOMON EISENBERG

Professor, Biomedical Engineering;
Electrical & Computer Engineering;
Senior Associate Dean for Academic Programs, College of Engineering
ScD, Electrical Engineering, Massachusetts Institute of Technology
Electrically mediated phenomena in tissues and biopolymers; cartilage biomechanics; computational modeling of electric field distributions in the human thorax and heart during defibrillation; transcranial magnetic stimulation.



JAMES GALAGAN

Professor, Biomedical Engineering;
Microbiology, Chobanian & Avedisian School of Medicine;
Associate Director, Precision Diagnostics Center
PhD, Computational Neuroscience, MIT
Biosensor development; computational biology; systems biology; genomics.



ALEXANDER GREEN

Associate Professor, Biomedical Engineering
PhD, Materials Science and Engineering, Northwestern University
Synthetic biology; nucleic acid nanotechnology; low-cost diagnostics; nanomaterials.



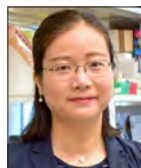
MARK GRINSTAFF

Professor, Biomedical Engineering; Chemistry;
Materials Science & Engineering;
Director, Nanotechnology Innovation Center
PhD, Chemistry, University of Illinois Urbana-Champaign
Biomaterials; tissue engineering; drug delivery; macromolecular chemistry and engineering, self-assembly; nanodevices.



XUE HAN

Professor, Biomedical Engineering
PhD, Physiology, University of Wisconsin-Madison
Neurotechnology; optical neural modulation; optogenetics; neural prosthetics; neural network dynamics; brain rhythms; neurological and psychiatric diseases; cognition.



LIANGLIANG HAO

Assistant Professor, Biomedical Engineering
PhD, Chemical Biology, Northwestern University
Noninvasive disease detection and treatment monitoring at the Point-of-Care; tissue-specific transcriptome engineering; multimodal systemic imaging.

Primary Faculty Cont.



DIANE JOSEPH-MCCARTHY

**Professor of the Practice, Biomedical Engineering;
Executive Director, Bioengineering Technology & Entrepreneurship Center**
PhD, Physical Chemistry, Massachusetts Institute of Technology
Chemical biology, biophysics; computational science; drug discovery & development.



SIMON KASIF

**Professor, Biomedical Engineering;
Bioinformatics; Computer Science**
PhD, Computer Science, University of Maryland
Genomic systems biology; P4 medicine, wellness and disease prevention; medical bioinformatics; artificial intelligence; machine learning; high performance systems; reproducibility and science informatics.



AHMAD (MO) KHALIL

**Professor, Biomedical Engineering; Molecular Biology, Cell Biology & Biochemistry; Bioinformatics;
Associate Director, Biological Design Center**
PhD, Mechanical Engineering, Massachusetts Institute of Technology
Synthetic and systems biology; gene regulation; protein aggregation; microbial communities; laboratory evolution.



CATHERINE KLAPPERICH

**Professor, Biomedical Engineering; Mechanical Engineering; Materials Science & Engineering;
Director, Precision Diagnostics Center;
Associate Director, DAMP-CTL**
PhD, Mechanical Engineering, University of California, Berkeley
Design of new molecular diagnostics and appropriate technologies for healthcare.



LAURA LEWIS

Assistant Professor, Biomedical Engineering
PhD, Neuroscience, Massachusetts Institute of Technology
Brain imaging; neural dynamics; computational neuroscience and signal processing; neural circuits underlying sleep and attention; decoding and predicting brain activity; neurovascular coupling; psychiatric and neurodegenerative disorders.



KENNETH R. LUTCHEN

**Dean, College of Engineering;
Professor, Biomedical Engineering;**
PhD, Biomedical Engineering, Case Western Reserve University
Airway and lung tissue mechanics and ventilation; computational modeling of structure-function relations in the lung; mechanical ventilation; integrated biomechanics of the lung; linear and nonlinear systems identification; blood-glucose regulation.



JEROME MERTZ

**Professor, Biomedical Engineering; Physics;
Electrical & Computer Engineering**
PhD, Physics, Université Paris VI and University of California, Santa Barbara
Development and application of new optical microscopy techniques to biological imaging.



JOHN NGO

Associate Professor, Biomedical Engineering
PhD, Biochemistry and Molecular Biophysics, California Institute of Technology
Protein structure and engineering; molecular and cellular engineering; single-molecule biophysics; cell signaling; fluorescence and electron microscopy.



HADI T. NIA

**Assistant Professor, Biomedical Engineering;
Materials Science & Engineering**
PhD, Mechanical Engineering, Massachusetts Institute of Technology
Tumor microenvironment; physical sciences of cancer; intravital imaging and animal models of cancer; mechanobiology and biomechanics.



TIMOTHY O'SHEA

Assistant Professor, Biomedical Engineering
PhD, Medical Engineering and Medical Physics, Massachusetts Institute of Technology
Glia Engineering, biomaterials, neural engineering, spinal cord injury, stroke, glial neurobiology, regenerative medicine, cell transplantation.



ERICA D. PRATT

**Assistant Professor, Biomedical Engineering;
Materials Science & Engineering**
PhD, Biomedical Engineering, Cornell University
Engineering-focused cancer research; liquid biopsy and rare cell detection; multi-omics in oncology; microfluidics and microfabrication; pancreatic cancer.



DARREN ROBLYER

**Associate Professor, Biomedical Engineering;
Electrical & Computer Engineering;
Director of BME PhD Program Admissions**
PhD, Bioengineering, Rice University
Optical functional imaging; diffuse optics; near infrared spectroscopy; monitoring of emerging targeted and cytotoxic therapies in oncology; non-invasive monitoring of tumor metabolism.



KAMAL SEN

**Associate Professor, Biomedical Engineering,
Director of Admissions and Recruitment for Master's Programs;
Director, Natural Sounds and Neural Coding Laboratory**
PhD, Physics, Brandeis University
Electrophysiological recording of neural responses in auditory processing; theoretical methods to characterize neuronal encoding; computational models of natural sound processing.



MICHAEL L. SMITH

**Associate Professor, Biomedical Engineering;
Materials Science and Engineering**
PhD, Biomedical Engineering, University of Virginia
Cellular mechanotransduction through the extracellular matrix; fibronectin structural biology; microfabricated surfaces for engineering cell function.



DIMITRIJE STAMENOVIĆ

**Professor, Biomedical Engineering;
Materials Science and Engineering**
PhD, Mechanics, University of Minnesota
Respiratory mechanics; cell mechanics; rheology of soft tissues; mechanics of foam-like structures.



BÉLA SUKI

**Professor, Biomedical Engineering;
Materials Science and Engineering**
PhD, Biomechanics, Jozsef Attila University, Szeged (Hungary)
Mechanical properties of living tissues; modeling the dynamic and nonlinear behavior of complex biological systems; pulmonary physiology.



MICHELLE TEPLENSKY

**Assistant Professor, Biomedical Engineering;
Materials Science and Engineering**
PhD, Chemical Engineering, University of Cambridge
Engineering nanotechnology to program immune cell connectivity, processing, and communication by design and harnessing these insights to synthesize potent vaccines; immunotherapeutics.

Primary Faculty Cont.



JOE TIEN

**Associate Professor,
Biomedical Engineering;
Materials Science & Engineering**

PhD, Physics, Harvard University

Vascularization of biomaterials; quantitative physiology of engineered tissues; biomaterials for microsurgical applications; lymphatics; interstitial transport; inverse problems in vascular imaging.



ADRIANA TOMIC

**Assistant Professor,
Biomedical Engineering;
Microbiology**

PhD, Infection Biology, Hannover Medical School

At the interface between computational immunology, infection biology and clinical research, aiming to define the immunological signature of protective immunity in infectious diseases.



LUCIA M. VAINA

**Professor, Biomedical Engineering;
Neurology, Chobanian & Avedisian School of Medicine**

PhD, Mathematical Logic, Sorbonne, Paris; MD/PhD, Neurology, Doctorat d'Etat ès Sciences and in Médecine (MD PhD); Institut National Toulouse, France
Behavioral, functional imaging (fMRI and MEG) and theoretical & computational approaches to study the neural basis and the plasticity of high-level visual functions in the human brain.



SANDOR VAJDA

**Professor, Biomedical Engineering;
Systems Engineering; Chemistry;
Director, Biomolecular Engineering Research Center**

PhD, Chemistry, Hungarian Academy of Science

Scientific computing applied to problems in engineering, biochemistry, and biology, with focus on molecular mechanics, protein structure determination, protein-ligand interactions, docking, and drug design.



JOHN WHITE

**Chair, Biomedical Engineering
Professor, Biomedical Engineering;
Pharmacology and Experimental Therapeutics; Neuroscience**

PhD, Biomedical Engineering, Johns Hopkins University

Mechanisms of episodic memory; pathophysiology of epilepsy; computational neuroscience; design of real-time instrumentation; imaging of activity in neurons and astrocytes.



JOYCE WONG

**Professor, Biomedical Engineering;
Material Science and Engineering**

PhD, Materials Science and Engineering, Program in Polymer Science and Technology, Massachusetts Institute of Technology

Biomaterials, tailoring cell-material interfaces for drug delivery and tissue engineering applications; direct, quantitative measurement of biological interactions.



WILSON WONG

Associate Professor, Biomedical Engineering

PhD, Chemical Engineering, University of California, Los Angeles

Developing ways to control mammalian cell functions through engineering, biological network design, molecular biology, and chemical biology for medical applications at four different levels of regulation: receptor signaling, post-transcription, transcription, and DNA.



MUHAMMAD ZAMAN

**Vice Chair, Biomedical Engineering
Professor, Biomedical Engineering;
Materials Science & Engineering**

PhD, Physical Chemistry University of Chicago

Comprehensive and quantitative approaches to develop a multiscale understanding of cell-matrix interactions for fundamental biological and applied clinical research.

Lecturers



OUSAMA M. A'AMAR

**Senior Lecturer,
Biomedical Engineering**

*PhD, with Distinction, Electrical Engineering,
The National Polytechnic Institute of Lorraine (INPL), France*



XIN BROWN

**Senior Lecturer,
Biomedical Engineering,
Biointerface Technologies Facility Manager**

PhD, Boston University School of Medicine



MARIO CABODI

**Master Lecturer,
Research Assistant Professor,
Biomedical Engineering,
Director of Masters Programs**

PhD, Cornell University



ANDERSON (ICHUN) CHEN

**Lecturer,
Biomedical Engineering;
Micro Nano Imaging Facility Manager**

PhD, Applied Physics, Stevens Institute of Technology



ANDY FAN

**Lecturer,
Biomedical Engineering**

*PhD, Electrical Engineering,
Massachusetts Institute of Technology*

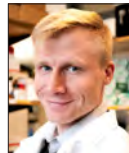


KAVON KARROBI

**Lecturer,
Biomedical Engineering
Manager,**

Bioengineering Technology & Entrepreneurship Center

PhD, Biomedical Engineering, Boston University



JOSHUA KAYS

**Lecturer,
Biomedical Engineering**

PhD, Biomedical Engineering, Boston University



CHRISTINE MULVEY

**Senior Lecturer,
Biomedical Engineering**

PhD, Biomedical Engineering, Boston University



KENN SEBESTA

**Lecturer,
Biomedical Engineering**

PhD, Controls, University of Luxembourg

Research Faculty



ELIZABETH BARTOLAK-SUKI
Research Assistant Professor,
Biomedical Engineering
MD, General Medicine, Szent-Gyorgyi Medical
School, DSc, Molecular Cell Biology, Semmelweis Medical
School
Inter/intracellular signaling and molecular/medical
pathology.



DIMITRI BEGLOV
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transport in the kidney, at different scales, to address
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tational neuroscience; understanding the underlying
mechanisms of neuronal electrical activity and its
implications for synaptic integration and spike output
modulation in cortical circuits.



