Saturday
December 12, 2015

2015 cell biology
ascb annual meeting
san diego, california · december 12-16

Daily Schedule—Saturday, December 12

8:00 am-7:00 pm	Registration Open	Registration Area
9:00-10:15 am	Mentoring Keynote	Ballroom 6A
10:30 am-2:30 pm	Grant Writing Seminar	Room 5B
1:00-5:00 pm	Special Interest Subgroups	
	A. Autophagy in Disease and Survival	Room 16A
	B. Building the Cell	Room 31B
	C. Cellular and Molecular Mechanobiology: New Approaches, Systems, and Responses	Room 33A
	D: Connexins and Pannexins in Disease	Room 16B
	E: Cytoskeletal and Membrane Protein Dynamics at the T Cell Immunological Synapse	Room 23B
	F: Diverse Roles of Glycans and Glycan-Binding Proteins in Human Diseases	Room 17A
	G: Dynamic Interplay between Lipids, Curvatures, and Diseases of Biological Membranes	Room 28D
	H: Extracellular Vesicles - Biogenesis and Function	Room 29B
	I: Increasing Diversity in a Changing Research Landscape	Room 17B
	J: Microtubule Networks in Differentiated Cells	Room 32B
	K: Neuronal Cytoskeleton: Cytoarchitecture and Dynamics	Room 33B
	L: Nuclear Envelope Dynamics	Room 28B
	M: Nucleation Phenomena in Cell Biology	Room 29C
	N: Polymerizing Enzymes: New Frontiers in Protein Compartmentalization and Localization	Room 30B
	O: Quantitative Microscopy and Image Analysis: Measuring Cellular Organization and Dynamics	Room 30D
2:15-3:15 pm	Undergraduate Program	Ballroom 6A
3:30-5:30 pm	Poster Competition and Reception	Ballroom 6A
4:00-5:30 pm	High School Program: Exploring the Microscopic World with Your Own Foldscope	Room 5B
5:00-5:45 pm	Meet and Greet	Room 24A-C
6:00 pm	Keynote Symposium Sallie W. Chisholm, Massachusetts Institute of Technology The Honorable, Professor Jane Lubchenco, Oregon State University	Ballroom 20BC
6:00-8:00 pm	Posters on Display	Learning Center
Immediately following Keynote-10:00 pm	Opening Night Reception	Sails Pavilion
8:00-9:00 pm	International Research and Training Exchange Fair	Sails Pavilion

Saturday, December 12

Mentoring Keynote

9:00-10:15 am **Ballroom 6A**

Supported by a grant from The Burroughs Wellcome Fund

JoAnn Trejo
Professor, Director, San Diego IRACDA, Vice Chair for Education, Department of Pharmacology, University of California, San Diego

This talk will focus on diversity in biomedical research and professional development.

Grant Writing Seminar

10:30-2:30 pm **Room 5B**

Stephen W. Russell
Grant Writers' Seminars & Workshops, LLC

Geared toward senior postdocs and junior faculty, this seminar will address both practical and conceptual aspects that are important to the proposal-writing process. The focus is primarily on grant applications to the U.S. National Institutes of Health. Participants will be taught to write with a linear progression of logic, which leads reviewers through their applications. Audience questions and participation are encouraged.

Preregistration was required for this program and the cost is $50. If you would like to attend, please come to Room 5B just before the start of the session to see if there is room available.

Special Interest Subgroups

1:00-5:00 pm

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

Subgroup A: Autophagy in Disease and Survival

Organizers: **Nihal Altan-Bonnet**, National Heart, Lung, and Blood Institute, NIH; and **Rosa Puertollano**, National Heart, Lung, and Blood Institute, NIH **Room 16A**

This subgroup will bring together a diverse group of scientists to present their latest studies on the role of cellular autophagy membrane systems in disease and survival. The autophagosomal membrane systems are critical for maintaining protein and lipid homeostasis and overall organelle and cell identity. Cutting edge basic and translational research will be presented on the mechanisms by which the autophagosomal membrane systems and associated machinery can maintain cell survival during periods of cell stress; can be subverted during oncogenesis; can be hijacked by pathogens; and can lead to devastating cardiovascular and neurodegenerative disorders when disrupted. The goal of the subgroup will be to identify key and potentially common roles played by autophagosomal membrane systems in diverse and complex diseases and to discuss the feasibility of developing therapeutic approaches targeting these pathways.

Presentations:

1:00–1:05 pm	Introduction
1:05–1:30 pm	Intercellular transmission of viral populations by secreted autophagosomes. **Nihal Altan-Bonnet**, National Heart**,** Lung, and Blood Institute, NIH
1:30–2:00 pm	Unexpected functions of autophagy during pathogenesis. **Ken Cadwell,** New York University
2:00–2:30 pm	Harnessing the autophagy-lysosome machinery in cardiac myocytes for disease prevention and therapy. **Abhinaw Dinaw**, Washington University School of Medicine
2:30–3:00 pm	Cell death induced by nutrient deprivation. **Michael Overholtzer**, Memorial Sloan-Kettering Cancer Center
3:00–3:15 pm	Break
3:15–3:45 pm	Autophagy and Aging: Lessons from *C. elegans.* **Malene Hansen**, Sanford-Burnham Medical Research Institute
3:45–4:15 pm	Role of Autophagy in Cellular Adaptation to Stress. **Rosa Puertollano**, National Heart, Lung, and Blood Institute, NIH
4:15–4:45 pm	Mechanisms supporting lysosomal responses to intracellular nutrient availability. **Shawn Ferguson**, Yale University
4:45–5:00 pm	Discussion, General Questions

