ASCB | EMBO
2017 meeting

Dec. 2-6, 2017 | Philadelphia, PA

Saturday
December 2, 2017

Daily Schedule—Saturday, December 2

7:30 am-7:00 pm	Registration Open	Registration Area
8:30 am-12:30 pm	Special Interest Subgroups – Morning	
	A. 4D Nucleome Organization: Unlocking the Structure-Function Relationships of Genome Organization and Nuclear Morphology	Room 108B
	B. Advanced Imaging for Quantitative Cell Biology	Room 114
	C. Cell Biology in Adaptive Immune Response	Room 113B
	D. Cilia: Traffic, Signals, Disease	Room 120B
	E. Microtubule Motors: Emergent Phenomena and New Paradigms	Room 118C
	F. Optogenetics: From Molecular Switches to (Multi-)Cellular Circuits	Room 113C
	G. Spatial and Temporal Control of Cell Signaling	Room 113A
	H. The Cell Biology of Glycoconjugates	Room 117
	I. The Cell Biology of Organoids	Room 108A
	J. Building a Multiscale, Multidimensional Human Cell Atlas	Room 119A
	K. When Cytoskeletal Networks Collide	Room 118B
9:00–10:15 am	Mentoring Keynote: Isiah M. Warner	Room 122B
10:30-11:30 am	Getting into Graduate School: The Do's and the Don'ts and the What If's	Room 122B
10:30-11:30 am	Getting the Most Out of Your Thesis Committee	Room 124
10:30-12:30 pm	Navigating Your Mentoring Relationships with a MAP (Mentoring Action Plan) as a Mentee	Room 126A
11:45 am-12:45 pm	Planning Your Exit from Graduate School	Room 124
1:30-5:30 pm	Special Interest Subgroups – Afternoon	
	L. Actin Functions across the Tree of Life	Room 118C
	M. Bottom-Up Cell Biology	Room 113C
	N. Building the Cell 2017	Room 120B
	O. Cell Cycle Regulation of Morphogenetic Behavior	Room 113B
	P. Cell-Cell Fusion	Room 108A
	Q. Emerging Model Systems	Room 113A
	R. From Motors to Cancer: Integrating Mechanical Forces across Scales	Room 118B
	S. Sharing and Reusing Cell Image Data	Room 119B
	T. The Intersection of Lipids and Proteins in the Secretory Pathway	Room 119A
	U. Translating Cell Biology Research into Effective Immunotherapies for Cancer	Room 117
	V. Tunneling Nanotubes: Intercellular Highways, New Frontiers for Deciphering Intercellular Communication in Disease	Room 108B
1:30-3:30 pm	Science Learning for All: Inclusive Teaching Strategies	Room 126A
2:30-3:30 pm	Hit the Ground Running: Early Success in Graduate School	Room 124
3:45-5:45 pm	Judged Poster Session	Room 121B
6:00 pm	Fred Kavli Keynote Lecture: Cori Bargmann	Terrace Ballroom 3
Immediately Following Keynote-10:00 pm	Opening Night Reception	Terrace Ballroom 1, Terrace Ballroom Foyer, and Level 2 Foyer
8:00-9:00 pm	International Research and Training Exchange Fair	Terrace Ballroom Foyer
8:30 pm	Ask a Scientist Bar Night	Meet at the Message Boards in the Registration Area of the Broad Street Atrium

Special Interest Subgroups – Morning

8:30 am-12:30 pm

The following member-organized sessions were selected by the ASCB Program Committee. All meeting attendees are welcome to participate. Meeting registration is required.

Subgroup A: 4D Nucleome Organization: Unlocking the Structure-Function Relationships of Genome Organization and Nuclear Morphology

Room 108B

Organizers: **Sean E. Hanlon**, National Cancer Institute; and **Andrew Stephens**, Northwestern University

The nucleus is dynamically organized across length-scales, from genome architecture to nuclear body organization and overall nuclear morphology. All of these features influence gene expression and overall cellular function. For decades alterations to genome architecture and nuclear morphology have been observed in healthy cells or used as diagnostic markers of disease, but the mechanistic details underlying these alterations remain unknown. In 2015, the NIH Common Fund launched the 4D Nucleome program to investigate principles underlying nuclear organization, the role nuclear organization plays in cellular function, and how altering nuclear organization affects development and disease. This session will highlight recent advances in understanding genome and nuclear organization using approaches from genomics, biophysics and biomechanics, imaging, visualization, and computational modeling.

Presentations:

8:30-8:40 am	Introduction. **Sean E. Hanlon**, National Cancer Institute
8:40-9:10 am	Chromatin histone modifications and rigidity affect nuclear morphology independent of lamins. **Andrew Stephens**, Northwestern University
9:10-9:40 am	Role of nuclear lamina assembly in nuclear envelope rupture and repair. **Emily Hatch**, Fred Hutchinson Cancer Research Center
9:40-10:10 am	The mechanics of nuclear shaping. **Tanmay Lele**, University of Florida
10:10-10:40 am	Probing chromatin mechanics by applying diffusive state analysis to living cells. **Megan King**, Yale University
10:40-11:00 am	Break
11:00-11:30 am	Spatiotemporal control of intracellular phase transitions using light-activated optoDroplets. **Clifford Brangwynne**, Princeton University
11:30 am-12:00 pm	3D Epigenome reconfiguration in brain development and disease. **Jennifer Phillips-Cremins**, University of Pennsylvania
12:00-12:30 pm	Exploring long-range genome interaction data using the WashU Epigenome Browser. **Ting Wang**, Washington University, St. Louis

Subgroup B: Advanced Imaging for Quantitative Cell Biology

Room 114

Organizers: **Melike Lakadamyali**, University of Pennsylvania, Perelman School of Medicine; and **Jie Xiao**, Johns Hopkins School of Medicine

The last decade has seen a revolution in light microscopy where the development of super-resolution microscopy methods shattered the diffraction limit and extended the spatial resolution of light microscopy to the nanometer length scales. We are now in an exciting time in history where the living cell can be visualized with unprecedented resolution in multiple colors and three dimensions. Coupled with imaging modalities that enable visualization of cells in the context of their tissues, these microscopy and nanoscopy methods are bringing about a second revolution in quantitative cell biology. This session will bring together some of the leading experts who have been using and further developing advanced microscopy methods to unravel how cellular organization can regulate cell function.

Presentations:

8:30-8:40 am	Opening remarks. **Melike Lakadamyali**, University of Pennsylvania, Perelman School of Medicine

*Session 1: Chair, **Melike Lakadamyali**, University of Pennsylvania, Perelman School of Medicine*

8:40-9:10am	Analyzing nuclear structure by quantitative super-resolution and correlative electron microscopy. **Jan Ellenberg**, EMBL
9:10-9:40 am	Using high-throughput super-resolution microscopy to deduce structures and states in cells. **Suliana Manley**, EPFL
9:40-10:10 am	Imaging the early events of signal transduction. **Diane Lidke**, University of New Mexico
10:10-10:30 am	Coffee break

*Session 2: Chair, **Jie Xiao**, Johns Hopkins School of Medicine*

10:30-11:00 am	Gene expression by single RNA imaging. **Bin Wu**, Johns Hopkins School of Medicine
11:00-11:30 am	An update on OligoSTORM and OligoDNA-PAINT. **Ting Wu**, Harvard Medical School
11:30 am-12:00 pm	A non-enzymatic exponential amplification scheme for RNA detection in situ. **Arjun Raj**, University of Pennsylvania
12:00-12:30 pm	Single cell transcriptome and chromosome imaging. **Xiaowei Zhuang**, Harvard University/ HHMI
12:30 pm	Closing remarks. **Jie Xiao**, Johns Hopkins School of Medicine

Subgroup C: Cell Biology in Adaptive Immune Response

Room 113B

Organizers: **Xiaolei Su**, University of California, San Francisco; and **Jonathon Ditlev**, University of Texas Southwestern Medical Center

The adaptive immune system guards our body against pathogen attacks and creates long-term memory of immunity. It also kills tumors and can be reprogramed and engineered for advanced cancer therapies. Although functions and surface markers of the players in adaptive immunity (e.g., T cell, B cell, dendritic cell) have been well studied, the intracellular processes that mediate these cells' responding to and processing pathogenic stimuli remain much less understood. This subgroup highlights recent progress in understanding the cell biological mechanisms underlying immune cell activation. We aim to promote the interactions between the immunology and cell biology communities, benefiting each other through stimulating discussions on topics of common interest.

