



Engineered Cells and Tissues as Platforms for Discovery and Therapy

March 9–12, 2017 | Fairmont Copley Plaza | Boston, Massachusetts | USA

Scientific Organizers:

Laura E. Niklason, Yale University, USA

Milica Radisic, University of Toronto, Canada

Nenad Bursac, Duke University, USA

Tissue engineering, cell therapies and regenerative medicine have witnessed accelerated progress over the past decade. Fueled by fundamental discoveries in iPS, progenitor, and developmental cell biology, cells are now used as building blocks to create model systems, as testing platforms for drug interventions and as active therapeutics. High-throughput production of various types of “microtissues” or “organoids” is making increasing contributions to our understanding of human development, disease and repair. This Keystone Symposia meeting will highlight these rapidly emerging cell-based tools for fundamental and applied discovery. Culture systems ranging from simple cell cluster organoids, to highly advanced cell-electronic composites, will be discussed. In addition, the encouraging progress that is being made in cell-based therapies across a range of organs and diseases will be featured. The goal of this meeting is to provide a state-of-the-art review of both pluripotent and differentiated cells as tools for discovery and therapy. A broad range of cell types and therapeutic areas will be included.

Session Topics:

- Biologically-Based Microsystems
- Workshop 1: Human iPS Cells in Disease Modeling
- Engineered Organoids for Biological Discovery
- Cell-Based Platforms for Drug Screening
- Workshop 2: Career Development
- Engineered Tissues in Cancer
- The Current Wave – Cells as Therapeutics
- Workshop 3: Exosomes for Therapeutic Applications
- The Next Wave – Cells as Building Blocks

Abstract Deadline: December 13, 2016

Discounted Registration Deadline: January 13, 2017



Note: Abstracts can still be submitted online for poster presentation.

Upper image of bioengineered brain-like cortical tissue courtesy of National Institute of Biomedical Imaging and Bioengineering, NIH

Meeting Hashtag: #KScelltissue

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KEYSTONE SYMPOSIA

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THURSDAY, MARCH 9

Arrival and Registration

FRIDAY, MARCH 10

Welcome and Keynote Address

***Laura E. Niklason**, Yale University, USA

Danilo Tagle, NCATS, National Institutes of Health, USA
Catalyzing Translational Innovation

Biologically-Based Microsystems

***Jordan S. Miller**, Rice University, USA

Jeffrey Beekman, University Medical Center Utrecht, Netherlands
Epithelial Organoids as Tools for Discovery in Cystic Fibrosis

Takanori Takebe, Yokohama City University / Cincinnati Children's Hospital Medical Center, Japan
De novo Generation of Diverse Organ Buds from Stem Cells

Todd C. McDevitt, Gladstone Institutes, USA
Complex Cellular Models of Embryonic Development

Eduardo Marban, Cedars-Sinai Medical Center, USA
Self-Assembling Cardiac Microtissues and their Progeny in Clinical Therapeutics

Workshop 1: Human iPS Cells in Disease Modeling

***Todd C. McDevitt**, Gladstone Institutes, USA

Olga Kashpur, Tufts University, USA
Reprogramming of Diabetic Foot Ulcer Fibroblasts to iPSCs Reveals an Altered Wound Healing Potential

Adriana Blazeski, Johns Hopkins University, USA
Engineered Heart Slices Represent Syncytial Model of Arrhythmogenic Cardiomyopathy

Miguel Angel Hermida, Heriot Watt University, Scotland
3D Printing of Multilineage Human Glioblastoma Models

Alex Ng, Harvard Medical School, USA
Transcription Factor-Wide Engineering of Human Cell Types from Pluripotent Stem Cells

Jeffrey D. Serrill, City of Hope, USA
Using NGN3 Fusion Protein Constructs to Elucidate Optimal Cytoarchitecture in hPSC-Derived Pseudoislets

Kacey Ronaldson, Columbia University, USA
Adult-Like Cardiac Tissue Bio-Engineered From Human Ips Derived Cells Enables Predictive Modeling of Toxicity and Disease

Engineered Organoids for Biological Discovery

***Gary A. Gintant**, AbbVie, USA

Anjelica Leticia Gonzalez, Yale University, USA
Interstitial and Microvascular Interfaces in Inflammatory and Fibrotic Disease

Nenad Bursac, Duke University, USA
Microtissues for Studies of Skeletal Muscle Physiology and Disease

