Chemical Machinery of the Cell

scialog 2018®

The First Annual Scialog Conference
October 18-21, 2018 at Westward Look Resort
Tucson, Arizona

GORDON AND BETTY MOORE FOUNDATION

RESEARCH CORPORATION *for* SCIENCE ADVANCEMENT

THE PAUL G. ALLEN FRONTIERS GROUP

NIH National Institutes of Health

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.

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 cooperative give and take.

Make comments concise to avoid monopolizing the dialog.

Diversity, Inclusion and Avoiding 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 Research Corporation's *Scialog: Chemical Machinery of the Cell* meeting. We expect this meeting will be the first of several on this topic.

The goal of this Scialog—Science and Dialog—is to catalyze theorists, computational scientists, and experimentalists across multiple disciplines to collaborate on developing new and innovative projects to accelerate fundamental science to drive major advances in knowledge of the chemistry of the living cell.

Scialog's over-arching purpose is to help solve real-world problems of global significance 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.

To that end, under the guidance of Senior Program Directors **Richard Wiener** and **Silvia Ronco**, we hope you will be engaged in passionate discussions with colleagues, many of whom you will have met for the first time at this meeting. 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 world.

We hope this first 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 Officers

This year we are holding the first annual meeting of *Scialog: Chemical Machinery of the Cell*, sponsored by Research Corporation, the Gordon and Betty Moore Foundation, the Paul G. Allen Frontiers Group, and the National Institutes of Health. Scialog meetings, which are designed to be highly interactive, 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. scientists. The emphasis is on dialogue, networking and building new teams of researchers to pursue novel, high-risk, interdisciplinary research. The initial meeting is always an exciting opportunity for Fellows to experience the unique aspects of Scialog for the first time.

Research Corporation and the Gordon and Betty Moore Foundation chose to focus on chemical machinery of the cell because we believe this critical area of science requires major breakthroughs in fundamental understanding of chemical processes in the living cell that will lead to a new era of advancements in cell biology. We believe these breakthroughs can be accelerated by chemists, biologists, engineers, and physicists working collaboratively on novel, high-risk projects, particularly with theorists and experimentalists combining efforts.

We have two outstanding keynote speakers:

- **Rommie Amaro**, University of California, San Diego
- **Neil Kelleher**, Northwestern University

We also have outstanding discussion facilitators. Along with **Rommie** and **Neil**, they are **Kathy Franz**, Duke University, **Judith Frydman**, Stanford University, **Holly Goodson**, Notre Dame University, **Martin Gruebele**, University of Illinois Urbana Champaign, **Rigoberto Hernandez**, Johns Hopkins University, **Gang-yu Liu**, University of California, Davis, **Katrina Miranda**, University of Arizona, and **Cathy Murphy**, University of Illinois Urbana Champaign. Cathy is also a member of Research Corporation's Board of Directors.

We are also delighted to have program officers and representatives from multiple organizations at Scialog. Besides ourselves, we have **Silvia Ronco**, Research Corporation, **Adam Jones**, Gordon and Betty Moore Foundation, **Kathy Richmond** and **Kim Metzler**, Allen Institute, **Ravi Basavappa** and **Richard Conroy**, National Institutes of Health, **Boyana Konforti**, Howard Hughes Medical Institute, **Ed McCleskey**, Chan Zuckerberg Initiative, **Moses Lee**, Murdock Charitable Trust, **Mary O'Reilly**, Flinn Foundation, **Beth Etscheid**, Washington Research Foundation, and **Valerie Conn** and **Jason Tung**, Science Philanthropy Alliance. Research Corporation Board Chair **Brent Iverson**, University of Texas, Austin, is also attending.

An important feature of these meetings is the opportunity for Scialog Fellows to form teams and write proposals to pursue particularly creative ideas that emerge through the dialog. We hope this competition is exciting, but regardless of which proposals are funded, the 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 facilitate participants gaining new insights and connections that significantly advance efforts to fundamental understanding of the chemical machinery of the cell.