Presentations:

8:30-8:35 am	Introduction. **Xiaolei Su**, University of California, San Francisco
8:35-8:55 am	Phase Transition in T Cell Activation. **Xiaolei Su**, University of California, San Francisco
8:55-9:15 am	MHC class II Antigen-processing Chaperones, HLA-DM and HLA-DO, Cooperate and Select Immunodominant Epitopes for Presentation to CD4+ T cells in Thymus and B cells. **Scheherazade Sadegh-Nasseri**, Johns Hopkins University
9:15-9:35 am	A Phosphatidylinositol 4, 5-Biphosphate (PIP2) Metabolism-Derived Amplification Loop Fuels the Sustained Transmembrane Signaling. **Wanli Liu**, Tsinghua University
9:35-9:55 pm	STIM-Mediated Control of Calcium Entry and Clearance at the Immunological Synapse. **Jonathan Soboloff**, Temple University
9:55-10:15 am	Signaling and Cell Biology of TIM Family Proteins. **Lawrence Kane**, University of Pittsburgh
10:15 am	Break
10:30-10:50 am	Insights into Immune Cell Signaling from Germline and Somatic CARD11 Mutations. **Joel Pomerantz**, Johns Hopkins University
10:50-11:10 am	Composition of LAT Clusters Regulates Their Movement within Actomyosin Networks. **Jonathon Ditlev**, University of Texas Southwestern Medical Center
11:10-11:30 am	An Actomyosin Network Revealed by SIM Imaging Promotes the Activation of T Cells in a Ligand-Dependent Manner. **John Hammer**, National Institutes of Health
11:30-11:50 am	Cytoskeletal Crosstalk at the Immunological Synapse. **Janis Burkhardt**, University of Pennsylvania
11:50 am-12:10 pm	Mechanical Enhancement of Cytotoxic T Cell Killing. **Morgan Huse**, Memorial Sloan Kettering Cancer Center
12:10-12:30 pm	The Role of Ubiquitination at the Immune Synapse. **James Muller**, New York University

Subgroup D: Cilia: Traffic, Signals, Disease

Room 120B

Organizers: **Max Nachury**, University of California, San Francisco; **Peter Jackson**, Stanford University; and **Jeremy Reiter**, University of California, San Francisco

This special interest subgroup on cilia serves as a point of convergence for human geneticists working on kidney and eye diseases, for developmental biologists aiming to understand the Hedgehog pathway and left-right axis patterning, and for cell biologists interested in compartmentalized signal transduction. Researchers from the diverse fields that intersect with ciliary biology will discuss the interplay between membrane trafficking, signaling, and disease.

Presentations:

8:30-8:35 am	Introduction. **Jeremy Reiter**, University of California, San Francisco
8:35-8:53 am	Mechanisms of ciliary signaling. **Jeremy Reiter**, University of California, San Francisco
8:53-9:11 am	Regulation of primary cilia formation in the mouse. **Kathryn Anderson**, Sloan-Kettering
9:11-9:29 am	Response of immotile cilia to the fluid flow for establishing left-right asymmetry. **Hiroshi Hamada**, Riken Kobe
9:29-9:47 am	Structure and function of the BBSome. **Max Nachury**, University of California, San Francisco
9:47-10:05 am	Role of cilia in congenital heart disease and the neurodevelopmental outcome of congenital heart disease patients. **Cecilia Lo**, University of Pittsburg
10:05-10:23 am	Ciliary control of stem cell function. **Peter Jackson**, Stanford University
10:23-10:42 am	Break
10:42-11:00 am	Cilia regulation of injury response in the kidney and during cyst development. **Brad Yoder**, University of Alabama at Birmingham
11:00-11:18 am	Mechanisms underlying renal ciliopathies. **Sophie Saunier**, IMAGINE institute, Inserm UMR1163
11:18-11:36 am	Polycystic kidney disease gets more complex. **Carsten Bergmann**, University Medical Center Freiburg
11:36-11:54 am	Photoreceptor discs are formed through suppression of ciliary ectosome release. **Vadim Arshavsky**, Duke University
11:54 am-12:12 pm	Understanding the molecular etiology of craniofacial ciliopathies. **Samantha Brugmann**, Cincinnati Children's Hospital
12:12-12:30 pm	A comprehensive portrait of cilia and ciliopathies from a CRISPR-based screen for Hedgehog signaling. **David Breslow**, Yale University

Subgroup E: Microtubule Motors: Emergent Phenomena and New Paradigms

Room 118C

Organizers: **William Hancock**, Penn State University; and **Weihong Qiu**, Oregon State University

Kinesin and dynein are microtubule-based motor proteins that transform the chemical energy of ATP hydrolysis into mechanical work for a variety of essential processes including transport of intracellular cargo and mitotic spindle assembly. Recent advances have revealed a number of paradigm-shifting discoveries and emergent phenomena, which include but are not limited to 1) the discovery of bidirectional kinesins; 2) the discovery of processive kinesin-14 motors; 3) the discovery of non-canonical kinesin activities; and 4) the regulation of intraflagellar transport dynein. This subgroup meeting will provide a cohesive update of these new and exciting developments. Presentations will be followed by an interactive discussion involving all participants and audience members focused on challenges and opportunities in this area.

Presentations:

8:30-8:40 am	Introduction. **William Hancock**, Penn State University
8:40-9:05 am	Stapling and straightening: the kinesin-5 microtubule polymerase mechanism. **William Hancock**, Penn State University
9:05-9:30 am	New insights into the bidirectional motility of kinesin-5 motors. **Leah Gheber**, Ben-Gurion University of the Negev
9:30-9:55 am	Ensembles of bidirectional kinesin Cin8 produce additive forces in both directions of movement. **Thomas Surrey**, The Francis Crick Institute, UK
9:55-10:20 am	Switching on and off the motor activity of intraflagellar transport dynein. **Anthony Roberts**, University of London
10:20-10:40 am	Break
10:40-11:05 am	Engineering novel processive minus-end-directed kinesin-14 motors. **Weihong Qiu**, Oregon State University

11:05-11:30 am	Diffusive anchorage of molecular motors allows for adaptive force generation. **Stefan Diez**, Technische Universität Dresden
11:30-11:55 am	Role of minus-end-directed kinesin-14 motors in mitotic spindle organization. **Melissa Gardner**, University of Minnesota
11:55 am -12:20 pm	Formation of parallel microtubule networks at microtubule-organizing centers. **Maxim Molodtsov**, Research Institute of Molecular Pathology
12:20-12:30 pm	Closing & general discussion

Subgroup F: Optogenetics: From Molecular Switches to (Multi-)Cellular Circuits

Room 113C

Organizers: **Harald Janovjak**, IST Austria; and **Jared Toettcher**, Princeton University

Optogenetics is an emerging method that employs light to control the behavior of selected cells and tissues. The use of light permits transient and local regulation of processes on short time and small length scales and opens the door to dissect cause-consequence relationships that govern cell, tissue, and organism function. In this subgroup session, we will cover all aspects relevant to this emerging and multi-disciplinary field, including the origins and diversity of photoreceptors, design of optogenetic tools and experiments and strategies to dissect (multi-)cellular circuits in a variety of systems. This subgroup session will place emphasis on seminal and unpublished work and accessibility to a broad audience and thereby inform on most recent research, inspire future developments, and connect prospective collaborators.

Presentations:

8:30-8:35 am	Introduction. **Harald Janovjak**, IST Austria; and **Jared Toettcher**, Princeton University
8:35-9:00 am	Engineered protein responses - allostery and optogenetics. **Klaus Hahn**, University of North Carolina Chapel Hill
9:00-9:25 am	Near-infrared optogenetic tools designed from bacterial phytochromes. **Vladislav Verkhusha**, Albert Einstein College of Medicine
9:25-9:50 am	Engineering the bacterial transcriptional regulator AraC to make it light-responsive. **Barbara di Ventura**, University of Freiburg
9:50-10:05 am	Optical dissection of class C G protein-coupled receptors. **Josh Levitz**, Weill Cornell Medicine
10:05-10:20 am	Multi-color and bi-directional control of membrane receptor signaling. **Eva Reichhart**, IST Austria
10:20-10:30 am	Break
10:30-10:55 am	Expanding the boundaries of photosensory proteins as optogenetic tools. **Brian Chow**, University of Pennsylvania
10:55-11:20 am	Using optogenetics to control engineered metabolisms. **Jose Avalos**, Princeton University
11:20-11:45 am	Synthetic morphogenesis in naïve embryonic tissues. **Stefano de Renzis**, EMBL Heidelberg
11:45 am-12:00 pm	Real-time visualization and optogenetic regulation of transcription in single cells. **Andreas Milias-Argeitis**, University of Groningen
12:00-12:15 pm	Cracking the code: Ras/Erk interpretation by immediate-early genes. **Max Wilson**, Princeton University
12:15-12:30 pm	General questions and answers/closing remarks

Subgroup G: Spatial and Temporal Control of Cell Signaling

Room 113A

Supported by PicoQuant

Organizers: **Ivan Yudushkin**, Medical University of Vienna; and **Brendan D. Manning**, T.H. Chan School of Public Health, Harvard

Coordinated assembly, localization, and regulation of enzymatic complexes shape cellular signaling responses to the environmental cues. To ensure the fidelity of these reactions, the cells need to precisely position the enzymes and their substrates at specific compartments and provide mechanisms to trigger and quench the enzymatic reactions in time. The details of the biochemical architecture and coupling between subcellular localization and regulation of signaling enzymes are not well understood.

