

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Single Cell Biology: From Development to Cancer (E4)

June 18-22, 2023 • Keystone Resort • Keystone, CO, USA

Scientific Organizers: Mario Suva and Itay Tirosh

Sponsored by Chinese Society for Cell Biology, (Cell Research) and Janssen R&D: Pharmaceutical Companies of Johnson & Johnson

Scholarship Deadline: March 29, 2023 / Abstract Deadline: March 29, 2023 / Discounted Registration Deadline: April 18, 2023

SUNDAY, JUNE 18

Arrival and Registration

MONDAY, JUNE 19

Welcome and Keynote Address

***Mario Suva**, Harvard University, USA

***Itay Tirosh**, Weizmann Institute of Science, Israel

Sohrab Shah, Memorial Sloan Kettering Cancer Center, USA

Hematopoiesis and Leukemia

Andreas Trumpp, German Cancer Research Center, Germany
Leukemic Stem Cells

Dan A. Landau, Weill Cornell Medicine, USA
Mapping Genotype-phenotype Relationships in Human Clonal Mosaicism

***Fernando D. Camargo**, Boston Children's Hospital, USA
Single-Cell Lineage Tracing in Hematopoiesis

Ruslan Soldatov, MSKCC, USA
Short Talk: Transcriptional Signatures of Stem Cell Phenotypes in Normal and Clonal Hematopoiesis

Workshop

***Itay Tirosh**, Weizmann Institute of Science, Israel

Tatyana Lev, University of California, Irvine, USA
Tumorigenesis and Progression of BRCA1-mutant Basal-like Breast Cancer

Antonios Somarakis, The Jackson Laboratory, Greece
Exploring the Molecular Profile and Cellular Diversity of Endometriosis using Spatial Transcriptomics

Siddharth S. Dey, University of California, Santa Barbara, USA
Photo-sensitive Barcodes Combined with Topologically Imposed Light Gradients Enable Spatially-resolved Single-cell Transcriptomics and Epigenomics

Benjamin K. Johnson, Van Andel Institute, USA
Single-cell Total RNA Miniaturized Sequencing (STORM-seq) Reveals Differentiation Trajectories of Primary Human Fallopian Tube Epithelium

Ignas Masilionis, Memorial Sloan Kettering Cancer Center, USA
Impact of Nuclei Isolation Methods on snRNAseq

Kairavee Thakkar, University of Cincinnati, USA
De Novo Patient Subtype and Phenotype Discovery from Single-cell Data Using UDON

Doris Fu, Cellarity Inc., USA
Predicting Small Molecule Modulator for Megakaryocyte Progenitor Potential: Application in Chemotherapy Induced Thrombocytopenia

Development and Cancer of the Skin and Liver

Anna Christina Obenaus, Research Institute of Molecular Pathology, Austria
Remote Presentation: Mechanisms of Metastasis and Drug Resistance in Melanoma

***Meritxell Huch**, Max Planck Institute of Molecular Cell Biology and Genetics, Germany
Cellular Heterogeneity in Liver Regeneration and Cancer

Dylan Schaff, University of Pennsylvania, USA

Short Talk: Clonal Differences Underlie Differential Responses to Initial, Sequential and Prolonged Drug Treatment

Peter Renz, University of Zurich, Switzerland
Short Talk: Tissue-wide Single-cell CRISPR Uncovers Distinct TNFa Modes in Clonal Expansion and Transformation in the Skin

Poster Session 1

TUESDAY, JUNE 20

Brain Development and Cancer

***Mario Suva**, Harvard University, USA
Heterogeneity in Glioma by scRNA-seq

Arnold R. Kriegstein, University of California, San Francisco, USA
Radial Glia in Development and Glioma

Gioele La Manno, École Polytechnique Fédérale de Lausanne, Switzerland
A Single Cell Analysis of Neurodevelopment

Ian Cheong, Ontario Institute for Cancer Research, Canada
Short Talk: Uncovering Unique Human Gene Regulatory Networks in Hindbrain Development and Group 3 and 4 Medulloblastoma

Mary ONEILL, Brotman Baty Institute, USA
Short Talk: Five Years of Single-Cell Combinatorial Indexing at the BBI Advanced Technology Laboratory (BAT-Lab) at the University of Washington

Karthik Shekhar, University of California, Berkeley, USA
Short Talk: Multimodal Single-cell Insights into Experience-dependent and -Independent Specification of Neural Diversity

Alissa Greenwald, Weizmann Institute of Science, Israel
Short Talk: A Multi-layered Model of Glioma Spatial Organization

Career Roundtable

Andreas Trumpp, German Cancer Research Center, Germany

Andrea H. Bild, City of Hope Comprehensive Cancer Institute, USA

Fred P. Davis, Celsius Therapeutics, USA

Sidharth V. Puram, Washington University School of Medicine, USA

Technology Development

Jean Fan, Johns Hopkins University, USA
Integrative Spatial Transcriptomics Analyses