Richard Wiener
Senior Program Director
Research Corporation for Science Advancement

Gary Greenburg
Program Officer
Gordon and Betty Moore Foundation

Conference Agenda
Westward Look Resort
October 18-21, 2018

Thursday, October 18

1:00 pm	**Registration Opens**	Lobby
1:00 - 5:00 pm	**Snacks & Informal Discussions**	Palm Room & Terrace
5:00 - 6:30 pm	**Poster Session & Reception**	Sonoran Ballroom
6:00 - 6:30 pm	**Meeting for Discussion Facilitators**	Ocotillo & Cholla
6:30 - 7:30 pm	**Dinner**	Ocotillo & Cholla
7:15 - 7:30 pm	**Welcome** Dan Linzer, *President, RCSA*	Ocotillo & Cholla
7:30 - 7:45 pm	**Conference Overview, Desired Outcomes & Guidelines for Collaborative Proposals** Richard Wiener, *RCSA*	Ocotillo & Cholla
7:45 - 8:30 pm	**Keynote Presentation** *Predicting Chemistry in a Cellular Context* Rommie Amaro, *University of California, San Diego*	Ocotillo & Cholla
8:30 - 11:00 pm	**CMC Starlight Café** Snacks, conversations, etc.	Palm Room & Terrace

Friday, October 19

7:00 - 8:00 am	**Breakfast**	Palm Room & Terrace
8:00 - 8:45 am	**Introductions**	Ocotillo & Cholla
8:45 - 9:30 am	**Keynote Presentation** *Domesticating the Human Proteome* Neil Kelleher, *Northwestern University*	Ocotillo & Cholla
9:30 - 10:00 am	**Conference Photo & Break**	Palm Terrace
10:00 - 10:15 am	**Breakout Sessions Overview**	Ocotillo & Cholla
10:15 - 11:30 am	**Breakout Session I**	Ocotillo & Cholla*
11:30 am - 11:50 am	**Report Out**	Ocotillo & Cholla
11:50 - 12:30 pm	**Mini Breakout Session I**	Ocotillo & Cholla*
11:50 - 12:30 pm	**Facilitators Debrief**	Ocotillo & Cholla
12:30 - 1:30 pm	**Lunch**	Palm Room & Terrace
1:30 - 2:45 pm	**Breakout Session II**	Ocotillo & Cholla*
2:45 - 3:10 pm	**Report Out**	Ocotillo & Cholla
3:10 - 3:50 pm	**Mini Breakout Session II**	Ocotillo & Cholla*
3:50 - 5:00 pm	**Afternoon Break & Informal Discussions**	
5:00 - 6:30 pm	**Poster Session & Reception**	Sonoran Ballroom
6:30 - 7:30 pm	**Dinner**	Ocotillo & Cholla
7:15 - 7:45 pm	**NASEM Sexual Harassment Report Overview** Valerie Conn, *Executive Director, Science Philanthropy Alliance*	Ocotillo & Cholla
7:45 - 11:00 pm	**CMC Starlight Café** Snacks, Conversations, etc.	Palm Room & Terrace

