



COLUMBIA
ENGINEERING

Biomedical
Engineering

8th Annual
Engineering in Medicine
Symposium

Thursday, February 22, 2024 | 10:30 AM - 5:00 PM EST



COLUMBIA

COLUMBIA UNIVERSITY
IRVING MEDICAL CENTER



COLUMBIA ENGINEERING

The Fu Foundation School of Engineering and Applied Science

10:30 AM Opening Remarks



Katrina Armstrong

CEO of the Columbia University Irving Medical Center

Dean of the Faculties of Health Sciences at Vagelos College of Physicians and Surgeons



Shih-Fu Chang

Dean of the Fu Foundation School of Engineering and Applied Science

10:40 AM Neuroscience and Biomedical Imaging



Qi Wang

Associate Professor, Biomedical Engineering

Session Chair



Grace McIlvain

Assistant Professor of Biomedical Engineering

“Noninvasive Imaging of Brain Biomechanical Properties”



Raju Tomer

Associate Professor of Biological Sciences

“Scalable tools for high-resolution mapping of large pathological samples”



Elizabeth Hillman

Herbert and Florence Irving Professor, Mind Brain Behavior Institute

“Using real-time imaging to decode the living brain”



Elizabeth Olson

Professor, Biomedical Engineering; Professor, Auditory Biophysics

“An implanted microphone as a component of a fully internal cochlear implant”

12:05 PM Cancer and Genomics



Elham Azizi

Assistant Professor, Biomedical Engineering; Herbert & Florence Irving Assistant Professor of Cancer Data Research

Session Chair



Christine Chio

Assistant Professor of Genetics and Development at Columbia Irving Medical Center

“Site-specific methionine oxidation selectively drives pancreatic cancer metastasis”



José L. McFaline-Figueroa

Assistant Professor of Biomedical Engineering

“Single-cell genomic screens to define molecular response to therapeutic exposure”



Sara Zaccara

Assistant Professor Herbert & Florence Irving Assistant Professor of Cancer Data Research

“Understanding the complexity of the m6A regulatory program”



Brent Stockwell

William R. Kenan, Jr. Professor of Biological Sciences; Professor of Chemistry and of Pathology and Cell Biology

“Rewriting the cancer genome using diet, metabolism, and ferroptosis”

1:10 PM Lunch Break
Carleton Commons

2:30 PM Tissue Engineering



Gordana Vunjak-Novakovic

University Professor and Mikati Foundation Professor, Biomedical Engineering & Medical Sciences
Session Chair



Ke Cheng

Professor of Biomedical Engineering
“Extracellular Vesicles for Lung Repair and Drug Delivery”



Helen Lu

Percy & L.W Hudson Professor of Biomedical Engineering; Senior Vice Dean of Faculty Affairs & Advancement
“Dual Perspectives on Regenerative Biomaterials”



Ricardo Cruz-Acuña

Assistant Professor of Cancer Engineering; College of Dental Medicine
“The Role of Matrix Stiffness in Esophageal Cancer: Mechanism to Translational Therapeutics”



Treena Arinzeh

Professor of Biomedical Engineering
“Functional Biomaterials for Tissue Regeneration”

3:45 PM Biomechanics



Alice Huang

Associate Professor of Bioengineering
Session Chair



Nandan Nerurkar

Assistant Professor of Biomedical Engineering
“Mechanobiology of vertebrate gut morphogenesis”



Hasan Erbil Abaci

Assistant Professor Herbert and Florence Irving Assistant Professor of Cancer Data Research
“Engineering Human Skin as a Wearable Tissue”



Nadeen Chahine

Associate Professor of Bioengineering
“Inflammation in the Degeneration and Repair of the Intervertebral Disc”



Ed Guo

Stanley Dicker Professor of Biomedical Engineering; Professor of Medical Sciences
“Bone and Cartilage in Osteoarthritis”

