NIH Common Fund
4th Annual Single Cell Analysis Investigators Meeting
Natcher Conference Center, NIH Campus, Bethesda, MD

Meeting materials and further details are available online:
http://commonfund.nih.gov/singlecell/meetings

WEDNESDAY, MARCH 2, 2016

8:00 a.m. **Registration and Check-In**

8:30 a.m. **Welcome & Opening Remarks**

James Anderson, Ph.D., M.D., Director of the NIH Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI)
Roderic Pettigrew, Ph.D., M.D., Director of the National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Bruce Cuthbert, Ph.D., Acting Director of the National Institute of Mental Health (NIMH)

8:45 a.m. ***Keynote Address***
"TBD"
Xiaowei Zhuang, Ph.D., Harvard University

9:20 a.m. **"Single-cell metrics of the efficacy of CAR+ T cells"**
Navin Varadarajan, Ph.D., University of Houston

9:40 a.m. **"Single-cell transcriptomic analyses of CD8+ T cell fate specification"**
John Chang, M.D., University of California, San Diego

10:00 a.m. **"Development and validation of lab on a chip-based technology for immune regulation studies in cancer"**
Tania Konry, Ph.D., Northeastern University

10:20 a.m. **"Single-cell morphology encodes metastasis"**
Pei-Hsun Wu, Ph.D., Johns Hopkins University

10:40 a.m. **Break**

11:00 a.m. ***Keynote Address***
"Epigenomic Signatures Distinguish Brain Cell-Types"
Joseph Ecker, Ph.D., Salk Institute for Biological Studies

11:30 a.m. "**Multi-scale, high-throughput immunophenotyping by antibody-based and RNA flow cytometry: protocol development and application to tuberculosis"**
Maria Laura Gennaro, M.D., Rutgers, The State University of New Jersey

11:50 a.m. "**Single cell epigenetic analysis of EGR1 gene activation"**
Oleg Denisenko, Ph.D., University of Washington

12:10 p.m. **Lunch on Your Own**

1:15 p.m. ***Keynote Address***
"Drop-based microfluidics for single-cell studies"
David Weitz, Ph.D., Harvard University

1:45 p.m. **"MultiOmyx and DISSECT: two novel and complementary tools for interrogating complex tissues at single cell resolution in health and disease"**
Michael Gerdes, Ph.D., GE Global Research Center

2:05 p.m. **"Acoustic Tweezers: Manipulating Single Cells Using Sound Waves"**
Tony Jun Huang, Ph.D., Pennsylvania State University

2:25 p.m. "**Regulated Cellular Disorder Ensures Vertebrate Organism-Level Order"**
Scott Holley, Ph.D., Yale University

2:45 p.m. "**GiniClust: Detecting Rare Cell Types from Single-Cell Gene Expression Data with Gini Index"**
Guo-Cheng Yuan, Ph.D., Dana-Farber Cancer Institute

3:05 p.m. **Poster Session**

6:00 p.m. **Day 1 General Meeting Adjourns**

THURSDAY, MARCH 3, 2016

8:00 a.m.	**Registration and Check-In**
8:30 a.m.	***Keynote Address*** "**Emerging fluorescence technology to study the spatial and temporal dynamics of organelles"** Jennifer Lippincott-Schwartz, Ph.D., Janelia Research Campus, Ashburn, VA
9:00 a.m.	**"4D-IRIS: A Platform for Tomographic Imaging of Single Live Cells in Suspension with Isotropic Spatial Resolution"** Laimonas Kelbauskas, Ph.D., Arizona State University
9:20 a.m.	"**Innovative reporters to characterize heterogeneous states among cells"** Norbert Perrimon, Ph.D., Harvard Medical School
9:40 a.m.	"**Second-generation Single-cell Mass Spectrometry Finds Metabolic Cell Heterogeneity along the Left-Right Body Axis in the Developing Frog (Xenopus) Embryo"** Peter Nemes, Ph.D., George Washington University
10:00 a.m.	"**Tip-Enhanced Laser Ablation Sample Transfer for Single Cell Genomics"** Fabrizio Donnarumma, Ph.D., Louisiana State University
10:20 a.m.	**Break and additional time to view posters**
11:05 a.m.	**"New Photostable Nano Tools for Following that Single Live Cells"** X. Nancy Xu, Ph.D., Old Dominion University
11:25 a.m.	**"Single molecule tracking for dynamic multigene analysis in complex tissue environments"** Pak Kin Wong, Ph.D., Pennsylvania State University
11:45 a.m.	"**Optical probes of cell mechanics reveal extreme heterogeneity within and between cells"** Frederick Sachs, Ph.D., State University of New York (SUNY) Buffalo
12:05 p.m.	"**The CellRaft System for Single Cell Isolation: Applications and Advances"** Nick Trotta, Ph.D., Cell Microsystems, Inc.
12:25 p.m.	**Wrap-Up and Summary**
12:30 p.m.	**Meeting Adjourns**

