BEIS-2021

APRIL 19-21, 2021

(VIRTUAL)

2nd BIOMEDICAL ENGINEERING & INSTRUMENTATION SUMMIT

April 19-21, 2021 (Eastern Time)

Contact:

BEIS-2021

for the Scientific Committee

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Day...One

April 19
Monday

08:30-08:45 A/V Check

08:45-08:50 Introduction
Huaxiao Adam Yang, University of North Texas, TX

08:50-09:00 Welcome Speech by Convening Chair
Anthony Guiseppi-Elie, Anderson University, SC

Keynote Session

09:00-09:35 Science & Innovation, Industry & Academia In Medicine & Engineering
Elazer R. Edelman, Massachusetts Institute of Technology, MA

09:35-10:10 Introducing 4-D Printing and Other Nanomedicine Advances: Controlling Materials in the Body from the Outside
Thomas J. Webster, Northeastern University, MA

10:10-10:45 Clinical Translation of a PLG Nanoparticle-Based Delivery System for the Induction of Immune Tolerance
Stephen D. Miller, Northwestern University Medical School, IL

10:45-11:00 Break

11:00-11:35 Monitoring the Growth of HUVECs under Electrical Stimulation using an Electrical Cell Stimulation and Recording Apparatus (ECSARA)
Anthony Guiseppi-Elie, Anderson University, SC

11:35-12:10 Frontier in Optical Coherence Tomography: Doppler OCT, OCTA, and Optical Coherence Elastography
Zhongping Chen, University of California, CA

12:10-12:45 The Rise of Modern Genetic Engineering Tools: and our Responsibility to Introduce the Ethical and Societal Implication to our Students and the Public
Temple F. Smith, Boston University, MA

12:45-13:20 Multiphoton Microscopy for Imaging Deeper, Wider, and Faster
Chris Xu, Cornell University, NY

13:20-13:55 Label Free Two Photon Imaging to Assess Tissue Morphology and Function
Irene Georgakoudi, Tufts University, MA

13:55-14:10 Break

14:10-14:45 Functional Biomaterials for Tissue Regeneration
Treena Livingston Arinzeh, New Jersey Institute of Technology, NJ

14:45-15:20 Translating Big Data and AI for Biomedicine and Healthcare
May Dongmei Wang, Georgia Institute of Technology, GA

15:20-15:55 Navigating the Risks and Opportunities in Bioengineering and Regenerative Medicine Product Development
Scott P. Bruder, Bruder Consulting & Venture Group, LLC, NY

15:55-16:10 Break

*Drug Delivery Systems and Pharmaceutical Engineering

Chair: Gary Bowlin, University of Memphis, TN

16:10-16:30 **Crosslinking of Receptors as a Design Principle for Smart Nanomedicines**
Jindrich Kopecek, University of Utah, UT

16:30-16:50 **Magnetic Gene Delivery: Rotational Motion of Nanoparticles Triggers RNA Release Under Magnetic Fields**
Hiroshi Matsui, Hunter College of City University of New York, NY

16:50-17:10 **Bioinspired Synthetic Nanobiomaterials for Immunotherapy**
Evan A Scott, Northwestern University, IL

17:10-17:30 **Pulsed Focused Ultrasound Lowers Interstitial Fluid Pressure and Improves Nanoparticle Delivery in Solid Tumor Xenografts**
Ali Mohammadabadi, University of Maryland School of Medicine, MD

17:30-17:50 **Spatial Bioengineering of Single Cells for Visually Encoded Precision Medicine**
Ahmet F Coskun, Georgia Institute of Technology and Emory University, GA

17:50-18:10 **Mammalian Synthetic Biology: Foundation and Therapeutic Applications**
Ron Weiss, MIT, MA

18:10-18:30 **Inertial Sensing for Transfemoral Amputee Gait Detection**
Elissa D Ledoux, Middle Tennessee State University, TN

*Biomaterials & Tissue Engineering | *Medical Technology Innovation and Invention
*Biomechanics | *3d Bioprinting