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Formulation of cortical computation principles
that underlie the speech decoding process and that
are capable of predicting human performance in
speech perception tasks.



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Development of protein-protein and protein-ligand
docking algorithms, fast and efficient scoring
functions for screening large number of potential
docked complexes, protein homology models
suitable for docking.



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Yee, Jessica (*Lewis*)
Zamballo, Courtney (*Lewis*)
Zimmerman, Dabriel (*Lewis*)

External Research Funding

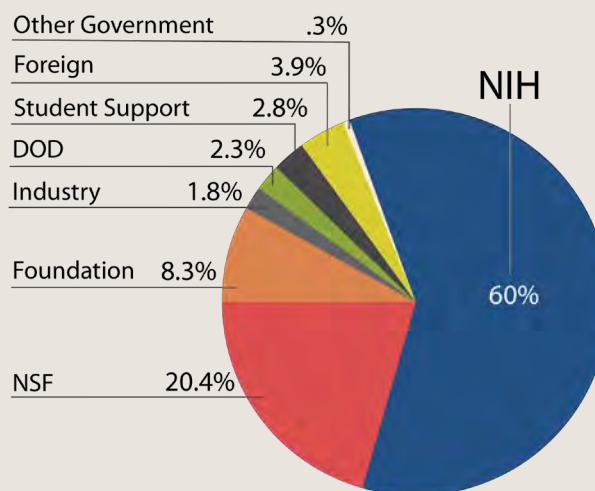
Boston University's Department of Biomedical Engineering

maintains a vibrant research program in its approximately 96,000 square feet of space on Boston University's Charles River Campus. We are comprised of **40 separate research laboratories**, and our faculty lead **8 research centers**.

The research can be characterized by a combination of:

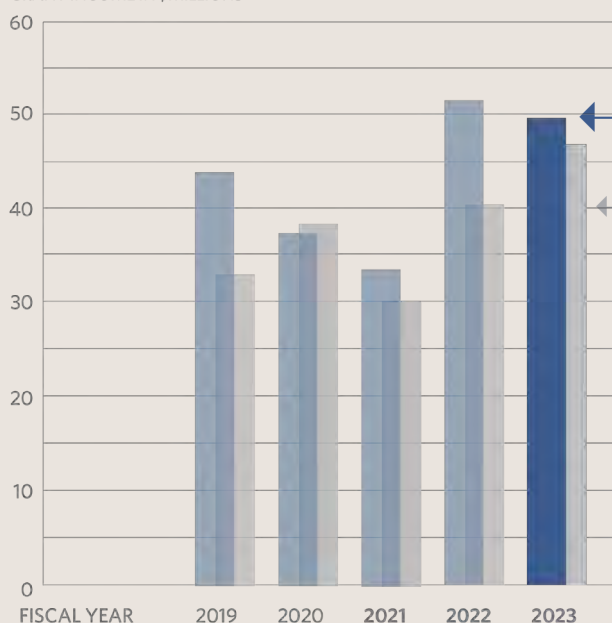
- Empirical and theoretical work with an attention to explicit mathematical models for the phenomena under study
- Intensive computer use for experimental and theoretical work
- A basic scientific flavor to the fundamental questions being asked
- An attention to the applications of improving health care, and a thorough understanding of the underlying physiological processes
- 4 Training Grants funding PhD students

BME Grant Funding by Agency



BME Faculty Annual Total Grant Funding

GRANT INCOME IN \$MILLIONS



BME Faculty Research Funding

\$49,878,135 7/1/22- 6/30/23

\$47,182,403 EXPENDITURES

129 new and continuing awards were funded.

\$178 million in research proposals were submitted.

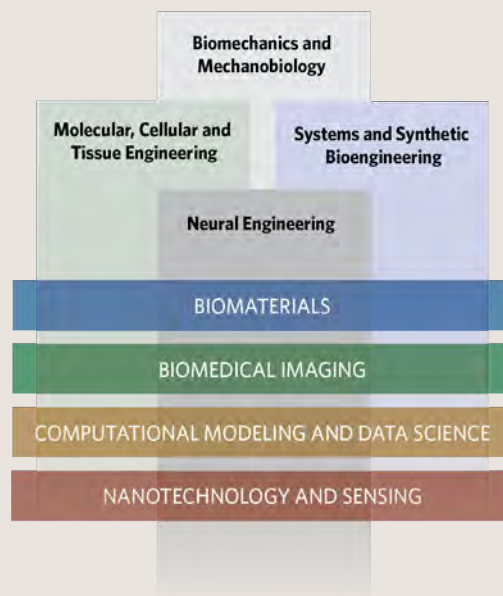
BU BME Research Areas

We have world leaders in these areas of research:

- Biomechanics and Mechanobiology
- Synthetic and Systems Bioengineering
- Molecular-Cellular-Tissue Engineering
- Neural Engineering

Using the enabling technologies:

- Biomaterials
- Biophotonics and Biomedical Imaging
- Computation Modeling and Data Sciences
- Nanotechnology and Sensing



BU Research Centers

BU has eight interdisciplinary research centers that are directed by BME faculty:

BTEC

Bioengineering Technology and Entrepreneurship Center

Transforming education and innovation for bioengineering students through hands-on learning in partnership with industry, from gene editing to biosensors to digital medicine

BDC

Biological Design Center

To rigorously understand life's design principles and re-engineer them to revolutionize our approach to addressing critical challenges in human health and the environment

BMERC

Biomolecular Engineering Research Center

Developing and applying computational methods for the analysis and design of structures, functions, interactions, regulation and evolution of biological macromolecules

CFD

Center on Forced Displacement

Fostering research and engagement with the global challenge of forced displacement, through multidisciplinary teams from across BU, around the country, and around the world

CELL-MET

NSF Engineering Research Center in Cellular Metamaterials

Developing tissue-engineering principles to create scalable, low-cost technologies for growing clinically significant cardiac tissues from cell-level building blocks

BU nano

Nanotechnology Innovation Center

Where nanomaterials intersect medicine and energy through collaborative interdisciplinary research

NPC

Neurophotonics Center

Advancing our understanding and treatment of brain disorders through advanced optical science and photonic systems

PDC

Precision Diagnostics Center

Discovery, design and development and clinical translation of technology for disease screening and monitoring, treatment management and health maintenance

NIH Awards

PI	Award Title	Prime Sponsor	\$ Amount
ZAMAN	OPTIMIZATION AND VALIDATION OF QUANTITATIVE BIREFRINGENCE MICROSCOPY FOR ASSESSMENT OF MYELIN PATHOLOGIES ASSOCIATED WITH COGNITIVE IMPAIRMENTS AND MOTOR DEFICITS IN YOUNG AND OLD AGING MONKEY BRAIN	NIA	559055
BIGIO	VALIDATION OF LIGHT SCATTERING SPECTROSCOPY FOR INTRA-OPERATIVE MARGIN GUIDANCE DURING ORAL CANCER RESECTION	NIDCR (sub BMC)	179235
BOAS	TIME-GATED DIFFUSE CORRELATION SPECTROSCOPY FOR FUNCTIONAL IMAGING OF THE HUMAN BRAIN	NIBIB (sub MGH)	127784
BOAS	NEUROPHOTONIC ADVANCES FOR MECHANISTIC INVESTIGATION OF THE ROLE OF CAPILLARY DYSFUNCTION IN STROKE RECOVERY	NINDS	693711
CHEN	LOCAL REGULATION OF ANGIOGENESIS BY MICROENVIRONMENT	NIBIB	371250
CHEN	NOVEL STRATEGIES TO UNDERSTAND, PREDICT, AND PREVENT VASCULAR TOXICITY OF TARGETED CML THERAPIES	NHLBI (sub TUFTS)	180781
CHEN	DEFINING GENETIC ARCHITECTURE AND PATHWAYS OF DCM	NHLBI (sub WYSS)	31631
CHEN	MULTI-TISSUE PLATFORM FOR MODELING SYSTEMIC PATHOLOGIES	NIBIB (sub WYSS)	14833
CHEN	WYSS UH3 CHEN - YR6 BILLING AGREEMENT	NIBIB (sub WYSS)	1487
CHENG (HAN Co-PI)	UNVEILING THE MECHANISMS OF ULTRASOUND NEUROMODULATION VIA SPATIALLY CONFINED STIMULATION AND TEMPORALLY RESOLVED RECORDING	NINDS	804060
CHENG	TARGETING LIPID UNSATURATION IN OVARIAN CANCER STEM CELLS	NCI (sub NORTHWESTERN U)	170128
CHENG	VIBRATIONAL SPECTROSCOPIC IMAGING TO UNVEIL HIDDEN SIGNATURES IN LIVING SYSTEMS	NIGMS	1155000
CHENG	SENSING VULNERABLE PLAQUE IN VIVO BY AN ALL-OPTICAL INTRAVASCULAR ULTRASOUND AND PHOTOACOUSTIC CATHETER	NHLBI	580378
CHENG	MAPPING CANCER METABOLISM BY MID-INFRARED PHOTOTHERMAL MICROSCOPY	NCI	385566
CHENG	HIGH-CONTENT HIGH-SPEED CHEMICAL IMAGING OF METABOLIC REPROGRAMMING BY INTEGRATION OF ADVANCED INSTRUMENTATION AND DATA SCIENCE	NIBIB	456157
CHENG	SUB-MILLIMETER PRECISION WIRELESS NEUROMODULATION USING A MICROWAVE SPLIT RING RESONATOR	NEI	247500
CHENG	INCORPORATION OF QUANTITATIVE SRS IMAGING IN SEISA FOR DEVELOPING ANTICANCER NANOMEDICINES	NCI (sub Brandeis U)	123750
CHENG	FLUORESCENCE ENHANCED PHOTOTHERMAL INFRARED SPECTROSCOPY (FE-PTIR) BREAKTHROUGH FOR SIMULTANEOUS FLUORESCENCE MICROSCOPY AND SUB-MICRON IR SPECTROSCOPY	NIGMS (sub Photothermal Spectroscopy Co)	150000
CONNIZZO	AGING AND INFLAMMATION IN THE ETIOLOGY OF COMPRESSION-INDUCED TENDON DEGENERATION	NIA	331500
CONNIZZO	NON UNIFORMITY IN THE PDL: STRUCTURE AND FUNCTION OF THE DENSE COLLAR	NIDCR (sub TUFTS)	38814
CONNIZZO	CENTER FOR SKELETAL RESEARCH (OVERALL APPLICATION) - PILOT AWARDS SUBPROJECT FUND	NIAMS (sub MGH)	33400
DENNIS	IN VIVO MAPPING OF ENZYME ACTIVITY USING SWIR-EMITTING, SELF-ILLUMINATING QUANTUM DOT SENSORS	NIBIB	24750
DEVOR	LOCAL NEURONAL DRIVE AND NEUROMODULATORY CONTROL OF ACTIVITY IN THE PIAL NEUROVASCULAR CIRCUIT	NINDS	2784416
DEVOR	EFFECTS OF INTRINSIC AND DRUG-INDUCED NEUROMODULATION ON FUNCTIONAL BRAIN IMAGING	NIDA	377297
DEVOR	UNDERSTANDING THE RELATIONSHIPS BETWEEN FUS-BBB OPENING, NEUROINFLAMMATION, AND THE NEUROVASCULAR RESPONSE	NIBIB (sub BWH)	58316
DUNLOP	CELL-TO-CELL HETEROGENEITY AND THE EMERGENCE OF ANTIBIOTIC RESISTANCE	NIAID	503821
ECONOMO	REVERSE ENGINEERING THE BRAIN STEM CIRCUITS THAT GOVERN EXPLORATORY BEHAVIOR	NINDS (sub UCSD)	100000
ECONOMO	LINKING MOTOR CORTEX ACTIVITY AND MOVEMENT IN THE MOUSE OROFACIAL SYSTEM.	NINDS	489752
EDWARDS	RENAL ELECTROLYTE HANDLING IN FEMALES VS. MALES OVER LIFE CYCLE	NIDDK (sub USC)	159939
EYCKMANS	DEVELOPMENT OF A WOUND-ON-CHIP MODEL TO STUDY STROMAL-EPITHELIAL INTERACTIONS DURING TISSUE REPAIR	NIBIB	20625
GALAGAN (KLAPPERICH Co-PI)	NOVEL BIOSENSORS BASED ON MINING BACTERIAL TRANSCRIPTION FACTORS	NIBIB	655799
GREEN	RAPID LOW-COST PAPER-BASED BIODOSIMETRY THAT REVEALS INDIVIDUAL ORGAN INJURIES	NIAID (sub ASU)	91874
GRINSTAFF	SUPERHYDROPHOBIC DRUG LOADED BUTTRESSES FOR PREVENTION OF LUNG TUMOR RECURRENCE	NCI	505038
GRINSTAFF	OPTIMIZATION OF NANOPARTICLE TUMOR-LOCALIZATION AND DRUG-LOADING FOR TREATING MESOTHELIOMA	NCI	500083
GRINSTAFF	SULFATED POLY-AMIDO-SACCHARIDE (SULPAS) BIOMATERIALS AS ANTICOAGULANTS	NHLBI	562489
GRINSTAFF	R21: A NOVEL ANTIBODY-DRUG CONJUGATE FOR TREATMENT OF SQUAMOUS CELL LUNG CARCINOMA	NCI	192844
GRINSTAFF	SUSTAINED RELEASE RELAXIN-2 FOR THE TREATMENT OF FROZEN SHOULDER	NIAMS	1246667

NIH Awards Cont.