The speakers at this subgroup will present new methods for fast, high-resolution mapping, quantitation, and modeling of cellular biochemical activities and discuss how dynamic architecture of enzymatic activities defines the adaptive character and fidelity of cellular responses.

Presentations:

8:30-8:35 am	Introduction. **Brendan D. Manning**, T.H. Chan School of Public Health, Harvard
8:35-9:00 am	Spatio-temporal control of Rho GTPase signaling by RhoGEFs and RhoGAPs. **Oliver Rocks**, Max Delbruck Center, Berlin
9:00-9:25 am	Functional selectivity of GPCR-directed drug action through location bias. **Roshanak Irannejad**, University of California, San Francisco
9:25-9:50 am	Illuminating the cell's biochemical activity architecture. **Jin Zhang**, University of California, San Diego
9:50-10:15 am	Excitable networks in directed cell migration. **Peter Devreotes**, John Hopkins University
10:15 am	Break
10:45-11:10 am	Restricting promiscuous Akt: PI(3,4,5)P_3 binding controls Akt activity in cells. **Ivan Yudushkin**, Medical University of Vienna
11:10-11:35 am	Spatial control of ubiquitin signals underlying mitophagy. **Wade Harper**, Harvard Medical School
11:35 am-12:00 pm	A proximity map of a human cell. **Anne-Claude Gingras**, Lunenfeld-Tanenbaum Research Institute
12:00-12:25 pm	Phenotypic Profiling in Yeast Using High-content Screening and Automated Image Analysis. **Brenda Andrews**, University of Toronto
12:25-12:30 pm	Concluding remarks

Subgroup H: The Cell Biology of Glycoconjugates

Room 117

Organizers: **Michael Boyce**, Duke University; and **Richard Steet**, University of Georgia

Glycoproteins and glycolipids impact all aspects of cell biology, and dysregulation of their synthesis and turnover underlies the etiologies of many human diseases. Despite this clear biomedical significance, modern glycobiology and cell biology are not yet fully integrated. This subgroup features research presentations from leaders in the field on the cell biological roles of glycoconjugates in a wide range of physiological and disease contexts. The interactive program will offer attendees a window into the world of glycobiology and the diverse roles that glycoconjugates play in cell and developmental biology. The session will benefit cell biologists who want to learn more about how glycobiology informs their research as well as investigators in need of cutting-edge tools to track glycoconjugates and study their functions.

Presentations:

8:30-8:52 am	Novel Glycosylation Required for Dystroglycan Function as an Extracellular Matrix Receptor. **Kevin Campbell**, University of Iowa
8:52-9:14 am	Dissection of Glycan Function by Mass Spectrometry, Genetic Engineering, and Organotypic Tissue Models. **Hans Wandall**, University of Copenhagen
9:14-9:36 am	Glycans in Host-Microbe Interactions. **Laura Kiessling**, Massachusetts Institute of Technology
9:36-9:58 am	Decoding the Genome Using Systems-Approaches. **Lara Mahal**, New York University
9:58-10:20 am	The Sweeter Side of Cell Signaling. **Linda Hsieh-Wilson**, California Institute of Technology
10:20-10:42 am	Congenital Disorders of Glycosylation: New Defects, More Challenges. **Hudson Freeze**, Sanford Burnham Prebys Medical Discovery Institute
10:42-11:04 am	Protein O-GlcNAcylation in Space and Time. **Xiaoyong Yang**, Yale University
11:04-11:26 am	Mammalian Cell Adhesion Requires Active Balancing of Nucleotide-Sugar Pools. **Michael Boyce**, Duke University
11:26-11:46 am	A Sweet Tale of Secretory Granule Biogenesis. **Kelly Ten Hagen**, National Institute of Dental and Craniofacial Research
11:46 am-12:08 pm	Regulation of Receptor Activity by Carbohydrate-Dependent Lysosomal Targeting. **Richard Steet**, University of Georgia
12:08-12:30 pm	Concluding questions and discussion

Subgroup I: The Cell Biology of Organoids

Room 108A

Organizers: **Jason C. Mills**, Washington University; and **Xuebiao Yao**, University of Science & Technology of China

The Cell Biology of Organoids is a timely topic of relevance to a broad ASCB audience as organoids provide a powerful model system for studying context-dependent cell physiology. The basic cell biology of how cell fate decision and differentiation control is central to understanding metazoan development, the tissue homeostasis, and the cellular plasticity control. However, despite our knowledge of the developmental cues and context-elicited reprograms controlling organoids establishment in vitro, the cell biology of organoids is understudied. Recent advancements in multiplex organelle imaging and high-resolution proteomics combined with establishment of tissue specific engineering in mice enable us to dissect context-dependent cellular dynamics of organoids. Presentations in our session include work addressing how organelle communication, cytoskeletal dynamics, and host-microbe interactions regulate organoids plasticity.

Presentations:

8:30-8:35 am	Introduction. **Xuebiao Yao**, University of Science and Technology of China
8:35-9:00 am	Organoids help understand cell plasticity and tumorigenesis in the stomach. **Jason C. Mills**, Washington University School of Medicine
9:00-9:25 am	Modeling colorectal cancer using human pluripotent stem cell derived colonic organoids. **Shuibing Chen**, Cornell University
9:25-9:50 am	Spectral imaging to unravel the organelle interactome. **Alex Valm**, University at Albany, State University of New York
9:50 am	Break
10:10-10:35 am	The generation and application of haploid ESCs. **Jinsong Li**, Shanghai Institute for Biological Sciences
10:35-11:00 am	Exosome in endometrial organoids. **Winston Thompson**, Morehouse School of Medicine
11:00-11:25 am	Delineation of parietal cellular dynamics in gastric organoids. **Xing Liu**, Anhui Key Laboratory for Cellular Dynamics & Chemical Biology
11:25-11:50 am	Esophageal cancer 3D organoids: mechanisms to translation. **Anil K. Rustgi**, University of Pennsylvania
11:50 am-12:15 pm	Modeling Microvillus Inclusion Disease with MYO5B knockout mice and enteroids. **James R. Goldenring**, Vanderbilt University
12:15 pm	Questions and wrap-up

Subgroup J: Building a Multiscale, Multidimensional Human Cell Atlas

Room 119A

Organizers: **Emma Lundberg**, Royal Institute of Technology KTH, Human Protein Atlas; **Richard Conroy**, National Institutes of Health; and **Jonah Cool**, Chan Zuckerberg Initiative

The human body is composed of approximately 40 trillion cells, organized at different scales to create enormous functional diversity. The rapid emergence of technologies for multiplexed and high throughput molecular mapping is driving a deeper understanding of the relationship between molecular profiles, cellular descriptors, and functional measures. The creation of a multiscale, multidimensional atlas will require a massive community effort but provide the framework for understanding cellular functionality across the lifespan and the health-disease continuum. In this session we will discuss international programs that are supporting this community effort and some of the novel imaging approaches that will inform modeling of cellular organization and interactions in tissue environments. There will be discussions with all speakers addressing challenges related to the creation of such a human cell atlas.

