# 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
on Molecular and Cellular Biology

## Engineered Cells and Tissues as Platforms for Discovery and Therapy (K1)

**March 9-12, 2017 • Fairmont Copley Plaza • Boston, Massachusetts, USA**

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*Sponsored by Editas Medicine, Inc., Juno Therapeutics, Merck & Co., Inc. and Thermo Fisher Scientific Inc.*

*Abstract & Scholarship Deadline: November 9, 2016 / Abstract Deadline: December 13, 2016 / Discounted Registration Deadline: January 13, 2017*

### THURSDAY, MARCH 9

#### Arrival and Registration

### FRIDAY, MARCH 10

#### Welcome and Keynote Address

*__Laura E. Niklason__, Yale University, USA

__Danilo A. Tagle__, NCATS, National Institutes of Health, USA
*Catalyzing Translational Innovation*

#### Biologically-Based Microsystems

*__Jordan S. Miller__, , 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__, , 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__, Nottingham Trent University, UK
*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*

**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