

Mammalian Brain Cell Diversity and Census

The Banbury Center, Cold Spring Harbor Laboratory, New York

This meeting is funded by The National Institute for Mental Health, NIH
and National Institute of Neurological Disorders and Stroke, NIH

September 6-8, 2016

Organized by: Andrea Beckel-Mitchener, National Institute for Mental Health
Bethesda, Maryland
Josh Huang, Cold Spring Harbor Laboratory, Cold Spring Harbor,
New York

PROGRAM

Tuesday, September 6

Afternoon	Arrival at Robertson House
6:00 pm	Registration and Reception at Robertson House
7:30 pm	Dinner at Robertson House

Wednesday, September 7

7:30-8:30 am	Breakfast at Robertson House
8:45-8:50 am	Jan Witkowski, Executive Director, Banbury Center, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York Welcoming Remarks
8:50-9:00 am	Andrea Beckel-Mitchener, National Institute for Mental Health Bethesda, Maryland Introduction
9:00-12:00 pm	Session 1: Cell Type Moderator: Sean Hill, Ecole Polytechnique Fédérale de Lausanne, Geneva, Switzerland
9:00-9:20 am	Christof Koch, Allen Institute for Brain Science, Seattle, Washington Integrating distinct data modularities to derive cell types
9:20-9:40 am	Sten Linnarssen, Karolinska Institutet, Stockholm, Sweden Cell type discovery in mouse developing and adult nervous system
9:40-10:00 am	Josh Huang, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York Transcriptional definition of cortical GABAergic neuron types
10:00-10:30 am	Coffee Break
10:30-10:50 am	John Ngai, University of California, Berkeley, California Illuminating cellular diversity in the nervous system
10:50-11:10 am	Kenneth Harris, University College London, United Kingdom New algorithms for scRNA-seq data, applied to classification of CA1 and V1 interneurons

11:10-11:30 am	Aviv Regev, Broad Institute of MIT and Harvard, Cambridge, Massachusetts Case studies towards a cell atlas of neurons
11:30-12:00 pm	General Discussion
12:15-1:30 pm	Luncheon at Robertson House
1:30-3:30 pm	Session 2: Connectome Moderator: Yong Yao, National Institute of Mental Health, Rockville, Maryland
1:30-1:50 pm	Pavel Osten, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York Tools for automated mapping of brain cell density, morphology and connectivity
1:50-2:10 pm	Hongwei Dong, University Southern California, Los Angeles, California Mouse Connectome Project: Bridging macro-, meso-, and micro-scales
2:10-2:30 pm	Ed Callaway, Salk Institute for Biological Studies, La Jolla, California Improved monosynaptic neural circuit tracing using engineered rabies virus glycoprotein variants
2:30-2:50 pm	Hongkui Zeng, Allen Institute for Brain Science, Seattle, Washington Multiscale, integrated connectomics among cell types in local and global circuits
2:50-3:15 pm	General Discussion
3:15-3:30 pm	Coffee Break
3:30-5:00 pm	Session 3: Technology Moderator: Josh Huang, Cold Spring Harbor Laboratory, New York
3:30-3:50 pm	Qingming Luo, Huazhong University of Science and Technology, Wuhan, China Visible brain-wide networks at single neuron resolution with landmarks
3:50-4:10 pm	Jim Eberwine, University of Pennsylvania, Philadelphia, Pennsylvania Subcellular single neuron genomics
4:10-4:30 pm	Kun Zhang, University of California, San Diego, La Jolla, California Methods for cell type classification, annotation and spatial mapping
4:30-5:00 pm	General Discussion
5:00-6:00 pm	Session 4: Partnership-General discussion Discussion leaders Walter Koroshetz, National Institute of Neurological Disorders and Stroke, Bethesda MD Sean Hill, Ecole Polytechnique Fédérale de Lausanne, Geneva, Switzerland Christof Koch, Allen Institute for Brain Science, Seattle, Washington Guoping Feng, Massachusetts Institute of Technology, Cambridge, Massachusetts
6:15 pm	Reception at Robertson House
7:00 pm	Dinner at Robertson House

Thursday, September 8

- 7:30-8:30 am Breakfast at Robertson House
- 9:00-12:00 pm **Session 5: Big Brain**
Moderator: Christof Koch, Allen Institute for Brain Science, Seattle, Washington
- 9:00-9:20 am Tomomi Shimogori, RIKEN BSI, Saitama, Japan
Gene expression Atlas of Marmoset Brain
- 9:20-9:40 am Guoping Feng, Massachusetts Institute of Technology, Cambridge, Massachusetts
Genome-editing in primates
- 9:40-10:00 am Ed Lein, Allen Institute for Brain Science, Seattle, Washington
Multimodal characterization and classification of cell types in human neocortex
- 10:00-10:30 am Coffee Break
- 10:30-10:50 am Arnold Kriegstein, University of California, San Francisco, California
Origins of cell diversity in the developing human neocortex
- 10:50-11:10 am Chris Walsh, Harvard Medical School, Boston, Massachusetts
Cell type-specific splicing regulates neurogenesis in developing cerebral cortex
- 11:10-12:00 pm General Discussion
- 12:00-1:00 pm Luncheon in Conference Room
- 1:00-3:00 pm **Session 6: Data Integration & Visualization**
Moderator: Ken Harris, University College London, United Kingdom
- 1:00-1:20 pm Giorgio Ascoli, George Mason University, Fairfax, Virginia
Draft neuron census based on axonal/dendritic locations
- 1:20-1:40 pm Michael Hawrylycz, Allen Institute For Brain Science, Seattle, Washington
Digital atlases and resources for a Mammalian Brain Cell Census
- 1:40-2:00 pm Sean Hill, Ecole Polytechnique Fédérale de Lausanne, Geneva, Switzerland
A data-driven knowledge space for single cells
- 2:00-2:20 pm Coffee Break
- 2:20-3:00 pm General Discussion
- 3:00 pm Departure

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PARTICIPANTS

Giorgio Ascoli, George Mason University
Andrea Beckel-Mitchener, National Institute for Mental Health
Edward Callaway, Salk Institute for Biological Studies
Hongwei Dong, USC Stevens Neuroimaging and Informatics Institute
James Eberwine, University of Pennsylvania
Guoping Feng, Massachusetts Institute of Technology
Kenneth Harris, University College London
Michael Hawrylycz, Allen Institute for Brain Science
Sean Hill, EPFL, Blue Brain Project
Josh Huang, Cold Spring Harbor Laboratory
Christof Koch, Allen Institute for Brain Science
Walter Koroshetz, National Institute of Neurological Disorders and Stroke
Arnold Kriegstein, University of California, San Francisco
Edward Lein, Allen Institute for Brain Science
Sten Linnarssen, Karolinska Institutet
Qingming Luo, Huazhong University of Science and Technology
John Ngai, University of California, Berkeley
Pavel Osten, Cold Spring Harbor Laboratory
Michael Platt, University of Pennsylvania
Aviv Regev, Broad Institute and Howard Hughes Medical Institute
Sebastian Seung, Princeton University
Tomomi Shimogori, RIKEN BSI
Christopher Walsh, Harvard Medical School
Yong Yao, National Institute of Mental Health
Hongkui Zeng, Allen Institute for Brain Science
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