PI	Award Title	Prime Sponsor	\$ Amount
GRINSTAFF	BIODEGRADABLE, BIOCOMPATIBLE PRESSURE SENSITIVE ADHESIVES	NHLBI	1076134
GRINSTAFF	THE CONUNDRUM OF ABSENTEE RECEPTORS: EFFICACY POTENTIATION THROUGH DRUG-RECEPTOR MODULATION	NIAMS	649942
GRINSTAFF	SUPRATHERAPEUTIC PTX BUTTRESSES REDUCE LOCOREGIONAL RECURRENCE RATES FOLLOWING SURGERY FOR SOFT TISSUE SARCOMAS	NCI (sub BWH)	171187
HAN	VOLTAGE IMAGING ANALYSIS OF STRIATAL NETWORK DYNAMICS RELATED TO VOLUNTARY MOVEMENT AND PARKINSONS DISEASE	NINDS	484917
HAN	MULTIDIMENSIONAL OPTIMIZATION OF VOLTAGE INDICATORS FOR IN VIVO NEURAL ACTIVITY IMAGING	NIMH	677707
HAN	OPTICAL VOLTAGE IMAGING ANALYSIS OF THE CELLULAR AND NETWORK MECHANISMS OF DEEP BRAIN STIMULATION	NINDS	2023746
HAO	DEVELOPING MULTIPLEXED MICROENVIRONMENTAL SENSORS FOR PRECISION DIAGNOSTICS OF CANCER METASTASIS	NCI	249000
KHALIL (WONG W Co-PI)	SYNTHETIC TOOLKIT FOR PRECISION GENE EXPRESSION CONTROL AND SIGNAL PROCESSING IN MAMMALIAN CELLS	NIBIB	675046
KHALIL	PROGRAMMABLE BENCHTOP BIOREACTORS FOR SCALABLE ECO-EVOLUTIONARY DYNAMICS OF THE HUMAN MICROBIOME	NIAID	837526
KHALIL	EPACE: AUTOMATION PLATFORMS FOR ADAPTABLE AND SCALABLE CONTINUOUS EVOLUTION OF BIOMOLECULES WITH THERAPEUTIC POTENTIAL	NIBIB	871502
KINSTLINGER	SYNTHETIC MORPHOGENESIS TO RECAPITULATE MULTICELLULAR AIRWAY BRANCHING PATTERNS	NHLBI	69500
LEWIS	SLEEP-DEPENDENT MODULATION OF CEREBROSPINAL FLUID FLOW IN AGING AND ACROSS GENETIC RISK FOR ALZHEIMER'S DISEASE	NIA	690591
LEWIS	FMRI TECHNOLOGIES FOR IMAGING AT THE LIMIT OF BIOLOGICAL SPATIOTEMPORAL RESOLUTION	NIBIB (sub MGH)	48149
LEWIS	NEURAL CIRCUIT CONTROL OF FLUID AND SOLUTE CLEARANCE DURING SLEEP AWD00005648	NINDS (sub U Rochester)	507430
MERTZ	FAST, LARGE-SCALE NEURONAL IMAGING WITH MULTI-Z CONFOCAL MICROSCOPY	NIBIB	441393
MERTZ	MULTI-LAYER NEURONAL IMAGING WITH REVERBERATION MULTIPHOTON MICROSCOPY	NINDS	400516
MOYA	A SCALABLE METHOD FOR MAPPING MICROCONNECTIVITY IN TRANSCRIPTOMICALLY DISTINCT NEURON TYPES	NIMH	69802
NGO	INTEGRATIVE APPROACHES FOR PROBING CELL MECHANOTRANSDUCTION IN HEALTH AND DISEASE	NIGMS	412500
NGO	DEVELOPING A TEMPORALLY-REGULATED GENE THERAPY FOR THERAPEUTIC ANGIOGENESIS	NHLBI	67174
NIA	PROBING FUNCTIONING LUNG AT THE CELLULAR RESOLUTION IN HEALTH AND DISEASE	NHLBI	1485000
O'SHEA	INTRAVITAL IMAGING OF TRANSPLANT EVOKED GLIA REPAIR IN STROKE	NINDS	247500
ROBLER	LABEL-FREE MEASUREMENT OF BLOOD LIPIDS WITH HYPERSPECTRAL SHORT-WAVE INFRARED SPATIAL FREQUENCY DOMAIN IMAGING TO IMPROVE CARDIOVASCULAR DISEASE RISK PREDICTION AND TREATMENT MONITORING	NIBIB	20923
ROBLER	FREQUENCY DOMAIN DIFFUSE OPTICAL SPECTROSCOPY AND DIFFUSE CORRELATION SPECTROSCOPY FOR ASSESSING INSPIRATORY MUSCLE METABOLISM IN MECHANICALLY VENTILATED PATIENTS	NIBIB	200840
ROBLER	FREQUENCY DOMAIN SHORTWAVE INFRARED SPECTROSCOPY (FD-SWIRS) FOR VOLUME STATUS MONITORING DURING HEMODIALYSIS IN END STAGE KIDNEY DISEASE	NIDDK (sub USC)	254104
ROBLER	MULTIPLEXED IMAGING IN THE NEAR INFRARED WITH INDIUM PHOSPHIDE QUANTUM SHELLS	NIGMS (sub Northwestern U)	110478
TOMIC	SYSTEMS IMMUNOLOGY APPROACH TO UNDERSTAND INFLUENZA IMMUNITY	NIAID (sub JHU)	306954
VAJDA	ANALYSIS AND PREDICTION OF MOLECULAR INTERACTIONS	NIGMS	576150
WHITE	SYNCHRONIZATION IN NOISY, HETEROGENEOUS EXCITATORY/INHIBITORY NETWORKS	NINDS (sub LSU)	200091
WONG W (Grinstaff Co-PI)	PRECISE TUMOR TARGETING WITH LOGIC CAR CIRCUITS	NCI	554582
WONG W	MULTIPLEXED AND LOGICAL CONTROL OF THE MAMMALIAN TRANSCRIPTOME USING CAS13	NIBIB	396889
WONG W (Grinstaff Co-PI)	TARGETING FIBROBLAST DISCOIDIN DOMAIN RECEPTOR 2 FOR IMMUNOTHERAPY TO PULMONARY FIBROSIS	NHLBI (sub U Michigan)	20975
WONG J	THE BOSTON UNIVERSITY KIDNEY AND MEDICAL ENGINEERING PROGRAM (BU-KIDMEP)	NIDDK (sub BMC)	13157
HAN (Co-PI, KRAMER PI)	TARGETING PATHOLOGIC SPIKE-RIPPLES TO ISOLATE AND DISRUPT EPILEPTIC DYNAMICS	NINDS (sub MGH)	237371

NSF Awards

PI	Award Title	Prime Sponsor	\$ Amount
CHEN (Co-PI, BISHOP PI)	NANOSYSTEMS ENGINEERING RESEARCH CENTER FOR DIRECTED MULTISCALE ASSEMBLY OF CELLULAR METAMATERIALS WITH NANOSCALE PRECISION: CELL-MET	NSF	7530481
CHEN	SCIENCE AND TECHNOLOGY CENTER FOR ENGINEERING MECHANO-BIOLOGY	NSF (sub UPENN)	125000
ECONOMO	CAREER: HIGH-LEVEL CONTROL OF LOW-LEVEL CIRCUITS IN THE MAMMALIAN MOTOR SYSTEM	NSF	700000
GALAGAN	NOVEL PROGESTERONE BIOSENSOR FOR MONITORING FERTILITY HEALTH	NSF (sub BioSens8)	78045
HAN	COLLABORATIVE RESEARCH: DYNAMIC INTERACTIONS OF INDIVIDUAL NEURONS IN SUPPORTING HIPPOCAMPAL NETWORK OSCILLATIONS DURING BEHAVIOR	NSF	73641
KHALIL	UROL: EPIGENETICS 2: ROBUSTNESS AND ADAPTABILITY OF THE DYNAMIC EPIGENOME: A MULTISCALE APPROACH	NSF (sub Brandeis U)	267636
HAN (Co-PI, BOBAK PI)	CIF: MEDIUM: DISCOVERING CHANGES IN NETWORKS: FUNDAMENTAL LIMITS, EFFICIENT ALGORITHMS, AND LARGE-SCALE NEUROSCIENCE	NSF	599282
NIA	CAREER: LUNGEX FOR PROBING MULTISCALE MECHANOBIOLOGY OF PULMONARY RESPIRATION-CIRCULATION COUPLING IN REAL-TIME	NSF	566473
ZAMAN	D-ISN/COLLABORATIVE RESEARCH: FINANCIAL AND NETWORK DISRUPTIONS IN COUNTERFEIT AND ILLEGAL MEDICINES TRADE	NSF	250000

Awards from Industry

PI	Award Title	Prime Sponsor	\$ Amount
BOAS	COMPARING LASER SPECKLE CONTRACT AND DIFFUSE CORRELATION SPECTROSCOPY MEASUREMENTS IN HUMAN BRAIN FUNCTION	FACEBOOK	584
CHENG	INFRARED THERMAL SENSING OF SINGLE BIO-NANOPARTICLES	Leonardo DRS Daylight Solutions	100000
GRINSTAFF	STUDENT BILLING AGREEMENT FOR KIRK PIERCE	BIDMC	43700
KHALIL	SEMI-CONTINUOUS EVOLUTION OF DNMT3A/L-BINDING NANOBODIES FOR TARGETED EPIGENOME EDITING	Chroma Medicine	228383
NIA	PROBING THE PHYSICAL AND IMMUNE MICROENVIRONMENT IN LUNG TUMORS AT HIGH SPATIOTEMPORAL RESOLUTION	Johnson & Johnson Enterprise Innovation,	250000
ROBLER	ESTIMATING BLOOD PRESSURE CHANGES USING LASER SPECKLE CONTRAST MEASUREMENTS ON THE WRIST AND HAND	Facebook	269561
WHITE	INVESTIGATING HOW BIOCHEMICAL AND MECHANICAL CUES SHAPE CALCIUM DYNAMICS IN FIBROBLAST CELLS	HHMI	3000
WONG	MINIATURIZED MICROFLUIDIC DEVICE FOR HIGH THROUGHPUT FORMULATION OF LIPID NANOPARTICLES	Pfizer, Inc.	16500
ZAMAN	2021 DCLC - DR. MUHAMMAD ZAMAN	Howard Hughes Medical Institute	10000