Presentations:

8:30-8:35 am	Introduction: What is an atlas and why is it important to build? **Emma Lundberg**, KTH Royal Institute of Technology
Single Cell Analysis Technologies and Techniques for Building an Atlas	
8:35-8:50 am	Highly multiplexed imaging using the CODEX technology. **Garry Nolan**, Stanford University
8:50-9:05 am	Antibody validation: a cautionary tale and implications for cell atlases. **Cecilia Williams**, Karolinska Institutet

9:05-9:20 am	Tools for rare cell analysis. **Arjun Raj**, University of Pennsylvania
9:20-9:35 am	Spatial transcriptomics of the mammalian liver. **Shalev Itzkovitz**, Weizmann Institute of Science
9:35-9:50 am	A picture is worth a million numbers: The power of single-cell morphological measurements. **Shantanu Singh**, Broad Institute
9:50-10:05 am	Citizen science and challenges for building reference image datasets. **Emma Lundberg**, KTH Royal Institute of Technology
10:05-10:20 am	Building a 4D canonical human cell from quantitative protein imaging data. **Jan Ellenberg**, EMBL Heidelberg
10:20-10:40 am	Break

Building an International Community

10:40-11:00 am	The Human Cell Atlas. **Jonathan Weissman**, University of California, San Francisco
11:00-11:20 am	Creating a dynamic, high dimensional stem cell atlas. **Rick Horwitz**, Allen Institute
11:20-11:50 am	Status of the Human Protein Atlas. **Mathias Uhlén**, KTH Royal Institute of Technology

Panel Discussion with Funders

11:50 am-12:25 pm	Integration of data and deliverables for mapping human cells. With leaders from: Allen Institute, HCA, HPA Funders: **Richard Conroy** (NIH) - HuBMAP, **Jonah Cool** (CZI), **Shannon Hughes** (NCI) Moderator: **Jonathan Weissman**, University of California, San Francisco
12:25-12:30 pm	Concluding remarks: integrative endpoint and future perspectives

Subgroup K: When Cytoskeletal Networks Collide

Room 118B

Organizer: **Shae B. Padrick**, Drexel University, College of Medicine

The eukaryotic cytoskeleton is a collection of multiple filament forming systems including: actin, microtubules, intermediate filaments, and septins. Individual cytoskeleton systems all have powerful self-organization properties, with their signature common feature being the ability to form polymers. These cytoskeletal systems interact with one-another, in both transient and more persistent assemblies. When cytoskeletal systems interact, distinct cytoskeletal organizations, signaling and dynamic behaviors emerge. Here, we present recent and emerging stories on the functional consequences and the cytoskeletal network organizational changes that occur when cytoskeletal networks collide.

Presentations:

8:30-8:40 am	Introduction. **Shae B. Padrick**, Drexel University, College of Medicine
8:40-9:15 am	Where the septins meet microtubules: spatial guidance of microtubule organization and interactions with motors. **Elias T. Spiliotis**, Drexel University
9:15-9:50 am	Role of adenomatouspolyposis coli (APC) at the actin-microtubule intersection during cell migration. **Maria Angeles Juanes**, Brandeis University
9:50-10:25 am	Nebulette integrates desmin intermediate filaments to cardiac actin. **Gloria M. Conover**, Texas A&M University
10:25-10:35 am	Coffee break
10:35-11:10 am	Mechanisms regulating intermediate filament transport driven by microtubule-dependent motors. **Amelie Robert**, Northwestern University, Feinberg School of Medicine
11:10-11:45 am	Septins control of actin nucleation and network shape. **Shae B. Padrick**, Drexel University, College of Medicine
11:45 am-12:20 pm	Alpha-catenin integrates the actin and intermediate filament cytoskeletons at cardiomyocyte intercellular junctions. **Adam Kwiatkowski**, University of Pittsburgh School of Medicine
12:20-12:30 pm	Discussion

Mentoring Keynote

9:00-10:15 am **Room 122B**

Mentoring Keynote Lecturer: **Isiah M. Warner**, Vice President for Strategic Initiatives; Boyd Professor and Philip W. West Professor of Analytical and Environmental Chemistry; Howard Hughes Medical Institute Professor, Louisiana State University

This invited lecture recognizes an individual who has made outstanding, nationally recognized contributions to the mentoring of underrepresented minority (URM) scientists.

Outcomes:

1. Recognize an individual who has made outstanding contributions to the mentoring of minority scientists
2. Highlight the importance of research in the areas of mentoring of minority scientists
3. Highlight the importance of mentoring in the development of scientists

Target audience: all attendees

Getting into Graduate School: The Do's and the Don'ts and the What If's

10:30-11:30 am **Room 122B**

Tama Hasson, Assistant Vice Provost for Undergraduate Research, University of California, Los Angeles

Leticia Vega, Associate Professor, Barry University

This session is designed specifically to inform undergraduate attendees about the ins and outs of applying to and getting into graduate school or MD/PhD programs. Topics addressed in the presentation include timelines for admission, requesting letters of recommendation, crafting personal statements, and the interview process as well as potential pitfalls in the application process. The speakers have years of experience in mentoring undergraduates through the application process and will answer students' questions to help them become stronger applicants.

Outcomes:

1. Acquire broad-based knowledge regarding the process of applying to graduate school or MD/PhD programs, including the application timeline
2. Gain an understanding of the importance of a diversity statement in your personal statements
3. Appreciate the importance of the ASCB in your professional development

Target audience: undergraduates

Getting the Most Out of Your Thesis Committee

10:30-11:30 am **Room 124**

Jim O. Vigoreaux, Professor, Associate Provost, University of Vermont

James A. Olzmann, Assistant Professor, University of California, Berkeley

Andrew G. Campbell, Dean of the Graduate School, Professor of Medical Science, Brown University

A graduate student's thesis committee, a requirement for most programs, is an incredibly important factor in a graduate student's training and career advancement. While the importance of this group of people for a student's success is evident, advice on how to select, interact with, and leverage committee members is often implicit. This session will provide a platform to discuss a thesis committee's role, considerations in determining committee members, strategies for establishing and maintaining a productive mentoring relationship with committee members, and strategies for preparing and holding effective thesis committee meetings. Established ASCB faculty members will serve as panelists to further discuss these topics and provide lived-insights, advice, role models, and context.

Outcomes:

1. Understand the impact that a close relationship with a thesis committee can have
2. Acquire strategies for selecting a thesis committee, establishing mentoring relationships with its members, and preparing for and holding a thesis committee meeting
3. Demonstrate increased confidence in your ability to utilize their thesis committee for scientific and academic success

Target audience: early- and mid-stage graduate students, undergraduates

Navigating Your Mentoring Relationships with a MAP (Mentoring Action Plan) as a Mentee

10:30 am-12:30 pm **Room 126A**

Steve Lee, Graduate Diversity Officer for the STEM Disciplines, University of California, Davis

Succeeding in science is facilitated by helpful mentors. But this doesn't mean passively following your mentors—you must proactively "mentor up" as you engage with your mentors. In this interactive workshop, you will learn to develop and use a mentoring action plan (MAP) to navigate mentoring relationships to meet your goals. We will break into groups to discuss case studies and to share MAPs, to help you improve your relationship with your mentors and also equip you to mentor others.

Outcomes:

1. Recognize the importance of using a MAP for identifying and achieving academic and professional goals
2. Work on producing a MAP
3. Learn the seven principles of effective mentoring relationships
4. Identify and develop SMART goals for your mentoring relationships

Target audience: all attendees

Planning your Exit from Graduate School

11:45 am-12:45 pm **Room 124**

Jim O. Vigoreaux, Professor, Associate Provost, University of Vermont

Gaia Cantelli, Postdoctoral Associate, Duke University

Val Tutweiler, Postdoctoral Associate, University of Pennsylvania

Transitioning out of grad school, whether it's into postdoctoral training or the workforce, can be a daunting prospect for most students. In this session, panelists will discuss: timelines for planning; the importance of networking, as well as strategies, tips, and platforms for networking; the role of research advisors and other mentors; tools, such as the IDP, to help prioritize options, identify needs, and plan to work toward career objectives; preparing for interviews for postdoctoral and professional positions; juggling research and graduation responsibilities with exiting priorities; and managing challenges related to mentors or graduate program requirements. Students will receive a worksheet to help them plan and organize their exit from graduate school.

Outcomes:

1. Gain understanding of the ideal timelines and steps required to successfully exit graduate school and transition into the next academic or professional step
2. Acquire concrete strategies and resources to explore your career objectives and to work toward them
3. Demonstrate increased confidence in your ability to manage tasks related to exiting graduate school

Target audience: late-stage graduate students

Special Interest Subgroups – Afternoon

1:30-5:30 pm

The following member-organized sessions were selected by the ASCB Program Committee. All meeting attendees are welcome to participate. Meeting registration is required.

