KEYSTONE SYMPOSIA
on Molecular and Cellular Biology

Tissue Organoids as Models of Host Physiology and Pathophysiology of Disease (J1)

January 19-23, 2020 • Fairmont Hotel Vancouver • Vancouver, BC, Canada

Scientific Organizers: Thaddeus S. Stappenbeck and Linda G. Griffith

Sponsored by Merck & Co., Inc., Roche and Thermo Fisher Scientific Inc.

Discounted Abstract & Scholarship Deadline: September 25, 2019 / Abstract Deadline: October 17, 2019 / Discounted Registration Deadline: November 20, 2019

SUNDAY, JANUARY 19

Arrival and Registration

MONDAY, JANUARY 20

Welcome and Keynote Address

*__Thaddeus S. Stappenbeck__, Cleveland Clinic, USA

*__Linda G. Griffith__, Massachusetts Institute of Technology, USA

__Rudolf Jaenisch__, Whitehead Institute for Biomedical Research, USA
Modeling of Human Diseases in Mouse - Human Chimeras

Modeling Pathogen Interactions with Organoids

*__Thaddeus S. Stappenbeck__, Cleveland Clinic, USA

*__Linda G. Griffith__, Massachusetts Institute of Technology, USA

__Mary K. Estes__, Baylor College of Medicine, USA
Human Intestinal Organoids: Transformative Tools to Study Gastrointestinal Infections

__L. David Sibley__, Washington University School of Medicine, USA
New Models of Cryptosporidium Culture in Primary Intestinal Epithelial Cells

__Melanie M. Ott__, Gladstone Institutes, USA
Hepatitis C Virus (HCV) Infects and Perturbs Liver Stem Cells

__Seongmi Kim__, Washington University in St. Louis, USA
Short Talk: Primary Cells Isolated from Mice with Prior UTI History Revealed that Bladder Epithelial Stem Cells Undergo Epigenetic Changes Upon Chronic Infection

__Mouhita Humayun__, University of Wisconsin-Madison, USA
Short Talk: Immune Cell Response to Toxoplasma gondii Infection in a 3D Organotypic Intestinal Model

Poster Session 1

Workshop 1

*__Mary K. Estes__, Baylor College of Medicine, USA

__Joannie Allaire__, University of British Columbia, Canada
Defining the Roles of IL37/SIGIRR in Regulating Innate Signaling by Intestinal Epithelial Cells using Enteroids

__Carolina Arias__, University of California, Santa Barbara, USA
Retinal Organoids as Physiological Proxies for the Study of Ocular Viral Infections

__Ka-Yee Grace Choi__, University of British Columbia, Canada
Effects of Host Defence Peptides on Pseudomonas aeruginosa Lung Infections using Organoids and Mice

__Alyssa Fasciano__, Tufts University School of Medicine, USA
Breaching the Barrier: Investigating Selective Yersinia Entry into M Cells using Human Ileal Enteroid Monolayers

__Grace Hudson__, University of Calgary, Canada
Understanding the Infection Dynamics of Mycobacterium Paratuberculosis (MAP)

__Dasja Pajkrt__, Amsterdam University Medical Center, Netherlands
Studies on Picornavirus Infection using Human Organoids

__Annika Niehrs__, Heinrich-Pette Institut, Germany
Hepatocyte Organoids as a Model System to Study Immune Cell Recognition of HBV-Infected Hepatocytes

Modeling Immunity into Organoid Systems

*__Charles E. Whitehurst__, Boehringer Ingelheim Pharmaceuticals, Inc., USA

__Andres J. Garcia__, Georgia Institute of Technology, USA
Synthetic Hydrogels as Engineered Niches for Organoids

__Senthil K. Muthuswamy__, Harvard Medical School, USA
Stem Cell and Tumor Derived Organoids for Cancer Biology and Personalized Therapeutics

__Fred H. Gage__, The Salk Institute for Biological Studies, USA
Enhanced Glial Corporation and Vascularization of Brain Organoids

__Sebastian M. Löbl__, Heinrich Pette Institute Leibniz Institute for Experimental Virology, Germany
Short Talk: Lymphocytes and Angiocrine Signaling in Liver Regeneration

TUESDAY, JANUARY 21

Developmental Programs of Organoid Stem Cells for Therapy

*__Randolph Scott Ashton__, University of Wisconsin, USA

__Takanori Takebe__, Yokohama City University / Cincinnati Children's Hospital Medical Center, Japan
Modeling Hepato-Biliary-Pancreatic Organogenesis towards Therapy

__Todd C. McDevitt__, Gladstone Institutes, USA
Axial Elongation of Caudalized Human PSC Organoids Mimics Neural Tube Development

__Celeste M. Nelson__, Princeton University, USA
Recapitulating Morphogenesis of the Lung

__Sarah Saxton__, University of Washington, USA
Short Talk: Hepatoblast Organoids have Bipotential Fate in Engineered Liver Tissue

__Catarina Brito__, Instituto de Biologia Experimental e Tecnológica, Portugal
Short Talk: Modelling Neuronal Microenvironment Dynamics in Disease

Metabolic Crosstalk with Organoids and the Environment

*__Nastaran Zahir__, NCI, National Institutes of Health, USA

__Ömer Hidir Yilmaz__, Massachusetts Institute of Technology, USA
Dietary Control of Intestinal Stem Cells in Physiology and Disease

__Boudewijn MT Burgering__, Utrecht University, Netherlands
Interplay between Metabolic Identities in the Intestinal Crypt

