



Workshop 3: Experimental modalities for whole-brain connectivity mapping
March 5, 2021

Overall Goal: What are state of the art, opportunities and challenges relevant to each of the technologies and approaches you represent?

Agenda:

11:00 am ET **Welcome and Series Overview**
John Ngai, Ph.D.
Harriet Kung, Ph.D.

11:10 am ET **Welcome and Introduction**
Mark Ellisman, Ph.D. (Workshop Co-Lead)
Galya Orr, Ph.D. (Workshop Co-Lead)

11:30 am ET **Workshop Logistics**

11:35 am ET **Speaker Sessions**

Each speaker will address four questions:

- a) What resolution is required to attain meaningful wiring models?
- b) Which imaging technologies could be driven to scale and most easily disseminated?
- c) Compare and contrast single large-scale efforts to democratize data collection.
- d) How do you encode dynamics in static brain maps (adding the time domain)?

11:35 am ET **Session 1 – Multi-scale imaging of the connectome**

11:35 am ET Multi-scale Imaging of the Connectome
Jeff Lichtman, M.D., Ph.D.

11:45 am ET Raw speed
Winfried Denk, Ph.D.

11:55 am ET Multi-scale imaging of connectomes using TEM
Davi Bock, Ph.D.

12:05 pm ET Multi-scale Imaging of Connectomes With Photons and Electrons
Wei-Chung Allen Lee, Ph.D.

12:15 pm ET Synchrotron Hard X-ray Microscopy for the Connectome
Si Chen, Ph.D.

12:25 pm ET tomoSEM - tomography in tSEM
John Mendenhall, Ph.D.

12:35 pm ET **Q & A Session**

1:05 pm ET **Break**

1:15 pm ET **Session 2 – Projectome to Connectome Imaging**

Synapto-Projectomes: Toward connectome relationships in target fields

1:15 pm ET Axonal connectomics: projection maps in mice, NPHs, and humans
Clay Reid, M.D., Ph.D.

1:25 pm ET Mapping Projections of Melanopsin Retinal Ganglion Cells to Brain
Keun-Young Kim, Ph.D.

1:35 pm ET Connectome at the ‘operational’ resolution and in the context of protein dynamics
Tianyi Mao, Ph.D.

Strategies to bridge spatial and temporal gaps

1:45 pm ET Novel Mouse Genetic Tools for Scalable Analyses of Brain Cell Morphology
X. William Yang, Ph.D.

1:55 pm ET Towards Whole-Cortical Cellular Resolution Recording of Neuroactivity
Alipasha Vaziri, Ph.D.

2:05 pm ET Next-Generation Connectomics (NGC) via optical in-situ multiplexing
Adam Marblestone, Ph.D.

2:15 pm ET **Q & A Session**

2:45 pm ET **Break**

2:55 pm ET **Discussion Panel**

Panel Discussion topic: *The tyranny of scale: Challenges presented by spatial and temporal scales*

Panel chairs: *Moritz Helmstaedter, Ph.D.; Hongkui Zeng, Ph.D.*

Discussants: *Moritz Helmstaedter, Ph.D.; Hongkui Zeng, Ph.D.; Anton Maximov, Ph.D.; Kenneth Hayworth, Ph.D.; Lisa Miller, Ph.D.; Mark Schnitzer, Ph.D.*

3:55 pm ET **Closing remarks**

Mark Ellisman, Ph.D. (Workshop Co-Lead)

Galya Orr, Ph.D. (Workshop Co-Lead)

4:00 pm ET **Workshop ends**