Subgroup L: Actin Functions across the Tree of Life

Room 118C

Organizers: **Ronen Zaidel Bar**, Tel-Aviv University; **Buzz Baum**, University College London; and **Sally Horne-Badovinac**, University of Chicago

Actin structure is highly conserved throughout the tree of life; however, over the course of evolution it has taken up diverse functions. In this subgroup, we will explore the function of the actin cytoskeleton in a range of organisms (including bacteria, plants, fungi, amoeba, protozoa, invertebrates, fish, amphibians, and mammals) in a variety of cellular processes, such as control of cell shape, division, fusion, polarity, motility, tissue morphogenesis, and transcription. Highlighting both common principles and unique specializations in actin function across species, the session will provide a broad evolutionary perspective through the lens of a single protein.

Presentations:

1:30-1:50 pm	How bacterial actin like filaments orient along the highest curvature to create and maintain rod shape. **Ethan Garner**, Harvard University
1:50-2:10 pm	Actin dynamics during polarized growth in plants. **Magdalena Bezanilla**, Dartmouth College
2:10-2:30 pm	Giardia's Ventrolateral Flange: A static actin-based membrane sheet at the host-parasite interface. **Alex Paredez**, University of Washington
2:30-2:50 pm	CYRIPS - a Rac-binding protein that regulates dynamics of pseudopods - from Dictyostelium to cancer cells. **Laura Machesky**, Cancer Research Beatson Institute, UK
2:50-3:10 pm	Ras activity stabilizes the actin fusion focus at cell contact sites prior to yeast cell-cell fusion. **Laura Merlini** (Martin lab), University of Lausanne
3:10-3:25 pm	Break
3:25-3:45 pm	Functional dissection of the Arp2/3 complex and the branched actin filament network during *C. elegans* cytokinesis. **Fung Yi Chan** (Carvalho lab), i3S – Porto University
3:45-4:05 pm	Polarization of actomyosin refines tissue material properties to buffer mechanical stress in *Drosophila*. **Yanlan Mao**, University College London
4:05-4:25 pm	Nuclear envelope breakdown by polymerized actin in starfish meiosis. **Natalia Wesolowska** (Lenart lab), European Molecular Biology Laboratory
4:25-4:45 pm	Actin regulation and dynamics in the morphogenesis of epithelial microridges in the zebrafish skin. **Alvaro Sagasti**, University of California, Los Angeles
4:45-5:05 pm	Anillin regulates *Xenopus* epithelial cell mechanics by structuring the medial-apical actin network. **Torey Arnold** (Miller Lab), University of Michigan, Ann Arbor
5:05-5:25 pm	Nuclear actin polymerization in mouse embryonic development. **Kei Miyamoto**, Kindai University
5:25-5:30 pm	Concluding remarks

Subgroup M: Bottom-Up Cell Biology

Room 113C

Organizers: **Daniel Fletcher**, University of California, Berkeley; and **Matthew Good**, University of Pennsylvania

In vitro reconstitution of biological processes from their component molecular parts is a mainstay of biochemistry and has emerged over the last decade as a powerful tool in cell biology. Recent studies have shown that cell-like structures with micron-scale to millimeter-scale organization can be reconstituted from nanometer-scale parts by combining purified proteins and cytoplasmic extracts with cell-like boundary conditions. By identifying the necessary and sufficient conditions for assembly, these 'bottom-up' studies provide new mechanistic insight that complements more traditional 'top-down' cell biology. Rapid progress in micropatterning, microfluidics, and microfabrication, coupled with continued advancements in biochemistry and molecular biology, raise the possibility of creating more complete cellular reconstitutions that may one day rival the complexity of live cells and tissues.

Presentations:

1:30-1:35 pm	Introduction: **Dan Fletcher**, University of California, Berkeley
1:35-1:55 pm	Linking molecular properties to cellular behavior: Adventures in the mesoscopic wilderness. **Dyche Mullins**, University of California, San Francisco
1:55-2:15 pm	Membrane triggered actin assemblies. **Jennifer Gallop**, Gurdon Institute
2:15-2:35 pm	Self-organization processes in biomolecular systems. **Andreas Bausch**, Technical University of Munich
2:35-2:55 pm	Reconstituting cytoskeletal self-organization with cell-size confinement. **Shin' ichi Ishiwata**, Waseda University
2:55-3:15 pm	Active matters: probing forces, fluctuations and self-organization in actomyosin cortices. **Nikta Fakhri**, Massachusetts Institute of Technology
3:15-3:25 pm	Awarded trainee talk
3:25-3:45 pm	Dissecting and reconstituting organelle-based nutrient sensing. **Roberto Zoncu**, University of California, Berkeley
3:45-4:05 pm	Contribution of actomyosin dynamics to TCR clustering and signaling. **Mike Rosen**, University of Texas Southwestern
4:05-4:25 pm	Quantitative approaches to reconstitute the kinetochore-microtubule interactions. **Ekaterina Grishchuk**, University of Pennsylvania
4:25-4:45 pm	Buckling of an epithelium growing under spherical constraint. **Aurelian Roux**, University of Geneva
4:45-5:05 pm	Building the mammalian embryo in vivo and in vitro. **Magdalena Zernicka-Goetz**, Cambridge University
5:05-5:25 pm	Recapitulating early embryonic spatial patterning. **Ali Brivanlou**, Rockefeller University
5:25-5:30 pm	Closing remarks. **Matt Good**, University of Pennsylvania

Subgroup N: Building the Cell 2017

Room 120B

Organizers: **Susanne Rafelski**, Allen Institute for Cell Science; and **Steph Weber**, McGill University

Modern cell biology has made great strides in understanding cell structure and function. As with any engineering problem, however, there is a third important aspect that needs to be understood besides structure and function, and that is assembly. How are the complex three-dimensional structures found within the cell specified by a one-dimensional genome? In this session we will explore the mechanisms by which cellular structures are determined and regulated. Because this question lies at the interface of biology and physics, this Building the Cell session will be highly interdisciplinary with speakers whose interests range from physics and mathematical modeling to biochemistry and cell biology.

Presentations:

1:30-1:35 pm	Introduction
1:35-1:55 pm	Rewiring the 3D structure of the genome with engineered CRISPR-Cas guide RNAs. **Jesse Zalatan**, University of Washington
1:55-2:15 pm	Wiring up the synthetic fly. **Hernan Garcia**, University of California, Berkeley
2:15-2:35 pm	Transcriptional dynamics of single-cell regeneration in the ciliate Stentor coeruleus. **Pranidhi Sood** (Wallace Marshall lab), University of California, San Francisco
2:35-2:55 pm	Spatial organization of transcription in fast-growing bacterial cells. **Steph Weber**, McGill University
2:55-3:15 pm	Phase behavior encoded by multivalent proteins. **Rohit Pappu**, Washington University
3:15-3:30 pm	Break
3:30-3:50 pm	Mechanisms of LINC complex-dependent mechanotransduction. **Gant Luxton**, University of Minnesota
3:50-4:10 pm	Microtubule network architecture. **Manuel Thery**, Hospital St. Louis
4:10-4:30 pm	Mitochondrial anchors: positioning mitochondria and more. **Laura Lackner**, Northwestern University
4:30-4:50 pm	Cortical stabilization of active RhoA - a novel mechanism for regulating contractility at epithelial adherens junctions. **Srikanth Budnar** (Alpha Yap lab), University of Queensland
4:50-5:10 pm	Capturing variance: integrating a moving target. **Molly Maleckar**, Allen Institute for Cell Science
5:10-5:30 pm	From polysaccharide to polyhedron - how plant cells take shape. **Anja Geitmann**, McGill University

Subgroup O: Cell Cycle Regulation of Morphogenetic Behavior

Room 113B

Organizers: **David Q. Matus**, Stony Brook University; and **Benjamin L. Martin**, Stony Brook University

Eukaryotic cells undergo drastic rearrangements in response to their local microenvironment. These morphogenetic changes are required for many cell biological activities, including the cell shape changes associated with cell motility and migration. Dynamic changes occur in cytoskeletal architecture between interphase and mitosis, and animal cells exhibit additional morphogenetic phenomena as they differentiate and exit the cell cycle. Traditionally, simultaneous examination of cell cycle state and cell behavior has been challenging, due to a lack of live cell cycle biosensors. For this reason, it has been difficult to unravel the relationship between cell cycle state and execution of morphogenetic behavior. However, recent advances in both imaging and cell cycle state biosensors have facilitated re-examination of cell cycle regulation during morphogenesis, the central theme of this subgroup.