__William D. Rees__, University of British Columbia, Canada
Short Talk: Colon-Derived Enteroids from Inflammatory Bowel Disease Patients have Dysregulated Endoplasmic Reticulum Stress Pathways that Drive Dendritic Cell Maturation

__Elisabeth Gleisinger__, Technical University of Munich, Germany
Short Talk: Mitochondrial Impairment Drives Intestinal Stem Cell Transition into Dysfunctional Paneth Cells Predicting Crohn's Disease Recurrence

Poster Session 2

WEDNESDAY, JANUARY 22

Cancer Cell Organoids

*__Simon Andrew Hirota__, University of Calgary, Canada

__Herve Tiriac__, University of California, San Diego, USA
Pancreatic Cancer Patient-Derived Organoids as a Tool for Personalized Medicine

__Nicola Valeri__, Institute of Cancer Research, UK
Patient-Derived Organoids: Promises, Hurdles and Potential Clinical Applications

__Claus Jorgensen__, Cancer Research UK, UK
A Microenvironment Inspired Synthetic 3D Model for Pancreatic Ductal Adenocarcinoma

__Shuibing Chen__, Weill Cornell Medical College, USA
Human Pluripotent Stem Cells, Colonic Organoids and Colorectal Cancer

__Karuna Ganesh__, Memorial Sloan Kettering Cancer Center, USA
Short Talk: Regenerative Origin of Metastasis Initiating Cells

__Germain C. Ho__, BC Cancer Research Centre, Canada
Short Talk: Single-Cell Sequencing of Normal Endometrial Organoids to Investigate Contribution of Secretory and Ciliated Cells to Endometrial Carcinomas

Modeling Tissue Repair with Organoids

*__Andres J. Garcia__, Georgia Institute of Technology, USA

__Konstantina Nikolakopoulou__, University of Cambridge, UK
Organoids for the Study of Endometrial Physiology and Disease

__Thaddeus S. Stappenbeck__, Cleveland Clinic, USA
Modeling the Mechanisms That Control Injury Cycles of Intestinal Epithelial Stem Cells

__Randolph Scott Ashton__, University of Wisconsin, USA
Bioengineering Early CNS Morphogenesis for Scalable Assessment of Neural Tube Defect Risk

__Elisa M. Murray__, Washington University in St. Louis, USA
Short Talk: Deciphering the Role of Her2 and Apc Mutations on the Intestinal Epithelium using Gastrointestinal Organoids

__Sakurako Kobayashi__, Tokyo Medical and Dental University, Japan
Short Talk: Conceptual Basis of Lineage Shift between Intestinal Epithelium and Hepatocytes

Poster Session 3

THURSDAY, JANUARY 23

Engineering Solutions to Improve Organoid Growth

*__Todd C. McDevitt__, Gladstone Institutes, USA

__Linda G. Griffith__, Massachusetts Institute of Technology, USA
Integrating Synthetic Biomaterials and Perfusion to Enhance Organoid Function

__Sarah Heilshorn__, Stanford University, USA
Protein-Engineered Materials as Synthetic Niches for Organoids

__Zev Gartner__, University of California, San Francisco, USA
The Role of Self-Organization in the Maintenance and Breakdown of Tissue Structure during Breast Cancer Progression

__Jennifer A. Lewis__, Harvard University, SEAS, USA
Ex Vivo Vascularization of Organoid-on-Chip Models and 3D Tissues

__Kevin Achberger__, University of Tuebingen, Germany
Short Talk: Retina-on-a-Chip- An in vitro Tool to Study the Complexity of the Human Retina

__Katarina Klett__, Stanford University, USA
Short Talk: Tunable Engineered Matrix for the Culture of Human Intestinal Organoids

Workshop II

*__Mark Kennedy__, Thermo Fisher Scientific, USA

__Bo Yu__, University of Washington, USA
Establishing Acute Infection in a Fallopian Tube Organoid Model

__Claudia Beaurivage__, University of Sheffield, Netherlands
Establishment of a High Throughput Microfluidic Gut-on-a-Chip Model using Human Intestinal Organoids to Assess Compound Efficacy and Perform Target Validation in Inflammatory Bowel Disease

__Yoonseok Choi__, University of Ulsan, South Korea
Development of an ex vivo Microfluidic Platform that Enabled the Preclinical Immune Response Interaction Monitoring followed by the Immune Checkpoint Blockade

__Jose Fabian Oceguera-Yanez__, Kyoto University, Japan
Applications of Genetically Engineered Human iPSCs to Understand Skin Cancer Development and Pathology

__H.-H. Greco Song__, Massachusetts Institute of Technology, USA
Transient Support from Fibroblasts is Sufficient to Drive Functional Vascularization in Engineered Tissues

Integrating Vasculature, Nerve Networks, and Dynamic Behaviors into Organoids

*__Thomas Åskov Pedersen__, Novo Nordisk, Denmark

__Michael A. Helmrath__, Cincinnati Children's Hospital, USA
Integrating Models of Human Intestinal Development

__Roger D. Kamm__, Massachusetts Institute of Technology, USA
Microphysiological Models of Neurological Disease

__Peter W. Zandstra__, University of British Columbia, Canada
Engineering Stem Cell Fate and Function

__Adrianna K. San Roman__, Whitehead Institute, USA
Short Talk: Cell-Autonomous Effects of Sex Chromosome Dosage on Global Gene Expression

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

FRIDAY, JANUARY 24

Departure