National Institutes of Health
Office of Strategic Coordination - The Common Fund

NIH Common Fund

2018 High-Risk, High-Reward Research Symposium

Program Book

NIH DIRECTOR'S PIONEER A·W·A·R·D

NIH DIRECTOR'S NEW INNOVATOR AWARD

NIH DIRECTOR'S TRANSFORMATIVE RESEARCH AWARD

NIH DIRECTOR'S EARLY INDEPENDENCE AWARD

DoubleTree by Hilton Hotel Bethesda - Washington DC
8120 Wisconsin Avenue
Bethesda, MD

June 6-8, 2018

Program Description

The NIH Common Fund, in the Office of the Director, supports programs that address key roadblocks in biomedical research impeding basic scientific discovery and its translation into improved human health. Common Fund programs are designed to have broad impact, be catalytic, and tackle challenges that no other entity, including individual NIH Institutes, will be likely or able to do. There currently are 27 different Common Fund programs, spanning the broad mission of NIH. More information is available at commonfund.nih.gov.

The NIH Common Fund's High-Risk, High-Reward Research program was created to accelerate the pace of biomedical discoveries by supporting exceptionally creative scientists with highly innovative research ideas of unusually broad impact. Four initiatives within this program—the NIH Director's Pioneer, New Innovator, Transformative Research, and Early Independence Awards—serve distinct purposes in achieving this goal.

Pioneer Award: Supports individual scientists of exceptional creativity at any career stage who propose bold approaches to address major challenges in biomedical and behavioral research.

New Innovator Award: Supports unusually creative early career stage investigators who have highly innovative research ideas with the potential for broad impact.

Transformative Research Award: Supports exceptionally innovative and/or unconventional research projects that have the potential to create or overturn fundamental paradigms. The initiative permits multiple principal investigators and flexible budgets.

Early Independence Award: Provides a mechanism for outstanding early career scientists to move rapidly into independent research positions by omitting the traditional postdoctoral training period.

Agenda

Wednesday, June 6, 2018

9:00 a.m. **James Anderson,** Director, Division of Program Coordination, Planning, and Strategic Initiatives (DPCSI), Office of the Director, NIH

Opening Remarks and Announcement of 2017 Awardees

Session 1

9:15 a.m. **Kay Tye** (Massachusetts Institute of Technology; New Innovator Award; National Institute of Diabetes and Digestive and Kidney Diseases*#)

Neural Circuits of Compulsive Reward-Seeking

9:35 a.m. **Clifford Brangwynne** (Princeton University; New Innovator Award; National Institute of General Medical Sciences*#)

The Liquid Nucleolus

9:55 a.m. **Augusto Ochoa** (Louisiana State University Health Cancer Center; Transformative Research Award; National Institute of Allergy and Infectious Diseases*#$)

Lipid Metabolism and the Regulation of Chronic Inflammation

10:15 a.m. **BREAK**

Session 2

10:35 a.m. **Gabriel Victora** (Rockefeller University; Early Independence Award; National Institute of Dental and Craniofacial Research#)

Monitoring Cell–Cell Interactions In Vivo by Intercellular Enzymatic Labeling

NIH Institutes are designated by program responsibilities (*), grants management responsibilities (#), and/or award co-funding ($) [excludes the Office of the Director].

10:55 a.m. **Yvonne Chen** (University of California, Los Angeles; Early Independence Awardee; National Institute of Dental and Craniofacial Research[#])

Engineering Next-Generation T Cells for Cancer Immunotherapy

11:15 a.m. **Feng Zhang** (Broad Institute of MIT and Harvard; Pioneer Awardee; National Institute of Mental Health[*#$])

Advances in Genome Editing Technologies

11:35 a.m. **PHOTO SHOOT FOR ALL HRHR AWARDEES**

12:00 p.m. **LUNCH (ON YOUR OWN)**

Session 3

1:30 p.m. **Leor Weinberger** (University of California, San Francisco; Pioneer Awardee; National Institute of Dental and Craniofacial Research[*#$])

Therapeutic Interfering Particles (TIPs): Development of a Resistance-Proof, Transmissible Antiviral for Resource-Limited Settings

1:50 p.m. **Robert Gregg** (University of Texas at Dallas; New Innovator Awardee; *Eunice Kennedy Shriver* National Institute of Child Health and Human Development[*#])

Phase-Based Control of Locomotion for High-Performance Prostheses and Orthoses

2:10 p.m. **Scott Hansen** (The Scripps Research Institute; New Innovator Awardee; National Institute of Neurological Disorders and Stroke[*#$])

Membrane Disruption and the Molecular Basis of Anesthesia and Mechanosensation

2:30 p.m. **Chris Petersen** (Northwestern University; New Innovator Awardee; National Institute of Dental and Craniofacial Research[*#])

Regulatory Programs Controlling Regenerative Growth

NIH Institutes are designated by program responsibilities (*), grants management responsibilities (#), and/or award co-funding ($) [excludes the Office of the Director].