Chair: Jindrich Kopecek, University of Utah, UT

Chair: Stephen Yi, The University of Texas at Austin, TX

09:00-09:20	**Surface Area to Volume Ratio of Electrospun Polydioxanone Templates Regulates the Adsorption of Soluble Proteins from Human Serum** Gary Bowlin, University of Memphis, TN
09:20-09:40	**Modeling Diseases in Human Vascular Microphysiological Systems** George A. Truskey, Duke University, NC
09:40-10:00	**Biopolymer Hydrogels for Articular Cartilage Repair and Regeneration** Marcus Deloney, University of California, Davis, CA
10:00-10:20	**Eggshell Microparticle-reinforced Biomaterials for Bone Regeneration** Gulden Camci-Unal, University of Massachusetts Lowell, MA
10:20-10:40	**Cardiac-Specific Nanofibrous Scaffold for Cardiac Tissue Engineering** Feng Zhao, Texas A&M University, TX
10:40-11:00	**Resorbable Scaffolds of Polybutylene Succinate for Soft Tissue Repair and Support** David Martin, Tepha, Inc., MA
11:00-11:15	Break
	Posters
	Mechanical Stretch Promotes M1 Polarization in Raw264.7 Cells via the Rho/Rock1/Nf-Kb Signaling Pathway Yong Ma, Nanjing University of Chinese Medicine, China
	A Semi-Autonomous, Multi-Zone, Microfluidic Platform to Measure Transendothelial Electrical Resistance Priya P. Vijayakumar, UC Berkeley, CA
11:15-11:30	**Human Organ-on-a-Chip Models for Predictive Drug Screening to Determine Anti-Tumor Efficacy and Cardiac Safety** Alan Chramiec, Columbia University, NY
11:30-11:50	**Protein Therapeutic Manufacturing at the Point of Care** Leah Tolosa, University of Maryland Baltimore County, MD
11:50-12:10	**Efficacy of Engineered Skin Grafts Prevascularized with Skin-specific and Non-specific Endothelial Cells** Hasan Erbil Abaci, Columbia University, NY
12:10-12:30	**Engineered Models to Study the Role of Innervation in Cancer** Madeleine Oudin, Tufts University, MA
12:30-12:50	**3D Models to Study Tumor and Immune Cell Recruitment Following Normal Tissue Radiation Damage** Marjan Rafat, Vanderbilt University, TN
12:50-13:10	**Organs-on-Chips: Next Generation Platforms for Toxicological Studies of Engineered Nanomaterials** Herdeline Ann M Ardona, University of California, Irvine

