

# Single Cell Biology (EK26-2021)

Organizer(s): Shalev Itzkovitz and Arjun Raj

Virtual at your computer, , CO • March 17 - March 19, 2021

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## Wednesday, March 17

### Welcoming Remarks and Keynote

#### Address (8am Denver/Mountain Time)

##### Start) (8:00-8:40 AM)

**\*Shalev Itzkovitz**, Weizmann Institute of Science  
**Michael Elowitz**, California Institute of Technology  
*Multicellular Circuit Design: Natural and Synthetic*

### Single Cell Biology of Mammalian

#### Organs (8:30am Denver/Mountain Time)

##### Start) (8:40-11:00 AM)

**\*Arjun Raj**, University of Pennsylvania  
**Ana Domingos**, University of Oxford  
*Sympathetic Neuroimmune Heterogeneity*  
**Naomi Habib**, Hebrew University of Jerusalem  
*Dissecting the Alzheimer's Brain: From Single Cells to Cellular Communities*  
**\*Shalev Itzkovitz**, Weizmann Institute of Science  
*Spatial Omics of the Intestinal Epithelium*  
**Ramnik Xavier**, Massachusetts General Hospital  
*Single Cell Analysis of the Intestine*  
**Homaira Hamidzada**, University of Toronto  
*Short Talk: Single Cell Transcriptomics Reveals a Modular Macrophage Structure Conserved Across Organs and Species*  
**Michael Balzer**, University of Pennsylvania  
*Short Talk: Single Cell Profiling of Acute Kidney Injury in Mice Highlights Differential Cell Death Programs and Renal Fibrosis Patterns*

### Novel Technologies in Single Cell

#### Analysis (3pm Denver/Mountain Time)

##### Start) (3:00-6:00 PM)

**\*Arjun Raj**, University of Pennsylvania  
**Prisca Liberali**, Friedrich Miescher Institute for Biomedical Research  
*Single Cell Approaches to Collective Cell Behavior*  
**Britt S. Adamson**, Princeton University  
*Functional Genomics with High-Resolution Phenotypes*  
**Jessica Whited**, Harvard University  
*Single-Cell Approaches to Understanding Complex Tissue Regeneration in Axolotl*  
**Aaron Streets**, University of California, Berkeley  
*Imaging and Sequencing Single Cells*  
**\*Long Cai**, California Institute of Technology  
*Image-Based Transcriptomics in the Spatial Context*  
**Andrew B. Stergachis**, University of Washington  
*Short Talk: Single-Molecule Chromatin Fiber Sequencing Exposes Cell and Haplotype-Specific Chromatin Architectures*  
**Clarice Hong**, Washington University in St Louis  
*Short Talk: scTRIP: A Method to Identify Chromatin Features Influencing Gene Expression Noise*

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## Thursday, March 18

### Single Cell Analysis in Pathology (8am

#### Denver/Mountain Time Start) (8:00-11:00

##### AM)

**\*Shalev Itzkovitz**, Weizmann Institute of Science

**Leeat Keren**, Stanford University  
*New Tools for Visualizing Cellular Heterogeneity in Cancer*

**Martin Guillems**, Ghent University - VIB  
*Cell-Cell Circuits Driving Modular Tissue Regeneration*

**Uri Alon**, Weizmann Institute of Science  
*Optimal Division of Labour Within a Cell Type*

**\*Alex K. Shalek**, Massachusetts Institute of Technology

*Identifying and Rationally Modulating Cellular Drivers of Enhanced and Diminished Immunity*

**Regan Hamel**, University of Cambridge  
*Short Talk: Time-Resolved Single-Cell RNAseq Profiling Identifies a Novel Fabp5-Expressing Subpopulation of Inflammatory Myeloid Cells in Chronic Spinal Cord Injury*

**Sarah Pfau †**, Harvard Medical School  
*Short Talk: Vascular and Perivascular Cell Profiling Reveals the Molecular and Cellular Bases of Blood-Brain Barrier Heterogeneity*

