Chemical Machinery of the Cell

scialog 2021®

The Third Scialog Conference
October 7–8, 2021

GORDON AND BETTY MOORE FOUNDATION

RESEARCH CORPORATION *for* SCIENCE ADVANCEMENT

Objectives

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

Identify and analyze bottlenecks to advancing understanding of the chemical machinery of the cell and develop approaches for breakthroughs.

Build a creative, better-networked 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 even constructively criticize each other's ideas—in a spirit of cooperativegive and take.

Make comments concise to avoid monopolizing the dialogue.

Diversity, Inclusion and No Harassment

Research Corporation for Science Advancement fosters an environment for listening and considering new ideas from a diverse group, with respect for all participants without regard to gender, race, ethnicity, sexual orientation, age or any other aspect of how we identify ourselves other than 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.

From the President

Welcome to the 2021 *Scialog: Chemical Machinery of the Cell* meeting, cosponsored by Research Corporation and Gordon and Betty Moore Foundation. This is the third of three full-length Scialog meetings on this theme.

The goal of this Scialog is to catalyze theorists, computational and data scientists, and experimentalists across multiple disciplines to collaborate on developing new and innovative projects to accelerate fundamental science to drive advances in understanding the myriad reactions that are happening simultaneously in close proximity in the extremely dense and complex cellular environment.

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**, and **Silvia Ronco** (Research Corporation) and **Gary Greenburg** (Gordon and Betty Moore Foundation), 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 two days to be extremely worthwhile.

This is your opportunity to air that wild idea you have been reluctant to share with others, 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 world.

We hope this third full meeting on this topic 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

This year Research Corporation and Gordon and Betty Moore Foundation are cosponsoring the final meeting of *Scialog: Chemical Machinery of the Cell*. 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. The emphasis is on dialogue, networking, and building new collaborations to pursue novel, high-risk discovery research.

We have an outstanding keynote speaker to set the stage for breakout discussions:
Rigoberto Hernandez, Johns Hopkins University

We have a team of terrific discussion facilitators: **Rommie Amaro** (University of California, San Diego), **Holly Goodson** (University of Notre Dame), **Martin Gruebele** (University of Illinois at Urbana-Champaign), **Rigoberto Hernandez** (Johns Hopkins University), **Neil Kelleher** (Northwestern University), **Gang-yu Liu** (University of California, Davis), **Andreas Matouschek** (University of Texas at Austin), **Erika Matunis** (Johns Hopkins University), **Cathy Murphy** (University of Illinois at Urbana-Champaign), and **Paul Selvin** (University of Illinois at Urbana-Champaign).

Program representatives from our cosponsor **Gary Greenburg** (Gordon and Betty Moore Foundation), along with **Daren Ginete** (Science Philanthropy Alliance), **Jim Mitchell** (The Shurl and Kay Curci Foundation), **Sandra J. Laney** (Walder Foundation), and **Sandra Schmid** (Chan Zuckerberg Biohub) 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 discussions. 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 toward a deeper understanding of chemical machinery and reactions in the intact cell. We believe these breakthroughs can be accelerated by chemists, biologists, engineers, and physicists working collaboratively on novel, high-risk projects, particularly when theorists and experimentalists are combining efforts.

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 Senior Program Directors, **Andrew Feig** and **Silvia Ronco**, the RCSA staff, and I are here to help make the meeting a great experience!

Richard Wiener
Senior Program Director
Research Corporation for Science Advancement

Conference Agenda (Optional activities in green)
October 7–8, 2021

Thursday, October 7 *(all times listed in Pacific time zone)*

8:00 – 8:30 am	**Early login, Informal dialog, BYO breakfast/lunch**	Zoom Main Room & Breakout Rooms
8:30 – 8:40 am	**Welcome** Richard Wiener, *RCSA* Gary Greenburg, *Moore Foundation*	Zoom Main Room
8:40 – 8:55 am	**Conference Overview & Desired Outcomes** Richard Wiener, *RCSA*	Zoom Main Room
8:55 – 9:30 am	**Small Group Ice Breakers**	Zoom Breakout Rooms
9:30 – 10:05 am	**Keynote Presentation & Discussion** *Middle Scales of the Cell* Rigoberto Hernandez, *Johns Hopkins University*	Zoom Main Room
10:05 – 10:20 am	**Break**	
10:20 – 10:30 am	**Directions for Breakout Sessions**	Zoom Main Room
10:30 – 11:45 am	**Breakout Session I**	Zoom Breakout Rooms
11:45 am – 12:15 pm	**Report Out**	Zoom Main Room
12:15 – 12:30	**Directions for Mini Breakout Sessions**	Zoom Main Room
12:30 – 1:30 pm	**Lunch**	Zoom Main Room
1:30 – 2:15 pm	**Mini Breakout Session I (Fellows only)**	Gather Rooms
2:15 – 2:30 pm	**Break**	
2:30 – 3:15 pm	**Mini Breakout Session II (Fellows only)**	Gather Rooms
3:15 – 5:00 pm	**Break**	
5:00 – 7:00 pm	**Social Mixer**	Gather Rooms