2:50 p.m. **Isabelle Baconguis** (Vollum Institute; Early Independence Awardee; National Institute of Dental and Craniofacial Research[#])

Inhibition Mechanism in Epithelial Sodium Channel Revealed by Cryo-EM

3:10 p.m. – 5:00 p.m. **POSTER SESSION & NIH STAFF OFFICE HOURS**

4:00 p.m. – 5:30 p.m. **EARLY INDEPENDENCE AWARD CLOSED SESSION**

5:30 p.m. **SOCIAL NETWORKING EVENT**

Thursday, June 7, 2018

8:30 a.m. **Francis Collins,** Director, NIH

Remarks

Session 4

8:40 a.m. **Rafael Yuste** (Columbia University; Pioneer Awardee; National Eye Institute[*#$])

Can You See a Thought? Neuronal Ensembles as Emergent Units of Cortical Function

9:00 a.m. **Peng Yin** (Harvard University; Transformative Research Awardee; National Institute of Biomedical Imaging and Bioengineering[*#$])

Spatial Analysis of Molecular Features With DNA-PAINT Super-Resolution Microscopy and a Biochemical DNA "Nanoscope"

9:20 a.m. **Hannah Carter** (University of California, San Diego; Early Independence Awardee; National Institute of Dental and Craniofacial Research[#])

MHC Genotype Shapes the Oncogenic Mutational Landscape

9:40 a.m. **Alice Ting** (Stanford University School of Medicine; Transformative Research Awardee; National Cancer Institute[*#$])

Spatial Proteomics in Living Cells Via Proximity Labeling

10:00 a.m. **BREAK**

NIH Institutes are designated by program responsibilities (*), grants management responsibilities (#), and/or award co-funding ($) [excludes the Office of the Director].

Session 5

10:20 a.m. **Ravi Basavappa,** Office of Strategic Coordination, DPCSPI, Office of the Director, NIH

High-Risk, High-Reward Research Program Updates

10:35 a.m. **Ibrahim Cissé** (Massachusetts Institute of Technology; New Innovator Awardee; National Cancer Institute*#)

Super-Resolution Imaging of Transcription in Living Mammalian Cells

10:55 a.m. **Christine Denny** (Columbia University; Early Independence Awardee; National Institute of Dental and Craniofacial Research#)

Activation of Dentate Gyrus Memory Traces Rescues Age-Related Cognitive Decline

11:15 a.m. **Sarah Stabenfeldt** (Arizona State University; New Innovator Awardee; *Eunice Kennedy Shriver* National Institute of Child Health and Human Development*#)

Nanoparticle-Based Therapies for Traumatic Brain Injury, Is It Feasible?

11:35 a.m. **Anupam Jena** (Harvard Medical School; Early Independence Awardee; National Institute on Aging$; National Institute of Dental and Craniofacial Research#)

Natural Experiments in Health Care

11:55 a.m. **LUNCH (ON YOUR OWN)**

Session 6

1:30 p.m. **Ed Boyden** (Massachusetts Institute of Technology; Pioneer Awardee; National Institute of Neurological Disorders and Stroke*#$)

Optical Tools for Analyzing and Repairing Complex Biological Systems

1:50 p.m. **Manish Arora** (Icahn School of Medicine at Mount Sinai; New Innovator Awardee; National Institute of Environmental Health Sciences*#$)

Early Warning Systems for Childhood and Adult Disease

NIH Institutes are designated by program responsibilities (*), grants management responsibilities (#), and/or award co-funding ($) [excludes the Office of the Director].

2:10 p.m. **Bianxiao Cui** (Stanford University; New Innovator Awardee; National Institute of Neurological Disorders and Stroke*#)

The Role of Membrane Curvature in Topography-Induced Intracellular Signaling

2:30 p.m. **Emily Falk** (University of Pennsylvania; New Innovator Awardee; National Institute on Drug Abuse*#)

Using Neuroscience to Promote Health Behavior Change

2:50 p.m. **Reza Ardehali** (University of California, Los Angeles; New Innovator Awardee; National Heart, Lung, and Blood Institute*#)

Cardiac Microenvironment Supersedes Developmental Origin for Fibroblast-to-Cardiomyocyte Reprogramming

3:10 p.m. – 5:00 p.m. **POSTER SESSION & NIH STAFF OFFICE HOURS**

5:30 p.m. – 6:30 p.m. **HAPPY HOUR**

Friday, June 8, 2018

Session 7

8:30 a.m. **Anna Tischler** (University of Minnesota; New Innovator Awardee; National Institute of Allergy and Infectious Diseases*#)

Identification of *Mycobacterium tuberculosis* Counter-immune Factors Using Tn-Seq

8:50 a.m. **Siyang Zheng** (The Pennsylvania State University; New Innovator Awardee; National Cancer Institute*#$)

Micro/Nano Engineering for Liquid Biopsy and Cancer Therapeutics

9:10 a.m. **Yi Tang** (University of California, Los Angeles; Pioneer Awardee; National Institute of General Medical Sciences*#)

Target-Guided Genome Mining of Natural Products

9:30 a.m. **John Schoggins** (University of Texas Southwestern Medical Center; New Innovator Awardee; National Institute of Allergy and Infectious Diseases*#)

Expanded Potency of an Antiviral Transcription Factor in Bats

9:50 a.m. **BREAK**

NIH Institutes are designated by program responsibilities (*), grants management responsibilities (#), and/or award co-funding ($) [excludes the Office of the Director].

