COLUMBIA ENGINEERING | Biomedical Engineering

9th Annual

Engineering in Medicine Symposium

THURSDAY, 02.13.2025 | 10:30 AM - 6:00 PM ET

COLUMBIA | COLUMBIA UNIVERSITY IRVING MEDICAL CENTER

COLUMBIA ENGINEERING

10:30 AM Opening Remarks

Paul Sajda
Chair of the Department of Biomedical Engineering at Columbia University

Shih-Fu Chang
Dean of the Fu Foundation School of Engineering and Applied Science

Ajay Gupta
Chair of the Department of Radiology at Columbia University Irving Medical Center

Grace McIlvain
Assistant Professor of Biomedical Engineering

10:40 AM AI and Imaging

Elisa Konogafou
Robert & Margaret Hariri Professor of Biomedical Engineering & Radiology
Session Chair

Nuttida Rungratsameetaweemana
Assistant Professor of Biomedical Engineering
"Cortical Computations for Adaptive Learning in Biological and Artificial Networks"

Despina Kontos
Professor of Radiology at Columbia's Department of Biomedical Informatics
"CIMBID: AI-Driven Imaging to Transform Disease Prevention, Detection, and Treatment"

Michael Lipton
Professor of Radiology at CUIMC & Affiliate Professor of Biomedical Engineering
"Head Impacts in Sport: Personalized Neuroimaging of Risk and Resilience"

Jia Guo
Assistant Professor of Neurobiology (in Psychiatry) at CUIMC
"Rethinking Risk in Medical Imaging: AI Solutions for Contrast-Free and Low-Radiation Approaches"

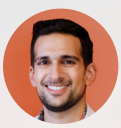
12:05 PM Cell and Tissue Engineering

Lance Kam
Professor of Biomedical Engineering & Medical Sciences
Session Chair

Harris Wang
Interim Chair & Associate Professor, Department of Systems Biology
"Therapeutic Editing of the Microbiome"

Parisa Yousefpour
Assistant Professor of Biomedical Engineering
"Engineering Biomolecular Immunotherapies"

Yvon Woappi
Assistant Professor of Physiology & Cellular Biophysics; Irving Professor of Dermatology (at VP&S)
"Synthetic Regeneration: Engineering Tissue Repair through Systems Physiology"



Santiago Correa
Assistant Professor of Biomedical Engineering
"Self-Assembling Nanotechnologies for Engineering the Immune System"

1:10 PM Lunch Break

Carleton Commons

2:30 PM Orthopedic and Biomechanics

Nadeen Chahine
Associate Professor of Biomechanics (in Orthopedic Surgery & Biomedical Engineering)
Session Chair

Clark Hung
Professor of Biomedical Engineering & Orthopaedic Surgery
"Columbia Ecosystem for Musculoskeletal Research"

Steve Thomopoulos
Carroll Professor of Biomechanics (in Orthopedic Surgery & Biomedical Engineering)
"Development and Regeneration of the Tendon Enthesis"

Andrew Laine
Percy K. and Vida L.W. Hudson Professor of Biomedical Engineering & Radiology
"Catalyzing Biomedical Innovation: Columbia's BioMedX Accelerator Program"

Gerard Ateshian
Andrew Walz Professor of Mechanical Engineering & Biomedical Engineering
"Cartilage Wear is Caused by Fatigue Failure"

3:45 PM Genomics

Helen Lu
Senior Vice Dean of Faculty Affairs & Advancement; Hudson Professor of Biomedical Engineering
Session Chair

José McFaline-Figueroa
Assistant Professor of Biomedical Engineering
"High-Throughput Tools for Perturbation-Induced Cell State Profiling"

Chao Lu
Assistant Professor of Genetics & Development at CUIMC
"Genetic Dissection of Epigenome Partitioning"

Alberto Ciccia
Associate Professor of Genetics & Development
"Dissecting the DNA Damage Response Network with CRISPR-Based Screens"