Friday, October 8 *(all times listed in Pacific time zone)*

8:00 – 8:30 am	**Early login, Informal dialog, BYO breakfast/lunch**	Zoom Main Room
8:30 – 8:40 am	**Check in regarding Thursday Sessions**	Zoom Main Room
8:40 – 9:00 am	**Proposal Writing and Team Formation**	Zoom Main Room
9:00 – 10:15 am	**Breakout Session II**	Zoom Breakout Rooms
10:15– 10:45 am	**Report Out**	Zoom Main Room
10:45 – 11:00 am	**Break**	
11:00 am – 12:15 pm	**Breakout Session III**	Zoom Breakout Rooms
12:15 – 12:45 pm	**Report Out**	Zoom Main Room
12:45 – 1:00 pm	**Wrap-up**	Zoom Main Room
1:00 – 2:00 pm	**Lunch**	Zoom Main Room
2:00 – 2:45 pm	**Mini Breakout Session III (Fellows only)**	Gather Rooms
2:45 – 3:00 pm	**Break**	
3:00 – 3:45 pm	**Mini Breakout Session IV (Fellows only)**	Gather Rooms
3:45 – 5:00 pm	**Break**	
5:00 – 7:00 pm	**Social Mixer**	Gather Rooms

Keynote Presentation

Middle Scales of the Cell

Rigoberto Hernandez
The Gompf Family Professor at the Johns Hopkins University and Director of the Open Chemistry Collaborative in Diversity Equity (OXIDE)

Abstract: We know the governing equations for atoms, though we can't necessarily keep track of every atom or describe how they assemble into molecules, aggregate, and form even larger structures of a cell. While Feynman recognized that there was a lot of room—that is combinatoric complexity—at the atomic scale, we see that the combinatorics increase quickly at the middle scales where a myriad of heterostructures (of submicron size) have been assembled and aggregated within a cell. Within Scialog CMC we have tackled questions that interrogate these structures and elucidate their function. We have also addressed other unknown knowns to discern how molecular identity (and control) can lead to larger scale changes in cellular functions. We will suggest that there remain many unknown unknowns in understanding the molecular machinery of the cell. Where to look? First, we can recognize that all of the machinery is presumably operating under nonequilibrium conditions. What are the multiscale mechanics describing the dynamics and evolution of these chemical machines? Is this an emergent function or are there regulators—or governors—directing processes at some or all of these scales? We thus propose that the search for the unknown unknowns in describing and controlling the chemical machinery of the cell must start at the middle scales.

2021 Proposal Guidelines and Collaborative Awards

Scialog: Chemical Machinery of the Cell

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. Two-page proposals should describe the project and the role of each team member. No budget is necessary. A third page may be used for references.
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 CMC 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. 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..
7. Teams are encouraged (but not required) to:
   a. Include members with different research approaches and methods.
   b. Include members from different disciplines.
8. Proposals must be submitted electronically by 11:59 p.m. PDT on **October 15, 2021**. Instructions for submission will be provided at the meeting.
9. Awards are anticipated to start on **January 1, 2022.**

2018 Collaborative Awards

A Plant-Based Cell Platform to Target Human Proteostasis Diseases
Kathryn Haas, Chemistry, St. Mary's College
Alice Soragni, Biochemistry, University of California, Los Angeles
Jing-Ke Weng, Biology, Massachusetts Institute of Technology

Breaking the Central Dogma: Reverse Translation of the Proteome
Christian Kaiser, Biology, Johns Hopkins University
David Limmer, Chemistry, University of California, Berkeley
Rebecca Voorhees, Biology, California Institute of Technology