Saturday, October 20

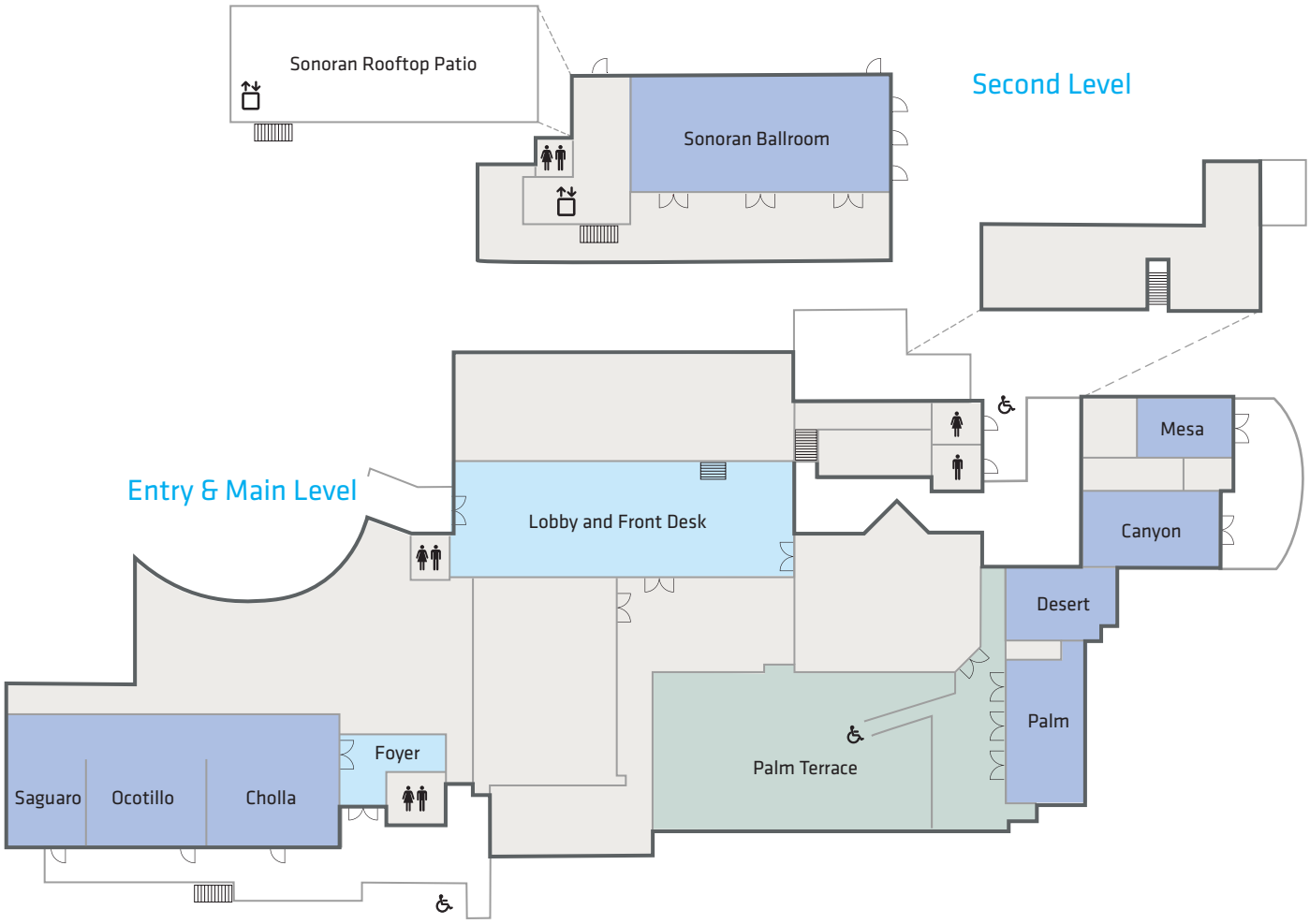
6:30 - 7:30 am	**Optional Guided Nature & Garden Walk**	WL Trails–Meet in Lobby
7:00 - 8:00 am	**Breakfast**	Palm Room & Terrace
8:00 - 9:15 am	**Breakout Session III**	Ocotillo & Cholla*
9:15 - 9:35 am	**Report Out**	Ocotillo & Cholla
9:35 - 10:15 am	**Mini Breakout Session III**	Ocotillo & Cholla*
10:15 - 10:30 am	**Morning Break**	
10:30 - 11:45 am	**Breakout Session IV**	Ocotillo & Cholla*
11:45 - 12:05 am	**Report Out**	Ocotillo & Cholla
12:05 - 12:45 pm	**Mini Breakout Session IV**	Ocotillo & Cholla*
12:05 - 12:45 pm	**Facilitators Debrief**	Ocotillo & Cholla
12:45 - 1:45 pm	**Lunch**	Palm Room & Terrace
1:45 - 6:00 pm	**Team Formation, Informal Discussion & Proposal Writing** Proposals due 6:30 am Sunday morning	
1:45 - 3:15 pm	**Discussion for Foundation Representatives Only**	Saguaro Room
6:00 - 6:30 pm	**Reception**	Ocotillo & Cholla Terrace
6:30 - 7:30 pm	**Dinner**	Ocotillo & Cholla
7:30 - 11:00 pm	**CMC Starlight Café** Snacks, Conversations, etc.	Palm Room & Terrace

Sunday, October 21

6:30 - 7:30 am	**Breakfast**	Palm Room & Terrace
7:30 - 10:45 am	**Presentations of Proposal Ideas**	Ocotillo & Cholla
10:45 - 11:00 am	**Assessment Survey & Wrap-up**	Ocotillo & Cholla
11:00 am - 12:00 pm	**Lunch** Available to go	Ocotillo & Cholla Foyer

*Breakout Sessions will be held in Ocotillo & Cholla, Desert, Canyon, Mesa, and Saguaro meeting rooms. Fellows will first meet in Ocotillo & Cholla and then disperse to their discussion groups.

Westward Look Resort



Keynote Speakers

Predicting Chemistry in a Cellular Context

Rommie Amaro
University of California, San Diego

Abstract: Biological and chemical sciences are on the brink of a new and transformational way to view living systems: the creation of detailed physical models of the fundamental unit of life, the cell. Several technical and scientific advances have brought us to this point. Structural data is now available at a wide range of length scales – ranging from atomic-resolution structures of macromolecules to organelles and larger cellular structures. Biophysical techniques range from atomic-resolution X-ray crystallography and nuclear magnetic resonance (NMR) spectroscopy, to electron and light microscopy. In addition, spatial distributions and dynamics are accessible by a variety of fluorescence microscopy methods, and expression and concentration levels are obtainable via technologies ranging from chip arrays and other mRNA technologies to mass spectrometry and other types of proteomic analyses. Complementary to these structure-based methods are bioinformatics and systems biology approaches that describe and analyze molecular interaction networks, signaling pathways, and information flow in complex cellular environments. Underpinning all these advances is the continuing exponential growth of computer power, in parallel with improved capabilities for data integration, simulation, analysis, and visualization. In this talk, I will discuss how data-centric and physics-based computation is poised to play a key role in turning islands of experimental data into a continuous landscape of interdisciplinary and cross-scale collaborations and knowledge.

