Molecular Basis of Cognition

The Third Annual Scialog Conference
October 24-27, 2024

scialog2024®

CIFAR

THE FREDERICK GARDNER COTTRELL FOUNDATION

RESEARCH CORPORATION *for* SCIENCE ADVANCEMENT

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Scialog: Molecular Basis of Cognition

Objectives

Engage in dialogue with the goal of accelerating high-risk/high-reward research.

Identify and analyze bottlenecks to advancing fundamental science for understanding the molecular basis of cognition and develop approaches for breakthroughs.

Build a creative, better-networked, collegial community that is more likely to produce breakthroughs.

Form teams to write proposals to seed novel projects based on highly innovative ideas that emerge at the conference.

Most importantly, enjoy the discussions about where this field should go and how we can work together to get there.

Process

Brainstorming is welcome; don't be afraid to say what comes to mind.

Consider the possibility of unorthodox or unusual ideas without immediately dismissing them.

Discuss, build upon and constructively criticize each other's ideas —in a spirit of cooperative give and take.

Make comments concise to avoid monopolizing the dialogue.

Diversity, Inclusion and No Harassment

Research Corporation for Science Advancement fosters an inclusive and respectful environment for listening in which the different identities, backgrounds, and perspectives of all participants are valued, and in which everyone is empowered to share ideas as fellow scientists.

RCSA does not tolerate any form of harassment, which could include verbal or physical conduct that has the purpose or effect of substantially interfering with anyone else's participation or performance at this conference, or of creating an intimidating, hostile, or offensive environment; any such harassment may result in dismissal from the conference.

Read RCSA's Code of Conduct

From the President

Welcome to the third meeting of ***Scialog: Molecular Basis of Cognition***, an initiative cosponsored by Research Corporation, CIFAR (the Canadian Institute for Advanced Research), and the Frederick Gardner Cottrell Foundation, with additional support from the Walder Foundation, the Peter and Carmen Lucia Buck (PCLB) Foundation, the Azrieli Foundation, and The Kavli Foundation. This is the third of three annual Scialog meetings on this theme. We hope the face-to-face exchanges, including informal times, will offer a rich experience in scientific ideation. We hope you find the opportunity to write team proposals "on-the-spot" exciting and rewarding.

The goal of this Scialog is to build a network of researchers across multiple disciplines to develop novel collaborative projects to accelerate deeper understanding of the molecular basis of cognition.

Scialog's overarching purpose is to advance cutting-edge science of great significance to humanity by catalyzing innovative, basic research leading to fundamental discoveries. Our focus is on scientists in the early years of their independent careers. Through the unique Scialog process, we seek to lay the foundation for an ongoing, highly creative, cross-disciplinary community of scientists that will prove adept at identifying exciting areas for research advances for decades to come.

To that end, under the guidance of Program Directors **Richard Wiener, Andrew Feig**, **Silvia Ronco,** and **Eileen Spain**, we hope you will be engaged in passionate discussions with colleagues, many of whom you will have met for the first time at Scialog. The process may even push you out of your comfort zone with the goal of stimulating new and better ideas. The result we expect will be a meeting unlike others that you attend. We are confident that you will find the next few days to be extremely worthwhile.

This is your opportunity to air that wild idea you have been reluctant to share with others, or to discuss a nagging hunch that does not yet have sufficient supporting data, or to take a leap on a high impact/high-risk project instead of concentrating all your effort on somewhat more "incremental" studies. This is the time to come up with, and be open to, completely new ideas that may truly change the scientific understanding of how minds work.

We hope this meeting yields a crop of outstanding team proposals, which will make our job of determining who receives funding very challenging. I wish you every success in exploring new and compelling ideas over the next few days.

Have a terrific meeting!

Daniel Linzer
President
Research Corporation for Science Advancement

From the Program Director

Research Corporation, CIFAR, and the Frederick Gardner Cottrell Foundation are cosponsoring the 2024 meeting of *Scialog: Molecular Basis of Cognition*, with additional support from the Walder Foundation, the PCLB Foundation, the Azrieli Foundation, and The Kavli Foundation. Research Corporation's highly interactive Scialog meetings have the goal of catalyzing new collaborations based on blue-sky ideas among Scialog Fellows who constitute a highly select group of exemplary early career U.S. and Canadian scientists, and a few from even farther abroad. The emphasis is on dialogue, networking, and building new collaborations to pursue novel, high-risk discovery research.