Finding Mitochondrial Memory
Abhishek Chatterjee, Chemistry, Boston College
Gulcin Pekkurnaz, Neurobiology, University of California, San Diego
Juan Perilla, Chemistry, University of Delaware

Identifying and Detecting Diseases prior to Physical Presentation of Symptoms
Laura Sanchez, Pharmaceutical Sciences, University of California, Santa Cruz
Judith Su, Optical Sciences and Biomedical Engineering, University of Arizona

Optical Mind Reading
Markita del Carpio Landry, Chemical and Biomolecular Engineering, University of California, Berkeley
Gulcin Pekkurnaz, Neurobiology, University of California, San Diego
Jennifer Prescher, Chemistry, University of California, Irvine

Synthetic Organelle Biology: Engineering Photosynthetic Animal Cells
Markita del Carpio Landry, Chemical and Biomolecular Engineering, University of California, Berkeley
Jing-Ke Weng, Biology, Massachusetts Institute of Technology
Joshua Widhalm, Horticulture, Purdue University

Understanding Biological Systems Using Resonator-Mediated Single-Molecule Raman Detection and Spectroscopy
Judith Su, Optical Sciences and Biomedical Engineering, University of Arizona
Lu Wei, Chemistry, California Institute of Technology

What Does "Self" Look Like?
Kamil Godula, Chemistry, University of California, San Diego
Jennifer Heemstra, Chemistry, Emory University
Abhishek Singharoy, Molecular Sciences, Arizona State University

2019 Collaborative Awards

Metabolite Pools: Where are They, Who's Using Them, and Can We?
Caitlin Davis, Chemistry, Yale University
Elizabeth Read, Chemical and Biomolecular Engineering, University of California, Irvine
Kamil Godula, Chemistry, University of California, San Diego

ProFIDs: Probes to Fold the Intrinsically Disordered
Alice Soragni, Orthopaedic Surgery, University of California, Los Angeles
Matthias Heyden, School of Molecular Sciences, Arizona State University

Reconstructing Time-resolved Single-cell Genome Organization
Bin Zhang, Chemistry, Massachusetts Institute of Technology
Brian Liau, Chemistry, Harvard University
G.W. Gant Luxton, Genetics, Cell Biology, and Development, University of Minnesota

Seeing the Forces of Life
Rongsheng (Ross) Wang, Chemistry, Temple University
Abhishek Singharoy, School of Molecular Sciences, Arizona State University
Alison Ondrus, Division of Chemistry and Chemical Engineering, California Institute of Technology

Small-Molecule Cathodophores for Multicolor Electron Microscopy
Maxim Prigozhin, Molecular and Cellular Biology, and Applied Physics, Harvard University
Xin Zhang, Chemistry, and Biochemistry and Molecular Biology, Pennsylvania State University
Jefferson Chan, Chemistry, University of Illinois at Urbana-Champaign

Understanding the Dark Side of the Genome
Ronit Freeman, Applied Physical Sciences, University of North Carolina at Chapel Hill
Alexis Komor, Chemistry and Biochemistry, University of California, San Diego
Davide Donadio, Chemistry, University of California, Davis

Scialog Fellows

Keri Backus kbackus@mednet.ucla.edu
University of California, Los Angeles,
Biological Chemistry
Chemoproteomic approaches to study the functional and druggable protein interactome.

Julien Berro julien.berro@yale.edu
Yale University, Molecular Biophysics and Biochemistry
Understanding how mechanics and chemistry crosstalk in cells, with a focus on actin and endocytosis.

Lulu Cambronne lulu@austin.utexas.edu
University of Texas at Austin, Molecular Biosciences
How does cell metabolism impact health and disease? Developer and user of genetically-encoded fluorescent biosensors to study the subcellular partitioning of metabolites. NAD connoisseur.

Seth Childers wschild@pitt.edu
University of Pittsburgh, Chemistry
The Childers lab studies the role of phase separation in organizing the bacterial cytoplasm and applies biochemistry, synthetic biology, and chemical biology approaches to bacterial signal transduction.

Caitlin Davis c.davis@yale.edu
Yale University, Chemistry
How do protein and RNA dynamics control life? We mix spectroscopy and microscopy to quantify biophysics inside cells.

Nate DeYonker ndyonker@memphis.edu
University of Memphis, Chemistry
My research group develops software that can automate the design and quantum mechanics-based molecular-level protein simulations. The software package improves reproducibility and reduced barriers for entry into the field of quantum chemical modeling of biomolecules.