Poster Abstracts

Poster	Authors	Poster Title
1	Li He, Norbert Perrimon; Harvard Medical School	Innovative reporters to characterize heterogeneous states among cells
2	Blue B. Lake, Rizi Ai, Gwendolyn E. Kaeser, Neeraj S. Salathia, Yun Yung, Rui Liu, Andre Wildberg, Derek Gao, Ho-Lim Fung, Song Chen, Raakhee Vijayaraghavan, Julian Wong, Allison Chen, Xiaoyan Sheng, Fiona Kaper, Richard Shen, Mostafa Ronaghi, Jian-Bing Fan, Wei Wang, Jerold Chun and Kun Zhang; University of California, San Diego, Scripps, Illumina	Using single-nucleus RNA sequencing to reveal neuronal subtypes and diversity in the adult human brain
3	Olga Ornatsky, Qing Chang, Eric Swanson, Bedilu Allo, Alexandre Bouzekri , Alexander Loboda, Vladimir Baranov; Fluidigm Canada, Inc.	Multiparametric analysis of cells in tissue sections using imaging mass cytometry
4	Weili Hong, Chien-Sheng Liao, Hansen Zhao, Waleed Younis, Yinxin Zhang, Mohamed N. Seleem, Ji-Xin Cheng; Purdue University	In situ detection of a single bacterium in complex environment by hyperspectral CARS imaging
5	Camille Lombard-Banek, Sushma Reddy, Sally A. Moody, Peter Nemes; George Washington University	Quantitative, Untargeted Proteomics for Single Embryonic Cells in the 16-cell Xenopus Embryo
6	Mei-Chen Liao, Christina R. Muratore, Todd M. Gierahn, Sarah E. Sullivan, Priya Srikanth, Philip L. De Jager, J. Christopher Love, Tracy L. Young-Pearse; Brigham and Women's Hospital, HMS, MIT	Single-cell detection of secreted Aβ and sAPPα from human iPSC-derived neurons and astrocytes
7	Caleb B. Bell III, Papia Chakraborty, Kayla Muth, Ryan Spitler, Abdul Wakeel, Joyce Barrozo, Chandler Foote, Andrea Chan, Kim Brewer, Brian K. Rutt; Bell Biosystems, Inc.	Characterization of Magnetotactic Bacteria as MRI Cell Tracking Agents
8	Terry J Amiss, Rainer Blaesius, Eileen Snowden, Richard Kelley, Frances Tong, Warren Porter, Friedrich G Hahn, Mitchell Ferguson, Chan Chen, Daphne Clancy, and W Shannon Dillmore; BD Technologies, Inc.	Phenotypic Sorting of Single Cells Followed by AmpliSeq NGS Suggests Distinct Genotypes in a PDX Model of Basal Breast Cancer
9	Jean Fan, Neeraj Salathia, Rui Liu, Gwendolyn E Kaeser, Yun C Yung, Joseph L Herman, Jian-Bing Fan, Kun Zhang , Jerold Chun, Peter V. Kharchenko; Harvard Medical School, Illumina, Scripps, UCSD	PAGODA: pathway and gene set over dispersion analysis identifies and characterizes single cell transcriptional heterogeneity
10	Montserrat Anguera, Kyoung-Jae Won; University of Pennsylvania	Studying X Chromosome Inactivation using Single Cell Transcriptome
11	Hesam Babahosseini, Jeannine S. Strobl, Masoud Agah; Virginia Tech	Single Cell Level Detection of Metastatic Cancer using a Pulsed Stress/Strain
12	Tae-Hee Kim, Assieh Saadatpour*, Guoji Guo, Madhurima Saxena, Alessia Cavazza, Niyati Desai, Unmesh Jadhav, Miguel N. Rivera, Stuart H. Orkin, Guo-Cheng Yuan, Ramesh A. Shivdasani; Dana-Farber Cancer Institute, HMS	Single-cell transcript profiles reveal multilineage priming in early progenitors derived from Lgr5+ intestinal stem cells
13	Ye Li, Bing Ye, Dawen Cai; University of Michigan	A genetic labeling tool to depict the complete neuronal lineages in individual Drosophila brains
14	Fumitaka Mizoguchi, Kamil Slowikowski, Nir Hacohen, Peter A Nigrovic, Soumya Raychaudhuri, Michael B	Single-cell transcriptomics of synovial fibroblasts reveals pathogenic subpopulations