We chose to focus on *Molecular Basis of Cognition* because we believe this critical area of science requires major breakthroughs in fundamental understanding. Just as firmly, we believe these breakthroughs can best be accelerated by scientists across disciplines, including neurobiology, neuroscience, and related cognitive sciences, working collaboratively on novel, high-risk projects, particularly with multiple approaches and methodologies.
We have an outstanding keynote speaker to set the stage for breakout discussions:

Adina Roskies, University of California, Santa Barbara

Along with Adina, we have a team of terrific discussion facilitators: **Adam Cohen**, Harvard University; **Jacqueline Gottlieb**, Columbia University; **Martin Gruebele**, University of Illinois Urbana-Champaign; **Jacob Hooker,** Massachusetts General Hospital; **Kenneth Kosik**, University of California, Santa Barbara; **Marina Picciotto**, Yale University; and **Mani Ramaswami**, Trinity College Dublin.

Program representatives **Candace Tebbenkamp**, the Walder Foundation, and **Lisa Nanstad**, Foundation Relations CU Boulder, are looking forward to interacting with Fellows and Facilitators.

Scialog meetings focus on dialogue and team building with the goal of creating novel strategies and collaborative approaches. An important feature is the opportunity for Scialog Fellows to form teams and write proposals to pursue particularly creative ideas that emerge through the dialogue. We hope this competition is exciting, but regardless of which proposals are funded, the primary purpose is to catalyze a deeper and more meaningful exchange of ideas than ordinarily occurs at scientific conferences. Our intent is for this process to help participants gain new insights and connections that significantly advance fundamental science to enable major advances in understanding the molecular basis of cognition.

We hope each participant finds the Scialog experience of great value. Please do not hesitate to provide feedback on how to make the conference better. My fellow Program Directors, **Andrew Feig, Silvia Ronco,** and **Eileen Spain,** and everyone from RCSA, are here to help make the meeting a great experience!

Richard Wiener
Senior Program Director
Research Corporation for Science Advancement

Conference Agenda
October 24-27, 2024

Thursday, October 24

2:00 pm	**Registration Opens**	Sonoran II Foyer
2:00 – 5:00 pm	**Snacks & Informal Discussions**	Sonoran II Foyer
5:00 – 6:30 pm	**Poster Session and Reception**	Murphey/Murphey Patio
6:00 – 6:30 pm	**Meeting for Discussion Facilitators**	Sonoran Ballroom
6:30 – 7:30 pm	**Dinner**	Murphey/Murphey Patio
7:30 – 8:30 pm	**Welcome** Dan Linzer, President, RCSA **Conference Overview, Outcomes and Proposal Guidelines** Richard Wiener, Senior Program Director, RCSA **Introductions/Ice Breakers**	Sonoran
8:30 – 11:00 pm	**Starlight Cafe**	Murphey/Murphey Patio

Friday, October 25

7:00 – 8:00 am	**Breakfast**	Murphey/Murphey Patio
8:00 – 8:45 am	**Keynote Presentation** *On a Correct Scientific Ontology for Cognition* Adina Roskies University of California, Santa Barbara	Sonoran
8:45 – 9:00 am	**Breakout Session Overview and Instructions**	Sonoran
9:00 – 10:15 am	**Breakout Session I**	Sonoran, Rincon, Finger Rock I, II and III
10:15 – 10:35 am	**Report Out**	Sonoran
10:35 – 10:45 am	**Conference Photo**	Stairs – Murphey Patio
10:45 – 11:15 am	**Morning Break**	Sonoran II Foyer
11:15 – 11:45 am	**Mini Breakout Session I** (Fellows) **Facilitator Meeting** (Facilitators)	All Spaces Sonoran
11:45 – 1:00 pm	**Lunch**	Murphey/Murphey Patio
1:00 – 2:15 pm	**Breakout Session II**	Sonoran, Rincon, Finger Rock I, II and III
2:15 – 2:35 pm	**Report Out**	Sonoran
2:35 – 3:05 pm	**Mini Breakout Session II** (Fellows)	All spaces
3:05 – 5:15 pm	**Afternoon Break, Informal Discussions and Leisure Time**	Sonoran II Foyer
5:15 – 6:30 pm	**Poster Session and Reception**	Murphey/Murphey Patio
6:30 – 7:30 pm	**Dinner**	Murphey/Murphey Patio
7:30 – 8:30 pm	**2023 Team Award Presentations**	Sonoran
8:30 – 11:00 pm	**Starlight Cafe**	Murphey/Murphey Patio