### Meet the Editors (12:30m

#### Denver/Mountain Time Start) (12:30-1:30

##### PM)

### Computational Approaches (3pm

#### Denver/Mountain Time Start) (3:00-6:00

##### PM)

**\*Shalev Itzkovitz**, Weizmann Institute of Science

**Arjun Raj**, University of Pennsylvania  
*Single Cell Analysis in Cancer*

**Stephen Quake**, Stanford University  
*Technology and Applications in Single Cell Analysis*

**Nancy R. Zhang**, University of Pennsylvania  
*Transfer Learning for Single Cell Transcriptomics*

**Jean Fan**, Harvard University  
*Statistical Approaches and Computational Tools for Analyzing Spatially Resolved Single-Cell Transcriptomics Data*

**\*Cole Trapnell**, University of Washington  
*Computational Tools for Biological Inference*

**Bo Wang**, Stanford University  
*Short Talk: Mapping Single-Cell Atlases throughout Metazoa Unravels Cell Type Evolution*

**Noah F. Greenwald**, Stanford University  
*Short Talk: Accurate Whole-Cell Segmentation of Multiplexed Imaging Data by Combining Large-Scale Data Annotation and Deep Learning*

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## Friday, March 19

### Tracking Dynamics of Single Cells (8am

#### Denver/Mountain Time Start) (8:00-11:00

##### AM)

**\*Shalev Itzkovitz**, Weizmann Institute of Science

**Roser Vento-Tormo**, Sanger Wellcome Trust  
*Mapping the Temporal and Spatial Dynamics of the Human Endometrium in vivo and in vitro*  
**Silvia Santos**, Francis Crick Institute  
*Signaling Dynamics for Cellular Fate Control*

**\*Sabrina L. Spencer**, University of Colorado-Boulder  
*Real-Time Visualization of Rapid Escape from Drug Treatment in Single Melanoma Cells*

**Hernan G. Garcia**, University of California Berkeley  
*Transcriptional Dynamics in Single Cells*

**Geethika Arekatla**, ETH Zurich

*Short Talk: Optogenetic Manipulation Reveals ERK and AKT Signaling Dynamics Required for ESC Differentiation*

**Federico Gatti**, Weill Cornell Medicine

*Short Talk: Deciphering the Epigenetic Encoding, Heritability, and Plasticity of Transcriptional Cancer Cell States via Single Cell Multi-Omics*

**Rinat Arbel Goren**, Weizmann Institute of Science

*Short Talk: Robust, Coherent and Synchronized Circadian Clock-Controlled Oscillations along Multicellular Filaments of Anabaena cyanobacteria*

**Steffen Rulands**, Max Planck Institute for the Physics of Complex Systems

*Short Talk: From Sequence to Space and Time: Inferring Emergent Epigenetic Processes from Single-Cell Multi-Omics*

### Networking Lounge (12pm

#### Denver/Mountain Time Start) (12:00-1:30

##### PM)

### Fate Tracing of Single Cells (3pm

#### Denver/Mountain Time Start) (3:00-5:50

##### PM)

**\*Arjun Raj**, University of Pennsylvania  
**Philipp Junker**, Max Delbrück Center for Molecular Medicine

*High-Throughput Lineage Tracing in the Regenerating Zebrafish Heart*

**Allon M. Klein**, Harvard University  
*Connecting Cellular States to Cellular Fates*

**Samantha A. Morris**, Washington University in St Louis

*New Genomic Technologies to Measure and Manipulate Cell Identity*

**\*John Isaac Murray**, University of Pennsylvania

*A Lineage-Resolved Molecular Atlas of C. Elegans*

**Katie Galloway †**, Massachusetts Institute of Technology

*Short Talk: Detangling DNA: Single-Cell Approaches to Understanding Plasticity in Cellular Reprogramming*

**Michael Ratz**, Karolinska Institutet

*Short Talk: Clonal Tracking and Expression Profiling in the Mouse Brain via Single Cell and Spatial Transcriptomics*

**Merrit J. Romeike**, Max Perutz Labs Vienna

*Short Talk: Impaired Differentiation: Understanding a Single Cell State Transition*

### Closing Remarks (5:50pm

#### Denver/Mountain Time Start) (5:50-6:00

##### PM)