SUNDAY, APRIL 3
Arrival and Registration

MONDAY, APRIL 4
Welcome and Keynote Session (Joint)
*Roger D. Kamm, Massachusetts Institute of Technology, USA
Session Chair
*Jason R. Spence, University of Michigan Health System, USA
Session Chair
Paola Arlotta, Harvard University, USA
Programming, Reprogramming and Modeling of the Mammalian Cerebral Cortex
Matthias Lutolf, EPF Lausanne, Switzerland
Engineering Epithelial Organoid Development
Embryoids and Gastruloids for Early Development (Joint)
*Nuria Montserrat Pulido, Institute for Bioengineering of Catalonia, Spain
Session Chair
*Todd C. McDevitt, Gladstone Institutes, USA
Session Chair
Jianping Fu, University of Michigan, Ann Arbor, USA
Building Synthetic Human Embryo-Like Structures
Magdalena D. Zernicka-Goetz, University of Cambridge, UK
Development of Cell Lineages and Patterning in the Early Mammalian Embryo
Xufeng Xue, University of Michigan, USA
Short Talk: A Patterned Human Neural Tube Model Using Microfluidics
Sunghee Estelle Park, University of Pennsylvania, USA
Short Talk: Geometric Engineering of Organoid Culture for Enhanced Organogenesis in a Dish

High Content Screening with Organoids (X8)
Jason R. Spence, University of Michigan Health System, USA
Complex Cell-Cell Interactions in the Developing Human Lung and Gut
Athanasia Apostolou, Emulate Inc, USA
Next Generation in vitro Systems for Drug Discovery
*Shuibing Chen, Weil Cornell Medical College, USA
A Multi-organoid Platform, SARS-CoV-2 Infection and Drug Screening
Filippo Cipriani, New York Stem Cell Foundation Research Institute, USA
Short Talk: Automated Platform to Derive iPSC-pancreatic Organoids for Population-scale Modeling of Type 2 Diabetes

Jack Song, USC, USA
Short Talk: Pluripotent Stem Cell-directed Model of Autosomal Dominant Polycystic Kidney Disease for Disease Mechanism and Drug Discovery

Engineering Principles of Developmental Biology and Regeneration (X7)
*Ron Weiss, Massachusetts Institute of Technology, USA
Mammalian Synthetic Biology, Programmable Organoids, and Neuromorphic Computing in Cells
Kevin Kit Parker, Harvard University, USA
Building Cardiac Anatomy and Physiology into Muscular Pumps
Alex Hughes, University of Pennsylvania, USA
Short Talk: Extracting and Building with the Engineering Principles of Kidney Development
Katharine Goodwin, Princeton University, USA
Short Talk: On Fate and Form: Branching Morphogenesis Instructs Spatial Patterns of Epithelial Differentiation in the Developing Lung

Poster Session 1
TUESDAY, APRIL 5
Increasing Complexity in Organoids by Leveraging Development (X8)
Barbara Treutlein, ETH Zürich, Switzerland
Remote Presentation: Single Cell Genomics to Guide Human Stem Cell and Tissue Engineering
Prisca Liberati, Friedrich Miescher Institute for Biomedical Research, Switzerland
Remote Presentation: Regenerative Landscape of Intestinal Organoids
*Giorgia Quadarto, University of Southern California, USC Stem Cell, USA
Modeling Human Brain Development and Disease at Single Cell Resolution with Brain Organoids
*Madeline Lancaster, Medical Research Council Laboratory of Molecular Biology, UK
Using Brain Organoids to Identify Conserved or Unique Factors in Human Brain Size Evolution
Anna Meier, Technical University of Munich, Germany
Short Talk: Epicardioi Single-cell Genomics Uncover Principles of Human Epicardium Biology in Heart Development and Disease
Nicole Pek, Cincinnati Childrens Hospital Medical Center, USA
Short Talk: Reconstructing Pulmonary Circulation to Study Lung Alvelogenesis in a Dish

* Session Chair † Invited but not yet accepted     Program current as of October 3, 2022. Meal formats are based on meeting venue. For the most up-to-date details, visit https://www.keystonesymposia.org.
Microphysiological Systems and Drug Discovery Platforms (X7)
*Adam W. Feinberg*, Carnegie Mellon University, USA
Session Chair
*Alex Hughes*, University of Pennsylvania, USA
Session Chair
Christine L. Mummery, Leiden University Medical Center, Netherlands
Remote Presentation: Characterization and Functional Analysis of Cardiovascular Derivatives of Human Pluripotent Stem Cells
*Roger D. Kamm*, Massachusetts Institute of Technology, USA
Microphysiological Models for Neurological Disease
*Sandra J. Engle*, Biogen, USA
*In vitro Models to Enable Drug Discovery*
Danilo A. Tagle, NCATS, National Institutes of Health, USA
*Tissue Chips for Drug Screening*
*Sylvia F. Boj*, Hubrecht Organoid Technology, Netherlands
*Patient-Derived Organoids for Drug Development and Screening*
Alice Stanton, MIT, USA
*Short Talk: Engineering Vascularized Mini-Brain-Tissue for Accelerating Drug Discovery and Translation with Cell-Instructive Materials*

Career Roundtable (Joint)
*Sandra J. Engle*, Biogen, USA
*Anjelica L. Gonzalez*, Yale University, USA
*Merixcell Huch*, Max Planck Institute of Molecular Cell Biology and Genetics, Germany
*Adriana Harbuzariu*, Emory University, USA
*Nuria Montserrat Pulido*, Institute for Bioengineering of Catalonia, Spain

