UNITED Scientific Group
A non-profit organization

BEI-2023
November 15-17, 2023

PROGRAM

3rd International Conference on
BIOMEDICAL ENGINEERING INSTRUMENTATION

November 15-17, 2023

Venue:
Boston Marriott Newton Hotel
Boston, MA, USA

Email: secretary@biomedicalmeetings.com
Web: https://biomedinstrumentation.com/

International Organizing Committee

Anthony Guiseppi-Elie
Founding Dean, College of Engineering, Anderson University, SC USA - **Convening Chair**

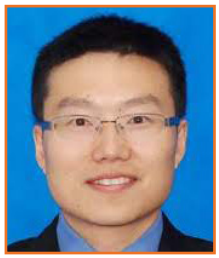
Frank Alexis
Universidad San Francisco de Quito Ecuador

Andrea Cataldo
University of Salento - Department of Engineering for Innovation, Italy

Tram Thuy Dang
Nanyang Technological University, Singapore

John Hardy
Lancaster University
United Kingdom

Ajeet Kaushik
Florida Polytechnic University
USA



Liang Luo
Huazhong University of Science and Technology, Wuhan, PRC

Rossana Madrid
National University of Tucumán-INSIBIO/CONICET, Argentina

Huaxiao "Adam" Yang
Nanyang Technological University
Singapore

Plenaries

Roozbeh Jafari
Tim and Amy Leach Professor, Texas A&M University, TX, USA

Luke P. Lee
Harvard Medical School, Harvard Institute of Medicine, Brigham Women's Hospital, MA, USA

Warren L Grayson
Department of Biomedical Engineering, Johns Hopkins University, MD, USA

King Li
Carle Illinois College of Medicine, University of Illinois, Adjunct Prof. of Radiology, Stanford Univ. School of Medicine, President, and Founder, Rosforcure, Inc., USA

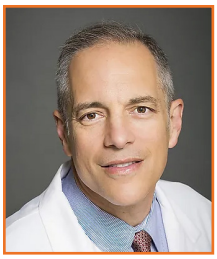
Plenary Panel: Bio-innovation to Commercialization

Mike Kopczynski
Principal & Managing Director Commercial Integration Services, Massachusetts Institute of Technology, USA

Saurabh Biswas
Executive Director, Technology Transitions, Texas A&M Engineering, USA

Tong Sun
Executive Director, Institute of Translational Health Sciences, Assistant Dean, School of Medicine at University of Washington, USA

Keynotes



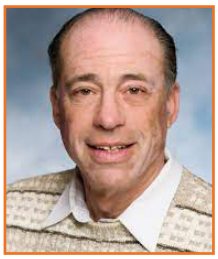
Elazer R. Edelman
Director, Institute for Medical Engineering and Science, MIT, MA, USA

John Hardy
Lancaster University United Kingdom

Ge Wang
Rensselaer Polytechnic Institute, NY, USA

Michael Levin
Distinguished Professor, Tufts University, MA, USA

Anthony Guiseppi-Elie
Founding Dean, College of Engineering, Anderson University, SC, USA
Convening Chair



Frederick H. Silver
Rutgers University, NJ
Founder of Optovibronex, LLC

Susan Drapeau
Vice President, Product Development & Commercialization, Bruder Consulting & Venture Group, MA, USA

Gulden Camci-Unal
Associate Professor, University of Massachusetts Lowell, USA

DAY 1

November 15, 2023 | Boston, MA
Eastern Time
@ Charles River Room

Join Zoom Meeting:
https://us06web.zoom.us/j/83746964503?pwd=hGlYhg1aV5XyHXQXeYbgFIzrUgmsOE.1

Meeting ID: 837 4696 4503
Passcode: 267385

07:45-08:20 Registrations @ Foyer

08:20-08:30 Welcome Remarks

Anthony Guiseppi-Elie
Founding Dean, College of Engineering, Anderson University, SC, USA, **Convening Chair**

Plenary Talks

08:30-09:15
Digital Twin for Cardiovascular Health
Roozbeh Jafari, Tim and Amy Leach Professor, Texas A&M University, TX, USA