Session 8

10:10 a.m. **Roberto Bonasio** (University of Pennsylvania; New Innovator Awardee; National Institute of Mental Health*#)

Epigenetics of Social Behavior in Ants

10:30 a.m. **Michael Lin** (Stanford University; Pioneer Awardee; National Institute of General Medical Sciences*#$)

Optical Control of Protein Activities by Engineered Photodissociable Fluorescent Protein Domains

10:50 a.m. **Stephen Smith** (Allen Institute for Brain Science; Transformative Research Awardee; National Institute of Neurological Disorders and Stroke*#$; National Institute of Mental Health$)

Synaptomes and Synaptic Protein Transcriptomes of Mouse and Man

11:10 a.m. **Lili Yang** (University of California, Los Angeles; New Innovator Awardee; National Cancer Institute*#)

Stem Cell-Engineered Invariant Natural Killer T Cells for Cancer Immunotherapy

11:30 a.m. **Sean Stowell** (Emory University; Early Independence Awardee; National Institute of Dental and Craniofacial Research#)

Microbes Regulate the Development of Anti-Blood Group Antibodies

11:50 a.m. **CLOSING REMARKS**

12:00 p.m. **ADJOURNMENT**

NIH Institutes are designated by program responsibilities (*), grants management responsibilities (#), and/or award co-funding ($) [excludes the Office of the Director].

Poster Sessions

Ballroom A

Poster Number 1
Daniel Giovenco
Columbia University Mailman School of Public Health

Neighborhood Correlates of Tobacco Product Advertising in New York City

Poster Number 2
Elaine Hill
University of Rochester

Does Shale Gas Development Impact Infant Health Through Drinking Water?

Poster Number 3
Jakob Jensen
University of Utah

Does a Personalized Ultraviolet Photo Increase Sun Safe Behavior?: Evaluating an Intervention in Utah High Schools

Poster Number 4
Samuel Mehr
Harvard University

Form and Function in Human Song

Poster Number 5
Gregor Neuert
Vanderbilt University

Single Cell Distribution Shapes Govern the Discovery of Predictive Models for Transcription Regulation

Poster Number 6
Hilary Finucane
Broad Institute of MIT and Harvard

Identifying Disease-Relevant Cell Types From Genome-Wide Association Study Data

Poster Number 7
Joanna Slusky
University of Kansas

Evolution of Environmentally-Enforced, Repeat Protein Topology in the Outer Membrane

Poster Number 8
Valerie Arboleda
UCLA

Phenotype-Specific Enrichment of Mendelian Genes Near GWAS Loci Across 62 Complex Traits

Poster Number 9
Ahmed Badran
Broad Institute of MIT and Harvard

Interrogation of Ribosomal Function Using Synthetic Biology and Continuous Evolution

Poster Number 10
Brent Martin
University of Michigan

Crosstalk in Cysteine Post-Translational Modifications

Poster Number 11
Matthew Simon
Dept of Molecular Biophysics & Biochemistry, Yale University
Chemical Biology Institute, Yale University

New Chemical Approaches to Reveal the Dynamics of the Transcriptome

Poster Number 12
Mohamed Abou Donia
Princeton University

Discovery of Drug-Like Small Molecules From the Human Microbiome

Poster Number 13
Raymond Moellering
University of Chicago

Chemical Proteomic Platforms to Probe Metabolic Signaling Across Scales of Space, Time and Reactivity

Poster Number 14
Steven Benner
Foundation for Applied Molecular Evolution
The Westheimer Institute for Science and Technology
Firebird Biomolecular Sciences LLC

Synthesis as a Recipe for Discovery in Biomedicine. Creating an Artificial Life Form

Poster Number 15
Hans Bjornsson
Johns Hopkins University

Haploinsufficiency of a Histone Modifier, Kmt2d, in a Mouse Model of Kabuki Syndrome Leads to Differentiation Defects in Plasma Cells

Poster Number 16
Howard Fine
Weill Cornell Medical Center

Human Brain Cancer, Rather than Brain Cancer Cells, on a Plate

Poster Number 17
Karunesh Ganguly
University of California, San Francisco
SFVAMC

Using ECoG Signals to Decode Intended Movements for Exoskeleton Control

Poster Number 18
Olujimi Ajijola
UCLA Cardiac Arrhythmia Center
UCLA Neurocardiology Research Center

Cardiac Nociceptive Afferents Expressing TRPV1 Promote Ventricular Arrhythmogenesis in Chronic Ischemic Cardiomyopathy

Poster Number 19
Steven Schiff
The Pennsylvania State University

Sustainable Health Engineering ? Towards Optimal Treatment of Infant Hydrocephalus in the Developing World

Poster Number 20
Zachary Morris
University of Wisconsin School of Medicine and Public Health

Combining Radiation and Tumor-Specific Antibody Therapies to Elicit In Situ Tumor Vaccination

Poster Number 21
Buck Samuel
Baylor College of Medicine

Microbiome Programming of Host Physiology

Poster Number 22
Chenghang Zong
Baylor College of Medicine

Effective Detection of Variations in Single Cell Transcriptome

Poster Number 23
Emma Farley
University of California, San Diego

Regulatory Principles Governing Enhancer Specificity During Animal Development

Poster Number 24
Ilana Brito
Cornell University

Systems-Level Analysis of Mobile Genetic Elements in a Population of Neutropenic Patients Highly Vulnerable to Multidrug Resistant Infection

Poster Number 25
Julia Oh
The Jackson Laboratory

The Human Skin Microbiome: Metagenomes to Therapeutics

Poster Number 26
Kevin Esvelt
Massachusetts Institute of Technology

Daisy Drive Systems for Safe, Local, and Reversible Population Editing

Poster Number 27
Leo Wan
Rensselaer Polytechnic Institute

Cell Chirality in Development and Disease

Poster Number 28
Martin Kampmann
University of California, San Francisco
Chan Zuckerberg Biohub

Elucidating Cellular Mechanisms and Therapeutic Strategies for Neurodegenerative Diseases With CRISPRi and CRISPRa

Poster Number 29
Michael Sheehan
Cornell University
Department of Neurobiology and Behavior