***Itai Yanai**, New York University School of Medicine, USA
Spatial Analyses in Cancer

***Samantha A. Morris**, Washington University School of Medicine in St Louis, USA
New Genomic Technologies to Deconstruct and Control Cell Identity

Jackson Weir, Harvard University, USA
Short Talk: Slide-tags: Scalable Single-nucleus Barcoding for Multi-modal Spatial Genomics

Nathan Spix, Van Andel Institute, USA
Short Talk: Deep Characterization of Single-Cell Epigenomes in Health and Disease with scDEEP-MeC

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Poster Session 2

WEDNESDAY, JUNE 21

Integrative Analyses and Comp. Methods

***Itay Tirosh**, Weizmann Institute of Science, Israel
Pan-Cancer Analysis of Cellular Heterogeneity

Aaron Newman, Stanford University, USA
Developmental States and Spatial Phenotypes in Cancer

Tali Raveh-Sadka, Immunai, Israel
Single-cell Data at Scale, from Exploration to Decision Making

Antony David Rose, Newcastle University, UK
Short Talk: Single Cell Atlas of Whole Human Embryos with Pseudo-spatial Visualisation

Kyoung Won, Cedars-Sinai Medical Center, USA
Short Talk: CellNeighborEX: Deciphering Neighbor-Dependent Gene Expression from Spatial Transcriptomics Data

Joshua D. Campbell, Boston University, USA
Short Talk: Novel Approaches for Detecting Gene Programs Associated with Lineage Plasticity and Tumor Aggressiveness in Lung Cancer Cells from 12 Datasets

Guanming Wu, OHSU, USA
Short Talk: A Computational Workflow to Construct Regulatory Networks of Transcription factors and Pathways Using scRNA-seq Data for Mathematical Modeling

Panel Discussion: Beyond the Bench – Career and Interpersonal Skills

***Dana Silverbush**, Broad Institute of MIT and Harvard, USA

***Chris Mount**, MGH, USA

Melissa Hirose Wong, Oregon Health & Science University, USA
Resilience

Karthik Shekhar, University of California, Berkeley, USA
Mentorship

Jean Fan, Johns Hopkins University, USA
Time Management

Aaron Newman, Stanford University, USA
Launching and Running a Data-Science Focused Research Group

Mark A. Krasnow, Stanford University School of Medicine, USA
How to Choose (or Invent) Model Systems for Your Science

Paivi Pihlajamaa, University of Helsinki, Finland
Pivoting from Dead-End to a Successful Project

Gynecological Development and Cancer

Andrea H. Bild, City of Hope Comprehensive Cancer Institute, USA
Evolution of Endocrine and Cell Cycle Therapy Resistance Driven by Tumor Cell Communication in Breast Cancer

***Devon A. Lawson**, University of California, Irvine, USA
Microenvironment Influence on Metastatic Spread in Breast Cancer

***Nicholas Navin**, University of Texas MD Anderson Cancer Center, USA
Clonal Diversity and Evolution in Breast Cancer

Melissa Saichi, Institut Curie, France
Short Talk: Pre-neoplastic States in BRCA1 Carriers

Yihan Wang, UT Southwestern, USA

Short Talk: Enhancer Regulatory Networks Globally Connect Non-coding Breast Cancer Loci to Cancer Genes

Poster Session 3

THURSDAY, JUNE 22

Gastrointestinal Development and Cancer

Moshe Biton, Weizmann Institute of Science, Israel
Epithelial-Immune Interaction in the Gut

***Karuna Ganesh**, Memorial Sloan Kettering Cancer Center, USA
Targeting Regenerative Plasticity in Metastasis

***Sidharth V. Puram**, Washington University School of Medicine, USA
Heterogeneity in Head and Neck Cancer

Fred P. Davis, Celsius Therapeutics, USA
Single-Cell Analysis for Drug Development

Ashley N. Anderson, Oregon Health and Science University, USA
Short Talk: Multi-omic and Imaging Single Cell Analyses Identify Neoplastic-immune Hybrid Cell Properties for Metastatic Progression in Colorectal Cancer

Paivi Pihlajamaa, University of Helsinki, Finland
Short Talk: Dissecting Transcription Factor Binding Events Essential for Proliferation of Colon Cancer Cells Using a CRISPR/Cas9-based Genome Editing Methods

Lung Development and Cancer

***Ashley M. Laughney**, Weill Cornell Medicine, USA
Tackling the Genotype-to-phenotype Problem in Lung Cancer Evolution

Mark A. Krasnow, Stanford University School of Medicine, USA
Single Cell Analysis of Alveolar Development and Stem Cells

Dian Yang, Whitehead Institute, USA
Short Talk: Lineage Tracing Reveals the Phylodynamics, Plasticity and Paths of Tumor Evolution

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

FRIDAY, JUNE 23

Departure