Improvements in Organoid Maturation (X8)
*J. Gray Camp*, University of Basel, Switzerland
*Interrogating Evolution using Single Cell Genomics and Genome Engineering*
*James M. Wells*, Cincinnati Children’s Hospital Research Foundation, USA
*Engineering Complexity into PSC-derived Gastrointestinal Organoids*
Meghan Capeling, University of Michigan, USA
*Short Talk: Suspension Culture Promotes Serosal Mesothelial Development in Human Intestinal Organoids*
*Ana Uzquiano Lopez*, Harvard University, USA
*Short Talk: Single-cell Atlas of Human Cortical Development in vitro and in vivo Reveals Longitudinal Molecular Programs of Human Cortex Diversification*

Julien G. Roth, Stanford University, USA
*Short Talk: Spatially Controlled Construction of Multi-organoid Neural Tissues using Bioprinting*

Advanced Technologies for Engineering Multi Cellular Living Systems: Computation (X7)
*Rashid Bashir*, University of Illinois, USA
Session Chair
*Yoshihiro Morishita*, RIKEN, Japan
Remote Presentation: Quantitative Analysis of Tissue and Cell Dynamics Towards Revealing Design Principles for Organ Morphogenesis
*Melissa L. Kemp*, Georgia Institute of Technology, USA
*Modeling Self-Organization in Multi-Cellular Engineered Living Systems*
Elebeoba E. May, University of Houston, USA
*Multiscale Models of Spatiotemporal Response to Mycobacterium Infection*
Dennis A. Norfleet, Georgia Institute of Technology, USA
*Short Talk: Model-driven Prediction of Novel Emergent Bioelectric Patterns in hiPSCs*
Aric Lu, Harvard University, USA
*Short Talk: Orthogonal Induced Differentiation for Programming Stem Cells, Organoids, and Printed Tissues*

Poster Session 2

**WEDNESDAY, APRIL 6**

Organoids for Disease Modeling (X8)
Samira Musah, Duke University, USA
Remote Presentation: Stem Cell-Derived Organ Chips for Disease Modeling
*Merixcell Huch*, Max Planck Institute of Molecular Cell Biology and Genetics, Germany
*Liver Organoids for Human Biology and Disease*
*Mina Gouti*, Max-Delbrück Center for Molecular Medicine, Germany
*Neuromuscular Organoids to Model Human Development and Disease*
*Pleun Hombrink*, Hubrecht Organoid Technology, Netherlands
*Short Talk: Organoid Co-cultures with Autologous TIL to Model Personalized Tumor Specific Immune-responses*
Jean-Paul Urenda, University of Southern California, USA
*Short Talk: A Next-generation Human Multi-organoids-based Platform to Model Neurodevelopmental Disorders Following Physiological Stimulation*

Advanced Technologies for Engineering Multi-Cellular Living Systems: Imaging, Biomaterials, and 3D Printing (X7)
*Matthias Lutolf*, EPF Lausanne, Switzerland
Session Chair

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**KEystone Symposia**

**Organoids as Tools for Fundamental Discovery and Translation (X8)**

Scientific Organizers: Jason R. Spence, Melissa Little and Barbara Treutlein

Sponsored by AbbVie Inc., Genmab A/S and Merck and Co., Inc.

**Engineering Multi-Cellular Living Systems (X7)**

Scientific Organizers: Roger D. Kamm, Nuria Montserrat Pulido and Jianping Fu

April 3-6, 2022 • Keystone Resort • Keystone, CO, USA

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Global Health Travel Award Deadline: March 24, 2022 / Scholarship Deadline: January 6, 2022 / Abstract Deadline: January 6, 2022 / Discounted Registration Deadline: February 3, 2022

*Kevin Kit Parker*, Harvard University, USA
Session Chair

Rashid Bashir, University of Illinois, USA

3D Printed Cellular Machines for Engineering and Biology

Adam W. Feinberg, Carnegie Mellon University, USA

3D Bioprinting of Collagen to Rebuild Components of the Human Heart

Anjelica L. Gonzalez, Yale University, USA

Development of Biomaterials for Use As Investigational Tools

Michael Blatchley, University of Colorado Boulder, USA

Short Talk: In Situ Super-resolution Imaging of Organoids and Extracellular Matrix Interactions via Photo-expansion Microscopy

Sarah M. Hull, Stanford University, USA

Short Talk: UNIversal Orthogonal Network (UNION) Bioinks Enable Multi-material, Multi-cellular 3D Bioprinting

Bioengineering of Organoids (Joint)

*Jianping Fu*, University of Michigan, Ann Arbor, USA
Session Chair

Nuria Montserrat Pulido, Institute for Bioengineering of Catalonia, Spain

Engineering Solutions for Pluripotent Stem Cell Derived Kidney Organoids

Ryuji Morizane, Harvard Medical School, USA

Vascularized Kidney Organoids for Disease Modeling and Regenerative Medicine

*Todd C. McDevitt*, Gladstone Institutes, USA

Talk Title to be Announced

Deeak Mishra, Massachusetts Institute of Technology, USA

Short Talk: Genetically Engineered Human Pluripotent Stem Cells Utilizing Multi-step Automated Differentiation for Development of 3D Liver Bud-like Organoids

Adriana Muler-Russe, Georgia Tech, USA

Short Talk: Engineered Synthetic Platform for Human Intestinal Organoid Delivery

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

**THURSDAY, APRIL 7**

Departure