Stefano Di Talia stefano.ditalia@duke.edu
Duke University, Cell Biology
I am interested in understanding the mechanisms that guide the spatiotemporal organization of embryos and regenerating tissues with particular emphasis to mechanisms of long-range coordination.

Davide Donadio ddonadio@ucdavis.edu
University of California, Davis, Chemistry
We use molecular multiscale simulations to study nonequilibrium phenomena in soft matter and the functional properties of nanomaterials.

Michelle Farkas farkas@chem.umass.edu
University of Massachusetts Amherst, Chemistry
Chemical Biology Approaches to Track and Perturb Circadian Rhythms and Macrophage Phenotypes in Disease-Relevant Models.

Ronit Freeman ronitfree@gmail.com
University of North Carolina at Chapel Hill,
Applied Physical Sciences
Developing biomimetic materials using self-assembling biological components.

Stephen D. Fried sdfried@jhu.edu
Johns Hopkins University, Chemistry
We repurpose proteomics technologies to study protein folding globally, sensitively, and in vivo.

Kamil Godula kgodula@ucsd.edu
University of California, San Diego,
Chemistry and Biochemistry
Biological functions of glycans and chemical approaches to engineer glycan functions in cells.

Alexander A. Green aagreen@bu.edu
Boston University, Biomedical Engineering
We engineer self-assembling nucleic acids that can sense, report, and respond to molecular cues.

Stephanie Gupton (She/Her) sgupton@unc.edu
University of North Carolina at Chapel Hill,
Cell Biology and Physiology
Cellular morphogenesis and function, the role of cytoskeletal dynamics and membrane remodeling, and regulation by protein modification.

Kathryn L. Haas kathryn.haas@duke.edu
Duke University, Chemistry
How do proteins control Cu redox chemistry in extracellular environments?

Scialog Fellows Continued

Matthias Heyden mheyden1@asu.edu
Arizona State University, Molecular Sciences
We utilize molecular simulations to study the interactions of proteins with each other and their molecular environments in the crowded intracellular medium of cells and in aqueous solutions.

Masha Kamenetska mkamenet@bu.edu
Boston University, Physics and Chemistry
Experimental physicist/chemist, probing molecular interactions on the single molecule level.

Lydia Kisley lydia.kisley@case.edu
Case Western Reserve University, Physics, Chemistry
Super-resolution imaging of biomolecule dynamics within the extracellular matrix & effect on cell response; biomaterials and microscopy.

Alexis C. Komor akomor@ucsd.edu
University of California, San Diego,
Chemistry and Biochemistry
We develop new genome editing tools and use them to study how point mutations in DNA repair protein genes impact human health.

Dmitri Kosenkov dkosenkov@monmouth.edu
Monmouth University, Chemistry and Physics
Development and application of computational chemistry and machine learning methods to study dynamics of biological molecules.

Markita Landry landry@berkeley.edu
University of California, Berkeley, Chemical Engineering
The development of nanomaterials-based tools to image neuromodulators in the brain, and for the delivery of genetic cargoes in plants.

Kathy Liu liufg@pennmedicine.upenn.edu
University of Pennsylvania, Biochemistry and Biophysics

Tania Lupoli tjl229@nyu.edu
New York University, Chemistry
Our laboratory studies the assembly of the multi-protein machines that construct bacterial cell surface glycans with defined sugar patterns that act as molecular barcodes for recognition.

GW Gant Luxton ggluxton@ucdavis.edu
University of California, Davis,
Molecular and Cellular Biology
The Luxton laboratory is interested in understanding the mechanisms underlying the physical coupling of the nucleus and the cytoskeleton and how they enable fundamental cellular processes, including DNA damage repair, differentiation, and mechanotransduction.

Shankar Mukherji smukherji@physics.wustl.edu
Washington University in St Louis,
Physics and Cell Biology & Physiology
Systems cell biology: how the eukaryotic cell coordinates systems-wide organelle biogenesis and cellular metabolism to achieve growth and homeostasis.

Allie Obermeyer aco2134@columbia.edu
Columbia University, Chemical Engineering
We engineer protein interactions and phase separation with other (bio)polymers to help us understand cell biology and for applications in biomedicine and textiles.