5:00 PM Reception and Poster Session
Carleton Commons



PRESENTER	PI	TOPIC
YASAMAN AGHLI	TREENA ARINZEH	Electroactive Gelatin Scaffolds for Promoting Cartilage Regeneration
DIVYA BHANSALI	KAM LEONG	Effective management of oral cancer pain through GPCR-targeted nanomedicine
GABRIELLA BOND	NADEEN CHAHINE	Therapeutic Treatment for Regulation of RhoA Pathway in Intervertebral Disc Degeneration
SARAH BORTEL	SANTIAGO CORREA	Nanocoated Tissue Scaffolds for Central Nervous System Regeneration
SALVATORE CARUSO	STEPHEN TSANG	Mutation Agnostic CRISPR Genome Surgery for RHO-linked retina dystrophies
YANAN CHEN	RAJU TOMER	Scalable, open-source projected Light Sheet Microscopy for high-resolution imaging of cleared samples
DANIELLA FODERA	KRISTEN MYERS	Photosensitizer-Mediated Low-Level Light Exposure Alters the Stiffness of Nonpregnant and Pregnant Human Cervix Tissue
PARTH GAMI	ELISA KONOFAGOU	Towards Wearable Pulse Wave Imaging: Estimation of Pulse Wave Velocity and Central Pulse Pressure Using an PMUT-based Ultrasound Sensor In Vivo
ROSS GIGLIO	JOSE MCFALINE-FIGUEROA	Uncovering EGFR Inhibitor Transcriptional Signatures in Models of Glioblastoma
KEVIN HOGGER-HAWLIK	ELHAM AZIZI & JOSE MCFALINE-FIGUEROA	Deep Generative Modeling Characterizes T Cell Trajectories Underlying Immunotherapy Response in Melanoma
NICHOLAS HOU	JOSE MCFALINE-FIGUEROA	Dissecting the transcriptional response to iEGFR treatment in glioblastoma using hierarchical Poisson factorization
RONALD INSTRELLA	CHRISTOPH JUCHEM	Uncertainty Propagation in Absolute Metabolite Quantification for In Vivo Magnetic Resonance Spectroscopy of the Human Brain
IOANA LIA	ELHAM AZIZI & JOSE MCFALINE-FIGUEROA	BacTIME: Computational inference of bacterial interactions with the tumor microenvironment
COSIMA LIANG	ELISA KONOFAGOU	A Simulation Framework for Pulse Wave and Vector Flow Imaging Using Fluid-structure Interaction and FIELD-II Simulations
ANDY LIU	QI WANG	Phase synchrony between the noradrenergic and cholinergic signals indexes inhibitory control
MENGRUI LIU	KE CHENG	Inhalable extracellular vesicle delivery of IL12 mRNA to treat lung cancer and promote systemic immunity
BRUNA LOPES DE COSTA	STEPHEN TSANG	Development of a prime editing strategy to treat mutations in the Crumbs homologue-1 (CRB1) gene
HOWARD NICHOLSON	CLARK HUNG	Investigating Blood-Induced ACL Injury and Therapeutic Strategies for Primary Repair
CAMERON PARK	ELHAM AZIZI	Spatiotemporal modeling of the leukemic marrow microenvironment reveals coordinated immune cell networks defining response to adoptive cellular therapy
JOSE POMARINO NIMA	YVON WOAPPI	Statistical Machine Learning Pipeline for Wound Healing Trajectory Prediction in a Transcriptomic, Cross-Species Context
NEERAJ SAKHRANI	CLARK HUNG	Towards Investigating the Effect of Diabetic High Blood Glucose on Osteoarthritic Cartilage Degradation using a Blood-Joint Spheroid Model
YE TIAN	KAVERI THAKOOR	Glaucoma Progression Detection and Humphrey Visual Field Prediction Using Discriminative and Generative Vision Transformers
STEVEN WELLMAN	QI WANG	Locus coeruleus modulation of population activity in the awake somatosensory cortex
SOPHIA WINDEMUTH	TAL DANINO & KAM LEONG	Probiotic Delivery to Orthotopic Glioblastoma Multiforme as an Immunotherapy
ERFAN ZABEH	JOSH JACOBS & JAQUELINE GOTTLIEB	Cortical traveling waves regulate single cell selectivity
WEIHANG ZHANG (SAVANNAH)	KE CHENG	Inhalable Bio-adhesive Hydrogel for Enhanced Lung-mucus Penetration (Bio-HELP)
ISABELLA ZINGHINI	CHRISTOPH JUCHEM	Field-based spatial self-registration of multi-coil hardware for BO field control