Genetic Basis of Individual Recognition in Paper Wasps

Poster Number 30
Alex Shalek
MIT
Broad Institute
Ragon Institute

Allergic Inflammatory Memory in Human Respiratory Epithelial Progenitor Cells

Poster Number 31
Andrea Schietinger
Memorial Sloan Kettering Cancer Center

Discrete Chromatin States Define Tumor-Specific T Cell Dysfunction and Therapeutic Reprogrammability

Poster Number 32
Brandon DeKosky
University of Kansas

Functional Interrogation and Mining of Natively-Paired Human Vh:Vl Antibody Repertoires

Poster Number 33
Isaac Chiu
Harvard Medical School

Neuron-Microbe Interactions in Pain and Host Defense

Poster Number 34
Jakob Von Moltke
University of Washington

Immune Sensing of Helminths and Allergens

Poster Number 35
Lingyin Li
Stanford University School of Medicine

SLC19A1 Is the Dominant Importer of 2'3'-cGAMP and Analogs in Primary Monocytes

Poster Number 36
Nikhil Malvankar
Dept. of Mol. Biophysics & Biochemistry, Yale University

Targeting Bacterial Infections by Imaging Electrical Interactions Between Host Surface and a Pathogen

Poster Number 37
Sloan Siegrist
University of Massachusetts Amherst

Membrane Partitioning of Mycobacterial Peptidoglycan Synthesis

Poster Number 38
Tijana Ivanovic
Brandeis University

Inspired by a Mechanism: A Story of Antiviral Drug Resistance

Poster Number 39
Zhilei Chen
Texas A & M University

Designed Ankyrin Repeat Proteins as Therapeutics Against Infectious Desease

Harmony

Poster Number 40
Adam De La Zerda
Stanford University School of Medicine

Speckle-Modulating Free and Large Gold Nanorod Enhanced Optical Coherence Tomography for Brain Tumor Margin Detection and In Vivo Neuroimaging

Poster Number 41
Anne Andrews
University of California, Los Angeles

Mechanisms of Aptamer-Field-Effect Transistor Neurotransmitter Sensing

Poster Number 42
Cecilia Leal
University of Illinois, Urbana-Champaign

Microfluidic Synthesis of Gene Silencing Cubosomes

Poster Number 43
Darren Lipomi
UC San Diego

Deformable Electronic Materials for Two-Way Communication With Biological Systems

Poster Number 44
Evan Scott
Northwestern University

A Targeted Immunotherapy to Address Atherosclerotic Inflammation

Poster Number 45
Gabe Kwong
Georgia Institute of Technology
Emory School of Medicine

Activity-Based Nanosensors for Early and Noninvasive Detection of Acute Organ Transplant Rejection

Poster Number 46
Ishan Barman
Department of Mechanical Engineering, Johns Hopkins University
Department of Oncology, Johns Hopkins School of Medicine

Nanopillar-Assisted Vibrational Spectroscopic Imaging for Decoding of Cellular Mechanochemistry

Poster Number 47
Jesse Jokerst
UC San Diego

Photoacoustic Imaging as a Tool to Study Biology

Poster Number 48
John Zhang
Dartmouth College
Thayer School of Engineering
Dartmouth-Hitchcock Medical Center

Implantable Cardiac Power Generation Using Flexible 3D Porous Thin Films

Poster Number 49
Joshua Vaughan
University of Washington

Spatially Resolved Transcriptomics Enabled by Ultrabright Pdot Probes for Interrogation of Complex Tissues

Poster Number 50
Marc Gershow
New York University

Recording Neural Activity in Unrestrained Animals With 3D Tracking Two Photon Microscopy

Poster Number 51
Ramsey Badawi
UC Davis Department of Radiology
UC Davis Department of Biomedical Engineering

Progress on the EXPLORER Project: Towards a Total Body PET Scanner for Human Imaging

Poster Number 52
Amy Palmer
University of Colorado Boulder
BioFrontiers Institute

Regulation of Cell Signaling by Zinc Dynamics

Poster Number 53
Chenxiang Lin
Yale University

DNA-Nanotechnology Enabled Membrane Engineering

Poster Number 54
Christopher D Johnston
The Forsyth Institute
Harvard School of Dental Medicine

SyngenicDNA: Stealth-By-Engineering to Evade Restriction-Modification Barriers

Poster Number 55
Duc Dong
Sanford Burnham Prebys Medical Discovery Institute

Novel Strategies for Induced In Vivo Transdifferentiation Across Germ Layers

Poster Number 56
Effie Apostolou
Weill Cornell Medicine

KLF4 Binding During Reprogramming is Linked to Enhancer Rewiring and Is Critical for the Architecture and Regulation of Enhancer Hubs

Poster Number 57
Fei Chen
Broad Institute

In Situ Genome Sequencing

Poster Number 58
Francesca Cole
University of Texas MD Anderson Cancer Center

Temporal, Spatial, and Genetic Regulation of Meiotic Recombination Pathways

Poster Number 59
Gabriela Schlau-Cohen
Massachusetts Institute of Technology

Identification of the Conformational Dynamics Behind EGFR Function

Poster Number 60
Hao Wu
University of Pennsylvania
Penn Epigenetics Institute

APOBEC-Coupled Epigenetic Sequencing Permits Low-Input, Bisulfite-Free Localization of 5-Hydroxymethylcytosine at Base Resolution

Poster Number 61
Jacob Brunkard
University of California, Berkeley
Plant Gene Expression Center, USDA ARS