Alison E. Ondrus aondrus@caltech.edu
California Institute of Technology, Chemistry
Decoding information in the structure of human metabolites

Gulcin Pekkurnaz gpekkurnaz@ucsd.edu
University of California, San Diego, Neurobiology
Metabolic homeostasis mechanisms and mitochondrial functions in neurons.

Juan R. Perilla jperilla@udel.edu
University of Delaware, Chemistry and Biochemistry
Molecular mechanisms of viral infection

Lars Plate lars.plate@vanderbilt.edu
Vanderbilt University,
Chemistry and Biological Sciences
Developing mass spectrometry and chemical biology tools to study dynamic protein interactions. We are interested in applying these tools to study protein misfolding diseases and viral infections.

Taras Pogorelov pogorelo@illinois.edu
University of Illinois at Urbana-Champaign, Chemistry
Biophysics of complex cellular environments that governs signaling, protein and membrane dynamics: advancing modeling and theory.

Scialog Fellows Continued

Elizabeth Read elread@uci.edu
University of California, Irvine,
Chemical and Biomolecular Engineering
We combine theory and simulation of stochastic processes in cell biology with statistical inference to learn about various aspects of cellular behavior, including gene regulation, epigenetics, and cell signaling.

Laura M. Sanchez lmsanche@ucsc.edu
University of California, Santa Cruz,
Chemistry and Biochemistry
We use imaging mass spectrometry to discover how microbes and cells use small molecules in different microenvironments.

Gabriela Schlau-Cohen gssc@mit.edu
Massachusetts Institute of Technology, Chemistry
Single-molecule and ultrafast spectroscopy to investigate the dynamics of membrane proteins.

Neel Shah neel.shah@columbia.edu
Columbia University, Chemistry
My lab is interested in dissecting mechanisms of interaction specificity and dynamic regulation in eukaryotic signaling proteins. We primarily focus on tyrosine kinases and phosphatases, and we explore these enzymes using synthetic chemistry, biochemistry, and cell biology.

Abhi Singharoy asinghar@asu.edu
Arizona State University, Biodesign Institute
Integrative modeling of cellular energy metabolism.

Anna Marie Sokac asokac@illinois.edu
University of Illinois at Urbana Champaign,
Cell and Developmental Biology
Actin biology including how actin shapes cells, contributes to stress response and influences nuclear homeostasis.

Alice Soragni alices@mednet.ucla.edu
University of California, Los Angeles,
Orthopaedic Surgery
Protein aggregation in cancer and 3D models of disease.

Jan Spille jhspille@uic.edu
University of Illinois at Chicago, Physics
Imaging structure and function of the cell nucleus one molecule at a time.

Grace Stokes gstokes@scu.edu
Santa Clara University, Chemistry and Biochemistry
Santa Clara undergrads and I use nonlinear optical spectroscopies to study adsorption of drug-like molecules to lipid membranes so we can predict & understand physiological effects.

Judith Su judy@optics.arizona.edu
University of Arizona, Optical Sciences
Label-free single molecule detection and spectroscopy for fundamental science and translational medicine.

Cheemeng Tan cmtan@ucdavis.edu
University of California, Davis, Biomedical Engineering
The Tan Lab investigates artificial cellular systems (also called biohybrid or biomimetic cells), which are hybrid material-bacteria systems that have broad applications in biosensing, bioremediation, disease treatment, and basic biological study.

Lu Wang lwang@chem.rutgers.edu
Rutgers University, Chemistry and Chemical Biology
The Wang group uses theoretical and computational tools to study the structure, dynamics and functions of biological macromolecules. We are elucidating how quantum effects and electrostatic fluctuations impact the functions and spectroscopic features of the biological systems.

Rongsheng (Ross) Wang rosswang@temple.edu
Temple University, Chemistry
Probing and understanding protein-protein interactions during post-translational modifications.

Wenjing Wang wenjwang@umich.edu
University of Michigan,
Chemistry and Life Sciences Institute
We are interested in designing optogenetic sensors and actuators to study the neuromodulatory system.

Lu Wei lwei@caltech.edu
California Institute of Technology,
Chemistry and Chemical Engineering
Optical-Spectroscopy, Bioimaging, Biophysics, Molecular vibrations, Multiplex imaging, Cellular metabolism.

Scialog Fellows Continued

Joshua Weinstein jaweinst@uchicago.edu
University of Chicago,
Medicine and Molecular Engineering
DNA-based technologies for high-throughput encoding and decoding of biological information; statistical mechanics of multicellular systems.