Saturday, October 26

7:00 – 8:00 am	**Breakfast**	Murphey/Murphey Patio
8:00 – 8:45 am	**2023 Team Award Presentations**	Sonoran
8:45 – 9:15 am	**Mini Breakout Session III** (Fellows)	All Spaces
9:15 – 9:45 am	**Morning Break**	Sonoran II Foyer
9:45 – 11:00 am	**Breakout Session III**	Sonoran, Rincon, Finger Rock I, II and III
11:00 – 11:20 am	**Report Out**	Sonoran
11:20 – 11:50 am	**Mini Breakout Session IV** (Fellows)	All Spaces
	Facilitator and Funding Partners Discussion	Sonoran
11:50 – 1:00 pm	**Lunch**	Murphey/Murphey Patio
1:00 – 5:45 pm	**Team Formation, Informal Discussions and Proposal Writing**	All Spaces
5:45 – 6:30 pm	**Reception**	Murphey/Murphey Patio
6:30 – 7:30 pm	**Dinner**	Murphey/Murphey Patio
7:30 – 11:00 pm	**Starlight Cafe**	Murphey/Murphey Patio

Sunday, October 27

6:30 – 7:30 am	**Breakfast**	Murphey/Murphey Patio
7:30 – 11:00 am	**Presentation of Proposals**	Sonoran
	Assessment Survey and Wrap-up	
10:00 – 12:00 pm	**Lunch** (available to go)	Sonoran II Foyer

Keynote Presentation

On a Correct Scientific Ontology for Cognition

Adina Roskies
Professor of Philosophy and Cognitive Science Program Chair
University of California, Santa Barbara

Abstract:

The quest for the molecular basis of cognition belies an implicit commitment to reductionism. I take as a case study the use of functional neuroimaging to explore whether this commitment is likely to be well-founded. By examining neuroimaging methods and drawing on an important insight in the history of philosophy of science, I argue that there may be no unique reductionist base to discover for cognition. Nonetheless, I provide reasons to think we can still make progress in understanding cognition and suggest strategies for constructing better scientific theories.

Biography:

Adina Roskies is a Distinguished Professor of Philosophy at UCSB, and chair of the university's Cognitive Science Program. Roskies received a Ph.D. from the University of California, San Diego, in Neuroscience and Cognitive Science in 1995, a Ph.D. from MIT in philosophy in 2004, and an M.S.L. from Yale Law School in 2014. Prior to her work in philosophy, she held a postdoctoral fellowship in cognitive neuroimaging at Washington University with Steven Petersen and Marcus Raichle, and from 1997-1999 was Senior Editor of the neuroscience journal *Neuron*. From 2004-2023 she taught at Dartmouth College and was the Helman Family Distinguished Professor and chair of the Cognitive Science program there. Dr. Roskies has received numerous awards and fellowships, including the Stanton Prize from the Society for Philosophy and Psychology, The Neuroethics Prize from the Italian Society of Neuroethics, a Mellon New Directions fellowship, and fellowships from the Princeton Center for Human Values and the University of Pittsburgh's Center for Philosophy of Science. Recent grants include awards from the NIH BRAIN Initiative and the Templeton Foundation. Dr. Roskies' research interests lie at the intersection of philosophy and neuroscience, and include philosophy of mind, philosophy of science, and ethics. She has coauthored a book with Stephen Morse, *A Primer on Criminal Law and Neuroscience*.

Scialog: MBC Team Awards 2022

Lucas Pinto, Neuroscience, Northwestern University *****
Evelyn Tang, Physics and Astronomy, Rice University **^**
Daniel Burnston, Philosophy / Brain Institute, Tulane University **†**
Network Topology Underlying Circuit Dynamics During Flexible Cognitive Behavior

Kate Hong, Biological Sciences, Neuroscience Institute, Carnegie Mellon University **†**
Benjamin Scott, Psychological and Brain Sciences, Boston University **†**
Matthew Lovett-Barron, Neurobiology, University of California, San Diego **†**
Understanding Cortical Control Over Subcortical Structures Using an Evolutionary Inspired Engineering Approach

Christina Kim, Center for Neuroscience & Department of Neurology, University of California, Davis **^**
Antonio Fernandez-Ruiz, Neurobiology & Behavior, Cornell University **†**
Bridging Mechanism of Memory Across Levels

Travis Baker, Center for Molecular and Behavioral Neuroscience, Rutgers University **†**
Megan Peters, Cognitive Sciences, University of California, Irvine **‡**
Robert Wilson, Psychology, University of Arizona **†**
Beyond Computational Behaviorism: The Structure of Thought in Naturalistic Behaviors

Becket Ebitz, Neuroscience, Université de Montréal **†**
Elizabeth Hong, Biology & Biological Engineering, California Institute of Technology **†**
Gordon Berman, Biology, Emory University **†**
FlyRanch: A Platform for Uncovering the Molecular Bases of Hidden Behavioral State Dynamics