Target of Rapamycin Coordinates Plant Growth by Dynamically Regulating Cell-Cell Transport

Poster Number 62
Jared Toettcher
Princeton University

Optogenetics for Intracellular Codebreaking: How ERK Activity Is Interpreted to Control Gene Expression and Cell Fate

Poster Number 63
Kai Zhou
Buck Institute for Research on Aging

Cellular Strategies for Controlling Protein Homeostasis

Poster Number 64
Kyle Loh
Stanford University School of Medicine

Exploiting Knowledge of Developmental Biology to Generate Pure Populations of Desired Human Cell-Types From Differentiating Embryonic Stem Cells

Poster Number 65
Meng Wang
Baylor College of Medicine

Olfaction Regulates Fat Storage Dynamics through Neuronal Asymmetry

Poster Number 66
Parijat Bhatnagar
SRI International
Stanford Cancer Institute

Antigen-Specific T-Cell Biofactories as Vectors for In Vivo Protein Synthesis

Poster Number 67
Patrick Hsu
Salk Institute for Biological Studies

Discovery of New RNA-Targeting CRISPR Systems for Transcriptome Engineering

Poster Number 68
Richard White
Memorial Sloan Kettering Cancer Center
Weill Cornell Medical College

How Adipocytes Drive Tumor Progression

Poster Number 69
Robert Judson-Torres
UCSF

To Mole or to Melanoma: The Transcriptional and Genetic Determinants of Human Melanocyte Transformation

Poster Number 70
Sabine Petry
Princeton University

Building the Microtubule Cytoskeleton: XMAP215 Is a Microtubule Nucleation Factor That Functions Synergistically With the Gamma-Tubulin Ring Complex

Poster Number 71
Sarah Calve
Purdue University

Three-Dimensional Visualization of the Extracellular Matrix in the Developing Mouse

Poster Number 72
Sean Collins
University of California, Davis

Deconstructing Control of Leukocyte Migration

Poster Number 73
Shangqin Guo
Yale University

An Intrinsic Fast Cell Cycle Qualifies the Cell-of-Origin for MLL-AF9 Mediated Transformation

Poster Number 74
Wen Xue
University of Massachusetts Medical School
The RNA Therapeutics Institute

Repairing Recessive Compound Heterozygous Mutations In Vivo Via Cas9-Mediated Allelic Exchange

Poster Number 75
William Israelsen
University of Texas Southwestern Medical Center

Hibernation in a Novel Rodent Model: Toward the Genetic and Molecular Basis of Torpor in Mammals

Poster Number 76
Xiaolu Cambronne
University of Texas at Austin

Gatekeepers of Mitochondrial NAD+

Poster Number 77
Abhishek Prasad
University of Miami

Spinal Cord Neural Interface for Neuroprosthetics in a Primate Model

Poster Number 78
Andrew Hires
University of Southern California

Circuit and Behavioral Mechanisms of Object Localization in Mice

Poster Number 79
Bozhi Tian
The University of Chicago

Rational Design of Silicon Structures for Optically-Controlled Multiscale Biointerfaces

Poster Number 80
Brian Wainger
Massachusetts General Hospital, Departments of Neurology and Pain Medicine
Harvard Medical School

A Human Stem Cell-Derived Neuromuscular Junction Model for Amyotrophic Lateral Sclerosis

Poster Number 81
Gregory Schwartz
Northwestern University

Finding the Cells That Tell Our Eyes How to Focus

Poster Number 82
Jeffrey Macklis
Harvard University
Department of Stem Cell and Regenerative Biology, & Center for Brain Science

"Subcellular RNA-Proteome Mapping": Subtype-Specific Growth Cone Control Over Cerebral Cortex Circuit Development, Diversity, and Potentially Disease, Regeneration Through ~Autonomous Local RNA and Protein Machinery

Poster Number 83
Jesse Goldberg
Cornell University
Department of Neurobiology and Behavior

Cortical Control of Kinematic Primitives in Mice Performing a Center-Out Reach Task

Poster Number 84
John Medaglia
Drexel University
University of Pennsylvania

Network Controllability in the Inferior Frontal Gyrus Relates to Controlled Language Variability and Susceptibility to Neuromodulation

Poster Number 85
Kevin Yackle
UCSF

Cellular and Molecular Identification of Breathing Pacemaker Neurons

Poster Number 86
Nicolas Tritsch
New York University

Functional Striatal Imaging During the Progression of Parkinsonism

2017 Awardees

NIH Director's Pioneer Awardees

Hongjie Dai, Ph.D.
Stanford University

Human Infrared Vision at Molecular and Cellular Scale

Amit Etkin, M.D., Ph.D.
Stanford University

A "Circuits-First" Platform for Personalized Neurostimulation Treatment

Howard A. Fine, M.D.
Weill Cornell Medicine

Human Brain Cancer, Rather than Brain Cancer Cells, on a Plate

Charles M. Lieber, Ph.D.
Harvard University

Syringe-Injectable Mesh Electronics for Seamless Integration with the Central Nervous System

Jeffrey D. Macklis, M.D., H.S.T.
Harvard University

Subcellular RNA-Proteome Mapping in Subtype- and Circuit-Specific Growth Cones: Development, Cell Biology, Disease, and Regeneration

Luciano A. Marraffini, Ph.D.
The Rockefeller University

Generation of Immunological Memory by CRISPR-Cas Systems

Alex Schier, Ph.D.
Harvard University

DNA-Mediated Recording of Cellular History

Ramin Shiekhattar, Ph.D.
Sylvester Comprehensive Cancer Center, Miller School of Medicine, University of Miami