Bio: Rommie E. Amaro is a Professor and Shuler Scholar in the Department of Chemistry and Biochemistry at the University of California, San Diego. She received her B.S. in Chemical Engineering (1999) and her Ph.D. in Chemistry (2005) from the University of Illinois at Urbana-Champaign. Rommie was a NIH postdoctoral fellow with Prof. J. Andrew McCammon at UC San Diego from 2005-2009, and started her independent research program in 2009 at the University of California, Irvine. In 2012 Rommie moved her lab to the Department of Chemistry and Biochemistry at UC San Diego. She is the Director of the NIH P41 National Biomedical Computation Resource and a co-Director of the NIH U01 Drug Design Data Resource. Rommie is the recipient of an NIH New Innovator Award, the Presidential Early Career Award for Scientists and Engineers, the ACS COMP OpenEye Outstanding Junior Faculty Award, the ACS Kavli Foundation Emerging Leader in Chemistry National Lecturer, and the Corwin Hansch Award. Rommie's scientific interests lie at the intersection of computer-aided drug discovery and biophysical simulation methods. Her scientific vision revolves around expanding the range and complexity of molecular constituents represented in such simulations, and the development of novel multiscale methods for elucidating their time dependent dynamics.

Keynote Speakers Continued

Domesticating the Human Proteome

Neil Kelleher
Northwestern University

Abstract: Fifty years ago, few scientists could have envisioned a project as ambitious as the Human Genome Project. It was unwieldy and the technology to make it possible had yet to be developed; however, over the past 20 years, the world of genomics has exploded through innovations first in capillary electrophoresis and later in massively parallel short-read sequencing. It's 2018 and the human proteome is still the Wild West. To complicate matters further, while the human genome is static across somatic cells, the human proteome changes from cell to cell within our bodies. Current technologies allow us to partially understand the system, but new leaps in technology are required to upgrade our comprehension of the human proteome across composition, space and time. In this talk, I will describe some challenges inherent to the "domestication" of the human proteome. I seek to stimulate thinking and discussion about how we can better regularize human biology at the protein level, including the major challenge of how to assign function to proteins and their post translational modifications present within cells. A few innovations and new programs to better understand wellness and disease will also be described.

Bio: With more than 300 papers published over the course of his career and teaching duties in two departments, Dr. Kelleher is a trans-disciplinary investigator with international impact in the field of proteomics and the discovery of new antibiotics and anti-cancer molecules from bacteria and fungi. The Kelleher group invents powerful new methods to understand how human cells work at the molecular level, and is generally regarded as the leading lab in "Top Down" Proteomics, a new approach to measure proteins with complete molecular specificity. If we as a species truly want to gain knowledge of self and all the benefits that go along with the "domestication" of cells and molecules, then mapping the universe of protein molecules within us will improve all the 21st Century goals of biomedical research including designer organs, personalized drugs, and early detection of human disease.

Early detection of disease using proteins has been an elusive goal, and the "Top Down" measurement approach offers an emergent strategy that measures proteins far more precisely than previously. In 2012, Dr. Kelleher described the details of a big science project called the Cell-Based Human Proteome Project, now viewable in a 15 minute TEDx video: *https://www.youtube.com/watch?v=hHJxMnq51KU*. Several foundations have begun supporting early aspects toward this effort including the W.M. Keck Foundation, the Sherman Fairchild Foundation, and the Paul G. Allen Family Foundation. A worldwide research consortium has been formed which focuses on expanding the reach of top down proteomics around the globe: *http://www.topdownproteomics.org/*.