Patrese Robinson-Drummer, Psychology, Haverford College **†**
Allyson Mackey, Psychology, University of Pennsylvania **‡**
Sydney Trask, Psychological Sciences, Purdue University **†**
From Cradle to Grave: Measuring the Lifetime Impact of Early-Life Stress

*** Funded by Walder**
^ Funded by The Kavli Foundation
† Funded by RCSA and the Frederick Gardner Cottrell Foundation
‡ CIFAR Azrieli Global Scholar funded by CIFAR

Scialog: MBC Team Awards 2023

Yao Chen, Neuroscience, Washington University in Saint Louis
Michael Economo, Biomedical Engineering, Boston University
Illuminating the Molecular Mechanisms of Memory Formation During Behavior

Anna Schapiro, Psychology, University of Pennsylvania
Megan Peters, Cognitive Sciences, University of California, Irvine
Marcelo Mattar, Psychology, New York University
Investigating the Conscious Accessibility of Neural Replay

Timothy Machado, Neuroscience, University of Pennsylvania
Kate Hong, Biological Sciences, Neuroscience Institute, Carnegie Mellon University
Michael Economo, Biomedical Engineering, Boston University
FLEX: Fluorescent Light Examination of eXtensors (and Other Muscles)

Lucas Pinto, Neuroscience, Northwestern University
Benjamin Scott, Psychological and Brain Sciences, Boston University
Yao Chen, Neuroscience, Washington University in Saint Louis
Understanding the Multiple Timescales of Neuromodulation Using Three Photon Instant FLIM

Daniel Burnston, Philosophy / Brain Institute, Tulane University
Wilma Bainbridge, Psychology, University of Chicago
Bob Wilson, Psychology, University of Arizona
Mapping Inner Worlds: Representational Spaces and Mental Life

Phillip Rivera, Biology, Macalester College
Alison Weiss, Neuroscience, Oregon Health & Science University
Elizabeth McNeill, Food Science and Human Nutrition, Iowa State University
The Mystery of Heavy Drinking: Exploring the Roots of Alcohol Dependency

Maithe Arruda-Carvalho, Psychology, University of Toronto
Rosemary Bagot, Psychology, McGill University
Leveraging Development to Reveal Molecular Mechanisms of Neural Circuit Divergence

2024 Proposal Guidelines

1. Awards are intended to provide seed funding for teams of two to three Scialog Fellows formed at this conference for high-risk, high-impact projects.

2. The application package should be submitted as a single PDF file. Pages one and two should describe the project and role of each team member. A third page may be used for references. No budget is necessary.

3. Awards will be in the amount of $50K direct funding per team member, plus a small percentage for overhead. Grant duration will be one year.

4. No Scialog Fellow can be a member of more than two teams. If a Scialog Fellow is a member of two teams, other members of the teams must be different. No team can submit more than one proposal.

5. No Scialog Fellow who previously has won a Scialog MBC Collaborative Award can be a member of more than one team. The other team members must be different from the members of the previously awarded team.

6. Scialog Fellows who have previously won two Scialog MBC Collaborative Awards are not eligible to be funded members of a team, but they can participate as a non-funded team member.

7. Teams cannot include members who have previously collaborated with one another. If you are unsure of your status (e.g., prospective team members were part of a large collaboration but did not significantly interact), please check for clarification with an RCSA Program Director.

8. Teams are encouraged (but not required) to:
    a. Include members with different research approaches and methods.
    b. Include members from different disciplines.

9. Proposals must be submitted electronically by **6:00 a.m. PST Sunday, October 27, 2024**. Instructions for submission will be provided at the meeting.

10. Awards are anticipated to start around **February 1, 2025**.

Scialog Fellows

Ahmed Abdelfattah ahmed_abdelfattah@brown.edu
Neuroscience, Brown University
The Abdelfattah lab is developing novel classes of molecular tools for large-scale functional analysis and manipulation of brain circuits.

Wilma Bainbridge wilma@uchicago.edu
Psychology, University of Chicago
Ccognitive neuroscience of perception and memory, looking at how certain items are intrinsically more memorable than others, using behavioral experiments, computer vision, machine learning, online studies, and fMRI.

Travis Baker travis.e.baker@rutgers.edu
Center for molecular and behavioral neuroscience, Rutgers University-Newark
To understand the neurobiological mechanisms that underlie goal-directed navigation, how to empirically identify and characterize these functions in the brain, and how these functions are disrupted in clinical populations (e.g. addictions).

Ann-Sophie Barwich abarwich@iu.edu
(1) History and Philosophy of Science and Medicine | (2) Cognitive Science, Indiana University Bloomington
I am a cognitive scientist and philosopher specializing in olfaction. In my lab, we integrate EEG with olfactometry, charting the course of odor responses on an ERP timeline and crafting experiments that reveal the critical role of molecular mechanisms in understanding cognition.