Enhancer RNA Therapy

David A. Sinclair, Ph.D.
Harvard Medical School

Uncovering the Human Secretome

Justin L. Sonnenburg, Ph.D.
Stanford University School of Medicine

Defining and Reconstructing the Human Ancestral Microbiome

Kay M. Tye, Ph.D.
Picower Institute for Learning and Memory | Massachusetts Institute of Technology

Neural Circuit Mechanisms of Social Homeostasis in Individuals and Supraorganismal Social Groups

Feng Zhang, Ph.D.
Broad Institute of MIT and Harvard; MIT

Exploration of Diverse Mobile Genetic Elements for Precision Genome Manipulation

NIH Director's New Innovator Awardees

Olujimi A. Ajijola, M.D., Ph.D.
University of California, Los Angeles

Multimodal Decoding of the Neural Circuitry of Sudden Death in Peripheral Ganglia

Eiman Azim, Ph.D.
Salk Institute for Biological Studies

Neural Control of Skilled Movements: An Ethological Dissection of Genetically Tractable Mammalian Motor Circuits

Ishan Barman, Ph.D.
Johns Hopkins University

Spectroscopy Assisted Mechano-Chemical Phenotype Recognition Nanoscope

Kivanc Birsoy, Ph.D.
The Rockefeller University

Dissecting Tumor Metabolic Heterogeneity In Vivo

Jessica Blackburn, Ph.D.
University of Kentucky

Harnessing Single Cell Technology to Define Self-Renewal in Normal and Malignant Stem Cells

Paul C. Blainey, Ph.D.
Massachusetts Institute of Technology and Broad Institute of Harvard and MIT

Live Cell Transcriptomics

Ilana Brito, Ph.D.
Cornell University

Systems-Level Perspectives of Horizontal Gene Transfer Within the Human Microbiome

Sarah Calve, Ph.D.
Purdue University

Defining the Mechanical Link that Unites the Musculoskeletal System During Limb Development

Lulu Cambronne, Ph.D.
Vollum Institute, OHSU

Gatekeepers of Mitochondrial NAD+

Zhilei Chen, Ph.D.
Texas A&M University

Artificial Ecology Sink as Prophylaxis Against Viral Infection

Jaehyuk Choi, M.D., Ph.D.
Northwestern University Feinberg School of Medicine

Identifying Mechanisms Governing T Cell Diversity

Sean R. Collins, Ph.D.
University of California, Davis

Rewiring Control of Leukocyte Motility for Therapeutic Application

Jacob Corn, Ph.D.
Innovative Genomics Institute and University of California Berkeley

Discovering Mechanisms that Regulate Organelle Autophagy

Iwijn De Vlaminck, Ph.D.
Cornell University

Precision Monitoring of Kidney Transplants via Single-Cell and Single-Molecule Sequencing

Greg M. Delgoffe, Ph.D.
University of Pittsburgh School of Medicine

Exploring and Exploiting Metabolic Plasticity in Regulatory T Cells

Emily Derbyshire, Ph.D.
Duke University

Enabling Host Processes for Defense Against Liver Stage Malaria Infection

Kevin Esvelt, Ph.D.
Media Lab, Massachusetts Institute of Technology

Developing Powerful Daisy Drive Systems for the Precise Alteration of Local Populations

Emma Farley, Ph.D.
University of California San Diego

Deciphering the Regulatory Principles Governing Enhancer Specificity

Jingyi Fei, Ph.D.
The University of Chicago

Quantitative Imaging of Epitranscriptomic Regulation Mediated by RNA Modification

Akhilesh K. Gaharwar, Ph.D.
Texas A&M University

Mineralomics: Designing Mineral Based Therapeutics to Control and Direct Cell Function

Hernan G. Garcia, Ph.D.
University of California Berkeley

Lighting Up the Central Dogma in Embryonic Development

Alexander A. Green, Ph.D.
Arizona State University

Molecular Fuses for Real-Time, Label-Free, Multiplexed Imaging of RNAs in Living Cells

Samuel Andrew Hires, Ph.D.
University of Southern California

New Approaches to Understanding Sensorimotor Learning and Perception

Edmund Hollis II, Ph.D.
Burke Medical Research Institute and Weill Cornell Medicine

Modulation of Cortical Networks, a New Approach to Spinal Cord Injury Rehabilitation

Gary Hon, Ph.D.
University of Texas Southwestern Medical Center

Combinatorial Biology of Gene Regulation for Cellular Engineering

Seungmin Hwang, Ph.D.
The University of Chicago

Targeting by Autophagy Proteins for Anti-Tumor Immunity

Tijana Ivanovic, Ph.D.
Brandeis University

Building Mechanistic Insight into Evolvability of Viral Cell-Entry Functions

YongTae Kim, Ph.D.
Georgia Institute of Technology

Probing the Functional Heterogeneity of High-Density Lipoprotein Using Physiological Biomimicry

Bo Li, Ph.D.
University of North Carolina at Chapel Hill

Mining Genomes for Synergistic Antibiotics

Lingyin Li, Ph.D.
Stanford University School of Medicine

Chemical Biology of Innate Immunity for Treating Cancer and Autoimmunity

Eleni Linos, M.D., Dr.P.H.
University of California San Francisco

Targeted Advertising for Cancer Prevention

Evan Macosko, M.D., Ph.D.
Broad Institute of MIT and Harvard, Massachusetts General Hospital