Presentations:

1:30-1:35 pm	Introduction. **David Q. Matus** and **Benjamin L. Martin**, Stony Brook University
1:35-1:50 pm	Single-cell analysis of the proliferation-quiescence decision. ***Mingwei Min** and **Sabrina Spencer**, University of Colorado Boulder
1:50-2:05 pm	The proliferation-quiescence decision in development, cancer and aging. **Laura Buttitta**, University of Michigan
2:05-2:20 pm	Synchronization of the cell cycle in early *Drosophila* embryos. **Stefano di Talia**, Duke University School of Medicine
2:20-2:35 pm	Live-imaging embryogenesis in the annelid Platynereis with a live-cell cycle reporter reveals distinct cell cycling patterns arising from a single lineage. ***B. Duygu Özpolat**[3], **Mette Handberg-Thorsager**[2], **Michel Vervoort**[1], and **Guillaume Balavoine**[1], [1]Institut Jacques Monod, [2]Max Planck Institute of Molecular Cell Biology and Genetics, [3]Marine Biological Laboratory
2:35-2:50 pm	Divergence of cell cycle regulation in space and time: a case study from spiralian micromeres. **Deirdre Lyons**, Scripps Institute of Oceanography, University of California, San Diego
2:50-3:05 pm	Mitosis choreographs FGF receptor redistribution during asymmetric heart progenitor induction in Ciona. ***Christina D. Cota**[1], **Matthew S. Dreier**[1], **William N. Colgan**[1], **Anna Cha**[2] and **Brad Davidson**[1], [1]Swarthmore College, [2]Harvard Medical School
3:05-3:20 pm	Single cell labeling and Fucci analysis in zebrafish reveal the importance of a regulated cell cycle during vertebrate body formation. **Cortney M. Bouldin**, Appalachian State University
3:20-3:35 pm	Cell cycle control of convergence and extension. **Benjamin L. Martin**, Stony Brook University
3:35-4:00 pm	Break
4:00-4:15 pm	Physical constraint induces cell division during neurulation. ***Lance A. Davidson** and **Deepthi S. Vijayraghavan**, University of Pittsburg
4:15-4:30 pm	Patterning the microtubule cytoskeleton during division and differentiation. **Jessica Feldman**, Stanford University
4:30-4:45 pm	Control of cell-cycle kinetics by EGF and Notch/Delta signaling during *C. elegans* vulval development. ***Wolfgang Keil**, **Sha Shaham,** and **Eric D. Siggia**, The Rockefeller University
4:45-5:00 pm	Cell cycle regulation of invasive behavior: insights from *C. elegans* anchor cell invasion. **Abraham Q. Kohrman**, **Jayson Smith**, **Wan Zhang**, and ***David Q. Matus**, Stony Brook University
5:00-5:15 pm	Mitotic cooperativity in collective cancer cell invasion. ***Emily Summerbell** and **Adam Marcus**, Winship Cancer Institute, Emory University School of Medicine
5:15-5:30 pm	Invasion, migration, and proliferation in development and metastasis. **Andrew Ewald**, Johns Hopkins University School of Medicine

* denotes presenting author

Subgroup P: Cell-Cell Fusion

Room 108A

Organizers: **Elizabeth Chen**, University of Texas Southwestern Medical Center; and **Mark Rose**, Georgetown University

Cell-cell fusion is a fundamental cellular process required for fertilization, development, and regeneration. The past two decades have witnessed remarkable progress in understanding this process, highlighted by the identification of transmembrane fusogens in *C. elegans*, *Chlamydomonas* and the placenta, the discovery of a highly conserved asymmetric fusogenic synapse, where mechanical forces generated by actin polymerization and actomyosin contraction drive cell membrane fusion, and the identification of highly conserved proteins regulating cell fusion in fungal mating. What used to be a small and upcoming field has been gaining a lot of momentum and attracting an influx of new investigators. Recently, the field is buzzing with excitement as new studies have structurally linked the *C. elegans* and *Chlamydomonas* fusogens, molecularly linked a fusogen and the actin cytoskeleton, and uncovered a potential bipartite skeletal muscle-specific fusogen. This subgroup aims to bring together investigators studying cell-

cell fusion in different organisms and with different methodologies, showcase the recent developments in the field, and provide a platform for exchanging ideas and synergizing future studies.

Presentations

*First session moderated by **Elizabeth Chen***

1:30-1:35 pm	Introduction. **Elizabeth Chen**, University of Texas Southwestern Medical Center; and **Mark Rose**, Georgetown University
1:35-1:55 pm	Positive and negative regulation of cell fusion in budding yeast. **Mark Rose**, Georgetown University
1:55-2:15 pm	Fusing yeast cells once and only once. **Sophie Martin**, University of Lausanne
2:15-2:35 pm	The gamete membrane fusion reaction: many adhesins, a single protein (HAP2) for bilayer merger. **Bill Snell**, University of Maryland
2:35-2:55 pm	The first superfamily of cell-cell fusion: Fusexins are sexual, viral and somatic fusogens. **Benjamin Podbilewicz**, Technion – Israel Institute of Technology
2:55-3:15 pm	Phosphatidylserine signaling in viral and developmental fusion. **Leonid Chernomordik**, National Institute of Child Health and Human Development, NIH
3:15-3:30 pm	Break

*Second session moderated by **Mark Rose***

3:30-3:50 pm	Mechanical tension drives cell-cell fusion. **Elizabeth Chen**, University of Texas Southwestern Medical Center
3:50-4:10 pm	Serum response factor controls myoblast fusion through the maintenance of actin architecture. **Athanassia Sotiropoulos**, Inserm – French National Institute of Health and Medical Research
4:10-4:30 pm	The micropeptide myomixer controls cell fusion and skeletal muscle formation. **Pengpeng Bi**, University of Texas Southwestern Medical Center
4:30-4:50 pm	Role of myomaker and myomerger during myoblast fusion. **Douglas Millay**, Cincinnati Children's Hospital Medical Center
4:50-5:10 pm	Convergent evolution of viral and cellular membrane fusion proteins. **Roy Duncan**, Dalhousie University
5:10-5:30 pm	Human placental syncytialization: from the very first fusion event to the largest syncytia. **Hongmei Wang**, Chinese Academy of Sciences

Subgroup Q: Emerging Model Systems

Room 113A

Organizers: **Bob Goldstein**, University of North Carolina at Chapel Hill; and **Mansi Srivastava**, Harvard University

Many fascinating questions in cell biology have been set aside for generations because they involve phenomena that aren't found in the popular model systems. But this situation is improving, as techniques developed in popular model systems are increasingly applied to other organisms—leading to a recent flowering of emerging and re-emerging models suited to answering diverse questions. Moreover, the study of diverse non-model organisms has led to the discovery of new phenomena that may have widespread importance. In this session, speakers will present cutting-edge results from diverse emerging model systems. The session will end with a Q&A panel in which all speakers will answer questions about topics relevant to studying emerging model systems, for example, challenges in getting started with a new model, approaches for sharing organisms and methods, strengths and limitations of emerging models, funding, and career development prospects.

Presentations:

1:30-1:35 pm	Introduction. **Bob Goldstein**, University of North Carolina at Chapel Hill; and **Mansi Srivastava**, Harvard University
1:35-1:49 pm	Cellular biology of axolotl regeneration. **Elly Tanaka**, IMP, Vienna
1:49-2:03 pm	Regeneration in annelids. **Alexa Bely**, University of Maryland
2:03-2:17 pm	Germ cell biology in colonial ascidians. **Tony De Tomaso**, University of California, Santa Barbara
2:17-2:31 pm	DNA repair and cancer biology in naked mole rats. **Vera Gorbunova**, University of Rochester
2:31-2:45 pm	Chromosome biology in the gnat *Sciara*. **Susan Gerbi**, Brown University
2:45-3:00 pm	Mechanisms of coral symbiosis in *Aiptasia*. **Annika Guse**, Heidelberg University
3:00-3:15 pm	Break
3:15-3:29 pm	Centriole assembly and function in *Tetrahymena*. **Chad Pearson**, University of Colorado School of Medicine
3:29-3:43 pm	Cellular structures mediating a parasitic lifestyle in *Giardia*. **Scott Dawson**, University of California, Davis