13:10-13:25	**Designing Microenvironments for Cardiovascular Disease Investigations** Renita Horton, University of Houston, TX
13:25-13:40	**Circadian Control of Organoid Physiology** Juan Alvarez, Harvard University, MA
13:40-13:55	**Microvasculature on Chip for Cancer Models** Zhengpeng Wan (Jason), Massachusetts Institute of Technology, MA
13:55-14:10	**Vibrational Optical Coherence Tomography** Nikita Uday Kelkar, OptoVibronex, LLC, PA
14:10-14:30	**Break**
14:30-14:50	**Innovative Non-Invasive Technology for Detecting Bone Fragility in Osteoporosis** Amit Bhattacharya, University of Cincinnati Colleges of Medicine and Engineering & Applied Science, OH
14:50-15:10	**The Intersection of Consumer Healthcare and Biotech** Ted Chan, Caredash, MA
15:10-15:30	**RylarTM a Bioresorbable Polymer for Congenital Heart Disease** Tre Welch, UT Southwestern Medical Center of Dallas, TX
15:30-15:50	**Biologically Selective Drug-Eluting Stent** Mehmet Hamdi Kural, Yale University, CT
15:50-16:05	**Effects of Endogenous and Exogenous Agents on Platelet Adhesion** Sowjanya Dokku, Louisiana Tech University, LA
16:05-16:25	**The Dawn of the Clinician Engineer** Neel Sharma, Queen Elizabeth Hospital, Birmingham, University of Birmingham, UK
16:25-16:45	**Modeling and Experimental Approaches to Understand Tenascin-C Production in Lung Cancer** Michelle Mendoza, University of Utah, UT
16:45-17:05	**Cellular Mechanotransduction at the Level of Organelles** Elizabeth Bartolak-Suki, Boston University, MA
17:05-17:25	**Hybrid Laser Platform for Printing 3D Multiscale Multi-material Hydrogel Structures** Pranav Soman, Syracuse University, NY
17:25-17:35	**Break**
17:35-17:55	**Computational Network Models of the Human Immunome in Cancer** Stephen Yi, The University of Texas at Austin, TX
17:55-18:15	**Intensive Care in the Age of Artificial Intelligence (AI)** Parisa Rashidi, University of Florida, FL
18:15-18:35	**Biomedical and Healthcare Data as a Service: A FHIR Approach** Rishi Saripalle, Illinois State University, IL
18:35-18:55	**Cerebrospinal Fluid Interaction with Cerebral Cortex during Pediatric Abusive Head Trauma** Milan Toma, New York Institute of Technology, NY
18:55-19:15	**Anchoring and Migration of Balloon in REBOA** Chiang C. MEI, Massachusetts Institute of Technology, MA
19:15-19:35	**Computational Prediction of Drug-eluting Stent Performance in Patient-specific Arteries – A Virtual Reality** Farhad Rikhtegar Nezami, Massachusetts Institutes of Technology, MA
19:35-19:50	**Aortic Valve Calcification Topography as an Updated Measure for Stenosis Severity** Farhan Khodaee, Massachusetts Institutes of Technology, MA

* Brain Research and Neural Engineering | *Device Technologies and Biomedical Robotics *Biomedical Sensors and Wearable Systems | *Biomedical Imaging and Biophotonics *Biomedical Signal and Image Processing

Chair: George A. Truskey, Duke University, NC
Chair: Amit Bhattacharya, University of Cincinnati Colleges of Medicine and Engineering & Applied Science, OH
Chair: Bing Yu, Marquette University, WI

09:00-09:20 **Human Models of the Reflex Arc for use in Efficacy Investigations in Pre-Clinical Drug Discovery for Applications in Neurological Diseases**
James J Hickman, University of Central Florida, FL

09:20-09:40 **Nanomeshing Adds Multifunctionality to Conventional Neuroelectrodes**
Hui Fang, Northeastern University, MA

09:40-10:00 **Detection of Psychological Stress Using Statistical Features of Phonocardiography Signals**
Sergey N Makarov, Harvard Medical School, MA

10:00-10:20 **UHPLC-QqQ-MS/MS Method Development and Validation with Statistical Analysis: Determination of Raspberry Ketone Metabolites in Mice Plasma and Brain**
Bo Yuan, Rutgers University, NJ

10:20-10:40 **Understanding DRG Stimulation to Enhance Management of Visceral Pain**
Bin Feng, University of Connecticut, CT

10:40-10:50 **Break**

10:50-11:05 **Simulating Neuroplasticity of an Isometric Movement Task using a Corticospinal Computational Model**
Namrata Kadambi, University at Buffalo, NY

11:05-11:20 **Non-Genetic "Optogenetics": Silicon Based Bio-Interfaces for Multi-scale Optical Modulation**
Menahem Rotenberg, Technion, Israel

11:20-11:40 **Novel Cytotoxicity and Broad-Spectrum Genotoxicity Platforms**
Bevin Engelward, Massachusetts Institute of Technology, MA

11:40-12:00 **Point-of-care Sensing Systems for Infectious Diseases Management**
Ajeet Kaushik, Florida Polytechnic University, MA

12:00-12:20 **Optomechanical Sensing in Wearables and Medical Textiles**
Mathias Kolle, Massachusetts Institute of Technology, MA