Slide-Seq: High-Resolution In Situ Expression Profiling for Neuropathology

Nikhil S. Malvankar, Ph.D.
Yale University

Targeting Bacterial Infections by Imaging Electrical Interactions between Host Surface Pathogens

Raymond Moellering, Ph.D.
University of Chicago

Targeting Transcription with Synthetic Biologics

Anna V Molofsky, M.D., Ph.D.
University of California-San Francisco

Coordinate Regulation of Neural Circuit Remodeling by Glia: A Prospective Molecular Approach

Daniel Morgan , M.D., M.S.
Baltimore VA Medical Center / University of Maryland School of Medicine

Incorporating Bayesian Reasoning into Physician Testing and Treatment Decisions

Julia Oh, Ph.D.
The Jackson Laboratory for Genomic Medicine

Metagenomes to Therapeutics: Defining the Rules for Engineering the Skin Microbiome

Angela K. Pannier, Ph.D.
University of Nebraska-Lincoln

Using Cell Priming and Telecommunications Modeling to Enhance Gene Delivery for Stem Cell Therapies

Priya Rajasethupathy, M.D., Ph.D.
Rockefeller University

Bridging the Gap from Genes to Circuits to Behavior in Understanding Cognitive Dysfunction

Sherri Rose, Ph.D.
Harvard Medical School

Machine Learning for Health Outcomes and Quality of Care in Low-Income Populations

Buck S. Samuel, Ph.D.
Baylor College of Medicine

Microbial Programming of Host Physiology

Neville E. Sanjana, Ph.D.
New York Genome Center and New York University

In Situ Functional Genomics to UnderstandTranscriptional Regulation

Kavitha Sarma, Ph.D.
The Wistar Institute

Epigenetic Regulation through the Formation and Resolution of R Loops

Andrea Schietinger, Ph.D.
Memorial Sloan Kettering Cancer Center

Spatiotemporal Regulation of T Cell Fate Decisions in Cancer

Gabriela S. Schlau-Cohen, Ph.D.
Massachusetts Institute of Technology

Nanometer Distance Assay to Uncover Protein Dynamics

Michael J. Sheehan, Ph.D.
Cornell Univesity

Encoding Knowledge in the Genome

Sloan Siegrist, Ph.D.
University of Massachusetts Amherst

Chemical Detection of *Mycobacterium tuberculosis* Growth and Antibiotic Response During Infection

Joanna S.G. Slusky, Ph.D.
University of Kansas

Designed Beta-Strands for Inhibiting Efflux Pumps and Disabling Antibiotic Resistance

Radhika Subramanian, Ph.D.
Massachusetts General Hospital and Harvard Medical School

A Versatile Platform for Reconstructing the Spatial Organization of Intracellular Signaling During Cell-Division

Nicolas X. Tritsch, Ph.D.
New York University School of Medicine

A Novel Framework for the Functional Dissection of Motor Systems

Jakob von Moltke, Ph.D.
University of Washington

Sensing of Helminths by Tuft Cells

Brian Wainger, M.D., Ph.D.
Massachusetts General Hospital | Harvard Medical School

A Human Stem Cell-Derived Neuromuscular Junction Model for Amyotrophic Lateral Sclerosis

Hao Wu, Ph.D.
University of Pennsylvania

Charting Oxygen-Sensing Gene Regulatory Network in Cardiomyocytes through Single-Cell Analysis and Epigenome Editing

Huanghe Yang, Ph.D.
Duke University School of Medicine

Manipulating TMEM16F Lipid Dcramblase to Understand the Transbilayer Phospholipid Transport Phenomenon

Yuebing Zheng, Ph.D.
The University of Texas at Austin

On-Chip Multiplexed Adhesion Frequency Assay for Measuring Receptor-Ligand Interactions on Cells

NIH Director's Transformative Research Awardees

Anne Milasincic Andrews, Ph.D.
Semel Institute of Neuroscience and Human Behavior, University of California, Los Angeles

Micro- to Nanoscale Neurochemical Sensors

Steven A. Benner, Ph.D.
Foundation for Applied Molecular Evolution | The Westheimer Institute for Science and Technology

Transforming Life Sciences: Artificial Life

Ed Boyden, Ph.D.
Massachusetts Institute of Technology

High-Performance Imaging Through Scattering Living Tissue

Long Cai, Ph.D.
Caltech

MEMOIR: Recording, and In Situ Readout of Cell Lineage and Transcriptional History

Daniel T. Chiu, Ph.D.
University of Washington

Spatially Resolved Transcriptomics Enabled by Ultrabright Pdot Probes for Interrogation of Complex Tissues

Karina W. Davidson, Ph.D., M.A.Sc.
Columbia University Irving Medical Center

Re-engineering Precision Therapeutics Through N-of-1 Trials

Michael B. Elowitz, Ph.D.
California Institute of Technology, Howard Hughes Medical Institute

MEMOIR: Recording, and In Situ Readout of Cell Lineage and Transcriptional History

Christopher D. Johnston, Ph.D.
The Forsyth Institute, Harvard School of Dental Medicine

The SyngenicDNA and µPOET Platform: Overcoming Innate Barriers to Genetic Engineering in Bacteria

Carlos Lois, M.D., Ph.D.
Caltech

MEMOIR: Recording, and In Situ Readout of Cell Lineage and Transcriptional History

Daniel Mucida, Ph.D.
The Rockefeller University

Functional Mapping of Enteric-Associated Neurons

Joshua C. Vaughan, Ph.D.
University of Washington

Spatially Resolved Transcriptomics Enabled by Ultrabright Pdot Probes for Interrogation of Complex Tissues