Gordon Berman gordon.berman@emory.edu
Biology, Emory University
Theoretical, computational, and data-driven approaches to gain quantitative insight into entire repertoires of animal behaviors, aiming to make connections to the neurobiology, genetics, and evolutionary histories that underlie them.

Jessica Bernard jessica.bernard@tamu.edu
Psychological and Brain Sciences, Texas A&M University
I am interested in understanding changes in cognition that occur with aging and how they relate to changes in brain structure, function, and network organization. I am particularly focused on cerebellar contributions to these changes.

Daniel Burnston dburnsto@tulane.edu
Philosophy, Tulane University
Systems biology and neuroscience, philosophy of mind, perceptual psychology, decision-making, rationality.

Scialog Fellows Continued

Cassi Callmann ccallmann@utexas.edu
Chemistry, University of Texas at Austin
My research program is focused on understanding the fundamental mechanisms by which carbohydrates mediate biological processes. To achieve this, we are developing carbohydrate-containing polymers to probe and perturb biological mechanisms, using a "bottom up" materials approach.

Yao Chen yaochen@wustl.edu
Neuroscience, Washington University in St. Louis
How the dynamics of biochemical signaling dynamics support brain functions. I am particularly interested in (1) how neuromodulators transform behavior; (2) how sleep promotes better brain and body functions; and (3) how plasticity signals mediate learning.

Ritchie Chen ritchie.chen@ucsf.edu
Neurological Surgery, University of California, San Francisco
My research group develops tools to study circuits across the brain and body. We are interested in circuit mechanisms of interoception and emotions.

Anita Disney anita.disney@duke.edu
Neurobiology, Duke University
Research in my lab seeks to understand ways in which neuromodulatory molecules dynamically reconfigure neural circuits to support flexible cognition and behavior.

Mike Economo mne@bu.edu
Biomedical Engineering, Boston University
(1) the multi-regional circuits in the mouse brain responsible for controlling movements of the body and (2) the development of new transcriptomic, connectomic, optical, and analytical technologies for neuroscience research.

Fernanda Eliott eliottfe@grinnell.edu
Computer Science, Grinnell College
I build AI systems that use cognitive inspiration and Reinforcement Learning techniques, and I seek to better understand human decision-making. My research focuses on the computational modeling of sensations, emotions, feelings, and moral reasoning.

Jonathan Fadok jfadok@tulane.edu
Psychology, Tulane University
My research is focused on discovering the neurobiological mechanisms underlying adaptive behavioral states, especially those related to threat. We specialize in developing novel behavioral assays that allow investigations into the neural control of responses to threat and trauma.

Scialog Fellows Continued

Louie Favela lhfavela@iu.edu
History and Philosophy of Science and Medicine Cognitive Science Program, Indiana University Bloomington
Interdisciplinary work in the cognitive sciences, experimental psychology, and philosophies of mind and science applying complexity science, dynamical systems theory, and ecological psychology to research on intelligent behavior (esp. cognition) in diverse systems.

Antonio Fernandez-Ruiz afr77@cornell.edu
Neurobiology and Behavior, Cornell University
We seek to understand the algorithmic underpinnings of animal flexible behaviors at the computational, circuit, and cellular levels. With these purposes, we develop and implement sophisticated electrophysiological, optogenetic, imaging and computational techniques in rodents

Nicole Ferrara nicole.ferrara@rosalindfranklin.edu
Physiology and Biophysics, Rosalind Franklin University
I am interested in the maturation of affective neural circuits promoting a variety of age-dependent behaviors, including social interaction and associative fear learning. My work identifies distinct neural mechanisms sensitive to and supporting adolescent and adult behavior.

Alex Frañó afrano@ucsd.edu
Physics, University of California, San Diego
Neuromorphic computing based on quantum materials.

Kurt Fraser kfraser@umn.edu
Psychology, University of California, Berkeley
I am a behavioral and systems neuroscientist interested in the regulation of motivation. I make use of a variety of cutting-edge techniques to link precise behavioral concepts with ongoing neurobiological process.

James Gaynor james.gaynor@northwestern.edu
Chemistry, Northwestern University
I seek to understand the microscopic, molecular-level description of condensed phase chemical dynamics, which host important phenomena, as they occur in "real-time"; i.e. on the natural timescales of electronic and vibrational motions in complex systems and environments.

William Gilpin wgilpin@utexas.edu
Physics, University of Texas at Austin
I am a physicist who works on computational nonlinear dynamics. I am broadly interested in prediction and control of complex systems, such as turbulence or biological networks. My group uses theoretical tools from statistical physics and computer science.