09:15-10:00
Design of Bioactive Scaffolds for Promoting Neurovascular Regeneration in Musculoskeletal Repair
Warren L Grayson, Department of Biomedical Engineering, Johns Hopkins University, MD, USA

10:00 -10:15 Coffee Break @ Foyer

Session-I Biosensors, Biomaterials, Biomechanics, and Machine Learning

Session Chair: Gulden Camci-Unal, Associate Professor, University of Massachusetts Lowell, USA

Keynote

10:15-10:40
Toward the Stratification of Vascularized Composite Allografts using Bioimpedance Spectroscopy and Deep Learning
Anthony Guiseppi-Elie, Founding Dean, College of Engineering, Anderson University, SC, USA

10:40-11:00 **Theoretical and Experimental Studies in the Mechanics of Porcine Upper Descending Thoracic Aorta**
Chandler Benjamin, Texas A&M University, USA

11:00-11:20 **Preliminary Investigation of Non-invasive Blood Pressure Estimation using Speckle Contrast Optical Spectroscopy**
Ariane Garrett, Boston University, USA

11:20-11:40 **Immunological Advances for Testing of Heart Valve Biomaterials**
Christopher McGregor, University of Minnesota, USA

11:40-12:00 **Sweat Metabolite Detection with Multiplexed Sensor Patch**
Li-Jing (Larry) Cheng, Oregon State University, USA

12:00-12:20 **Wearable Bioelectronics for Health and Performance Optimization**
Dhruv Ramakrishna Seshadri, Lehigh University, USA

12:20-12:40 **Interplay between Immune cells and Tissue Specific Microenvironmental Components: Immunomodulatory Scaffolds for Tissue Repair and Regeneration**
Olwyn Mahon, University of Limerick and Trinity Centre for Biomedical Engineering, Ireland

12:40 -13:20 Lunch **@ Foyer**

Session Chairs: Zhengpeng Wan, Massachusetts Institute of Technology, USA
Li-Jing (Larry) Cheng, Oregon State University, USA

Keynote

13:20-13:45
Unconventional Biomaterials to Improve Human Health
Gulden Camci-Unal, Associate Professor, University of Massachusetts Lowell, USA

13:45-14:05 **Research Progress on Materials with Negative Poisson's Ratio (Virtual)**
Xin Ren, Nanjing Tech University, China

14:05-14:25 **Multiplex Detection of Label-free miRNA Assayed Hydrogel Barcode through Low-Aspect-Ratio Micropore Sensor**
Chang-Woo Song, Korea University, South Korea

14:25-14:45 **Individualized Diagnostics of Infectious Diseases Driven by Multi-Modal Biosensors and Machine Learning**
Umer Hassan, Rutgers, The State University of New Jersey, USA

14:45-15:05 **A Novel Approach to Measure the Multiscale Stiffness of Precision Cut Lung Slices: Application to Human Emphysema**
Bela Suki, Boston University, USA

15:05 -15:20 Coffee Break **@ Foyer**

Keynote

15:20-15:45
Tissue Engineered Devices - Development and Regulatory Processes
Susan Drapeau, Bruder Consulting, USA

15:45-16:05 **Portable, Low-Cost Loop-Mediated Isothermal Amplification-Based Pathogen Detection Platforms for Field Applications (Virtual)**
Meltem Elitas, Sabanci University, USA

16:05-16:25 **Robust Strategies for Generating Perfusable Microvasculature-On-A-Chip Models**
Zhengpeng Wan, Massachusetts Institute of Technology, USA

16:25-16:45 **Digital and Point-of-Care-Amenable CRISPR/Cas-Based Nucleic Acid Detection**
Kuangwen Hsieh, Johns Hopkins University, USA

17:05-18:05 Poster Presentations @ Foyer

P-1 **Low cost, Low Footprint, Fast Processing POC Glucose Meter**
Senait Haileselassie, University of Massachusetts Lowell, USA

P-2 **Design of Soft Robotic Hand Orthoses for Stroke Recovery**
Elissa Ledoux, Vanderbilt University, USA

P-3 **The Effects of Manuka Honey-Derived Flavonoids on Neutrophil Production of Reactive Oxygen Species**
James Huang, University of Memphis, USA