12:20-12:40 **Tissue Oxygen Concentration Sensing from the Bench to the Bedside**
Conor Evans, Massachusetts General Hospital, MA

12:40-13:00 **Cognitive-based Motor Rehabilitation with Computerized Interfaces**
Raviraj Nataraj, Stevens Institute of Technology, NJ

13:00-13:20 **An NCATS Perspective: Progress, Challenges and Future Applications of Organs-on-Chips**
Passley Hargrove-Grimes, National Institutes of Health, MD

13:20-13:35 **Injectable Microscale Optoelectronically Transduced Electrodes (MOTEs)**
Sunwoo Lee, Cornell University, NY

13:35-13:50	**A Steerable Intubation Catheter Integrated with MEMS-based Sensors for Chronic Airway Management** Alekya B, Indian Institute of Science, Bangalore, India
13:50-14:00	**Break**
14:00-14:20	**Heart Rate Variability Analysis Using Neural Network Models for Automatic Detection of Lifestyle Activities** Sandy Rihana, Holy Spirit University of Kaslik, Lebanon
14:20-14:40	**Real-time Optical Monitoring of Endotracheal Tube Displacement** Bing Yu, Marquette University, WI
14:40-15:00	**Systems and Strategies for 3D Intravascular Ultrasound Imaging of Blood Flow Velocity Fields using Ultrasound** Brooks Lindsey, Georgia Institute of Technology, GA
15:00-15:15	**Assessing Fatty Acid-Induced Lipotoxicity in Glioblastoma Using Stimulated Raman Scattering (SRS) Microscopy** Yuhao Yuan, Binghamton University, NY
15:15-15:30	**Quantifying Normal and Cancerous Breast Temperatures: Results of a Pilot Clinical Study** Adolfo Lozano III, Raytheon Technologies Corporation, MA
15:30-15:45	**Endogenous Fluorescent Biomarkers Originate in Lipid Droplets of Adipose Tissues** Yang Zhang, Tufts University, MA
15:45-16:00	**Label-Free Optical Detection of Circulating Tumor Cell Clusters Using Back Scattered Flow Cytometry** Nilay Vora, Tufts University, MA
16:00-16:15	**Enabling Rapid, Fit-Free and User-Friendly Fluorescence Lifetime Imaging in Photon-Starved Conditions: A Deep Learning Approach** Jason T. Smith, Rensselaer Polytechnic Institute, NY
16:15-16:30	**3D-Imaging of Whole Porcine Cochlea Using Custom-Built Light-Sheet Microscopy** Adele Moatti, North Carolina State University, NC
16:30-16:45	**Understanding the Causes and Effects of Temporal Pitch Distortion in Cochlear Implant Users** Barry Jacobson, Massachusetts Institute of Technology, MA
16:45-17:05	**Design and Optimization of a Customized External Fixation Device for Lower Limb Injuries** Mohammed Alqahtani, University of Manchester, United Kingdom
17:05-17:20	**Comparison of Annulus Tension Between Clip and Edge-to-Edge Suture in Mitral Valve** Shadan Roumany, Southeast Missouri State University, MO
17:20-17:50	**Poster Session**
	Low Cost, Low Foot-print, Fast Processing POC Glucose Meter Senait Haileselassie, UMASS Lowell, BL
	Novel Tattoo Electrode For High-Density Surface Electromyography Sourav Chandra, Northwestern University, IL
	Diagnostic Performance of A Deep Learning-Based Voice Analysis for Diabetes Screening Pichatorn Suppakitjanusant, Ramathibodi Hospital, Thailand
	Studies of Polystyrene Nanoparticles Penetration Efficiency in PLGA Hydrogel of Different Hardness Mingze Sun, University of Connecticut, CT
	Deep Learning Classification Model for Atrial Fibrillation from Multichannel ECG and Validation on Synthetic and Clinical Databases Kresimir Friganovic, University of Zagreb, Croatia

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