Scialog Fellows Continued

Howard Gritton hgritton@illinois.edu
Comparative Biosciences, University of Illinois at Urbana-Champaign
Our lab is motivated to understand how the attentional and motivational properties conveyed by acetylcholine and dopamine contribute to the generation and timing of rhythms that contribute to cognition and social behavior.

Kate Hong katehong@andrew.cmu.edu
Biological Sciences and Neuroscience Institute, Carnegie Mellon University
My lab is interested in how cortical and subcortical areas interact to encode sensory-guided behaviors, using the mouse whisker system as a model.

Rainbo Hultman rainbo-hultman@uiowa.edu
Molecular Physiology & Biophyscis, University of Iowa
I am interested in electrical brain networks that can predict behavior, particularly at the intersection of sensation and emotion.

Deb Karhson dkarhson@uno.edu
Psychology, University of New Orleans
I am examining the role of the endocannabinoid signaling in the neurobiological mechanisms of social synchrony and learning of neurodivergent people.

Sarah Kostinski sk10775@nyu.edu
Physics, New York University
My main areas of research are biological physics and stochastic processes. While I previously focused on the growth of unicellular organisms, I am currently interested in signal processing of neural spike train data and memory formation.

Chris Krupenye krupenye@jhu.edu
Psychological & Brain Sciences, Johns Hopkins University
Krupenye studies the cognitive and inferential mechanisms that enable humans and other animals to track, predict, and navigate their worlds, especially their social worlds. His research focuses on humans, our very closest ape relatives, and pet dogs.

Matt Lovett-Barron mlb@ucsd.edu
Neurobiology, University of California, San Diego
My lab is interested in the perceptual and neural basis of collective behavior, using the schooling glassfish (Danionella cerebrum) as a model system to study how group behavior emerges from the sensory-motor processes of individuals and their interactions.

Timothy Machado Timothy.Machado@PennMedicine.upenn.edu
Neuroscience, University of Pennsylvania
My lab uses multiregional neural recording techniques to study how circuits across the brain send commands to control movement during different behavioral states.

Scialog Fellows Continued

Marcelo Mattar marcelo.mattar@nyu.edu
Psychology, New York University
Computational neuroscience, decision making, reinforcement learning.

Elizabeth McNeill emcneill@iastate.edu
Food Science and Human Nutrition, Iowa State University
My long-term research goal is to contribute to understanding the molecular mechanisms regulating gene expression through miRNAs in response to environmental factors such as diet across the lifespan in the nervous system.

Tim Mosca timothy.mosca@jefferson.edu
Neuroscience, Thomas Jefferson University
The Mosca Lab studies, broadly, how synapse organization arises in the brain and how that organization enables behavior. We study Drosophila synapses, taking in vivo genetic, biochemical, and microscopy approaches to understand the molecular pathways that enable synapses to form.

Farzaneh Najafi fnajafi3@gatech.edu
Biological Sciences, Georgia Institute of Technology
We study how the brain generates and updates predictions about the world. We focus on cortical and cerebellar computations that underlie predictive processing during passive, motor and perceptual behaviors. We use mice, 2p calcium imaging, optogenetics, and computational methods.

Jean-Paul Noel jpn5@nyu.edu
Neuroscience, University of Minnesota Twin Cities
Neural basis of causal inference, multisensory intergration, navigation, and decision-making in health and disease.

Brian Odegaard bodegaard@ufl.edu
Psychology, University of Florida
My laboratory's work employs psychophysics, computational modeling, and neuroimaging to study multisensory integration, peripheral vision, attention, and metacognition, with an emphasis on understanding how these topics inform current theories of visual awareness.

Megan Peters megan.peters@uci.edu
Cognitive Sciences, University of California, Irvine
I am broadly interested in neuroscience, perception, computational modeling, machine learning/AI, and consciousness in humans. I also have budding interests in explainable AI, the nature of belief formation and its relation to cognitive penetrability, and meta-science.

Lucas Pinto lucas.pinto@northwestern.edu
Neuroscience, Northwestern University
mouse decision making, cognitive flexibility, cortical circuits, neuromodulation, optical methods

Scialog Fellows Continued

Phil Rivera privera@macalester.edu
Biology, Macalester College
I am interested in understanding how the immune system mediates cognition in a sex-dependent manner. To do this, a mouse model is used to elucidate the immune signaling component involved during specific stages of learning and memory.

Patrese Robinson-Drummer probinsond@haverford.edu
Psychology, Haverford College
I am a developmental behavioral neuroscientist. I use rodents to model the ontogeny of learning/memory systems, their neurobiological mechanisms and how early-life traumas (stress, abuse, drug exposure, etc) change typical neurobehavioral trajectories and outcomes.