P-4 **Nanoparticles in Neurology: A Comprehensive Review of Strategies for Effective Drug Delivery across the Blood-Brain Barrier**
Arjun Verma, University of Cincinnati, USA

P-5 **An Evaluation of the Effectiveness of 'ULTRACOL 200' in Enhancing Nasolabial Fold Wrinkles Through Cutaneous Repair**
HyunjeeKim, Korean Skin Clinical Research Center, South Korea

P-6 **Clinical Trial to Evaluate the Efficacy and Safety of the Tissue Restoration Device ULTRACOL100 in Improving Nasolabial Folds**
Keonwoo Choi, Korean Skin Clinical Research Center, South Korea

P-7 **Smartphone-Based Foldable Affordable Blood Coagulation Screening Device**
Weiming Xu, Texas A&M University, USA

DAY 2

November 16, 2023 | Boston, MA
Eastern Time

Join Zoom Meeting:
https://us06web.zoom.us/j/83746964503?pwd=hGlYhg1aV5XyHXQXeYbgFIzrUgmsOE.1

Meeting ID: 837 4696 4503
Passcode: 267385

Plenary Panel: Bio-innovation to Commercialization @ Charles River Room

08:30-09:15
Michael Kopczynski (Moderator)
Massachusetts Institute of Technology, USA

Saurabh Biswas
Executive Director for Commercialization & Entrepreneurship and Associate Professor of Practice in Biomedical Engineering, Texas A&M University, USA

Tong Sun
Executive Director, Institute of Translational Health Sciences and Assistant Dean, School of Medicine at University of Washington, USA

Plenary Talk

09:15-10:00
King Li, ROSforcure, Inc., USA
How Can We Accelerate Bio-innovation to Commercialization?

10:00 -10:15 Coffee Break @ Foyer

Parallel Track I @ Charles River Room

Session-II Biomaterials, Cellular, Tissue, and Genetic Engineering

Session Chair: Taylor Bertucci, Neural Stem Cell Institute, USA

Keynote

10:15-10:40
Tissue Engineering and Cell Pluripotency: Linked Elements Determining Therapeutic Potential and Scientific Insight
Elazer R. Edelman, Massachusetts Institute of Technology, MA, USA

10:40-11:00 **Adult Stem Cells Improve Cardiac Perfusion in Ischemic Non-revascularized Myocardium**
Jose E Krieger, University of Sao Paulo, Brazil

11:00-11:20 **Applications for Dental Stem Cells in Regenerative Medicine and Dentistry (Virtual)**
Pamela C. Yelick, Tufts University, USA

11:20-11:40 **Gene Edited Rabbits for Biomedical Research**
Jie Xu, University of Michigan, USA

11:40-12:00 **Retroviral Vectorization for *ex-vivo* Gene Therapy (Virtual)**
Xiaomo Wu, Dermatology Institute of Fuzhou, China

12:00-12:20 **Improved Protocol for Reproducible Human Cortical Organoids to Study Tauopathy**
Taylor Bertucci, Neural Stem Cell Institute, USA

12:20-12:40 **Mechanical Conditioning Rejuvenates Mesenchymal Stem Cells**
Aaron Baker, University of Texas at Austin, USA

12:40 -13:25 **Lunch** @ Foyer

13:25-13:45 **Single-cell Spatial Omics Journey to Signaling and Metabolism Neighbors of Immunity and Cancer (Virtual)**
Ahmet F Coskun, Georgia Institute of Technology, USA

13:45-14:05 **Strategies for Ensuring Robustness in Clinical AI Applications**
Morteza Zabihi, Harvard Medical School, USA

Session III Biomedical Informatics, Computational Modelling, AI, and Machine Learning

@ Charles River Room

Session Chairs: Jose E Krieger, University of Sao Paulo, Brazil
Marco Antonio Gutierrez, University of Sao Paulo, Brazil

Keynote

14:05-14:30 **Generative AI Models for Medical Imaging (Virtual)**
Ge Wang, Professor, Rensselaer Polytechnic Institute, USA

14:30-14:50 **Advancing Cancer Diagnosis and Treatment with Histopathological Analysis of High-Resolution Microscopy Images using Deep Learning**
Saeed Hassanpour, Dartmouth College, USA