NIH Director's Early Independence Awardees

Valerie A. Arboleda, M.D., Ph.D.
David Geffen School of Medicine, University of California, Los Angeles

Unraveling Correlations between Mendelian and Common Disease using Functional Genomics

Ahmed H. Badran, Ph.D.
The Broad Institute of MIT & Harvard

Functional Interrogation of Ribosomal Biology using Continuous Evolution

Fei Chen, Ph.D.
Broad Institute of MIT and Harvard

Characterizing Glioma Heterogeneity with Novel Multiplexed Nanoscale Imaging Technologies

Kyle P. Eagen, Ph.D.
Northwestern University Feinberg School of Medicine

Biochemical Basis of Chromatin Folding and Chromosome Condensation

Hilary Finucane, Ph.D.
Broad Institute of MIT and Harvard

Identifying Disease-Relevant Cell Types by Integrating Genetic and Functional Genomics Data

Melissa Gymrek, Ph.D.
University of California San Diego

Systematic Identification and Interpretation of Repetitive Variants Underlying Schizophrenia

Kyle M. Loh, Ph.D.
Stanford University School of Medicine, Institute for Stem Cell Biology & Regenerative Medicine

Developing Approaches for Universal Organ Transplantation

Samuel A. Mehr, Ed.D.
Harvard University

Psychological Functions of Music in Infancy

Zachary S. Morris, M.D., Ph.D.
University of Wisconsin School of Medicine and Public Health

Combining Radiation and Tumor-Specific AntIbody Therapies to Elicit In Situ Tumor Vaccination

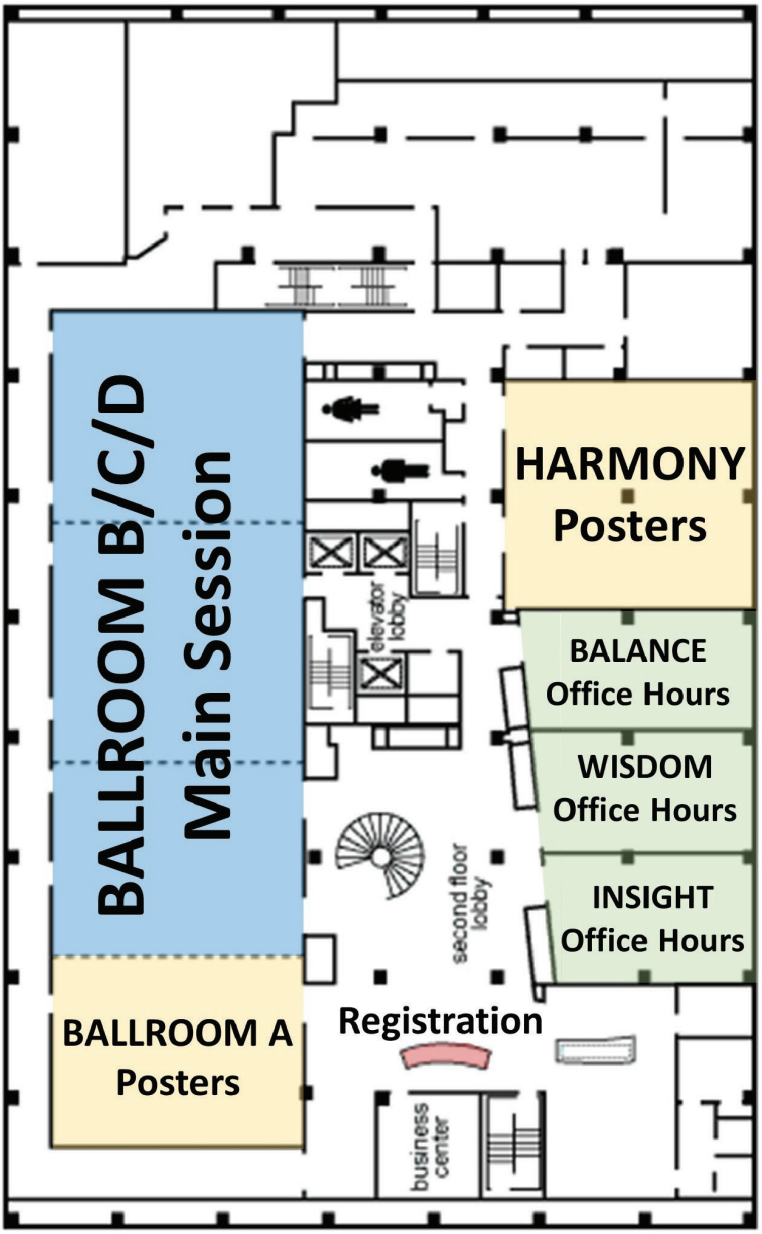
Zirui Song, M.D., Ph.D.
Harvard Medical School and Massachusetts General Hospital

Inequities in Health Outcomes in the Twenty-First Century: Understanding New Causes and the Impact of Delivery System Reforms on Health Care Disparities

Chuankai Zhou, Ph.D.
Buck Institute for Research on Aging

Mechanism of Organelle Dysfunction During Aging and the Related Rejuvenation Process

DOUBLETREE HOTEL BETHESDA – SECOND FLOOR



Social networking event & happy hour will be held at hotel bar on first floor

Notes

Notes

National Institutes of Health
Office of Strategic Coordination - The Common Fund

Please scan this QR Code to visit
the 2018 High-Risk High-Reward
Research Symposium website.

https://commonfund.nih.gov/symposium