Awards from Other Government Agencies

PI	Award Title	Prime Sponsor	\$ Amount
BIGIO	PERSONNEL AGREEMENT FOR RESEARCH SERVICES OF OUSAMA A'AMAR	VA	12665
BIGIO	PERSONNEL AGREEMENT FOR RESEARCH SERVICES OF IRVING BIGIO	VA	53121
CHENG	IPA FOR CHENG JI-XIN	VA	22119
CHENG	PERSONNEL AGREEMENT FOR RESEARCH SERVICES OF HONGJIAN HE	VA	75120

Foreign

PI	Award Title	Prime Sponsor	\$ Amount
KHALIL	SCALABLE AND AUTOMATABLE NANOBODY DISCOVERY AND AFFINITY MATURATION IN YEAST	FTX	1550000
KLAPPERICH	SARS-COV-2 VARIANT DYNAMICS	China Evergrande Group (sub BMC)	29481
ZAMAN	GOVERNING THE GLOBAL ANTIMICROBIAL COMMONS IN A SUSTAINABLE, ACCEPTABLE, FAIR AND EFFECTIVE (SAFE) MANNER	Social Sciences and Humanities Research (sub York U)	125867
ZAMAN	HEALTH OF REFUGEES AND FORCIBLY DISPLACED COMMUNITIES	Wellcome Trust	251508
CHENG (Co-PI, YANG PI)	FABRICATION OF FLAT PHOTOACOUSTIC FILM FOR RETINAL STIMULATION	Axorus	9999

Awards from Foundations

PI	Award Title	Prime Sponsor	\$ Amount
CHEN	ENGINEERING HIGH DENSITY FUNCTIONAL VASCULAR, LYMPHATIC, AND DUCTAL TREES	WELLCOME TRUST (SUB WYSS)	250265
CHENG	BOND-SELECTIVE INTENSITY DIFFRACTION TOMOGRAPHY	SILICON VALLEY COMMUNITY FOUNDATION	1360955
CONNIZZO	INFLUENCE OF SEX AND HORMONE SIGNALING ON RECOVERY FROM EXERCISE	WU TSAI HUMAN PERFORMANCE ALLIANCE	200000
ECONOMO	INVESTIGATING THE CONTROL OF MOVEMENTS BY SUBSPACES AND CELL TYPES IN THE MOUSE OROFACIAL SYSTEM	WHITEHALL FOUNDATION	75000
GRINSTAFF	RELAXIN-2 AS A NOVEL INTRA-ARTICULAR THERAPEUTIC FOR ARTHROFIBROSIS	BLAVATNIK FAMILY FOUNDATION (SUB BIDMC)	81464
KHALIL	DECIPHERING A NEW DIMENSION OF GPCR BIOLOGY THROUGH THE CONTINUOUS EVOLUTION OF BIASED MODULATORS	KECK FOUNDATION (SUB UC IRVINE)	500000
KLUMPE	DAMON RUNYON POSTDOCTORAL FELLOWSHIP AWARD	DAMON RUNYON CANCER RESEARCH FOUNDATION	62000
LEWIS	SPI STEVENS: GLIAL MECHANISMS BY WHICH SLEEP PRESERVES COGNITIVE FUNCTION AND PLASTICITY IN AGING	SIMONS FOUNDATION	250000
LEWIS	IMAGING ELECTROPHYSIOLOGICAL AND FLUID DYNAMICS IN THE SLEEPING BRAIN	THE MCKNIGHT FOUNDATION	75000
O'SHEA	DIRECTING ADAPTIVE GLIA REPAIR IN ADULT SPINAL CORD INJURY USING INJECTABLE BIOMATERIALS	PARALYZED VETERANS OF AMERICA	150000
SEN	INVESTIGATING AUDITORY SCENE ANALYSIS IN HUMANS WITH WEARABLE FNIRS AND EEG	AMERICAN HEARING RESEARCH FOUNDATION	50000
SHAW	DECIPHERING GENETIC AND EPIGENETIC REGULATION IN EUKARYOTIC GENE CLUSTERS USING SYNTHETIC GENOMICS	EUROPEAN MOLECULAR BIOLOGY ORGANIZATION	10000
UROZ	MELANOMA VESSEL CO-OPTION IN BRAIN METASTASIS	NHLBI	71306
WONG	ENGINEERING BRANCHING NETWORKS THROUGH SYNTHETIC TURING MORPHOGEN CIRCUITS	ALLEN INSTITUTE	200000
KHALIL (Co-PI, YAZICIGIL PI)	SCHMIDT FUTURES MODULAR BIOFILM REACTORS TO CONVERT WASTE-BASED FEEDSTOCKS TO VITAMIN A	SCHMIDT FUTURES (SUB BioMADE)	750000
ZAMAN	FELLOWSHIP IN QUALITY OF MEDICAL PRODUCTS AT BOSTON UNIVERSITY	UNITED STATES PHARMACOPEIAL CONVENTION	55216

Awards for Student Support

PI	Award Title	Prime Sponsor	\$ Amount
ADEWUMI	FACULTY FOR THE FUTURE FELLOWSHIP	Schlumberger Foundation, Inc.	50000
BRESSLER	DEVELOPMENT OF A SURGICAL DRUG DELIVERY SYSTEM FOR ENHANCEMENT OF CAR T CELL ACTIVITY	NCI	51752
DORAN	SIMULTANEOUS OPTICAL VOLTAGE IMAGING AND FMRI IN BEHAVING MICE	NINDS	39091
DUNLOP	CLARE BOOTHE LUCE FELLOWSHIP FOR MADISON FLETCHER	Henry Luce Foundation	112157
EWOLDT	HYPERTROPHIC CARDIOMYOPATHY-INDUCED PARACRINE SIGNALING AND STROMAL ACTIVATION	NHLBI	47694
GRINSTAFF	TRANSLATIONAL RESEARCH IN BIOMATERIALS	NIBIB	318373
LAMMERS	ELUCIDATING MECHANISMS FOR RAPID VASCULARIZATION BY MODELING VASCULAR ISLANDS IN EARLY EMBRYOGENESIS	NHLBI	49252
MOUNT	MECHANISTIC STUDY OF THE ROLE OF AUTISM SPECTRUM DISORDER RISK GENES IN HIPPOCAMPAL CA1 POPULATION DYNAMICS DURING LEARNING AND MEMORY	NIMH	39932
NIA	CLARE BOOTHE LUCE GRADUATE FELLOWSHIP FOR GABRIELLE GRIFNO	Henry Luce Foundation, Inc.	76947
SHI	PROBING IMMUNOVASCULAR MECHANOBIOLOGY IN PNEUMONIA-ASSOCIATED ACUTE LUNG INJURY AT THE SINGLE CAPILLARY LEVEL	NHLBI	52694
SIDDIQUI	ENGINEERING CAR T CELLS TO ESTABLISH STABLE MIXED CHIMERISM IN ALLOGENEIC TRANSPLANTATION	NHLBI	37783
WHITE	TRAINING PROGRAM IN QUANTITATIVE BIOLOGY & PHYSIOLOGY (QBP)	NIGMS	530535

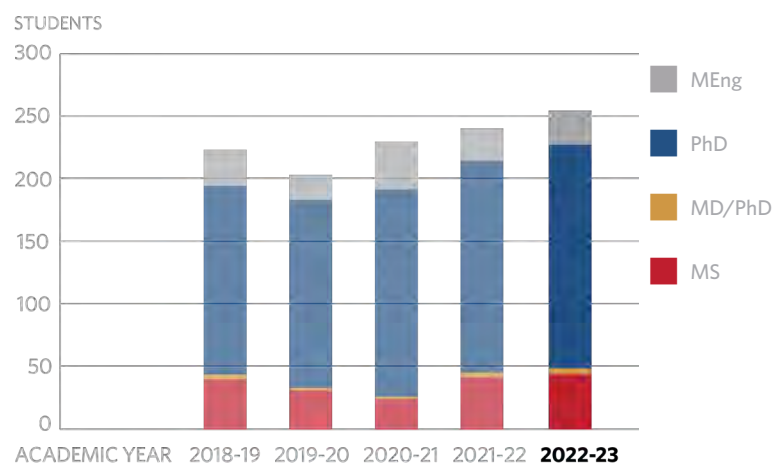
PI	Award Title	Prime Sponsor	\$ Amount
GALAGAN	BIOSENSORS FOR PHYSIOLOGICAL MONITORING FROM BACTERIAL MINING	DOD	150,000
GALAGAN	BIOLOGICAL AND PHYSIOLOGICAL MONITORING AND MODELING	DOD	167000
GREEN	DIAL-A-THREAT	DOD (sub Excet Inc)	213422
KHALIL	EPIGENETICALLY PROGRAMMED BIOLOGICAL MATERIALS	DOD	599626

Graduate Enrollment

ENROLLMENT FOR AY 2021-2022

		LEAP	MS	MD/PhD	PhD	MEng	TOTAL
US	M	7	19	4	78	7	115
	F	5	16	1	52	18	92
INT'L	M	1	4	0	17	1	23
	F	2	4	0	32	2	40
TOTAL		15	43	5	179	28	270

GRADUATE PROGRAM POPULATION

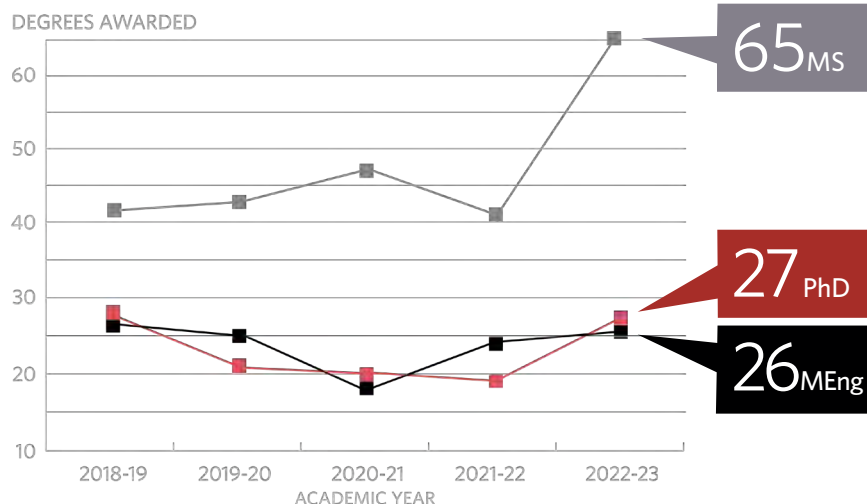


GRADUATE FUNDING AY 2021-2022

FELLOWSHIPS AND GRANTS	PhDs
Doctoral Research Fellowship	115
BME Distinguished Fellowship	19
Dean's Fellowship	2
NIH Quantitative Biology and Physiology T32 Training Grant	11
NIH Translational Research in Biomaterials T32 Training Grant	6
NIH Synthetic Biology and Biotechnology T32 Training Grant	2
BUSM T32 Training Grant	2
NSF Graduate Research Fellowship	11
NIH F31 Fellowship	7
Martin Luther King Fellowship	1
Taiwan Government Fellowship	1
Schlumber Foundation Fellowship	1
Dean's Fellowship	1
Clare Booth Luce Fellowship	1
Nanotechnology Innovation Center (BU nano) Fellowship	1
Kilachand Fellowship	1
Fellowship funded by Abhijit Kulkarni Gift	1
Lincoln Lab Scholarship	1
TOTAL	184

