

# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## 3D Genome: Gene Regulation and Disease (X6)

Scientific Organizers: Bing Ren, Ana Pombo and Joseph R. Ecker

Sponsored by Cell Research and Incyte Corporation

## Epigenetics and Human Disease (X5)

Scientific Organizers: Cheryl H. Arrowsmith, Anne Schaefer and Mark A. Dawson

March 17-21, 2019 • Fairmont Banff Springs • Banff, Alberta, Canada

Sponsored by Cell Research and Incyte Corporation

Abstract & Scholarship Deadline: November 15, 2018 / Abstract Deadline: December 12, 2018 / Discounted Registration Deadline: January 22, 2019

### SUNDAY, MARCH 17

#### Arrival and Registration

### MONDAY, MARCH 18

#### Welcome and Keynote Session (Joint)

**Richard A. Young**, Whitehead Institute for Biomedical Research, USA  
*Transcriptional Regulation by the 3D Genome*

**Wendy A. Bickmore**, University of Edinburgh, UK  
*Spatial Organisation of Human Genome in Genetic Disease*

#### 3D Epigenome/Epigenetics and Disease (Joint)

**Matthias Merckenschlager**, Imperial College London, UK  
*Cohesin and CTCF in the Immune System*

**Mathieu Lupien**, University Health Network, Canada  
*Epigenetics of Cancer Stem Cells*

**Joanna Wysocka**, Stanford University School of Medicine, USA  
*Epigenetic Regulation of Craniofacial Development*

#### Short Talk(s) Chosen from Abstracts

#### Workshop 1: 4DN Nucleome Consortium Resources (X6)

##### Short Talks Chosen from Abstracts

#### Workshop 1: Epigenetic Memory and Inheritance in Health and Disease (X5)

##### Short Talks Chosen from Abstracts

#### Single Cell Analysis of Genome Architecture (X6)

**Alistair Boettiger**, Stanford University, USA  
*Optical Reconstruction of Chromatin Architecture in Developing Embryos*

**Peter Fraser**, Florida State University, USA  
*Cell Cycle Dynamics of Chromosomal Organisation at Single-Cell Resolution*

**Ibrahim Cissé**, Massachusetts Institute of Technology, USA  
*Super-Resolution Imaging of Transcription in Live Mammalian Cells*

#### Short Talk Chosen from Abstracts

#### Epigenetic Dysregulation in Neurobiology (X5)

**Anne Schaefer**, Mount Sinai School of Medicine, USA  
*Epigenetic Regulation of Neurodevelopment and Neurodegeneration*

**Danny F. Reinberg**, HHMI/New York University, USA  
*One Genome, Multiple Phenotypes*

**Shelley L. Berger**, University of Pennsylvania, USA  
*Alzheimer and Metabolic Control of Transcription*

#### Short Talk Chosen from Abstracts

#### Poster Session 1

### TUESDAY, MARCH 19

#### Analysis of 3D Genome with Advanced Microscopy (X6)

**Cornelis Murre**, University of California, San Diego, USA  
*Tracking Long-Range Genomic Interactions in Live Cells*

**Jan Ellenberg**, European Molecular Biology Laboratory, Germany  
*Dissecting Structure and Assembly of Nuclear Pores and Mitotic Chromosomes by Nano-Scale Imaging*

**Andrew S. Belmont**, University of Illinois at Urbana-Champaign, USA  
*Revealing Fundamental Features of Large-Scale Chromatin Organization and their Relationship to Gene Regulation through Live-Cell Imaging*

**Clodagh C. O'Shea**, The Salk Institute for Biological Studies, USA  
*Cracking the Nucleus: Visualizing the Higher Coding Structures of DNA*

#### Short Talk(s) Chosen from Abstracts

#### Understanding and Targeting Epigenetic Dysregulation (X5)

**Mark A. Dawson**, Peter MacCallum Cancer Centre, Australia  
*Mechanisms of Epigenetic Therapeutics in Leukemia*

**Johannes Zuber**, Research Institute of Molecular Pathology, Austria  
*Decoding and Exploiting Chromatin-associated Dependencies in Leukemia*

**Cheryl Arrowsmith**, University of Toronto, Canada  
*Probing the Epigenome for Therapeutic Opportunities*

**Marie Classon**, , USA  
*Epigenetic Mechanisms of Drug Resistance*

#### Short Talk(s) Chosen from Abstracts

#### Workshop 2: ENCODE Consortium Resources (X6)

##### Short Talks Chosen from Abstracts

#### Workshop 2: Post-Translational Modifications, Novel Methods of Detection and Quantification, and Functional Significance (X5)

##### Short Talks Chosen from Abstracts

#### Chromatin and Epigenetics (X6)

**Bas van Steensel**, Netherlands Cancer Institute, Netherlands  
*Lamina Associated Domains*

**Mitchell Guttman**, California Institute of Technology, USA  
*3D Genome Organization and X Chromosome Inactivation*

**Joseph R. Ecker**, The Salk Institute for Biological Studies, USA  
*Single Cell Analysis of DNA Methylation*

#### Short Talk Chosen from Abstracts

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### Infectious Diseases and Autoimmunity (X5)