2018 Proposal Guidelines & 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 **novel, out-of-the-box, cutting-edge** and **potentially high-impact projects**.
2. Two-page proposals should describe the proposed 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 per team member direct funding and a small amount of institutional overhead for 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 two teams must be different. No team can submit more than one proposal.
5. No Scialog Fellow who previously has won a Scialog 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. (Applicable in Year 2)
6. No Scialog Fellow who has won two Scialog Collaborative Awards can be a member of a team. (Applicable in Year 2)
7. Teams cannot include members who have previously collaborated with one another.
8. Teams are encouraged (but not required) to
   a) Include at least one theorist or computational scientist and one experimentalist.
   b) Include members from different disciplines.
9. Proposals must be submitted electronically by Sunday morning at 6:30 am. Instructions for electronic submission will be provided at the meeting.
10. Awards will be announced in 2018 and start approximately at the beginning of 2019.

Scialog Fellows

Oni Basu onibasu@uchicago.edu
University of Chicago, Medicine
Interface bio/nano materials, device and sequencing techniques to answer questions in genomics, biology and medicine.

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

Cliff Brangwynne cbrangwy@princeton.edu
Princeton University,
Chemical and Biological Engineering
Biophysical rules underlying membrane-less condensates and pathological aggregates in the cytoplasm and nucleus.

Jeff Chan jeffchan@illinois.edu
University of Illinois at Urbana-Champaign, Chemistry
Development of chemical tools to study biological processes in vivo.

Louise Charkoudian lcharkou@haverford.edu
Haverford College, Chemistry
Gaining access to new chemical diversity by engineering natural product pathways.

Abhishek Chatterjee abhishek.chatterjee@bc.edu
Boston College, Chemistry
We develop new ways to probe and manipulate protein function in living cells using chemical biology and synthetic biology approaches.

Stefano Di Talia stefano.ditalia@duke.edu
Duke University, Cell Biology
Quantitative analysis of cell proliferation during embryonic development and regeneration.

Davide Donadio ddonadio@ucdavis.edu
University of California, Davis, Chemistry
We perform molecular simulations of systems and processes out of equilibrium: our main focus is in heat transport and crystal nucleation.

D. Allan Drummond dadrummond@uchicago.edu
The University of Chicago,
Biochemistry and Molecular Biology
We study how cells sense and respond to primordial stresses, like heat and starvation, at molecular up to evolutionary scales.

Jingyi Fei jingyifei@uchicago.edu
The University of Chicago,
Biochemistry and Molecular Biology
RNA, including regulatory RNAs and RNA modifications, mediated gene regulation; development of new labeling, imaging and analysis methods.

Stephen Fried sdfried@jhu.edu
Johns Hopkins University, Chemistry
We want to understand how proteins fold and assemble into complex assemblies in their native cellular context.

Kamil Godula Kgodula@ucsd.edu
University of California, San Diego,
Chemistry and Biochemistry
Complexity of the Glycocalyx and its role in transducing information at the cellular boundary.

Alex Green alexgreen@asu.edu
Arizona State University, School of Molecular Sciences
My lab engineers multi-functional RNA molecules that can detect, compute, and report in response to different molecular stimuli.

Stephanie Gupton sgupton@email.unc.edu
University of North Carolina at Chapel Hill,
Cell Biology and Physiology
Neuronal shape change involves plasma membrane expansion driven by exocytosis and coordinated with actin-based protrusion.

Kathryn Haas khaas@saintmarys.edu
Saint Mary's College, Chemistry and Physics
How do metal ions change the structures of floppy proteins?

Jen Heemstra jen.heemstra@emory.edu
Emory University, Chemistry
Bio-supramolecular chem: leveraging biomolecular recognition for applications in biosensing, bioimaging, and responsive architectures.

Matthias Heyden mheyden1@asu.edu
Arizona State University, School of Molecular Sciences
Computational modeling of the self-assembly of biomolecular complexes and molecular recognition.

Christian Kaiser kaiser@jhu.edu
Johns Hopkins University, Biology
We are using single-molecule manipulation to understand mechanisms of protein folding, synthesis and translocation.

Scialog Fellows Continued

Dmytro Kosenkov dkosenkov@monmouth.edu
Monmouth University, Chemistry and Physics
Multiscale modeling of biosystems: from quantum dynamics of energy transfer in proteins to chemical kinetics of neural and cell signaling.

Elena Koslover ekoslover@ucsd.edu
University of California, San Diego, Physics
Physical modeling of protein and organelle transport in the complex intracellular environment.

Markita Landry landry@berkeley.edu
University of California Berkeley,
Chemical and Biomolecular Engineering
Nanomaterials for imaging neuromodulation in the brain, and for the delivery of genes and proteins to agriculturally relevant plants.

David Limmer dlimmer@berkeley.edu
University of California, Berkeley, Chemistry
Our research endeavors to advance theoretical descriptions of complex systems especially in instances where equilibrium ideas do not apply.