Graduate Degrees Awarded

DEGREES AWARDED



ADMISSION RESULTS FOR AY 2021-2022

		APPLICANTS					MATRICULANTS				
		LEAP	MEng	MS	PhD	TOTAL	LEAP	MEng	MS	PhD	TOTAL
US	M	15	26	51	148	240	7	5	9	13	34
	F	14	46	58	206	324	5	11	13	16	45
INT'L	M	4	33	87	166	290	1	2	1	3	7
	F	11	34	81	151	277	2	2	1	8	13
TOTAL		44	139	277	671	1131	15	20	24	40	99

ADMISSION RESULTS FOR AY 2022-2023

		APPLICANTS					MATRICULANTS				
		LEAP	MEng	MS	PhD	TOTAL	LEAP	MEng	MS	PhD	TOTAL
US	M	10	24	53	163	250	7	6	14	15	42
	F	14	47	53	194	308	5	14	11	9	39
INT'L	M	11	28	71	229	339	0	0	3	4	7
	F	8	24	86	210	328	2	0	4	8	14
TOTAL		43	123	263	796	1225	14	20	32	36	102

PHD Graduates

AUGUST 25, 2022

Usman Ghani
(Sandor Vajda, PhD Advisor)
"Investigating Determinants of Tumor Escape and Developing Computational Tools for Protein-Protein Interface Analysis"

Xuedong Zhu
(Michelle Sander, PhD Advisor)
"Pulsed Infrared Light for Modulating Neuromuscular Transmission"

JANUARY 13, 2023

Yoseph Warren Dance
(Joe Tien, PhD Advisor)
"Engineering Three-Dimensional Breast Tumor-on-a-Chip Devices to Investigate the Roles of Adipose Tissue and Obesity in the Early Stages of Breast Cancer Metastasis"

Megan Elizabeth Griebel
(Sandor Vajda, PhD Advisor)
"Deconstructing Wound Healing: in vitro Models and Factors Affecting Stromal Tissue Repair"

Zachary Joseph Heins
(Mo Khalil, PhD Advisor)
"Development of the eVOLVER Continuous Culture Platform for High-Throughput Phage-Assisted Continuous Evolution"

Uros Kuzmanovic
(James Galagan, PhD Advisor)
"Mining Microbes to Engineer Novel Biosensors"

Antonio Ortega Martinez
(David Boas, PhD Advisor)
"Wearable Brain Computer Interfaces with Near Infrared Spectroscopy"

David Patrick McIntyre
(Doug Densmore, PhD Advisor)
"Design Automation and Rapid Prototyping of Multi-Component Droplet Microfluidic Platforms"

Matthew Herbert Ning
(Kamal Sen, PhD Advisor)
"Decoding Spatial Location of Attended Audio-Visual Stimulus with EEG and fNIRS"

Jian Carlo Paz Nocon
(Kamal Sen, PhD Advisor)
"Neural Circuits for Solving the Cocktail Party Problem in Mouse Auditory Cortex"

Breanna M. O'Reilly
(Allyson Sgro, PhD Advisor)
"Multiscale Interrogation of Mechanically Driven Stromal Cell Behaviors"

Anup Tank
(Darren Roblyer, PhD Advisor)
"Optical Imaging Markers of Breast Cancer Treatment Response and Resistance"

Jiarui Yang
(David Boas, PhD Advisor)
"Serial Sectioning Block-Face Imaging of Post-Mortem Human Brain"

MAY 21, 2023

Mark Samuel Aronson
(Allyson Sgro, PhD Advisor)
"Biophysical Methods Bridging Signal Pathway Architecture and Dynamics in Multigenerational Bacterial Processes"

Yage Ding
(Wilson Wong, PhD Advisor)
"Orthogonal Inducible Control of Cas13 Circuits Enables Programmable RNA Regulation in Mammalian Cells"

John Thomas Giblin
(David Boas, PhD Advisor)
"Quantifying the Effects of Cerebral Capillary Flow Disruptions with Two Photon Microscopy"

Chuoqiao Huyan
(Allyson Sgro, PhD Advisor)
"Advance Cell Signaling Interrogation Using Theoretical and Experimental Approaches in Eukaryotic Model Systems"

Sebastian Eureko Jusuf
(Ji-Xin Cheng, PhD Advisor)
"Antimicrobial Phototherapy: Mechanisms and Translation"

Jack Rainier Kirsch
(Mark Grinstaff, PhD Advisor)
"Biotherapeutic Potentiation for the Treatment of Musculoskeletal Disease"

Andrew Martin
(Mark Grinstaff and Xue Han, PhD Co-Advisors)
"Tools for Modulating and Measuring Autophagy"

Rebecca Anna Mount
(Xue Han, PhD Advisor)
"Characterization of Hippocampal CA1 Network Dynamics in Health and Autism Spectrum Disorder"

Robert Sabatelle
(Mark Grinstaff, PhD Advisor)
"Design, Formulation Characterization and Evaluation of Polymeric Nanoparticles for Local Chemotherapy"

Nathan Tague
(Mary Dunlop, PhD Advisor)
"Utilizing Light as an Input and Output for Synthetic Biology and Metabolic Engineering"

Yuying Tan
(Ji-Xin Cheng, PhD Advisor)
"Uncovering Cancer Metabolic Signatures by High-Content Stimulated Raman Scattering (SRS) Imaging"

Kuan Cheng Wu
(David Boas, PhD Advisor)
"Critical Closing Pressure with Pulsatile Diffuse Optical Signals"

Xin Ye
(Jerry Chen, PhD Advisor)
"Ultra-Fast Two-Photon Microscope for Population Neuronal Voltage Imaging"

MENG Graduates

AUGUST 25, 2022

Catherine E. Barker
Nushera Khan

JANUARY 13, 2023

MEng with Practice Degree**Jessica Koch**

MAY 21, 2023

Kylee Ann Adams Anders
Christopher Baeky
Julie Anne Constantinescu
Stella Arianna Erickson
Omar Labban
Ryan Jason Lee
Aubrey Anmei Little
Erin Lockhart
Destiny Uchechi Matthew
Anushka Murti
Alexandra Catherine Elizabeth Nadeau
Matthew Thomas Nestler
Camille Nimmer-Guentner
Thomas Edward Joseph Noonan
Chisom Joan Orakwue
Corey Jacob Orlando
Ana Margarita Rosa Garcia
Alice Margaret Rose
Sara Elizabeth Rumpfer
Kaylee P. Tran
Sarah Michelle Young

MEng with Practice Degrees

Jordan Michelle Camarillo
Tzu-Yu Chiang

Brennan Lilliana Lavoie

MS Graduates

AUGUST 25, 2022

Isabella Camille Darke

Marissa McPhillips
(Joyce Wong, MS Thesis Advisor)
"A Biomaterials Science and Engineering Approach to Developing Spion-Based Lipid Nanoparticle Systems for Rare Immune Cell Isolation"

Inbo Shim
(Wilson Wong, MS Thesis Advisor)
"Tuning the SUPRA CAR to Different High/Low HER2 Levels"

Eileen Carol Walsh-Rock
(Joyce Wong, MS Mentored Project Advisor)
"Targeted Microbubbles as a Theranostic for Nascent Abdominal Adhesions"

Sydney Bailes
(Laura Lewis, PhD Advisor)
"Investigating Alterations in Resting-State and Sleep-Related Network Dynamics in Aging Populations"

Katie A. Bunde
(Michael Smith and Dimitrije Stamenović, PhD Co-Advisors)
"Application of Biomechanical Imaging to Observe the Effect of Force Transmission on Tensional Homeostasis of Living Cells"

Daniel David Carbonero
(John White and Mark Kramer, PhD Co-Advisors)
"Machine Learning Framework for Analyzing Shifting Neuronal Network Dynamics in Calcium Recordings"

Jingyao Chen
(Wilson Wong, PhD Advisor)
"Cell-Free Recombinase Genetic Circuit for Biological Memory Storage"

Neilesh Raymond Frings
(Elise Morgan, PhD Advisor)
"Characterizing the Vertebral Endplate Region and its Risk of Failure with Respect to Aging and Disc Degeneration"

Nin Rebecca Kang
(Alex Green, PhD Co-Advisor)
"Integrating Antibodies and Nucleic Acid Amplification for Rapid, Sensitive and Portable Protein Detection"

De'Ja Simone Rogers
(David Boas, PhD Advisor)
"Investigating Spontaneous Dynamics during All Sleep Stages using Modified fNIRS-EEG Hybridization"

Cristina Tous
(Wilson Wong, PhD Advisor)
"Optogenetic Control of Mammalian Gene Expression using Recombinases and Cas13"

Jeremy Christian Tran
(John Ngo, PhD Advisor)
"Proteolytic Regulation of Natural and Synthetic Notch Signaling Proteins"

MS with Practice Degree**Yibin Chen**

JANUARY 13, 2023

Priyam Shrikant Ambastha
(Mo Khalil and Christine McBeth, MS Thesis Co-Advisors)
"Developing a Microfluidic Device for Detecting Antibiotic Tolerance in Bacteria"

Sina Analoui
(Ben Scott, MS Mentored Project Advisor)
"Dispersion and Differentiation of Transplanted HVC-Derived Neural Progenitors in Juvenile Finches"

Anna Dailey Barbo
(Irving Bigio, MS Mentored Project Advisor)
"Multispectral Imaging of Colonoscopies"

Nina Zhou Chen
(Cathie Klapperich, MS Mentored Project Advisor)
"Designing In-House Lateral Flow Strips"

Yuqi Chen
(Ji-Xin Cheng, MS Mentored Project Advisor)
"Video-rate Mid-infrared Photoacoustic Microscopy"

Christian Daniel DeMoya
(Mark Grinstaff, PhD Advisor)
"Development of a Sulfated Poly(amido-saccharide) Interpenetrating Polymer Network as a GAG-Mimetic Treatment for Osteoarthritis"

Pierre Fabris
(Xue Han, PhD Advisor)
"Genetically Encoded Post-Synaptic Activity Indicators"

Zhongyue Guo
(Ji-Xin Cheng, PhD Advisor)
"Protein Aggregation in Living Cells by Mid-infrared Photothermal Microscopy"

Munib Hasnain
(Mike Economo, PhD Advisor)
"Investigating Population-Level Control Mechanisms of Movement Planning and Execution in the Mouse Motor Cortex"

Sebastian Jusuf
(Ji-Xin Cheng, PhD Advisor)
"Potentiation of Antimicrobials through Catalase Inactivation for Skin and Soft Tissue Infections"

Christopher Joseph Kuffner
(John Ngo, PhD Advisor)
"Conditionally Stable Proteins for Single-Molecule RNA Imaging and Protein Interaction Control in Live Cells"

Rang Li
(Diane Joseph-McCarthy, MS Thesis Advisor)
"Computational Identification of Antibody-Binding Epitopes from Mimotope Datasets"

Colleen Mary McCarthy
(Joyce Wong, MS Thesis Advisor)
"Fibrin Targeting Microbubbles for the Detection of Nascent Surgical Adhesions"

Adam Case McCormack

Mohamed Athif Mohammad Rizan (Xue Han, PhD Advisor)
"Single-Cell and Population Dynamics of Neuronal Networks"

Shriya Gajanan Nimbalkar
(Brianne Connizzo, MS Mentored Project Advisor)
"In vivo Model to Investigate the Effect of Sustained Inflammation on Shoulder Joint Health"

Owen O'Connor
(Mary Dunlop, PhD Advisor)
"High Throughput Analysis of Single-Cell Dynamics in Bacterial Microcolonies Using Deep Learning"

Nikola Otic
(David Boas, PhD Advisor)
"Multi-Wavelength Multi-Distance Approach for Evaluating the Metabolic Activity of the Brain in Diffuse Correlation Spectroscopy and Wearable Near Infrared Spectroscopy"

Kathryn Eleanor Regan
(Hadi Nia, PhD Advisor)
"Probing the Multiscale Mechanical Properties of Biological Tissues in 3-D at Optical Resolution"