**Ido Amit**, Weizmann Institute, Israel

*Quantitative, Single Cell, Transcription and Cell Fate Determination*

**Eric A. Miska**, University of Cambridge, UK

*RNA Modifications and Novel Antiviral Response*

**Alexander Tarakhovsky**, Rockefeller University, USA

*I-BET, Inflammation, Histone Mimicry in Pathogens, Antiviral Response*

**Short Talk Chosen from Abstracts**

### Poster Session 2

#### WEDNESDAY, MARCH 20

### 3D Genome and Gene Regulation (X6)

**Bing Ren**, Ludwig Institute for Cancer Research, USA

*Regulation of Enhancer/Promoter Interactions*

**Gerd A. Blobel**, Children's Hospital of Philadelphia, USA

*"Editing" the Genome and Epigenome to Treat Hemoglobinopathies*

**Jennifer E. Phillips-Cremins**, University of Pennsylvania, USA

*Dynamic Chromatin Organization during Stem Cell Differentiation*

**Stavros Lomvardas**, Columbia University, USA

*3D Chromatin Organization of the Olfactory Receptor Locus*

**Short Talk(s) Chosen from Abstracts**

### Chromatin Signaling and Epigenetic Mechanisms (X5)

**Christopher Vakoc**, Cold Spring Harbor Laboratory, USA

*Transcriptional Vulnerabilities in Cancer*

**Cigall Kadoch**, Dana-Farber Cancer Institute, Harvard Medical

School, USA

*BAF Complex and Chromatin Remodeling*

**Emily Bernstein**, Mount Sinai School of Medicine, USA

*Epigenetic Sensitivities in Cancer*

**Xiaobing Shi**, Van Andel Institute, USA

*Novel Histone Marks and Reader Domains*

**Short Talk(s) Chosen from Abstracts**

### Roundtable Discussion: Women in Science (Joint)

### Workshop 3: International Human Epigenome Consortium (X6)

**Short Talks Chosen from Abstracts**

### Workshop 3: Epigenetic Therapy (X5)

**Short Talks Chosen from Abstracts**

### Genome Architecture and Development (X6)

**Wei Xie**, Tsinghua University, China

*Chromatin Reprogramming in Early Mammalian Development*

**Ana Pombo**, Max-Delbrück-Centrum für Molekulare Medizin, Germany

*Genome Architecture Mapping of Embryonic Stem Cells*

**Denis Duboule**, EPFL-SV-ISREC-UPDUB, Switzerland

*Hox Gene Regulation and Limb Development*

**Short Talk Chosen from Abstracts**

### Metabolic Diseases and Aging (X5)

**Ross L. Levine**, Memorial Sloan Kettering Cancer Center, USA

*Metabolic Control of DNA and Protein Methylation*

**Steve Horvath**, University of California, Los Angeles, USA

*Epigenetic Aging Clock versus Gene Regulation*

**Anne Brunet**, Stanford University, USA

*Epigenetic Regulation of Aging and Rejuvenation*

**Short Talk Chosen from Abstracts**

### Poster Session 3

#### THURSDAY, MARCH 21

### Computational Analysis of 3D Genome (X6)

**Erez Lieberman-Aiden**, Baylor College of Medicine, USA

*A 3D Code in the Human Genome*

**X. Shirley Liu**, Dana-Farber Cancer Institute, Harvard School of Public Health, USA

*Epigenomic Analysis of Cancer Cells*

**Frank Alber**, University of Southern California, USA

*Computational Modeling of 3D Genome*

**Mario Nicodemi**, University of Naples, Italy

*Strings and Binders Switch Model of Chromatin Fibres*

**Short Talk(s) Chosen from Abstracts**

### Epigenetic Regulation in Immunoncology and Cancer Therapeutics (X5)

**Daniel De Carvalho**, University Health Network, Canada

*DNA Methylation, Viral Mimicry, Epigenetic Therapy*

**Rab K. Prinjha**, GlaxoSmithKline, UK

*Drug Discovery and Clinical Progression or Epigenetic Therapies*

**Ronan C. O'Hagan**, Merck Research Laboratories, USA

*Epigenetics and Immune Modulation in Cancer*

**Ricky W. Johnstone**, Peter MacCallum Cancer Centre, Australia

*Epigenetic Modulation of the Immune System for Cancer Treatment*

**Short Talk(s) Chosen from Abstracts**

### Roundtable Discussion: Careers in Industry (Joint)

### 3D Genome and Disease (Joint)

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**Xiaowei Zhuang**, Harvard University, USA

*Single-Cell Transcriptome and Chromosome Imaging*

**Bradley E. Bernstein**, Massachusetts General Hospital, USA

*Instability of Chromosome Conformations in Cancer*

**Anjana Rao**, La Jolla Institute for Allergy and Immunology, USA

*Talk Title to be Announced*

**Meeting Wrap-Up: Outcomes and Future Directions (Organizers)**  
(X6)

**Meeting Wrap-Up: Outcomes and Future Directions (Organizers)**  
(X5)

**FRIDAY, MARCH 22**

Departure