

Biology, Biotechnology & Health 2

As in any other major industry, problem solving in modern medicine increasingly requires a true convergence of many scientific and engineering fields. While some of the last frontiers of biomedicine, such as neuroscience and regenerative medicine, critically demands new ideas and tools from other disciplines, paradigm-shifting technological innovations in information science, nanotechnology, and robotics could open new opportunities in healthcare. At the same time, a new generation of engineers, "fluent" in many different languages of science, are creating entirely new fields to view the old questions with a fresh look. In the BME symposium, we strive to provide a stimulating forum for all researchers willing to go beyond the "comfort zone" to explore new opportunities in biomedical engineering.

Chair



James Moon

University of Michigan

Co-chairs



Chun Gwon Park

Sungkyunkwan University



Youngjae Chun

University of Pittsburgh



Jung Soo Suk

University of Maryland

Biology,
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Health 2

@ Olympic A, B

Friday, Aug 7 3:15 – 5:00pm

BME Session I: Biomaterials, Immunotherapy, and Drug Delivery

Chairs: TBD

Time	Title and Speaker
3:15	Translational Research for Female Reproductive System Jungho Ahn (Sungkyunkwan University) Invited
3:35	Evidence for Collective NK Cell Surveillance Revealed by Causal Network Analysis in Tumor-on-a-Chip Models Invited Sangyoon J. Han (Michigan Technological University)
3:55	Heart dECM Hydrogel Facilitates Structural Maturation and Functional Stability of Human Cardiac Organoids Jaemyung Shin (Johns Hopkins University)
4:10	Development of Inducible Stable Cell Lines for rAAV Production: From Packaging to Producer Cell Line Seongkyu Yoon (University of Massachusetts Lowell)
4:25	Systems Mechanobiology Approaches to Fibrosis Resolution and Cardiac Repair Yoonyoung Choi (University of Massachusetts Lowell)
4:40	Self-aggregating Long-acting Injectable Microcrystals (SLIM): A Versatile Platform Sanghyun Park (Massachusetts Institute of Technology)

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Saturday, Aug 8 8:00 – 10:00pm

BME Session II: Bioelectronics and Medical Devices

Chair: TBD

Time	Title and Speaker
8:20	Multiscale Photoacoustic Imaging: From Nanostructures to Human Tissues I Byullee Park (Sungkyunkwan University) Invited
8:40	Toward Genetic Manipulation of Patient-Derived Circulating Tumor Cells Using Integrated Microfluidic Electroporation Invited Soojung Claire Hur (Johns Hopkins University)
8:55	A Synergistic Hybrid Bioceramic for Structural Reinforcement and Bioelectric Stimulation for Smart Implants Albert Kim (University of South Florida)
9:10	Multiplexed Microfluidics Decodes Antibiotic Combination and Sequence Effects Yoon Jeong (University of Chicago)
9:25	A Wireless Wearable Monitoring System with a Smart Mouthguard and Soft Chest Patches for Dehydration and Health Monitoring of Athletes Karam Kim (Georgia Institute of Technology)
9:40	Clinically Translatable Arthroscopic Instrument Stabilization Interface with Defined Regulatory Pathway Sang-Eun Song (The University of Akron)

Poster Session
Bio 2

@ International
Ballroom II

Friday, Aug 7 5:00 – 6:45pm

BME Poster Session

Chairs: TBD

P1	A Nanoemulsion-Based TLR7/8 Adjuvant Platform for Coordinated Immune Activation Against Diverse Viral Threats JuA Song (Sungkyunkwan University)
P2	Integrated spatial multi-omics identifies TRPS1 as a regulator of joint cell fate linking cartilage development to osteoarthritis Ji-Hye Yea (Johns Hopkins University)
P3	Assessing the Role of GAN-Based Synthetic Data in Cell Microscopy Classification under Limited Data Conditions So-yun Park (Kumoh National Institute of Technology)
P4	A Rat Glioma Spheroid-Neural Cell Tri-Culture Model to Investigate Cellular Crosstalk in Glioma Pathology Testaverde Sangwoo Kim (University of California, Davis)
P5	Rootin: A Mobile Symptom Tracking and Self-Care App for Women with Breast Cancer on Aromatase Inhibitors Soyeon Lee (University of Connecticut)
P6	Dual-Responsive Gelatin Microspheres for Ultrasound-Regulated Enzyme-Mediated Drug Release in Cancer Therapy Yuri Kang (Pohang University of Science and Technology)
P7	Rational Design of Injectable Materials for Myocardial Infarction by Tuning Hydrophilic-Hydrophobic Balance and Hydrophobic Chain Length for Enhanced Mechanical Support Sujeong Park (University of Pittsburgh)
P8	Capacitive Sensors for Non-invasive Monitoring of Vital Signs in Small Animals Ethan Reyes (The Geneva Foundation)
P9	Flexible, Three-Dimensional Electronic Framework for Electromechanical Monitoring in Engineered Heart Tissues Hayeon Yun (Northwestern University)
P10	Machine Learning Prediction of CaHA Responsiveness in Fibrosis: Toward Precision Anti-Fibrotic Therapy Younjee Jeong (Busan Foreign School)
P11	Soft Wearable BW-NIRS for Monitoring Sleep-Dependent Brain Water Dynamics Seunghyeob Ban (Georgia Institute of Technology)
P12	A 3D Brain Geometry Toolkit for Scalable Multisite Vertex-wise Brain Morphometry Analysis Yanghee Im (University of Southern California)
P13	Multiscale Biointerfaces for Neuromodulation: Access, Targeting, Modeling, and Sensing Eunji Hong (Binghamton University)

Poster Session
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BME Poster Session

Chairs: TBD

P14	A Minimally Invasive Magnetically Actuated Intravesical Occlusion Device for Urinary Incontinence Youngjae Chun (University of Pittsburgh)
P15	Microfluidic and Machine Learning-Guided Fabrication of Sub-5 μm PLGA Microparticles with Adhesive Integration for Vascular Drug Delivery Youngjae Chun (University of Pittsburgh)
P16	Soft Wearable NIRS for Monitoring Cardiac, Respiratory, and Slow-Oscillation Rhythms during Sleep Junwoo Kwon (Cornell University)
P17	Cytoprotective Effect of Kartogenin-Loaded Nanosomes on Arthritic Chondrocytes Ryan Qiu (University of Tennessee Health Science Center)
P18	Biophysical control of cell density promotes stem cell retention and tissue healing Gwang-Bum Im (Boston Children's Hospital, Harvard Medical School)
P19	Computational modeling of durotactic cell migration Donghyun Yim (Purdue University)
P20	Reactive Oxygen Species, Electrode Potential and pH Affect CoCrMo Alloy Corrosion and Semiconducting Behavior in Simulated Inflammatory Environments Hwaran Lee (Clemson University)\
P21	Large Language Model and Human Performance on a Motor Sequence Learning Task Hakjoo Kim (McLean Hospital, Harvard Medical School)