

2021 NHLBI Systems Biology Symposium  
May 12 – 13, 2021

**Wednesday, May 12, 2021**

9:00-9:05am **Welcome and Opening Remarks** (5 mins)  
**Keji Zhao, Ph.D.**  
*Organizing Committee Chair  
National Heart, Lung and Blood Institute, NIH*

**Michael M. Gottesman, M.D.**  
*Deputy Director of Intramural Research  
Office of Intramural Research, NIH*

**Session 1 Omics** Moderator: Susan Harbison, Ph.D.

\*Speaker Presentations slots are 25 minutes + 5 minutes Q&A + 5 minutes transition time

9:10-9:40am **Nuclear Condensates in Gene Regulation and Disease** (30 mins)  
**Richard Young, Ph.D.**  
*Whitehead Institute, Massachusetts Institute of Technology*

9:45-10:15am **Epigenetic Basis of Single-Cell Heterogeneity** (30 mins)  
**Keji Zhao, Ph.D.**  
*National Heart, Lung, and Blood Institute, NIH*

10:15-10:45am Morning Break (30 mins)

10:45-11:15am **Integrative Approaches Probing Disrupted Cellular Homeostasis in Metabolic Diseases** (30 mins)  
**Anna Greka, M.D., Ph.D.**  
*Harvard Medical School, Brigham & Women's Hospital, Broad Institute of MIT*

11:20-11:50am **New Advances in Single-cell 3D Genome Structures and High Precision Transcriptomics** (30 mins)  
**Xiaoliang Sunney Xie, Ph.D.**  
*Peking University*

11:50am-12:20pm **Pre-Recorded Poster Presentations Segment #1** – (12 posters/24 mins)

12:20-1:15pm\* Lunch Break (55 min)

\*12:20-12:45pm **Poster Presenters Break-Out Rooms** (30 mins)

**Session 2 Systems Imaging** Moderator: Mark Knepper, M.D., Ph.D.

\*Speaker Presentations slots are 25 minutes + 5 minutes Q&A + 5 minutes transition time

1:15-1:45pm **3D Imaging of Cells by FIBSEM with Correlation to Cryo Fluorescence Microscopy** (30 mins)  
**Harald Hess, Ph.D.**  
*Howard Hughes Medical Institute, Janelia Research Campus*

1:50-2:20pm **Subcellular Connectomic Analyses of the Energy Distribution System in Striated Muscle** (30 mins)  
**Brian Glancy, Ph.D.**  
*National Heart, Lung, and Blood Institute and National Institute of Arthritis and Musculoskeletal and Skin Diseases, NIH*

2:20-2:50pm **Pre-Recorded Poster Presentations Segment #2** – (12 posters/24 mins)

2:50-3:20pm\* Afternoon Break (30 mins)

2021 NHLBI Systems Biology Symposium  
May 12 – 13, 2021

- \*2:50-3:20pm **Poster Presenters Breakout Rooms** (30 mins)
- 3:20-3:50pm **Tools for Analyzing and Controlling Biological Systems** (30 mins)  
**Edward Boyden, Ph.D.**  
*Massachusetts Institute of Technology and Howard Hughes Medical Institute*
- 3:55-4:25pm **Metabolic Design of the Metabolic Extreme, the Shrew** (30 mins)  
**Robert Balaban, Ph.D.**  
*National Heart, Lung, and Blood Institute, NIH*
- 4:30-5:00pm **Spatial Genomics: *in situ* Transcriptome Profiling by RNA seqFISH+** (30 mins)  
**Long Cai, Ph.D.**  
*California Institute of Technology*
- 5:05-5:35pm **Integrating single-DNA-fiber analyses and genome-wide sequencing: insights into the dynamics of chromosome duplication** (30 mins)  
**Mirit Aladjem, Ph.D.**  
*National Cancer Institute, NIH*
- 5:35-5:40pm **Closing Remarks** (5 mins)  
**Mark Knepper, M.D., Ph.D.**  
*National Heart, Lung, and Blood Institute, NIH*
- 5:40pm **Adjourn Day 1**