Eva-Maria Dehne, TissUse GmbH and Technische Universitat Berlin, Germany

Microphysiological Systems – State of the Art and Future Perspectives

Abhishek Ananthanarayanan, Invitrocue Pte Ltd., Singapore
Short Talk: Hepatocyte Spheroid Cultures in Galactosylated Cellulosic Sponge for Drug DMPK and Efficacy Testing

Poster Session 1

SATURDAY, MARCH 11

Cell-Based Platforms for Drug Screening

***Nenad Bursac**, Duke University, USA

Gary A. Gintant, AbbVie, USA
Development of an in vitro Pro-Arrhythmia Assay

Sharon Presnell, Organovo, Inc., USA
Bioprinting of Liver Organoids

Milica Radisic, University of Toronto, Canada
Evaluation of Cardiotoxicity Using Biowires

Karl-Heinz Krause, University of Geneva Faculty of Medicine, Switzerland
Engineered Neural Tissues as Human Disease Models

Patrick Guye, InSphero AG, Switzerland
Short Talk: A Microfluidic Multi-Tissue Culturing Platform Based on 3D Microtissue Spheroids

Workshop 2: Career Development

***Laura E. Niklason**, Yale University, USA

***Milica Radisic**, University of Toronto, Canada

***Nenad Bursac**, Duke University, USA

Engineered Tissues in Cancer

***Milica Radisic**, University of Toronto, Canada

Biju Parekkadan, Rutgers University, USA
Engineered Cancer-Stroma Microenvironments

Jordan S. Miller, Rice University, USA
Models of Lung Cancer Invasion and Metastasis

Alison P. McGuigan, University of Toronto, Canada
TRACER: An Engineered Tumor for Exploring Cellular Phenotype and Microenvironment in Hypoxic Gradients

Deena Mohamad Ameen Gendoo, Princess Margaret Cancer Centre, Canada
Short Talk: Comprehensive Assessment of the Genetic Landscape of Matched Primary, Xenograft, and Organoid Models for Pancreatic Cancer

Poster Session 2

SUNDAY, MARCH 12

The Current Wave – Cells as Therapeutics

***Laura E. Niklason**, Yale University, USA

Joanne Kurtzberg, Duke University, USA
Game Changers: Using Cord Blood to Help the Brain

Thomas Schulz, ViaCyte, Inc., USA
Development of Stem-Cell Derived, Islet Replacement for Type 1 Diabetes

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Gordana V. Vunjak-Novakovic, Columbia University, USA
Human Cardiac and Tumor Platforms for Study of Disease

Jorge Mansilla-Soto, Memorial Sloan Kettering Cancer Center, USA
*Short Talk: CRISPR/Cas9-Targeted Chimeric Antigen Receptor
Enhances CAR T Cell-Mediated Tumor Eradication*

Workshop 3: 3-Dimensional Cellular Models

***Laura E. Niklason**, Yale University, USA

Amir Ali Khan, University of Sharjah, United Arab Emirates
*Unravelling the Gene Expression Profiles of the Early Differentiation of
Mesenchymal Stem Cells into Neural Lineage*

Sijie Sun, University of Washington, USA
*Bioengineering 3D Human Skin Equivalent with Perfused
Microvascular Network to Study Host-Viral Interactions During Infection*

Christopher Hubert, Cleveland Clinic, Lerner Research Institute, USA
Modeling Glioblastoma through Cancer Stem Cell Organoids

Anastasia Korolj, University of Toronto, Canada
*Biomimetic Curvature in Cell Culture Platform Improves Podocyte
Differentiation in vitro*

Sara Nunes Vasconcelos, University of Toronto, Canada
*Diabetes Impairs Arterio-Venous Specification in Engineered Vascular
Tissues in a Perivascular Cell Recruitment-Dependent Manner*

Ryan LaRanger, University of Texas Southwestern Medical Center,
USA
*Engineering Reconstituted Decellularized Mouse Lungs with
Conditionally Reprogrammed Human Bronchial Epithelial Cells*

The Next Wave – Cells as Building Blocks

***Sara Nunes Vasconcelos**, University of Toronto, Canada

Miguel Gonzalez-Andrades, Harvard University, USA
Tissue Engineered Corneas: A Clinical Reality?

Daniela Franco Bueno, Institute of Teaching and Research of Sirio
Libanes Hospital, Brazil
Alveolar Bone Tissue Engineering for Cleft Lip and Palate

Laura E. Niklason, Yale University, USA
Engineered Arteries in Renal Failure and Arteriosclerosis

Meeting Wrap-Up: Outcomes and Future Directions (Organizers)

MONDAY, MARCH 13

Departure