14:50-15:10 **Utilizing Artificial Intelligence for Surgical Anatomy and Phase Recognition in Thoracic Surgery**
Arian Mansur, Harvard Medical School, USA

15:10 -15:25 **Coffee Break** @Foyer

15:25-15:45 **How to Use AI for Critical Care Monitoring? Diabetes mellitus Risk Prediction based on Federated Learning**
Chengwei Huang, Zhejiang Lab, China

15:45-16:05 **Computational Characterization of Coronary Plaques Beyond Physiological Strains through *ex-vivo* Pre-Dilation**
Arash Ghorbannia, Medical College of Wisconsin, USA

16:05-16:25 **An Implant-Assisted Delivery Strategy for Safe and Efficient Transport of Nanoformulations into Solid Tumors**
Sajanlal R. Panikkanvalappil, Dana-Farber Cancer Institute, USA

16:25-16:45 **Development of Remote, Non-invasive, Continuous Blood pressure Device based on PPG Signal Analysis using Machine Learning Models**
Marco Antonio Gutierrez, University of Sao Paulo, Brazil

16:45-17:05 **Bio-functional Antifouling Polymer Brush Nano-Coatings for Biomedical Applications**
Hana Vaisocherova-Lisalova, Institute of Physics of the Czech Academy of Sciences, Czech Republic

Join Zoom Meeting:
https://zoom.us/j/97810490210?pwd=ZnpxTGpPWXRUQU5GRFFvMWp6cm1yUT09

Meeting ID: 978 1049 0210
Passcode: 351540

Parallel Track II @ Old Meeting House

Session IV Biomedical Imaging, Medical Device Technologies, Biomedical Robotics, Implantable Medical and Drug Delivery Devices

Session Chairs: Ara Nazarian, Beth Israel Deaconess Medical Center / Harvard Medical School, USA
Qing-Xiang Sang, Florida State University, USA

Keynote

10:15-10:40
Towards Remote Controlled Stimuli-Responsive Biomaterials for Drug Delivery
John Hardy, Lancaster University, United Kingdom

10:40-11:00 **Speckle-free Phase-Contrast Ultrasound Imaging**
Jerome Mertz, Boston University, USA

11:00-11:20 **Myocardial Imaging and Analysis to Elucidate Cardiac Structure and Contractility**
Yichen Ding, The University of Texas at Dallas, USA

11:20-11:40 **Quantum Enhanced MRI agents - A Powerful New Weapon in the War Against Cancer**
Sella Brosh, NVision Imaging Technologies GmbH, Germany (Virtual)

Keynote

11:40-12:05
Noninvasive Use of Vibrational Optical Coherence Tomography and Machine Learning to Diagnose Skin Cancer and Ocular Diseases
Frederick H. Silver, Professor, Rutgers University, NJ Founder of Optovibronex, LLC

12:05-12:25 **Advanced Technologies for Diagnosis, Monitoring, and Understanding of Diseases**
Mahla Poudineh, University of Waterloo, Canada

12:25-12:45 **Neonatal Phototherapy -Towards Accurate Local Irradiance and Whole-Body Surface Dose Rate Measurements (Virtual)**
Douglas Clarkson, UHCW NHS Trust, United Kingdom

12:45 -13:30 **Lunch** @ Foyer

Session Chairs: Xiaofeng Jia, University of Maryland, USA
Yichen Ding, The University of Texas at Dallas, USA

13:30-13:50 **A Comprehensive Surface-Enhanced Raman Scattering (SERS) Platform for Label-Free Biomedical Detection**
Gou-Jen Wang, National Chung-Hsing University, Taiwan

13:50-14:10 **High Density Optoelectrical Neural Interfaces for Bi-directional Read/Write Access to the Brain**
Maysam Chamanzar, Carnegie Mellon University, USA

14:10-14:30 **Genome Editing Human Induced Pluripotent Stem Cells to Build Brain Cancer Models**
Qing-Xiang Sang, Florida State University, USA

14:30-14:50 **Human Neural Stem Cells Improve Functional Outcomes After Cardiac Arrest**
Xiaofeng Jia, University of Maryland, USA

14:50-15:10 **Relaxin-2 as a Therapeutic for Arthrofibrosis**
Ara Nazarian, Beth Israel Deaconess Medical Center / Harvard Medical School, USA