Elham Azizi
Associate Professor of Biomedical Engineering, Irving Associate Professor of Cancer Data Research
"Machine Learning for Modeling Dynamics in the Tumor Microenvironment"

5:00 PM Reception and Poster Session

Carleton Commons

POSTER SESSION

PRESENTER	PI	TOPIC
Ronald Instrella	Christoph Juchem, Angela Lignelli-Dipple	1. Sequence Validation of Magnetic Resonance Spectroscopy (MRS) for in vivo Neurochemical Profiling of IDH-mutated Gliomas
Claire Pinnie	Clark Hung	2. Phenol as a Growth Factor: Enhancing Tissue-Engineered Cartilage for Osteoarthritis Treatment Through Estrogenic Properties
Caroline Schleif	Clark Hung	3. Pulsed Electromagnetic Field Therapy Enhances Recovery by Mitigating Inflammation Following Anterior Cruciate Ligament Injury
Aaron Sossin	Despina Kontos	4. Automatic DCIS Segmentation in First Post-Contrast DCE-MRI Image using MA-SAM architecture with pre-trained MedSAM backbone
Fotios Tsitsos	Elisa Konofagou	5. Characterization of Microbubble Cavitation in Transcranial Theranostic Ultrasound-mediated Blood-Brain Barrier Opening
Parth Gami	Elisa Konofagou	6. In Vivo Assessment of Central Arterial Mechanics with a Miniaturized pMUT Array using Pulse Wave Imaging
Yangpei Liu	Elisa Konofagou	7. Detection of tumor stiffness and vasculature changes using harmonic motion imaging & ultrasound localization microscopy following contrast-enhanced-power-Doppler-guided sonoporation
Daniella Jimenez	Elisa Konofagou	8. Characterizing the mechanism of FUS-BBBO at pre-clinically and clinically relevant frequencies
Andrew Countryman	Karen Kasza	9. Interrogating developmental mechanics with endogenous OptoRhoGEFs
Alma Davidson	Michael Lipton	10. Ensuring Reliable Diffusion Tensor Estimation for the Study of Brain Microstructure
Daria Kussovska	Nuttida Rungratsameetaweemana	11. Decoding cellular dynamics of human memory computations
Shruti Kumar	Paul Sajda	12. Investigating The Neurophysiological Response To tVNS: Modulating Arousal For Enhanced Decision-Making
Tim Lantin	Qi Wang	13. Brain-wide cell-type-specific transcriptomic signatures of noradrenergic stimulation
Abigail Ayers	Samuel Sia	14. Integrated device for plasma separation and nucleic acid extraction from whole blood toward point-of-care detection of bloodborne pathogens
Sarah Bortel	Santiago Correa	15. Nanocoated Scaffolds for Immune Cell Modulation
Anders Knudsen	Stephen Tsang	16. Development of an allele-specific CRISPR therapy for p.C147F SAG autosomal dominant retinitis pigmentosa
Hannah Hu	Stephen Tsang	17. CRISPR Perturbation of Oxidative Stress Response Pathway to Rescue Retinal Degeneration
Hana Ro	Sunil Agrawal	18. Robotically Controlled Head Oscillations During Overground Walking: A Comparison of Elderly and Young Adults
Priya Kulkarni	Sunil Agrawal	19. Design and Validation of a Novel Robotic Neck Brace for Cervical Traction
Robert Carrera	Sunil Agrawal	20. Using Visual Error Manipulation to Alter Motor Learning in Virtual Reality
Xupeng Ai	Sunil Agrawal	21. Improving Trunk Control in Children with Cerebral Palsy Using a Robotic Trunk Support Trainer
Sumayia Saif Jaima Chowdhury	Treena Arinzeh	22. A biodegradable piezoelectric aligned gelatin scaffold promotes axon growth for use in spinal cord repair
Yasaman Aghli	Treena Arinzeh	23. Biodegradable Piezoelectric Gelatin for Promoting Cartilage Repair