Tomás Ryan tomas.ryan@tcd.ie
Biochemistry and Immunology, Trinity College Dublin
Memory engrams, Innate representations, Development, Information, Neuroimmunology

Monsheel Sodhi msodhi@luc.edu
Molecular Pharmacology and Neuroscience, Loyola University Chicago
Identification of molecular pathways leading to enhanced cognition and stress resilience, with a focus on the impact of RNA editing on neurotransmitter systems in the brain. We use human postmortem brain, mouse models and in vitro strategies to test hypotheses.

Masashi Tabuchi mxt512@case.edu
Neurosciences, Case Western Reserve University
The research interests of my lab span neural circuits underlying learning, memory, and sensory processing, with a focus on understanding the mechanisms of synaptic plasticity and its implications for brain disorders.

Longzhi Tan tttt@stanford.edu
Neurobiology, Stanford University
Building a DNA sequencing-based "biochemical microscope" to study how each brain cell controls gene expression by reshaping the 3D structure of the human and mouse genome over the life span, and how this biophysical process shapes learning, memory, and dementia.

Jordan Theriault jtheriault2@mgh.harvard.edu
Radiology, Massachusetts General Hospital
I use quantitative MR/PET imaging and control-based computational frameworks to study the relationship between brain metabolism (e.g., task-elicited increases glucose metabolism) and brain-based information encoding (e.g. within predictive-coding frameworks).

Scialog Fellows Continued

Alison Weiss weissa@ohsu.edu
Neuroscience, Oregon National Primate Research Center
Nonhuman primate researcher focused on developing biomarkers that predict age-associated impairments in learning/memory. I employ multimodal neuroimaging (MRI, DTI, rsfMRI, and PET), in conjunction with cognitive tasks, in monkeys ranging from middle age (15y) to very old (30y).

Robert Wilson bob.wilson@gatech.edu
Psychology, University of Arizona
Computational modeling of human decision making

Elena Zannoni elena.zannoni@austin.utexas.edu
Mechanical Engineering, University of Texas at Austin
My research focuses on the development of nuclear imaging instrumentation (SPECT, PET, XFET) and data analysis techniques in radiological science and molecular imaging for clinical and preclinical applications, including radiation dosimetry, spectrometry and quantitative imaging.

Discussion Facilitators

Adam Cohen cohen@chemistry.harvard.edu
Chemistry & Chemical Biology, Harvard University
My lab is interested in developing physical tools to study the brain, across spatial scales from molecules to whole-organ and across time scales from microseconds to months. We aim to relate the biophysics of the molecular parts to principles of neural information processing.

Jackie Gottlieb Gottlieb jg2141@columbia.edu
Neuroscience, Columbia University
Cognition, attention, memory, decision making, neurophysiology

Martin Gruebele mgruebel@illinois.edu
Chemistry, Physics, Biophysics and Quantitative Biology, College of Medicine, University of Illinois at Urbana-Champaign
Fish behavioral dynamics

Jacob Hooker jhooker@mgh.harvard.edu
Radiology, Harvard University
Research aims to deepen brain understanding via molecular imaging agent development. Investigating biochemical dysregulation in neurodegenerative diseases, neurodevelopmental, and psychiatric disorders, particularly in neuroinflammation, epigenetics, and neurochemical dynamics.

Kenneth Kosik kosik@lifesci.ucsb.edu
Molecular, Cellular, and Developmental Biology, University of California, Santa Barbara
Kosik's interests cover a broad swath of neurobiology from neurodegenerative to neurodevelopmental disorders studied from the perspectives of cell and molecular biology as well as the physiology of brain organoids and genetics of rare mutations

Marina Picciotto marina.picciotto@yale.edu
Psychiatry, Yale University
Dr. Picciotto's research focuses on acetylcholine and its receptors in cellular processes and circuits relevant to complex behaviors and psychiatric illness.

Mani Ramaswami RAMASWAM@tcd.ie
Genetics and Institue of Neuroscience, Trinity College Dublin
Learning and memory. "Inhibitory engrams" or "negative images," that may mediate habituation, and memory silencing. Neuronal RNP-granules in long-term memory and neurodegeneration. Integrative transdisicplinary science: chemical ecology, neurohumanities, biodiversity.

Adina Roskies aroskies@ucsb.edu
Philosophy, University of California, Santa Barbara
My interests lie mainly in the intersection of philosophy and the biological and cognitive sciences, in particular in philosophy of neuroscience and cognitive science, neuroethics, and philosophy of mind.

Guests

Ruoming Gong ruoming.gong@northwestern.edu
Applied Math, Northwestern University
I am interested in how people form collaborations in scientific conferences.