Abhishek Samal
(Lucia M. Vaina, MS Mentored Project Advisor)
"Critical Regions Underlying the Detection of a Moving Object during Observer's Self-Motion"

Brett Michael Tingley
(Mark Grinstaff, PhD Advisor)
"Disabling Respiratory Virus Proliferation via Localized Drug Delivery and Virus Deactivating Nanoparticles"

Brandon Williams
(John White, PhD Advisor)
"Mechanisms of Neural Synchrony in the Medial Entorhinal Cortex"

Siyi Zheng
(Hadi Nia, MS Thesis Advisor)
"Evolution of Residual Solid Stresses and Viscoelastic Properties in Murine Brains by Age"

Xingjian Zhong
(Allison Dennis, PhD Advisor)
"Evaluating NIR-II Active Semiconductor Nanocrystals towards Biomedical Applications"

MS with Practice Degree

Prem Nelesh Kothandaraman Gowri
(Michael Albro, MS Mentored Project Advisor)
"Optimizing TGF- β in Engineered Cartilage and Studying the Effects of Clustered Cell Morphology"

MAY 21, 2023

Honour Oluwatemiloron Adewumi
(Tim O'Shea, PhD Advisor)
"Engineering Immature Astrocyte Grafts for Neural Regeneration"

Andrew S. Chan
(David Boas, MS Mentored Project Advisor)
"Fluoro-Sequencing of Proteins using Hyperdimensional Imaging"

Jiyang Chen
(Ji-Xin Cheng, MS Mentored Project Advisor)
"Near Infrared Phototherapy of MRSA: Sensitizes MRSA to Anti-Microbials in Both in vitro and in vivo Environment"

Dhimiter Cobani
(Sandor Vajda, MS Mentored Project Advisor)
"Improving Antibody-Antigen Structure Prediction Using AlphaFold-2"

Cristian Enrique Coriano-Ortiz
(Mary Dunlop, PhD Advisor)
"Characterization of Optogenetic Systems for Multiplexed Control of Synthetic Biological Networks"

Aditya Datye
(Shelley Fried and Lucia M. Vaina, MS Mentored Project Co-Advisors)
"Morphological Analysis of Fluorescently Labeled Ion Channels in CNS Neurons"

David DeMeritt
(David Boas, MS Mentored Project Advisor)
"Semi-Auto OCT Stalling Validation"

Simrita Dhulekar
(Joyce Wong, MS Mentored Project Advisor)
"Characterization of Fibrin-Targeted Polymerized Shell Microbubble Theranostic Agents for the Detection and Treatment of Abdominal Surgical Adhesions"

Eric Michael DuBois
(Tim O'Shea, PhD Advisor)
"Regulation of Glial Interfaces in the Mouse Central Nervous System Leveraging Bioactive, Glycosylated Materials"

Amit Eshed
(Alex Green, MS Thesis Advisor)
"Aptamer-Based Sequence Verification Platform for Rapid Multiplexed Detection of Viral RNA Targets"

Ariane Garrett
(Darren Roblyer, PhD Advisor)
"Monitoring Cardiovascular Health with Speckle Contrast Optical Spectroscopy"

Yuyang Gu
(Mark Grinstaff, MS Thesis Advisor)
"Poly(1,2-glycerol carbonate) Nanoparticles for Delivery of Hydrophilic Therapeutics"

Rose Anna Keating
(John Ngo, MS Thesis Advisor)
"Translational Control via Viral Protease Activated Stop Codon Base Editing"

James Kweonkyeong Kim
(Xue Han, MS Mentored Project Advisor)
"Investigate L-dopa Induced Dyskinesia and Potential Music Therapy for Parkinson's Disease"

Noshin Nawar
(Zeba Wunderlich, PhD Advisor)
"Quantifying Heterogeneity in the Drosophila melanogaster NF-KB Imd Pathway of Innate Immunity with Live Imaging of Fluorescent Reporters"

Jinan Qin
(Alex Green, MS Mentored Project Advisor)
"Investigating Methods to Protect Linear DNA in Lysate-Based Cell-Free Protein Expression Systems"

Cara Rose Ravasio
(Xue Han, PhD Advisor)
"Understanding Deep Brain Stimulation in the Hippocampus"

Shruthi Sankaranarayanan
(Alex Reinhart, MS Thesis Advisor)
"Causal Role of Different Frequencies of Brain Rhythms for the Processing of Conscious and Unconscious Perceptual Contents"

Dylan A. Smolen
(Hadi Nia, MS Thesis Advisor)
"Design and Fabrication of Porcine Crystal Ribcage for High Resolution ex vivo Imaging"

Azeo Torre
(Hadi Nia, MS Mentored Project Advisor)
"Lung Cancer Classification using Deformable Image Registration of Sequential CT volumes and Machine Learning"

Anish Srinivas Vasan
(Chris Chen and Jeroen Eyckmans, PhD Co-Advisors)
"Effects of Senescence on 3D Matrix Generation in a Wound-on-Chip Model"

Austin Wetzel
(Alberto Cruz-Martin, MS Mentored Project Advisor)
"Implementing a Multi Camera Acquisition Pipeline to Study Rodent Behavior"

Aleksandrs Zosuls
(Kamal Sen, MS Thesis Advisor)
"Focal Stimulation of the Basilar Membrane"

MS with Practice Degrees

Soham Prasad Kulkarni
(Jeroen Eyckmans, MS Mentored Project Advisor)
"Validation of WoundCompute: A Program to Assess Wound Closure in Engineered Microtissues"

Sydney Helen Marchando
(Joyce Wong, MS Thesis Advisor)
"Establishing a Method for Modulating Progesterone Using a Nanoparticle-Based System"

Jashan Sandhu
(Arjit Chakravarty and Diane Joseph-McCarthy, MS Mentored Project Co-Advisors)
"Engineering Molecular Binders to Prevent SARS-CoV-2 Spike Protein from Adopting a Conformation Competent to Bind its Human Receptor"

GRAD STUDENT AWARDS, TALKS AND FELLOWSHIPS

SB2/QBP/TRB Annual Symposium - Best Talk: **Adam Sanford**

NIH F31: **Patrick Doran**

Kilachand Fellowship: **Erin Neu**

NIH/NHLBI F31: **Menna Siddiqui**

NSF-GRFP: **Juan Jaramillo Montezco**

NSF GRFP: **Vivian Shi**

International Society for Magnetic Resonance in Medicine - ISMRM Summa Cum Laude Merit Award (talk): **Baarbod Ashenagar**

World Congress on Endometriosis in Edinburgh Scotland (poster): **Emily Davis**

Gordon Research Conference - Synthetic Biology (talk): **Jingyao Chen**

Gordon Research Conference : Physical Science of Cancer: **Rohin Banerji**

NSF GRFP Honorable Mention: **Zoe Garman**

BMES (talk): **Eric DuBois**

SB3C: Neil Frings, **Timothy Josephson**

BMES Faculty for the Future Schlumberger Foundation (poster): **Honour Adewumi**

BUnano: **Brett Tingley**

BMES 2023 : **Laboni Hassan**

University of Wisconsin Division of Otolaryngology, Voice & Swallow Clinics Lecture Series: **Hasini Weerathunge**

ASHA Convention: **Hasini Weerathunge**

Harvard-MIT Speech and Language Biomarkers Interest Group: **Hasini Weerathunge**

Neural Bases of Speech Production Symposium: **Hasini Weerathunge**

ASHFoundation New Century Scholars Doctoral Scholarship: **Hasini Weerathunge**

Academy of Neurologic Communication Disorders and Sciences (ANCDS) Student Fellowship: **Hasini Weerathunge**

American Speech-Language-Hearing Association Pathways program: **Hasini Weerathunge**

American Speech-Language-Hearing Association Research Mentoring-Pair Travel Award: **Hasini Weerathunge**

Barrels Meeting XXXV: **Hasini Weerathunge**

McNair Scholars program at UConn - PhD panel: **Hasini Weerathunge**

NSF Graduate Research Fellowship(posters): **Hasini Weerathunge**

Undergraduate Enrollment

ENROLLMENT FOR AY 2022-2023

602 STUDENTS
in the BME program

34%
of the College of
Engineering

	BME Department			All College of Engineering		
	F	M	TOTAL	F	M	TOTAL
FRESHMAN	106	72	178	201	308	509
SOPHOMORE	86	83	169	157	345	502
JUNIOR	62	56	118	112	223	335
SENIOR	66	71	137	134	272	406
TOTAL	320	282	602	604	1148	1752

COLLEGE OF ENGINEERING SELECTIVITY FOR AY 2022-2023

51% INCREASE
in selectivity over 10 years

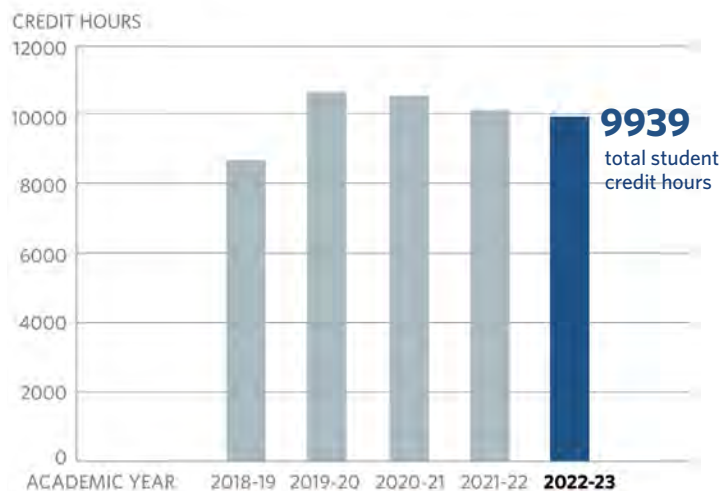


BME TEACHING HISTORY - AY 2022-2023

70 COURSES TAUGHT

42 PRIMARY FACULTY

\$50 MILLION
in research funding



Undergraduate Degrees Awarded

BS DEGREES BREAKDOWN - AY 2022-2023

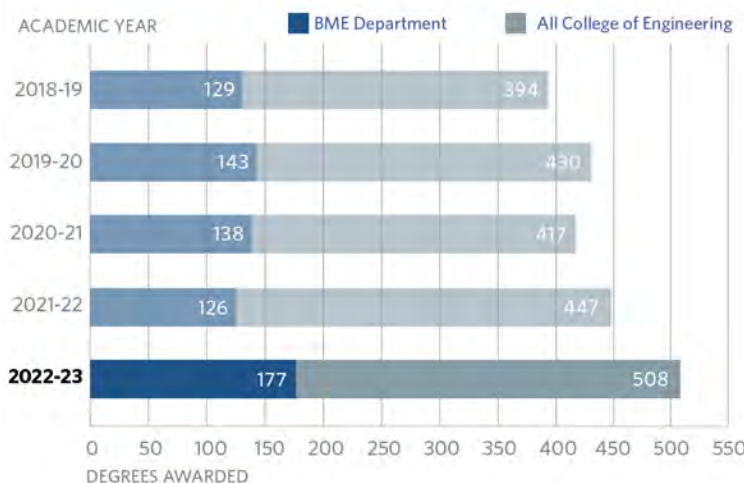
The Department awarded

177

BACHELOR OF SCIENCE
DEGREES

22%

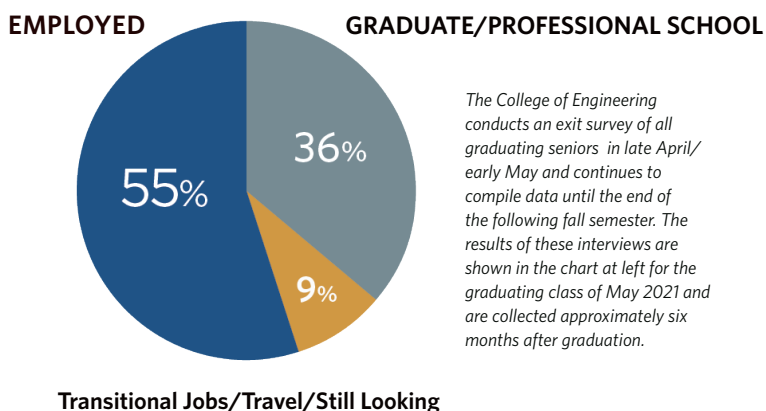
of all the BS degrees awarded by
the College of Engineering.