G.W. Gant Luxton gwgl@umn.edu
University of Minnesota, Genetics,
Cell Biology and Development
We study mechanotransduction (how cells sense and convert mechanical stimuli into biochemical/biological responses) in health and disease.

Megan Matthews megamatt@upenn.edu
University of Pennsylvania, Chemistry
Discovering new druggable enzymes and regulatory protein modifications in human cells using chemical probes and protein mass spectrometry.

Alison Ondrus aondrus@caltech.edu
California Institute of Technology, Chemistry
Signaling roles of cholesterol metabolites in human development and cancer.

Gulcin Pekkurnaz gpekkurnaz@ucsd.edu
University of California, San Diego, Neurobiology
The goal of my laboratory is to define the molecular pathways necessary to maintain energy homeostasis across distinct cell classes.

Juan Perilla jperilla@udel.edu
University of Delaware, Chemistry and Biochemistry
Computational biophysics of cellular processes related to life and disease.

Michael Pluth pluth@uoregon.edu
University of Oregon, Chemistry and Biochemistry
We develop chemical tools (sensors, donors, etc.) for investigating reactive sulfur, oxygen, and nitrogen species in biological systems.

Jenn Prescher jpresche@uci.edu
University of California, Irvine, Chemistry
My group develops chemical tools and noninvasive imaging strategies to spy on cellular communication.

Elizabeth Read elread@uci.edu
University of California, Irvine,
Chemistry and Biomolecular Engineering
My group studies biochemical networks, cell-fate decisions, stochastic processes in the cell, complex systems, and simulation methods.

Laura Sanchez sanchelm@uic.edu
University of Illinois at Chicago,
Medicinal Chemistry and Pharmacognosy
We are excited to develop tools to view chemicals in situ #microbialcommunities #ovariancancer

Gabriela Schlau-Cohen gssc@mit.edu
Massachusetts Institute of Technology, Chemistry
Energetic and structural dynamics of biological systems, particularly membrane proteins.

Abhishek Singharoy asinghar@asu.edu
Arizona State University, School of Molecular Sciences
Hybrid modeling of cellular organelles with exascale computers.

Anna Marie Sokac sokac@bcm.edu
Baylor College of Medicine,
Biochemistry and Molecular Biology
We study how actin is remodeled by gene expression, signaling and mechanics to robustly convert single-celled embryos into viable offspring.

Alice Soragni alices@mednet.ucla.edu
University of California, Los Angeles, Medicine
We investigate conditions causing proteins to change conformation and undergo LLPS in tumors and how these changes alter cancer progression.

Nicholas Stephanopoulos nstepha1@asu.edu
Arizona State University, School of Molecular Sciences
Self-assembling protein/peptide-DNA hybrid nanomaterials for biology and medicine.

Scialog Fellows Continued

Grace Stokes gstokes@scu.edu
Santa Clara University, Chemistry and Biochemistry
I study adsorption of aqueous-phase organic molecules to lipid membranes in order to predict & understand physiological effects.

Judith Su judy@optics.arizona.edu
University of Arizona,
Biomedical Engineering and Optical Sciences
We do single molecule detection using microtoroid resonators. We focus on basic research, clinical applications, and translational medicine.

Kandice Tanner Kandice.tanner@nih.gov
National Cancer Institute, National Institutes of Health
Physicist working on the role of the tissue microenvironment on cancer progression.

Elisa Tomat tomat@email.arizona.edu
University of Arizona, Chemistry and Biochemistry
Synthesis and coordination chemistry to target metal and redox dishomeostasis in human health. Current focus on iron in cancer growth.

Steve Townsend steven.d.townsend@vanderbilt.edu
Vanderbilt University, Chemistry
Deciphering how human milk maintains homeostasis over dysbiosis.

Rebecca Voorhees voorhees@caltech.edu
California Institute of Technology,
Biology and Biological Engineering
My lab studies protein biosynthesis and quality control using functional and structural techniques.

Lu Wei wei@caltech.edu
California Institute of Technology, Chemistry
We exploit nonlinear optical microscopy methods to understand macromolecule and organelle dynamics and interactions in live cells.

Jing-Ke Weng wengj@wi.mit.edu
Whitehead Institute/Massachusetts Institute of Technology, Biology
The Weng Lab studies natural product biosynthesis and metabolic evolution in eukaryotic organisms.

Josh Widhalm jwidhalm@purdue.edu
Purdue University, Plant Biology and Horticulture
The Widhalm lab studies how plant metabolites are synthesized (gene discovery and pathway architecture), trafficked and released from cells.