3:43-3:57 pm	Cell shape regulation in *Helicobacter*. **Nina Salama**, Fred Hutchinson Cancer Research Center
3:57-4:11 pm	Archeal cell organization and shape. **Ethan Garner**, Harvard University
4:11-4:25 pm	Cell biology of unicellular relatives of animals. **Elena Casacuberta**, Consejo Superior de Investigaciones Científicas, Barcelona
4:25-4:39 pm	Evolutionary origins of epithelial organization. **Scott Nichols**, University of Denver
4:39-4:55 pm	Evolution of cell motility mechanisms. **Lillian Fritz-Laylin**, University of Massachusetts at Amherst
4:55-5:30 pm	Question and answer panel with all speakers

Subgroup R: From Motors to Cancer: Integrating Mechanical Forces across Scales

Room 118B

Organizers: **Johanna Ivaska**, University of Turku; and **Xavier Trepat**, Institute for Bioengineering of Catalonia

Understanding complex system-level diseases, like metastatic cancer, requires sophisticated understanding of the biological processes involved. Many such processes, including motility, invasion, adhesion, matrix remodeling, and intra/extravasation, require cells to exert and sense physical forces. These forces are generated at the level of individual motor molecules and integrated across scales up to cell clusters and entire tumors. The aim of this subgroup is to bring together scientists working on different levels of this complex process to understand how mechanical forces impact cancer progression. The session will span the entire scope from modeling and detailed understanding of individual molecular motors, to force generation and dissipation in cellular cytoskeletal networks and adhesions, to collective cancer cell behavior in reductionist systems and in vivo.

Presentations:

1:30-1:35 pm	Introduction. **Johanna Ivaska**, University of Turku
1:35-2:05 pm	Simulating cell migration. **David Odde**, University of Minnesota
2:05-2:35 pm	Alterations in focal adhesion architecture and force transduction accompanying epithelial to mesenchymal transition. **Alexander Dunn**, Stanford University
2:35-3:00 pm	Integrin activity and cell adhesion dynamics. **Johanna Ivaska**, University of Turku
3:00-3:30 pm	Biomaterials approaches to assess the role of ECM dynamics in cancer. **Claudia Fischbach**, Cornell University
3:30-4:00 pm	Mechanics of collective cell invasion, division and folding, **Xavier Trepat**, Institute for Bioengineering of Catalonia
4:00-4:30 pm	What cell-level processes govern tissue solidification and surface tension during development and disease? **Lisa Manning**, Syracuse University
4:30-5:00 pm	Crosstalk between carcinoma-associated fibroblasts and cancer cells during invasion. **Danijela Vignevic**, Institute Curie
5:00-5:30 pm	Blood flow forces metastatic extravasation. **Jacky Goetz**, University of Strasbourg

Subgroup S: Sharing and Reusing Cell Image Data

Room 119B

Organizer: **Assaf Zaritsky**, University of Texas Southwestern Medical Center and the Weizmann Institute of Science

The rapid growth in content and complexity of cell imaging data creates an opportunity for synergy between experimental and computational scientists. Sharing microscopy data enable computational scientists to develop algorithms and tools for data analysis, integration, and mining. These tools can be applied by experimentalists to promote discovery. We are now at the dawn of this revolution: Infrastructure is constantly being developed for data standardization, deposition, sharing, and analysis; journals and funding agencies mandate data deposition; data journals publish high-content microscopy datasets; quantification becomes standard in scientific publications; new analytic tools are being developed and dispatched to the community. This subgroup will bring together scientists to reflect on opening cell imaging data and the opportunities that will come along with it.

Presentations:

1:30-1:40 pm	Introduction. **Assaf Zaritsky**, University of Texas Southwestern Medical Center and The Weizmann Institute of Science
1:40-2:00 pm	Research parasites? Research symbionts? But I just want to do my research! **Casey Greene**,

	University of Pennsylvania
2:00-2:20 pm	An open data exchange ecosystem for cell migration data. **Lennart Martens**, Ghent University
2:20-2:40 pm	Using (and reusing) experimental data in computational models. **Paul Macklin**, Indiana University
2:40-3:00 pm	The Image Data Resource: a platform for publishing, integrating and mining biological imaging data at scale. **Jason Swedlow**, University of Dundee
3:00-3:30 pm	Coffee break
3:30-4:10 pm	Editor Panel on sharing and reusing cell imaging data. **Laurie Goodman**, *GigaScience*; **Emma Ganley**, *PLoS Biology*; **Quincey Justman**, *Cell Systems*; **Thomas Lemberger**, *Molecular Systems Biology*; and **Marie Bao**, *Developmental Cell*
4:10-4:30 pm	The Allen Institute for Cell Science: Building tools and sharing data to empower the scientific community. **Winfried Wiegrabe**, Allen Institute of Cell Science
4:30-4:50 pm	Integrating information from diverse microscope images: learning and using generative models of cell organization. **Robert F. Murphy**, Carnegie Mellon University
4:50-5:10 pm	Quantitative functional imaging of cell adhesion and migration. **Benny Geiger**, The Weizmann Institute of Science
5:10-5:30 pm	Discussion: barriers and solution for image data share and reuse in cell biology

Subgroup T: The Intersection of Lipids and Proteins in the Secretory Pathway

Room 119A

Organizers: **Guillaume Thibault**, Nanyang Technological University; and **Prasanna Satpute-Krishnan**, Uniformed Services University of the Health Sciences

Recent discoveries highlight the role of lipids and proteins as key drivers of critical biological functions in the secretory pathway and tightly associated compartments, such as lipid droplets and autophagosomes. These functions include lipid and protein homeostasis, cell signaling, and protein quality control and secretion. This subgroup will provide a platform for researchers coming from traditionally distinct fields of lipid and protein biology to discuss common interests in lipid-protein interactions. Specific topics include: sphingolipid biosynthesis, lipid droplets formation and lipid trafficking, lipid homeostasis and the unfolded protein response (UPR), ER-associated protein degradation (ERAD), GPI-anchor processing, protein quality control, and lipid-protein interactions in the formation of membrane microdomains.

Presentations:

1:30-1:35 pm	Opening remarks. **Prasanna Satpute-Krishnan**, Uniformed Services University of the Health Sciences; and **Guillaume Thibault**, Nanyang Technological University
1:35-2:00 pm	Lipid droplets: organelle crosstalk and cellular functions. **James Olzmann**, University of California, Berkeley
2:00-2:25 pm	Role of transmembrane domain 1 of LCB1 in ORM regulation of serine palmitoyltransferase. **Teresa Dunn**, Uniformed Services University of the Health Sciences
2:25-2:50 pm	Lipid droplet budding from specialized ER domains. **William Prinz**, National Institutes of Health
2:50-3:15 pm	Mechanisms of membrane protein quality control. **Pedro Carvalho**, University of Oxford
3:15-3:40 pm	Dissecting the role of the UPR during lipid perturbation. **Guillaume Thibault**, Nanyang Technological University
3:40-4:05 pm	Recognition of transmembrane domains during protein quality control. **Malaiyalam Mariappan**, Yale School of Medicine
4:05-4:30 pm	Structural changes of GPI-anchor in the secretory pathway. **Taroh Kinoshita**, Osaka University,
4:30-4:55 pm	Protein quality control in the secretory pathway. **Prasanna Satpute-Krishnan**, Uniformed Services University of the Health Sciences
4:55-5:20 pm	Regulation of protein recruitment to plasma membrane platforms by lipid phase separation: implications for viral assembly and microvesicle biogenesis. **Prabuddha Sengupta**, Howard Hughes Medical Institute, Janelia Research Campus
5:20-5:30 pm	Closing remarks

Subgroup U: Translating Cell Biology Research into Effective Immunotherapies for Cancer

Room 117

Organizers: **Daniel J. Powell, Jr.,** University of Pennsylvania; and **Keith L. Knutson**, Mayo Clinic Jacksonville

This subgroup, presented in collaboration with the Society for Immunotherapy of Cancer, will address how the integration and translation of cell biology is necessary for effective cancer immunotherapy applications. The speakers will provide an overview of the critical cellular mediators and processes in cancer cell biology as it relates to success of immunotherapy, highlighting recent advances in immune escape/resistance, mutational landscape/neoantigen discovery, and current immunotherapeutic applications.