15:10 -15:25 Coffee Break **@Foyer**

15:25-15:45 **Transparent Ultrathin Gold Neural Electrode Arrays for Minimally Invasive, Multimodal, Large-Scale Neural Recording**
Hongki Kang, Daegu Gyeongbuk Institute of Science and Technology, South Korea

15:45-16:05 **Design Optimization of an Actuated Probe for Pulmonary Nodule Localization and Resection**
Gregory Buckner, North Carolina State University, USA

16:05-16:25 **Neural Spike Detection and Discrimination in Intra-Cortical Neural Signals Using Lock-in Amplifiers**
Amir M. Sodagar, York University, Canada

16:25-16:45 **Engineering Nano-Biomaterials and Bioprinting for Tissue Fabrication and Regenerative Medicine**
Su-Ryon Shih, Harvard Medical School, USA

16:45-17:05 **Investigation of Apoptosis Initiating Temperature of Cultured Hippocampal Neurons during Photothermal Stimulation with a Novel Multifunctional Microelectrode Array**
Jee Woong Lee, Daegu Gyeongbuk Institute of Science and Technology, South Korea

DAY 3

November 17, 2023 | Boston, MA
Eastern Time
@ Charles River Room

Join Zoom Meeting:
https://us06web.zoom.us/j/83746964503?pwd=hGlYhg1aV5XyHXQXeYbgFIzrUgmsOE.1

Meeting ID: 837 4696 4503
Passcode: 267385

Plenary Talk

08:15-09:00
Nanomedicine via Quantum Plasmonic SANDs, EXODUS, and Brain Organoid MAP
Luke P. Lee, Harvard Medical School, Harvard Institute of Medicine, Brigham Women's Hospital, MA, USA

Session V 3D Bioprinting, Rehabilitation Engineering, Recent Trends in Biomedical Engineering and Instrumentation

Session Chair: Tram Thuy Dang, Nanyang Technological University, Singapore

Keynote

09:00-09:25
Tools for Exploiting the Collective Intelligence of Cells in Regenerative Medicine (Virtual)
Michael Levin, Distinguished Professor, Tufts University, MA, USA

09:25-09:45 **Development of Bioinks for 3D Bioprinting to Model Neurodevelopment and Neurological Disorders**
Marimelia Porcionatto, Federal University of Sao Paulo, Brazil

09:45-10:05 **Continuous Centrifugal Microfluidics (CCM) Technology: from Cancer Diagnostics to Therapeutics**
Minseok S. Kim, DGIST / CTCELLS, South Korea

10:05-10:25 **Scalable Manufacturing of Microfluidics Devices for Emerging Needs in Precision Medicine**
Andrew D. Stephens, University of Michigan Medical School MI, USA

10:25-10:35 **Coffee Break** @ Foyer

10:35-10:55 **MANTRA: Music Assistive Neuro-Therapy Response and Assessment**
Vijayan K Asari, University of Dayton, USA

10:55-11:15 **EEG Complexity Analysis for Early Diagnosis of Alzheimer's Disease**
Raissa Schiavoni, University of Salento, Italy

11:15-11:35 **Phi-Bonacci Index for Walking Ability Assessment in Paroxysmal Positional Vertigo: The Role of Rehabilitation (Virtual)**
Nicola Colistra, University of Rome Tor Vergata, Italy

11:35-11:55 **Immuno-modulatory Biomaterials and Therapeutic Delivery Systems**
Tram Thuy Dang, Nanyang Technological University, Singapore

11:55-12:15 **Air Pollutant-Induced Neuroinflammation and Neurodegeneration in 3D Human Mini Brains**
Hansang Cho, Sungkyunkwan University, South Korea

12:15-12:35 **Rapid Prediction of Cancer Therapy using Ex-vivo Drug Treatment**
Patrick Bhola, Harvard Medical School, MA, USA

12:35-12:55 **Medical Textiles in 2024: Key Players to Guarantee Blood Supply Throughout the Body**
Robert Guidoin, Laval University, Canada (Virtual)

Closing Remarks **Prof. Dr. Anthony Guiseppi-Elie**, Sc.D., Conference Chair

UNITED Scientific Group
A non-profit organization

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