TRACKING ALUMNI

POST GRADUATION PLANS - 2020-2021 BME GRADUATES

91% EMPLOYED
or ENROLLED IN
GRADUATE SCHOOL
of 2020-2021 graduates



MMEDIC

MMEDIC

The **Modular Medical/Dental Integrated Curriculum (MMEDIC)** is a competitive early selection program that leads to a BS in Engineering and an MD from the Medical School.

This program is offered and administrated in collaboration with our School of Medicine and is designed to train biomedical engineers who have the MD as their ultimate degree objective. MMEDIC admits to the School of Medicine a small number of highly qualified students who have completed two years of the premedical option of the biomedical engineering curriculum. The program is not designed to accelerate the engineering or the medical training but rather to effect a better transition from undergraduate engineering study to graduate medical training. The BS in Biomedical Engineering is normally earned after 4 years of undergraduate study and the MD after an additional 4 years of study at the Boston University Medical School.

Undergraduate Student Awards

In 2023, several of the BME seniors were recognized for achievements and contributions to the Boston University community and BME profession.

Adam M. Miller Memorial Award:	Awarded by the Biomedical Engineering Department to the graduating senior who has best advanced the reputation and prestige of the department through his/her involvement in department, college, university, professional activities, or organizations, as well as through the academic and senior project programs. This year the award was presented to Riya Sen .
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Engineering Alumni Association Student Leader Award:	Presented to seniors who have made outstanding contributions to the College and University through their involvement in activities and organizations. The 3 award winners this year are Anushka Rathi , Owen Kelly and Brian Zhou .
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Student Advisor Service Awards:	Among the ENG winners for outstanding assistance in advising this year, the following BME seniors were recognized: Owen Kelly , Kate Lee , Yuke Li , Laura Raiff , Riya Sen and Ahmed Al Saif .
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Undergraduate Student Service Award:	This year's award winner is BME senior Soumaya Fayie .
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Outstanding Senior Project Award:	First Place in the Department's 2023 Outstanding Senior Design Project Award went to Ksenija Tasich , Krish Kapadia , Naimah Gill and Sarah Sheng for their project "Panoramic Camera Design for the Detection of Colorectal Cancer", under the supervision of Ousama A'amar and Irving Bigio (Boston Veterans Administration Hospital)
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Societal Impact Capstone Project Award (joint award):	Second Place in the Department's 2023 Societal Impact Capstone Project Award went to Alexandra Dolynuk , Soumaya Fayie , Kfir Flank , Aurelia Leona and Farida Korna for their project "White Matter Lesion Quantification from Structural Brain Images".
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Entrepreneurial Award:	Second Place in the Department's 2023 Entrepreneurial Award went to Mikayla Crowley and Dea Turashvili for their project "Autonomic Nervous System Data: Automatic Analysis".
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Undergraduate Student Organizations

Boston University Student Chapter of the Biomedical Engineering Society

The purpose of the Biomedical Engineering Society is: "To promote the increase of biomedical engineering knowledge and its utilization." The student chapter at Boston University works towards this goal in all of its activities. The Biomedical Engineering Society provides a focus for community building among BME students with activities which strengthen their understanding of and interest in Biomedical Engineering. The Society provides students with literature, field trips, films and guest lectures, which provide them with a "resource center" concerning such vital areas as career opportunities and graduate study in Biomedical Engineering.

BMES Officers AY 2021-2022

President - Prinjali Kalyan '23

Vice President - Brian Zhou '23

Treasurer - Abbigale Shi '24

Communications Chair:- Yiwen Zhang '24

Events Chair - Maiko Lum '25

Public Relations Chair - Arya Padalkar '24



Undergraduate Research Activities

Fellows from the **Distinguished Summer Research Fellowship program (DSRF)** spend the summer engaged in a transformative research experience under the guidance of a faculty member. The program provides students with \$10,000 per summer to cover housing, living expenses, and research expenses such as supplies, books, and related travel. Fellows must work full time in the lab of an engineering faculty member for at least 10 weeks.

The College of Engineering **Supplemental Undergraduate Research Funds (SURF)** program encourages faculty to involve undergraduates in their research programs during the academic year by providing matching funds for undergraduate students who are working on faculty-sponsored research. Requests for SURF funds are made by individual students when they have found positions in faculty labs.

The **Undergraduate Research Opportunities Program (UROP)** is a University-wide academic program which promotes participation by Boston University undergraduates in faculty-mentored research across all disciplines and throughout the calendar year.

DSRF Summer 2022

Gabriela Berniac
Hadassah Flagg
Rashid Kolaghassi
Farida Korna
William Krska
Taylor Ly
Johnathan Muhvich
Danielle Nadira
Do Hyun Park
Sarah Sheng
Armaan Vasowalla
Yiwen Zhang

DSRF Summer 2023

Jacob Labovitz
Julia Nowak
Logan Packard
Alexander Wagner
Chunlin Zhu
Anvita Reddy

SURF Summer 2022

Grace Chabbott
Hailey Fox
Ronald Huang
George Katsarakas
Kate Lee
Aurelia Leona
Yifei Liu
Shea Mowry
Nisrine Rahmaoui
Ayrton Reulet
Emilia Schimmelpfennig

SURF Fall 2022

May Aon
Gabriela Berniac
Massinissa Bosli
Grace Chabbott
Jacob Chin
Kayla Dunson
Sanford Edelist
Ricardo Fernandez
Hailey Fox
Anne-Sophie Gall
Emma Hartman
Maxine Hsiung
Ronald Huang
Innah Jeon
George Katsarakas
Anna Kawai
Madelyn Keller
Kate Lee
Aurelia Leona
Nicole Leonard
Yifei Liu
Taylor Ly
Artemis Margaronis

SURF Spring 2023

May Aon
Massinissa Bosli
Grace Chabbott
Jacob Chin
Kayla Dunson
Sanford Edelist
Ricardo Fernandez
Anne-Sophie Gall
Emma Hartman
Maxine Hsiung
Jivesh Jain
Allen Jang
Innah Jeon
Anna Kawai
Madelyn Keller
Kate Lee
Aurelia Leona
Nicole Leonard
Joseph Licata
Audrey Lindsay
Taylor Ly
Hanhminh Nguyen
Dylann Palmer
Savannah Parke
Felicia Pinto
Emily Pira
Marissa Ruiz
Adora Saro
Rashmina Sayeeda
Emilia Schimmelpfennig
Erin Shivers
Iris Vinal
Anne Zambon
Yiwen Zhang

SURF Summer 2023

Sulaiman Alsalamah
May Aon
Samer Berghol
Massinissa Bosli
Jacob Chin
Henry Chow
Ricardo Fernandez
Zain Jafri
Allen Jang
Madelyn Keller
Samuel Krick
Meron Nephtalem
Hanhminh Nguyen
Takaya Niibori
Dylann Palmer

UROP Fall 2022

Sukhneet Bhogal
Yazmin Camacho
Andy Liu
Emilia Schimmelpfennig
Olivia Border
Jacob Chin
Alexandra Dolynuk
Nourhan El Sherif
Veronica Hui
Madelyn Keller
Owen Kelly
Nikhil Lahiri
Jeffrey Li
Siyuan Li
Joseph Licata
Payton O'Connor
Ananya Pamaraj
Sabrina Wilderotter

UROP Spring 2023

Bernadelle Boateng
Massinissa Bosli
Sukhneet Bhogal
Madelyn Keller
Jeffrey Li
Emily McCarthy
Takaya Niibori
Payton O'Connor
Laura Raiff
Sabrina Wilderotter

UROP Summer 2023

Henry Chow
Ricardo Fernandez
Aidan Holmes
Jivesh Jain
Allen Jang
Nikhil Lahiri
Joseph Licata
Audrey Lindsay
Emily Long
Emily McCarthy
Hawa Ndiaye
Takaya Niibori
Abed Rhmari Tlemcani
Varun Shah
Anne Marie Zambon

The Senior Design Project

A major strong point of our undergraduate program continues to be the **Senior Design Project**.

Biomedical Engineering



The Senior Design Project Experience

Every BME senior is required to develop a project proposal with an individual faculty member, local area scientific mentor, or even a bioengineering corporate technical advisor (with a BME faculty co-supervisor). The project is then carried out with the guidance of the student's technical advisor. This brings together elements of engineering science and engineering design. In coordination with the technical work, this course includes experience in planning, establishing priorities and formal training in technical communication including proposal, abstract, progress reports and oral and written presentations of the final work. In conjunction

with the BME Department's Visiting Committee, we have additional lectures from our industry partners to expose the students to elements of entrepreneurship, business plans, intellectual property, marketing, and clinical regulatory issues. The project continues over the full academic year and culminates in a Senior Design Project Conference that is attended by students, faculty, and representatives from BME industry, hospitals and other academic institutions. A record of the project presentations is followed by a listing of participating companies.

2023 Project Presentations

Devices

Development of a Device to Assess Closed-loop Reaching in Children with Motor Disability

Taylor Ly, Tucker Lau, Amy Zeng, Marian Karam, Lizzy Avery

Multiplexed SNP Detection for Rapid Drug Resistance Analysis

Kyra Scott, Nancy Perez, Eren Ergene

Electrically Modulated Optical Phantoms for Mimicking In Vivo Hemodynamics of Layered Tissue

Saif Eldeen Ragab, Nicholas Wayhs

Soft Robotics for Active Resistance Hand Rehabilitation

Megan Le, Tessa Johnson, Caroline Stevenson (ECE), Tommy Murillo, Justin Sadler (ECE)

Accessible, Efficient, and Reusable Cytospinning Apparatus for Cancer Diagnostics

Olivia Lewallen, Kate Lee

Smartphone Based Detection and Monitoring of Skin Jaundice in Newborn Babies

Hailey Fox, Minh Nguyen, Grace Lange, Paridhi Surana, Esha Vaishnav

Burst Pressure/Leak Testing System for Surgical Adhesives

Brian Zhou, Aniket Joshi, Felicia Pinto, Prinjali Kalyan

Fluidic Trapping Device for Electron Microscope Sample Preparation

Bo Zhou, Ziyang Zhang

The Senior Design Project

Devices (continued)

In situ Hydrating Polymer Coatings to Improve Chronic Performance of Neural Devices

Riya Sen, Payton O'Connor

PanCam - Panoramic Camera Design for the Detection of Colorectal Cancer

Ksenija Tasich, Krish Kapadia, Naimah Gill, Sarah Sheng

Laryngoscopic Attachment

Ruhaan Bhagat, Zixin Guan, Zixian He, Yousuf Shehadi, Camila Zhan Jin

Automation of a Lick Port for Neuroscience Experiments

Daniel Jiang, Shouhao Jiang

Autonomic Nervous System Data: Automatic Analysis

Dea Turashvili, Mikayla Crowley

Neuroengineering

SynapseSafe: A Device To Detect Mild Traumatic Brain Injury (mTBI) In Athletes Using Brain Waves and Cerebral Blood Flow

Johnathan Muhvich, Maria Shevchuk, Layth Amra, Rashid Koughassi (ME)

Utilizing Speckleplethysmographic (SPG) Waveforms To Determine Brain Activation-Induced Blood Flow