Stephen Yi stephen.yi@austin.utexas.edu
University of Texas at Austin,
Biomedical Engineering and Oncology
My lab research is at the interface of human genetics, chemical biology and informatics in the modern era of precision medicine. I am interested in fundamental questions underlying genotype-phenotype relationships and cell network perturbations in disease.

Yan Yu yy33@iu.edu
Indiana University, Chemistry
Interactions at the nano-bio interface.

Haoran Zhang Haoran.Zhang@rutgers.edu
Rutgers University,
Chemical and Biochemical Engineering
My research focuses on developing new approaches to investigate and manipulate cellular behaviors. In particular, we utilize metabolite biosensors to dynamically regulate cellular activities in the context of mono-cultures and co-cultures.

Brian M. Zid zid@ucsd.edu
University of California, San Diego,
Chemistry and Biochemistry
My lab explores how gene expression can be modulated during fluctuating environmental conditions, especially at the post-transcriptional level.

Discussion Facilitators

Rommie Amaro ramaro@ucsd.edu
University of California, San Diego,
Chemistry and Biochemistry
Molecular modeling at the mesoscale, including multiscale methods to bridge chemical and biological complexity.

Holly Goodson hgoodson@nd.edu
University of Notre Dame, Chemistry and Biochemistry
Mechanisms of subcellular self-organization, focusing on the cytoskeleton. Evolution of proteins and biochemical processes, with applications to cell biology. Collaborative projects include whole-cell biosensors for applications in the environment and human health.

Martin Gruebele mgruebel@illinois.edu
University of Illinois at Urbana-Champaign,
Chemistry, Physics, Biophysics, College of Medicine
Dynamics of biomolecules, quantum systems, and excited state nanomaterials.

Rigoberto Hernandez r.hernandez@jhu.edu
Johns Hopkins University, Chemistry
Theoretical and Computational Chemistry @ JHUChemistry, nonequilibrium dynamics: reactions, TST, sustainable nanoparticles, proteins, machine learning, autonomous computing materials - @EveryWhereChem @Hernandez_Lab @OxideChem

Neil Kelleher n-kelleher@northwestern.edu
Northwestern University, Chemistry
Proteoform biology and measurement; better detection and assignment of function to post-translational modifications.

Discussion Facilitators Continued

Gang-yu Liu gyliu@ucdavis.edu
University of California, Davis, Chemistry
Using nanotechnology including 3D nanoprinting to regulate and control cellular signaling processes.

Erika Matunis matunis@jhmi.edu
Johns Hopkins University School of Medicine, Cell Biology
The Matunis lab combines genetics, live imaging, and genome-wide approaches to study the molecular signals that establish and maintain stem cell niches.

Cathy Murphy murphycj@illinois.edu
University of Illinois at Urbana-Champaign, Chemistry
Synthesis, physical properties, surface chemistry, bio applications of nanomaterials

Paul Selvin selvin@illinois.edu
University of Illinois at Urbana-Champaign, Physics
Single molecule fluorescence with super-resolution applied to neuroscience (Alzheimer's Disease) and Multiple Molecular Motors (Myosin, Kinesin, Dynein) and to Cancer (Estrogen Receptor, p53).

Guests

Daren Ginete dginete@sciphil.org
Science Philanthropy Alliance

Gary Greenburg gary.greenburg@moore.org
Gordon and Betty Moore Foundation, Science
The Gordon and Betty Moore Foundation fosters path-breaking scientific discovery, environmental conservation, patient care improvements and preservation of the special character of the Bay Area.

Sandra J. Laney, PhD slaney@walderfoundation.org
Walder Foudation, Science Innovation
Purpose-inspired Life Science and Science Innovation Equity.

Jim Mitchell james_g_mitchell@yahoo.com
The Shurl and Kay Curci Foundation,
Science Advisory Board
I am interested in basic research on the machinery of the cell, including gene editing, computational biology, and cancer modifications.

Sandra L. Schmid sandra.schmid@czbiohub.org
Chan Zuckerberg Biohub, Quantitative Cell Science
As CSO at the CZ Biohub, my goal is to facilitate collaborative, high-risk/high impact research in an environment that brings fundamental research together with technology development.