Jackie Winter jaclyn.winter@utah.edu
University of Utah, Medicinal Chemistry
Exploring the biomolecular chemistry of natural products produced by microorganisms and engineering their biosynthetic machinery.

Bill Wuest wwuest@emory.edu
Emory University, Chemistry
Wuest lab leverages diverted total synthesis to create inhibitors for pathogen-specific treatments & probes to study antibiotic resistance.

Bin Zhang binz@mit.edu
Massachusetts Institute of Technology, Chemistry
Using a combination of modeling, bioinformatics analysis and stat mech, we study the 3D genome organization at various length scales.

Wenjun Zhang wjzhang@berkeley.edu
University of California, Berkeley, Chemical and Biomolecular Engineering
Secondary metabolite discovery, biosynthesis, and functional study.

Xin Zhang xuz31@psu.edu
The Pennsylvania State University, Chemistry
We develop chemical tools that visualize and characterize, in live cells, the many conformations during protein aggregation.

Brian Zid zid@ucsd.edu
University of California, San Diego,
Chemistry and Biochemistry
Gene expression during fluctuating environmental conditions, focusing on the specificity of mRNA localization to mRNP granules during stress.

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.

Kathy Franz chair@chem.duke.edu
Duke University, Chemistry
Inorganic chemist involved in elucidating structural and functional consequences of metal ion coordination in biological systems.

Judith Frydman jfrydman@stanford.edu
Stanford University, Biology and Genetics
We study how proteostasis pathways help proteins fold and maintain proteome integrity; and how their disfunction leads to disease and aging.

Holly Goodson hgoodson@nd.edu
University of Notre Dame,
Chemistry and Biochemistry
Cell biologist and biochemist focused on the cytoskeletal assembly and molecular evolution.

Martin Gruebele mgruebel@illinois.edu
University of Illinois,
Chemistry, Physics and Biophysics
Quantum dynamics, protein dynamics, single particle spectroscopic imaging, animal behavior.

Rigoberto Hernandez r.hernandez@jhu.edu
Johns Hopkins University, Chemistry
@EveryWhereChem: Theoretical and Comp Chemistry @JHUChemistry: nonequilibrium reactions, TST, nanoparticles, proteins, diversity and leadership.

Neil Kelleher n-kelleher@northwestern.edu
Northwestern University,
Proteomics Center of Excellence
Would like to domesticate the human proteome by getting really precise about protein PRIMARY structure and atom composition.

Gang-Yu Liu gyliu@ucdavis.edu
University of California, Davis, Chemistry
Liu team specializes in high-resolution imaging and 3D nanoprinting for biomaterial development and applications.

Katrina Miranda kmiranda@email.arizona.edu
University of Arizona, Chemistry and Biochemistry
Analysis of small, redox active molecules in signaling and disease and design of methods to specifically detect and produce these species.

Catherine Murphy murphycj@illinois.edu
University of Illinois at Urbana-Champaign, Chemistry
Inorganic nanoparticles for biology.

Guests

Ravi Basavappa basavapr@od.nih.gov
National Institutes of Health
NIH Common Fund Program Leader of the High-Risk High-Reward Research Program; background in structural biology and biophysics.

Valerie Conn vconn@sciphil.org
Science Philanthropy Alliance
I represent funders who fund cutting edge basic science. RCSA Scialogs uniquely let me see cross disciplinary science develop in real time.

Richard Conroy conroyri@mail.nih.gov
National Institutes of Health
Richard Conroy is curious in what are the basic organizing principles of cells and multi-cellular systems.

Beth Etscheid beth@wrfcapital.com
Washington Research Foundation
WRF funds translational research and investigators at institutions within Washington State.

Gary Greenburg Gary.Greenburg@Moore.org
Gordon and Betty Moore Foundation
Funder of basic science research in the physical and life sciences.

Adam Jones adam.jones@moore.org
Gordon and Betty Moore Foundation
Oceanography, biochemistry, science policy.

Boyana Konforti konfortib@hhmi.org
Howard Hughes Medical Institute
Diversity, equity and inclusion in science. A healthier academic system. Public engagement with science.

Moses Lee mosesl@murdocktrust.org
M.J. Murdock Charitable Trust
Targeting specific genes and signaling pathways in cancer, and development of a malaria vaccine.

Ed McCleskey emccleskey@chanzuckerberg.com
Chan Zuckerberg Initiative
Ion channels: the biophysics of calcium permeation in calcium-selective channels and the biology of certain ion channels that trigger pain

Kim Metzler kimberly.metzler@alleninstitute.org
Allen Institute
Interested in the fundamental events involved in cell fate decisions that lead to organogenesis and goes awry in disease.