	Brenner; Brigham and Women's Hospital, Broad	in rheumatoid arthritis
15	Aaron M Streets, Yanyi Huang; Peking University, UCSF Berkeley	Correlating morphology and gene expression in single cells using coherent Raman microscopy and RNA sequencing
16	Sachiko Sato, Ann Rancourt, Yukiko Sato, Masahiko S. Satoh; Laval University, McGill	Single-cell lineage tracking analysis reveals that HeLa cell line comprises putative cancer stem cells and their heterogeneous progeny
17	Greg Shelley, Hui Jiang, Evan T. Keller; University of Michigan	Single cell analysis of intratumoral regions of prostate cancer
18	Mark Hills, Peter M. Lansdorp; BC Cancer Agency	Leapfrogging genome assemblies by sequencing single cells
19	Mark Hills, Peter M. Lansdorp; BC Cancer Agency	Sequencing single DNA strands from single cells to identify structural variation, haplotypes and improve genome assemblies
20	Bo Huang; University of California, San Francisco	Expanding the CRISPR imaging toolset with Staphylococcus aureus Cas9 for simultaneous imaging of multiple genomic loci
21	Andrew J. Martins, Manikandan Narayanan, Thorsten Prüstel, Bethany Fixsen, Yong Lu, Rachel A. Gottschalk, Cindi Pfannkoch, Kyemung Park, William Lau, Kathe; ine Wendelsdorf, John S. Tsang; National Institutes of Health	Analysis of cellular heterogeneity in activated macrophages reveals hidden modes of state-specific gene regulation
22	J Rachel Haggerty, Jeanette Baran-Gale, Jeremy Purvis; University of North Carolina at Chapel Hill	Mechanism Inference from Single Cells (MISC)
23	Kevin Leslie, Catherine Roberts, Roy Sabo, Amir Toor, Jason Reed; Virginia Commonwealth University	Mononuclear Single Cell Mass Spectrum Following Stem Cell Transplantation: Predicting Clinical Outcomes
24	Jacqueline Morris, Youngji Na, Jaehee Lee, Jennifer Singh, Stephen Fisher, James Eberwine, Junhyong Kim, Jai-Yoon Sul; University of Pennsylvania	Nuclear pre-mRNA Analysis of Single cells in Brain slice
25	Pawel Osmulski, Maria Gaczynska, Guangcun Huang, Devalingam Mahalingam, Chun-Liang Chen, Tim Hui-Ming Huang; University of Texas Health Science Center	Power of atomic force microscopy in study of circulating tumor cells biology
26	R. Ileng Kumaran, Jingjing Li, William S. Dynan, Matthew H. Porteus, David L. Spector; Cold Spring Harbor Laboratory, Emory, Stanford	Analysis of DNA repair pathway choice upon zinc finger nuclease induced double-strand breaks
27	Ahmet F. Coskun, Mary Yui, Long Cai, Ellen Rothenberg; California Institute of Technology	Single Cell Dissection of Transcriptional Codes for T Cell Identity
28	Magnolia Bostick, Sangwon Lee, Yevgeniy Gindin, Andrew Farmer; Clontech Laboratories, Inc.	SMART-Seq v4 Ultra Low Input RNA Kit for the Fluidigm® C1™ System: improved chemistry for single cell transcriptome studies
29	Ebrahim Azizi, Shamileh Fouladdel, Hyeun Joong Yoon, Eric Lin, Tae Hyun Kim, Monika L. Burness, Sunitha Nagrath, Max S. Wicha; University of Michigan	Single cell analysis of circulating tumor cells from metastatic breast cancer patients revealed presence of heterogeneous breast cancer stem cells with EMT, MET and or dual EMT-MET phenotypes
30	Xiaoyang (Alice) Wang, Chip Lomas, Kyle Dembski, Amy Tam, Jessie Duller, Craig Betts, Suzanne Weaver; BD Life Sciences, Inc.	High-Throughput, Single-Cell Whole Transcriptome Sequencing Analysis of Cancer Cells with the New BD FACSseq™ Cell Sorter and BD™ Precise Assay
31	Russell H Cole, Adam R Abate, Zev J Gartner; UCSF	Identifying the intercellular networks