Gordon and Betty Moore Foundation

Gary Greenburg gary.greenburg@moore.org
Gordon and Betty Moore Foundation, Science

Research Corporation

Jennifer Dukes jdukes@rescorp.org
Program & Award Administrator, Senior

Laura Esham lesham@rescorp.org
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Meg Martin mmartin@rescorp.org
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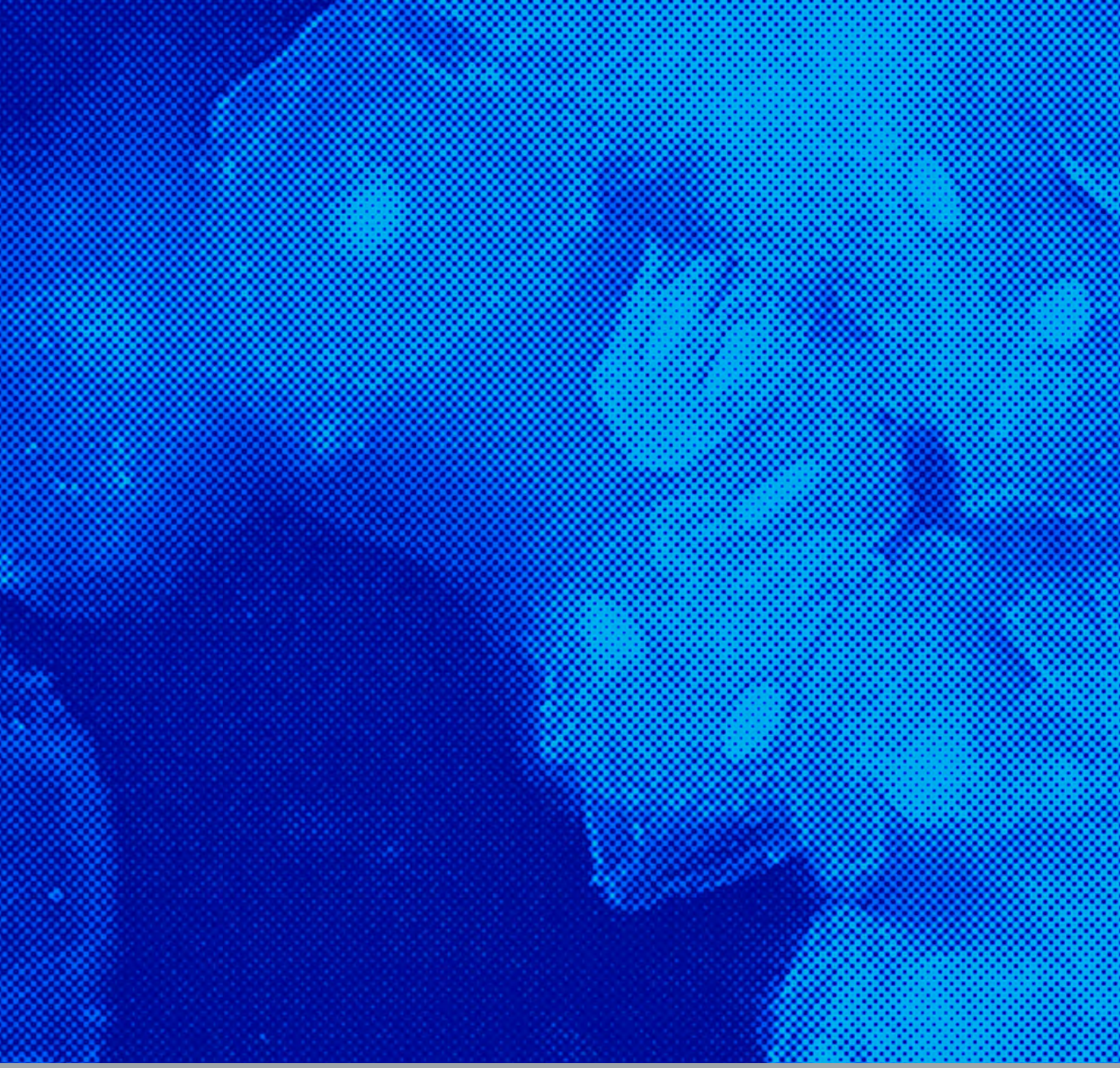
Aileen Quezada aquezada@rescorp.org
Program & Award Administrator

Silvia Ronco sronco@rescorp.org
Senior Program Director

Richard Wiener rwiener@rescorp.org
Senior Program Director



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