Chancellor Lee, Ananya Mehta, Evgeniia Kozlova, Grace Chabott, Matthew Leal

Biomarker-Based Optimization For Alzheimer's Disease Classification

Kerena Belony, Nicholas Chong, Aiyana Cubias, Jordana Kasaato, Amber McBorrough

40 Hz Investigation on Brain Cognitive Ability Enhancement

Junny Myung, Ahmed Al Saif, Ameen Andijiani, Abdulaziz Sulimani, Saud Alfakhri

Investigating Biophysical Effects of Ultrasound Neuromodulation

Laura Raiff, Natalia Alonzo

Cancer Technologies

Multiplexed Microfluidic Analytical Platform (M-MAP)

Benedek Gyuris, Patra Hsu

Age-Related Differences in Strain Transfer Mechanisms from ECM to Cell

Nick Mauro, Zewen Zhao

Polymer-Drug Conjugation for Ultra-High Loading Nanoparticles

Alexia Kaloudis, Melissa Gillis

Investigating the Effects of Pulmonary Diseases on Lung Acoustics as Potential Diagnostic Biomarker

Nicholas Rabines, Alexander Barutis, Alejandro Smith Malizia, Dogancan Kuyel

Boosting the Chemotherapeutic Effect of Cancer Drugs using Focused Ultrasound (FUS)

Jason Gashi, George Katsarakis

Software Generation for Visual Analysis of Multiomic Data

Isha Havale, Owen Murray, Jarod Zizza, Kevin Panaro

PREDICT96 Data Analysis Pipeline

Sumner Warden, Stephen Sweet, Jeevith Chandrasekar, Jin San Yoon

Digital & Predictive Medicine

Software for Closed-loop Neurofeedback

Emma Hartman, Yuhang Li, Yuke Li, Wei-Fang Liu, Yongjun Lu

White Matter Lesion Quantification from Structural Brain Images

Farida Korna, Aurelia Leona, Soumaya Fayie, Kfir Flank, Alexandra Dolynuk

Interactive Speech Therapy Application for Children with Autism Spectrum Disorder

Aida Berberian Morales, Jason Lipari, Emily Boyce, Ashraye Vallabhaneni

Integrated Platform for Cell Quantification, Morphometrics, and Statistical Analysis

Chenkai Yao, Kevin Yuyang Kang (ECE)

Computational Investigation of Peptide Binding to Fibrin for Molecular Imaging of Post-Surgical Abdominal Adhesions

Nicole Ostrovsky, Alisha Ragatz

The Senior Design Project

Synthetic Biology/Cell & Tissue Engineering

Developing an In vitro Model of Luminal Breast Cancer

Anushka Rath, Owen Kelly

Design of a Streamlined Tissue Engineered Blood Vessel Biofabrication Platform

Duy Nguyen, Connor Brashears, Drew Aggarwal, Shawn Xu, Daniel Ludwizewski

Expanding the Optogenetic Toolkit through the Development of Light-inducible Phenotype Switches for Multiplexed Control of Gene Expression

Jenny Deng, Vinaya Akavoor, Chenxuan Tong

Leveraging Optogenetics for the Development of Tissue Patterning

Miguel Mazumder, Gaby Berniac, Richaa Kalva

High-throughput In Vitro Assessment of Paracrine Factors in Cardiac Fibrosis

Artemis Margaronis, Medha Shekhar

Projects Previously Presented

Microneedle Array-Based Kit for Painless Point-of-Care Anemia Diagnostics

Jordan Ahn, Chloe Grubb, Grant Winkey, Kelton Nguyen

Detection and Analysis of Iron Deficiency Biomarkers for Point-of-Care Anemia Diagnostic Test

Brandon Kao, Oskar Cheranov, Varun Bhalla

Bactericidal Topology for Medically Implantable Device Surfaces

Mia Metni, Ann Rizos, Robert Henderson, Vaibhavi Hansrajani, Gus Betts-O'Rourke

Project Javelin - Titania Nanorods

Andrew Finebaum, Tomer Kushner, Christo Pulickal, Christopher Coco

Fixing Irreparable Rotator Cuff Tears By Restoring The Subacromial Space

Katie Hill, Alec Perliss

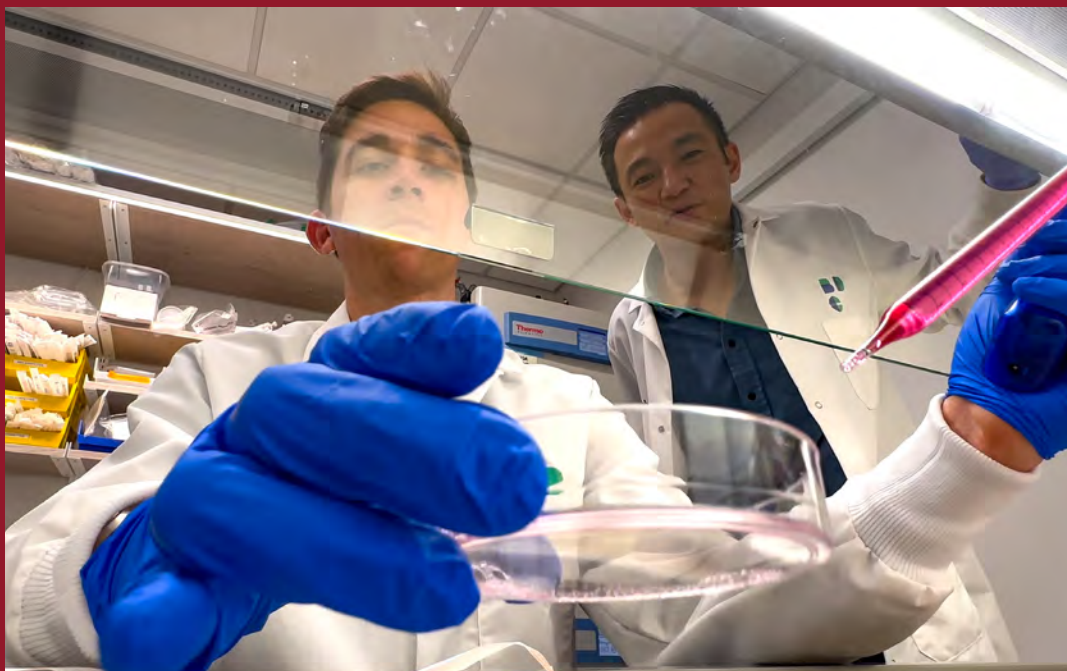


First Place in the Department's 2023 Outstanding Senior Design Project Award went to Sarah Sheng, Krish Kapadia, Ksenija Tasich and Naimah Gill, shown here with Professors Diane Joseph-McCarthy and Darren Roblyer. Their project "Panoramic Camera Design for the Detection of Colorectal Cancer" was supervised by Professors Ousama A'amar and Irving Bigio.

The Senior Design Project

Participating Companies

3M	Columbia University, College of Physicians and Surgeons	Massachusetts General Hospital
Accenture Life Sciences	Comprehensive Health Management Inc.	Massachusetts Institute of Technology
Advanced Instruments, Inc.	ConforMIS, Inc.	Medtronic, Inc.
Advanced Silicon Group	Covidien	METI
Ajax Biomedica	CSA Medical	Minnesota State University
AltraBio	Cynosure	MIT/Koch Institute
Altran	Davison	Motility Biomedical, Inc.
Applied Medical Resources	Davol - C.R. Bard, Inc.	nanoView Diagnostics, Inc.
ArQule, Inc.	Decision Resources	Navinet
Aperture Bio	DEKA Research and Development Corporation	Neuroptix Corporation
Atrium Medical	DePuy Spine, Inc.	New Health Sciences
Avedro, Inc.	DocBox, Inc.	NijiNeuro
Banyan Life Sciences LLC	Draeger Medical Systems, Inc.	Novartis Institutes for BioMedical Research
BD Advanced Diabetes Care	Draper	NuOrtho Surgical, Inc.
BD Medical	Eastman Kodak Company	Olympus Surgical Technologies America
Beta Bionics	Eaton-Peabody Laboratory	Optasia Medical, Inc.
Beth Israel Deaconess Medical Center	Elm Electrical & Automation	Oregon Health & Science University
Biotronik	EndoCore	O'Shea Getz PC
BioTrove, Inc.	Enumeral Biomedical Holdings, Inc.	Parexel
Bioventus LLC	Essex Orthopedics & Optima Sports Medicine	Perceptive Informatics PerkinElmer
Bitome	Fellers Snider et al.	Pfizer Biotherapeutics
Boston Engineering	Ferrotec Corporation	Philips Healthcare
Boston Medical Center, Dept. of Anesthesiology	Fluidform	Philips Ultrasound
Boston Medical Center, Dept. of Clinical Engineering	Foundation Medicine	Praxis Advisors LLC
Boston Medical Center, Dept. of Orthopedic Surgery	Fractal Therapeutics	Pulmatrix, Inc.
Boston Scientific	Fraunhofer USA-CMI	Raytheon
Boston University School of Management	GE Healthcare	Regeneron Pharmaceuticals
Boston University School of Medicine	Gems Sensors	Respiratory Motion, Inc.
Boston University School of Public Health	Genzyme Corporation	Rtangent
Boston University, Dept. of Athletic Training and Physical Therapy	GlobalData Healthcare	Sanofi
Boston University, Dept. of Biochemistry	Goodyear-Veyance Technologies, Inc.	Sapient
Boston University, Dept. of Biology	Grant Street Group	Schepens Eye Research Institute
Boston University, Dept. of Mechanical Engineering	Harvard Business School	Schneider Electric
Boston University, Dept. of Physiological and Brain Sciences	Harvard Medical School	Shire Pharmaceuticals
Boston University, Dept. of Speech, Language and Hearing Sciences	Harvard University	Solace Therapeutics, Inc.
Brandeis University	Harvard-MIT Division of Health Sciences and Technology	SoundMedicine
Brigham and Women's Hospital	HeartWare, Inc.	SQZ Biotechnologies
Bright Cloud International Corp	Higher Order Technologies, LLC	St. Jude Medical
Broad Institute	Hologic	Synthera Health
Bruker Daltonics	Hypertherm	Takeda
C4 Therapeutics	Iandiorio Teska & Coleman	Teleflex Medical
CAE Healthcare	IDEXX Laboratories	Ten15Ventures
CBS Local	Image Stream Medical	Toxikon Corporation
Center for Global Health and Development	ImagiRation	Tufts University
Children's Hospital Boston	Instrumentation Labs, Inc.	UMASS
CIMIT	Integra LifeSciences	Universidad de Valencia
CKD Associates	Ironwood Pharmaceuticals	University of Texas at Austin
Clark & Elbing LLP	iWorx Systems, Inc.	University of Wisconsin-Madison
Cleveland Clinic	Jana Care Inc.	US Army Institute of Environmental Medicine
Codman Neuro, Johnson & Johnson	Janssen Pharmaceutical, Johnson & Johnson	USA Research Institute of Environmental Medicine
Colorado Nepal Alliance, Dept. of Veterans Affairs	JH Technologies	VA Boston Healthcare System
	Johnson & Johnson	Vantage Management Group Verbal Care
	Lahey Hospital and Medical Center	Vertex Pharmaceuticals
	Legionarius	Veterans Administration
	Lux Research	Visus Technologies
	Mankato National Instruments	Worcester Polytechnic Institute
	Massachusetts Eye and Ear Infirmary	Wyss Institute for Biologically Inspired Engineering
		Xcellerex
		Youpling Corp.



ABOVE: BME graduate student Jeremy Tran and Associate Professor John Ngo are working in the Ngo lab to understand how cells sense mechanical forces.

Department of Biomedical Engineering

Boston University
Department of Biomedical Engineering

Annual Report 2022-2023

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This report provides a description of the instructional and research activities of the Department of Biomedical Engineering at Boston University during the 2022-2023 academic year.

Boston University's policies provide for equal opportunity and affirmative action in employment and admission to all programs in the university.

For more information or to download this report as a PDF, please visit our website at:

bu.edu/bme



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