Candace Tebbenkamp ctebbenkamp@walderfoundation.org
Science Innovation, Walder Foundation
Candace has diverse interests across the life sciences, with primary research spanning from bacterial engineering to neurogenomics. Candace leverages this breadth of experience leading academic and philanthropic research initiatives to accelerate discovery and innovation.

Lisa Nanstad lisa.nanstad@colorado.edu
Research Development, University of Colorado Boulder
As a research development professional in interdisciplinary, collaborative, translational research, I am eager to gain insight into the Scialog model for catalyzing collaborative research and teaming, and to develop a strategy for adapting it for use at University of Colorado.

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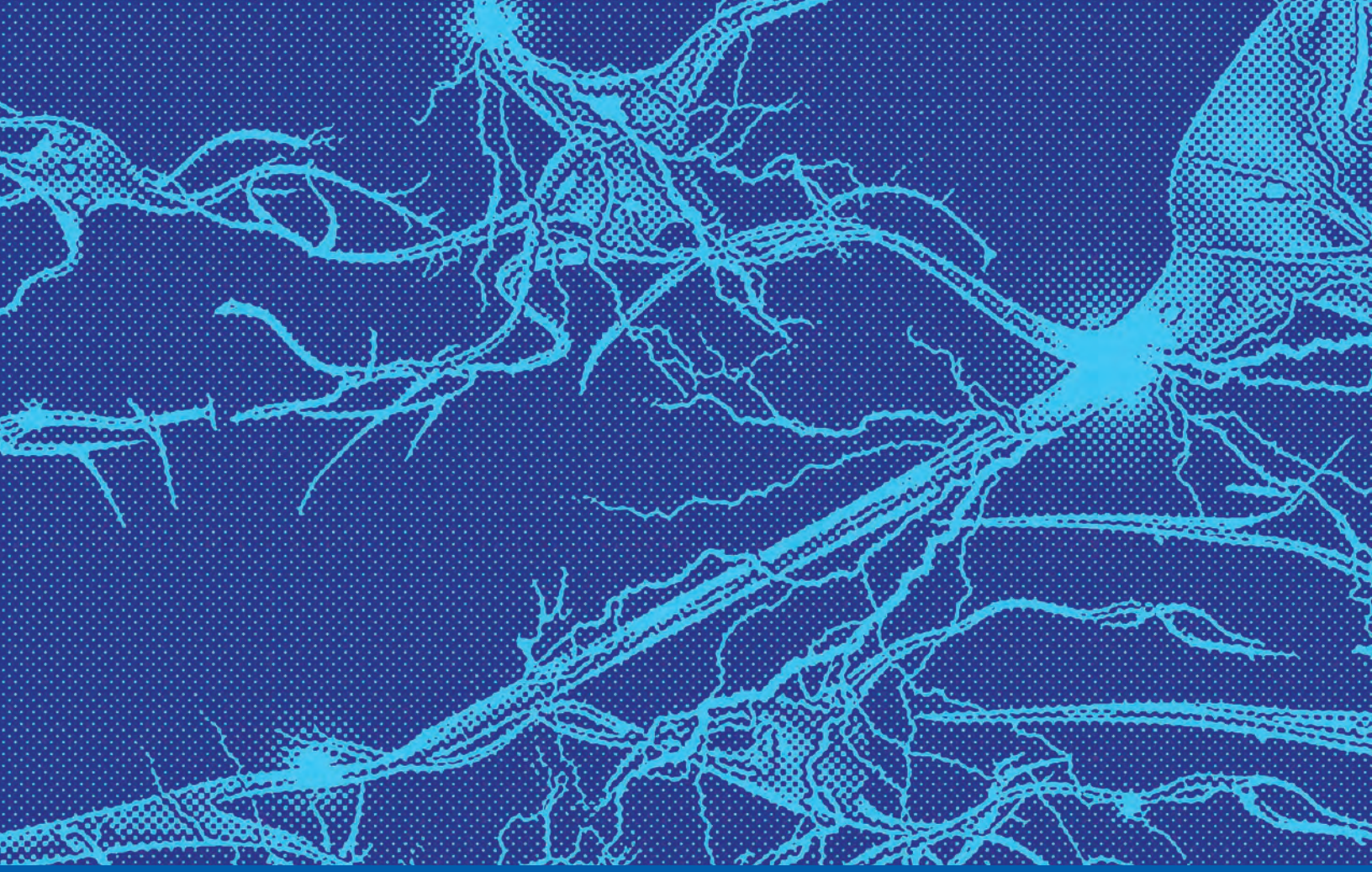
Senior Program Director



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