		regulating estrogen receptor expression with a high definition single cell printer
32	Xiangxing Kong, Fengyu Su, Liqiang Zhang, Yanqing Tian, Deirdre R. Meldrum; Arizona State University	Highly Selective Mitochondria-Specific Fluorescent K+ Sensor
33	Jacob Messner, Honor Glenn, Deirdre R. Meldrum; Arizona State University	Laser Fabricated Cell Patterning Stencil
34	Edward S. Boyden, Craig Forest, Hongkui Zeng; MIT, Georgia Tech	High-throughput robotic analysis of integrated neuronal phenotypes
35	Zhe Mei, Chau Dihn, Gerardo Narez, Constance Ardila, Kendall Chuang, Will Alaynick, Sung Hwan Cho, José M. Morachis; NanoCellect Biomedical, Inc.,	WOLF Cell Sorter Isolates Target Cells for Single Cell Analysis
36	Yu Ouyang, Tae Jin Kim, Guillem Pratx; Stanford University	Whole-body tracking of single cells by positron emission localization
37	Vishnu Dileep, David M. Gilbert; Florida State University	Measuring genome-wide replication timing in single cells
38	Sara H. Rouhanifard, Ian A. Mellis, & Arjun Raj; University of Pennsylvania	Imaging A to I editing of individual mRNAs in mammalian cells using iFISH
39	Nick Trotta, Joshua D. Welch Lindsay A. Williams, Matthew Di Salvo, Alicia T. Brandt, Raoud Marayati, Steven Gebhart, Nicholas Dobes, Yuli Wang, Chris Sims, Jan Prins, Jen Jen Yeh, Corbin Jones, Nancy Allbritton; Cell Microsystems, Inc., UNC	The CellRaft System for Single Cell Isolation: Applications and Advances
40	Jeremy L. Norris, Bo Yang, Jeff Spraggins, Richard M. Caprioli; Vanderbilt University School of Medicine	Single Cell Analysis using High Spatial Resolution Imaging Mass Spectrometry
41	Alan J. Simmons, Amrita Banerjee, Eliot T. McKinley, Cherie R. Scurrah, Charles A. Herring, Jeffrey L. Franklin, Leslie S. Gewin, Ryota Masuzaki, Seth J. Karp, Michael J. Gerdes, Jonathan M. Irish, Robert J. Coffey, Ken S. Lau;	CyTOF-based single-cell analysis of intact signaling reveals divergent TNF-induced behaviors in the intestinal epithelium
42	Peter Nemes, Rosemary M. Onjiko, Erika Portero, Sally A. Moody; The George Washington University	Second-generation Single-cell Mass Spectrometry Finds Metabolic Cell Heterogeneity along the Left-Right Body Axis in the Developing Frog (Xenopus) Embryo

Meeting Information

The general meeting sessions will be held in the Main Auditorium in the Natcher Conference Center Building (Building 35) on the NIH Campus. The poster session on March 2nd will be held in the upstairs foyer area of the Natcher Building. A map of the NIH can be found here. Details of campus access and security can be found here. You must present a valid form of ID. Expect the security check to take 20-30 minutes. Please refer to the NIH Visitors and Security attachment for more information.

Parking on campus is limited and is paid parking. If you are not an NIH employee, you will need to pass through NIH security at the Gateway Center (from Rockville Pike – Route 355) before you are allowed on campus.