**Thursday, May 13, 2021**

- 9:00-9:05am **Opening Remarks** (5 mins)  
**Keji Zhao, Ph.D.**  
*National Heart, Lung, and Blood Institute, NIH*

**Session 3** **Systems Physiology: Metabolomics and Sleep** *Moderator: Hong Xu, Ph.D.*

*\*Speaker Presentations slots are 25 minutes + 5 minutes Q&A + 5 minutes transition time*

- 9:10-9:40am **Identifying Metabolites That Alter Physiology** (30 mins)  
**Gary Siuzdak, Ph.D.**  
*The Scripps Research Institute*
- 9:45-10:15am **Multi-Omic Approach to Understanding Regulation of Aquaporin-2 in Kidney** (30 mins)  
**Mark Knepper, M.D., Ph.D.**  
*National Heart, Lung, and Blood Institute, NIH*
- 10:15-10:45am Morning Break (30 mins)
- 10:45-11:15am **Obstructive Sleep Apnea and Cardiometabolic Disease: Dissecting Causal, Pleiotropic and Mediating Pathways** (30 mins)  
**Susan Redline, M.D., M.P.H.**  
*Harvard Medical School, Brigham and Women's Hospital*

2021 NHLBI Systems Biology Symposium  
May 12 – 13, 2021

- 11:20-11:50am **Perturbing Genetic Networks That Influence Sleep Duration in *Drosophila Melanogaster*** (30 mins)  
**Susan Harbison, Ph.D.**  
*National Heart, Lung, and Blood Institute, NIH*
- 11:50am-12:20pm **Pre-Recorded Poster Presentations Segment #3** – (14 posters/28 mins)
- 12:20-1:20pm\* Lunch Break (1 hr)
- \*12:20-12:50pm **Poster Presenters Break-Out Rooms** (30 mins)

**Session 4 Systems Biology in Genetics and Development** Moderator: *Brian Glancy, Ph.D.*

\*Speaker Presentations slots are 25 minutes + 5 minutes Q&A + 5 minutes transition time

- 1:20-1:50pm **CRISPR Mediated Homologous Recombination and the Discovery of Rare Human Diseases** (30 mins)  
**Hugo Bellen, DVM, Ph.D.**  
*Baylor College of Medicine and Neurological Research Institute*
- 1:55-2:25pm **scRNAseq Developmental Trajectories to Investigate Differentiation** (30 mins)  
**Jeffrey Farrell, Ph.D.**  
*National Institute of Child Health and Human Development, NIH*
- 2:25-2:40pm Afternoon Break (15 mins)
- 2:40-3:10pm **Single-cell Transcriptomics of the Mouse Kidney Reveals Potential Cellular Targets of Kidney Disease** (30 mins)  
**Katalin Susztak, M.D., Ph.D.**  
*University of Pennsylvania Perelman School of Medicine*
- 3:15-3:45pm **A Darwin Selection Within Developing Germ Cells** (30 mins)  
**Hong Xu, Ph.D.**  
*National Heart, Lung, and Blood Institute, NIH*
- 3:50-4:20pm **A Systems-wide Approach to Understanding Interorgan Communication in *Drosophila*** (30 mins)  
**Norbert Perrimon, Ph.D.**  
*Harvard Medical School/Howard Hughes Medical Institute*
- 4:25-4:55pm **Mitochondrial Calcium and Regulation of Myocardial Cell Function** (30 mins)  
**Elizabeth Murphy, Ph.D.**  
*National Heart, Lung, and Blood Institute, NIH*
- 4:55-5:00pm **Closing Remarks** (5 mins)  
**Robert Balaban, Ph.D.**  
Scientific Director, Division of Intramural Research  
*National Heart, Lung, and Blood Institute, NIH*
- 5:00pm **Adjourn Day 2**