Mary O'Reilly moreilly@flinn.org
Flinn Foundation
All things biosciences & bioengineering.

Kathryn Richmond kathrynr@alleninstitute.org
Allen Institute
The Paul G. Allen Frontiers Group explores the landscape of science to identify and invest in pioneers with ideas.

Jason Tung jtung@sciphil.org
Science Philanthropy Alliance
Philanthropic approaches to support basic science research.

Research Corporation Scientists

Dan Linzer dlinzer@rescorp.org
President

Silvia Ronco sronco@rescorp.org
Senior Program Director

Richard Wiener rwiener@rescorp.org
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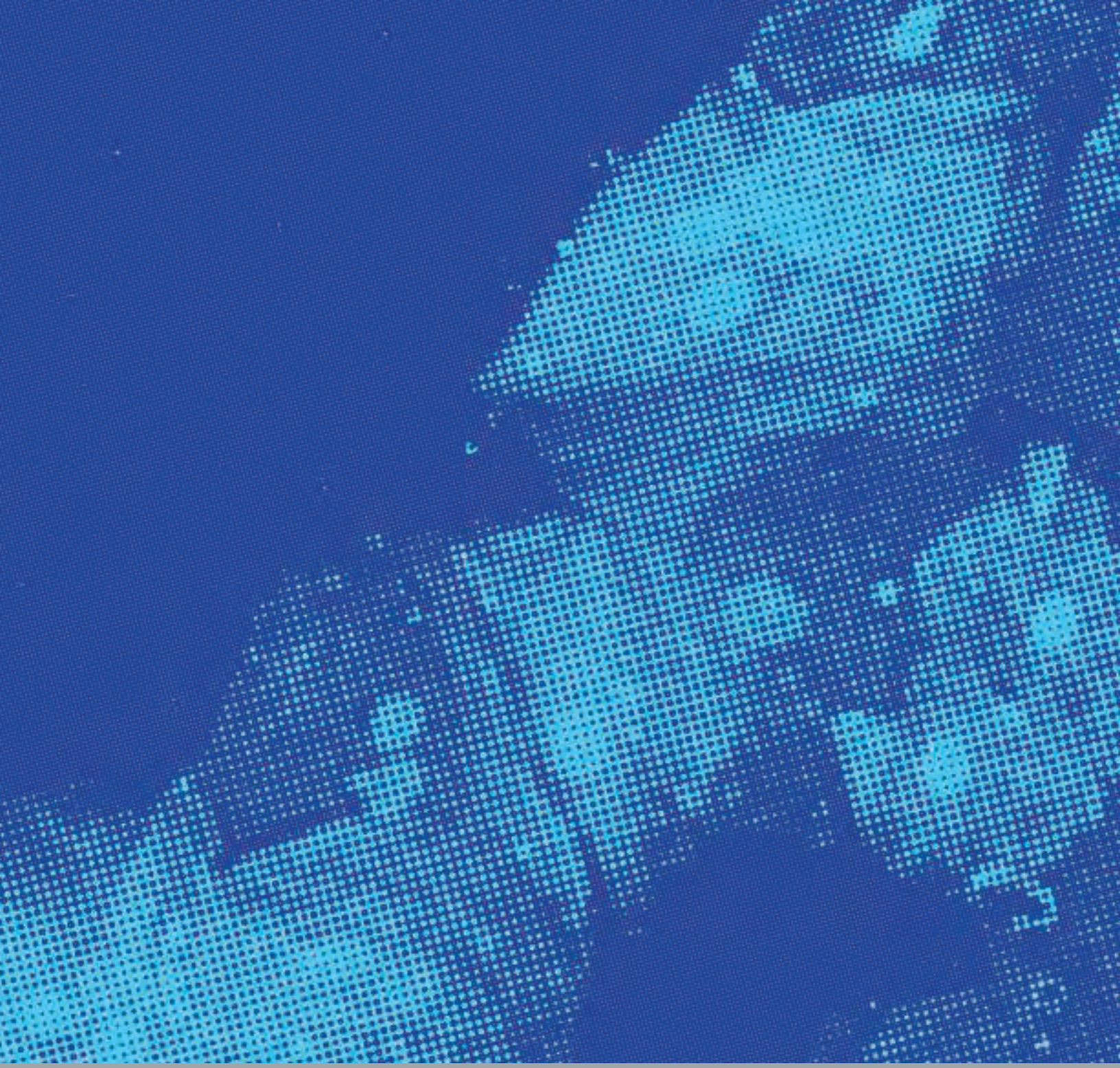

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