Presentations:

Theme 1: Tumor Plasticity and Mechanisms of Immune Resistance

1:30-1:55 pm	Mechanisms of Resistance to Cytotoxic Cell Killing. **Steven M. Frisch**, West Virginia University
1:55-2:25 pm	Cytokines and Tumor Immune Resistance. **Claudia Palena**, National Cancer Institute

Theme 2: Modifying Malignant Cells to Enhance Susceptibility to Immunotherapy

2:25-2:55 pm	Radiation Therapy and the Immune Response. **Andy J. Minn**, University of Pennsylvania
2:55-3:20 pm	Epigenetic Potentiation of Immunotherapies. **Kunle Odunsi**, Roswell Park Cancer Institute
3:20-3:35 pm	Break

Theme 3: Neoantigen Discovery and Applications

3:35-4:00 pm	Bioinformatic Pipelines. **Yan Asmann**, Mayo Clinic Jacksonville
4:00-4:30 pm	Mutation Load, Outcomes in Cancer and Personalized Cancer Vaccines. **Catherine J. Wu**, Dana-Farber Cancer Institute

Theme 4: Clinical Translation and Current Use of Immunotherapies

4:30-5:00 pm	Immune Checkpoint Blockade. **Keith L. Knutson**, Mayo Clinic Jacksonville
5:00-5:30 pm	Adoptive T Cell Therapy. **Bruce Levine**, University of Pennsylvania

Subgroup V: Tunneling Nanotubes: Intercellular Highways, New Frontiers for Deciphering Intercellular Communication in Disease

Room 108B

Organizer: **Emil Lou**, University of Minnesota

There has been a steady rise in interest in studying novel cellular extensions and their potential roles in facilitating human diseases. One of the exciting new aspects of this field is improved characterization and understanding of tunneling nanotubes, which are actin-based filamentous protrusions that form and connect cells at long distance. These connections serve as direct conduits for intercellular communication in a wide range of cell types. Recent work has begun to unravel their role in mediating cancer cell invasion and drug resistance, cellular transfer of proteins or cargo that induce neurologic compromise, and even stem cell rescue via cellular transfer of mitochondria following hypoxic injury. This subgroup will bring together leading researchers in this field to discuss work on tunneling nanotubes and the potential implications for human disease.

Presentations:

1:30-1:40 pm	Introduction. **Emil Lou**, University of Minnesota
1:40-2:05 pm	Tunneling nanotubes: mechanism of formation, structure and role in the spreading of neurodegenerative diseases. **Chiara Zurzolo**, Institut Pasteur
2:05-2:30 pm	Involvement of tunneling nanotubes in tissue preservation after hematopoietic stem cell transplantation in degenerative genetic disorders. **Stephanie Cherqui**, University of California, San Diego
2:30-2:40 pm	Questions
2:40-3:05 pm	Role of TNT in HIV infection and reactivation. **Eliseo Eugenin**, Rutgers University, New Jersey
3:05-3:30 pm	The role of Rho-GTPases and actin polymerization in macrophage tunneling nanotube biogenesis. **Dianne Cox**, Albert Einstein College of Medicine
3:30-3:40 pm	Questions
3:40-4:05 pm	Tumor microtubes induce resistance to chemotherapy, radiation, and surgical lesions in glioblastomas. **Frank Winkler**, University of Heidelberg

4:05-4:30 pm	Lattice light sheet imaging of membrane nanotubes between human breast cancer cells in culture and in brain metastases. **Ian Smith**, University of California, Irvine
4:30-4:40 pm	Questions
4:40-5:05 pm	Intercellular mRNA trafficking via membrane nanotubes in mammalian cells. **Gal Haimovich**, Weizmann Institute
5:05-5:20 pm	Tunneling nanotubes: the missing link to tumor heterogeneity and emergence of chemoresistance in cancer. **Emil Lou**, University of Minnesota
5:20-5:30 pm	Questions and/or general discussion on TNT biology and new avenues of investigation.

Science Learning for All: Inclusive Teaching Strategies

1:30-3:30 pm **Room 126A**

Tracie M. Addy, Associate Director, Faculty Teaching Initiatives, Yale University
Elizabeth Morse Luoma, STEM Education Program Director, Yale University
Veronica A. Segarra, Assistant Professor of Biology, High Point University
Ahna R. Skop, Associate Professor of Genetics, University of Wisconsin-Madison
Omar Quintero, Assistant Professor of Biology, University of Richmond

Scientific teaching is a pedagogical approach whereby teaching is informed by evidence and is approached with the same rigor as science itself. Inclusive teaching—the practice of using methods that engage all learners—is one of the central tenets of scientific teaching, along with active learning and assessment. In this two-hour workshop, participants will 1) review evidence regarding the impact of identity and classroom climate on student learning; 2) engage in activities that demonstrate how implicit biases affect our interactions with others; and 3) share strategies to modify instruction in order to address the needs of students with a variety of backgrounds, learning approaches, and abilities. Participants will leave empowered with concrete tools and strategies to improve their ability to promote inclusive learning environments.

Outcomes:

1. Gain awareness and understanding of how diversity and inclusion impacts science teaching and learning
2. Acquire concrete strategies on teaching inclusively in the classroom
3. Demonstrate increased confidence in your ability to implement inclusive teaching practices in your classroom

Target audience: postdocs, faculty

Hit the Ground Running: Early Success in Graduate School

2:30-3:30 pm **Room 124**

The session will feature a panel of faculty members and senior graduate students from a range of different universities. Panelists will first provide brief personal perspectives on success in graduate school, and then will answer audience questions in a highly interactive dialogue.

This session will help advanced undergraduates and early-stage graduate students improve the knowledge and skills they need to succeed in the first three years of graduate school. Panelists will discuss such topics as choosing a research lab, advisor, and project; why and how students should integrate into their local and national scientific and academic communities; and how students can bolster their scientific and professional confidence. The diverse panel will provide a variety of perspectives on early graduate education.

Outcomes:

1. Discuss the skills needed to succeed in the first three years of graduate school
2. Receive tips and advice on such topics as: choosing a lab/advisor/project; integrating into the academic community; coping with stress
3. Learn strategies to build scientific professional skills and confidence
4. Engage in an interactive question-and-answer session driven by attendee interests

Target audience: undergrads, early stage graduate students

Judged Poster Session

3:45-5:45 pm **Room 121B**

The Minorities Affairs Committee (MAC) in partnership with the Education Committee offer a judged poster session for all MAC travel grant awardees as well as undergraduate authors on abstracts. At this event postdoctoral, graduate and undergraduate posters are judged by volunteer faculty and postdocs. This event is an opportunity for networking between our diverse and up-and-coming ASCB meeting attendees and the membership at large. The experience offers professional development opportunities for presenters and professional service opportunities for poster judges.

Outcomes:

1. Communicate your lab findings with a diverse group of peers and more senior cell biologists from around the world
2. Demonstrate an understanding of the processes involved in the generation of new knowledge, including the scientific method, data collection, and analysis
3. Demonstrate the ability to ask and respond to questions about your research

Target audience: all MAC travel awardees, undergraduate authors on abstracts; all ASCB attendees

Fred Kavli Keynote Lecture

6:00 pm **Terrace Ballroom 3**

Supported by the Kavli Foundation

Building Knowledge by Integrating Levels: Genes, Cells and Behavior

Photo Credit: John Abbott

Cori Bargmann
The Rockefeller University and Chan Zuckerberg Initiative

Opening Night Reception

Immediately Following Keynote-10:00 pm **Terrace Ballroom 1, Terrace Ballroom Foyer, and Level 2 Foyer**

Supported by BioLegend

Join us in celebrating the start of another great meeting! Meet new people, find old friends and colleagues, and start having fun. All registered meeting attendees and exhibitors are invited to the buffet reception. Cash bar available.

International Research and Training Exchange Fair

8:00-9:00 pm **Terrace Ballroom Foyer**

Coordinator: **Xuebiao Yao**, University of Science & Technology of China

As a feature of the Opening Night Reception, the fair will allow attendees to learn about research, training, and other opportunities in countries around the world; encourage students and postdocs to think about possibilities in other countries; and open up exchanges between labs for international collaboration. Tables will be set up displaying information from various countries and regions around the world, and representatives will be available to answer questions. Make sure to check out this event while you enjoy refreshments and collegiality during the Opening Night Reception!

Target audience: all ASCB attendees interested in scientific opportunities around the world

Ask a Scientist Bar Night

8:30 pm **Meet at the Message Boards in the Registration Area of the Broad Street Atrium**

Groups of 5-10 scientists will go to local bars near the convention center with signs and t-shirts reading "I'm a scientist. Ask me about my research!" The purpose is for scientists to engage in conversations about science with the local public in a more organic manner, advocate for science, and have fun!

Outcomes:

1. Learn what misconceptions exist about science, while educating the public about science
2. Practice discussing science with a general audience
3. Improve the public perception of scientists

Target audience: all meeting attendees and exhibitors

Notes