Subgroup B: Building the Cell

Organizer: **Susanne Rafelski**, University of California, Irvine, and Allen Institute for Cell Science, Seattle **Room 31B**

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:

1:00–1:05 pm	Introduction
1:05–1:25 pm	Probing cellular biophysics with genetically encoded nanoparticles. **Liam Holt**, University of California, Berkeley
1:25–1:45 pm	Organizing the bacterial cell with protein gradients. **Anthony Vecchiarelli**, National Institutes of Health
1:45–2:05 pm	Organization of spindle microtubule architecture by minus-end directed kinesin motors. **Melissa Gardner**, University of Minnesota
2:05–2:25 pm	Towards whole cells modeled in 3D molecular detail and community curated with cellPack. **Graham Johnson**, University of California, San Francisco
2:25–2:45 pm	Building mechanosensitive artificial cells. **Allen Liu**, University of Michigan
2:45–3:05 pm	Israel reconstitution of contractile actin networks within artificial cells. **Kinneret Keren**, Technion Israel Institute of Technology, Haifa, Israel
3:05–3:20 pm	Break
3:20–3:40 pm	3D mechanics of fast amoeboid cell migration. **Juan Carlos Del Alamo,** University of California, San Diego
3:40–4:00 pm	Spatio-temporal dynamics and metabolic alterations of P53 upon DNA damage. **Michelle Digman**, University of California, Irvine
4:00–4:20 pm	Reliable signal transduction. **Roy Wollman**, University of California, San Diego
4:20–4:40 pm	Cell size dependent mitochondrial functionality in size control. **Teemu Miettinen**, University of Dundee, Dundee, Scotland
4:40–5:00 pm	Noise and robustness in an organelle size control system. **Wallace Marshall**, University of California, San Francisco

Subgroup C: Cellular and Molecular Mechanobiology: New Approaches, Systems, and Responses

Organizers: **Morgan Huse**, Memorial Sloan-Kettering Cancer Center; **Lance C. Kam**, Columbia University; **Bin Chen**, Zhejiang University; and **Baohua Ji**, Beijing Institute of Technology, China **Room 33A**

Over the past decade, a number of key technological breakthroughs have emerged that enable investigators to address how physical forces influence cellular physiology. As a result, we have begun to appreciate the importance of mechanosensing in shaping cell fate and function. It is now well established that cells can sense the physical properties of their environment and use this information to guide their proliferative and developmental decisions. Furthermore, there are indications that mechanotransduction serves as a conduit for information transfer between pairs of cells and also among groups of cells within a tissue. We are just beginning to understand how these interactions control systems level behavior in both normal and diseased states. This program will bring together a diverse group of biologists, bioengineers, and physicists to discuss exciting new conceptual and technical advances in mechanobiology. The following four topics will be covered: 1) Mechanosensing in the context of cellular differentiation, homeostasis, and disease, 2) Mechanotransduction during tissue development and repair, 3) Mechanical properties of cell-cell interfaces and their functional consequences, and 4) Novel tools for the analysis of cellular mechanics both in vitro and in vivo. It is our hope that this session will promote wide-ranging discussion of both the key biological questions facing the field and also the technologies that will enable investigators to address them.

Presentations**:**

1:00–1:10 pm	Introduction. **Lance Kam**, Columbia University
1:10–1:30 pm	Force-dependent regulation of alpha-catenin in adherens junction assembly. **William Weis**, Stanford University
1:30–1:50 pm	Mechanotransduction: not just a local affair**. Deborah Leckband**, University of Illinois
1:50–2:10 pm	Nanoscale dynamics of cyto-mechanical transduction triggered by single adhesive ligand bonds to receptors in a spreading cell surface. **Evan Evans,** Boston University
2:10–2:30 pm	Mechanosensing in cell collective behaviors on patterned substrate. **Baohua Ji,** Beijing Institute of Technology, Beijing, China
2:30–2:50 pm	Illuminating the osmotic regulation of wound detection in zebrafish. **Philipp Niethammer**, Memorial Sloan-Kettering Cancer Center
2:50–3:00 pm	Break
3:05–3:25 pm	Niche dynamics promote epithelial-mesenchymal transition via mechanical signaling. **Adam Engler**, University of California, San Diego
3:25–3:45 pm	Actin retrograde flow orients and aligns activated, ligand-engaged integrins in focal adhesions. **Clare Waterman**, National Heart, Lung, and Blood Institute, NIH
3:45–4:05 pm	Cooperative unfolding of the GPIbα mechanosensitive and leucine-rich repeat domains transduces signals across platelet membrane. **Cheng Zhu**, Georgia Institute of Technology
4:05–4:25 pm	DNA-based nanoparticle tension probes reveal the role of molecular forces in T cell function. **Khalid Salaita**, Emory University
4:25–4:45 pm	Mechanical potentiation of cytotoxic T cell function. **Morgan Huse**, Memorial Sloan-Kettering Cancer Center
4:45–5:00 pm	Closing Remarks and Open Discussion

Subgroup D: Connexins and Pannexins in Disease

Organizer: **Dale Laird**, University of Western Ontario, Canada **Room 16B**

It is a general requirement for normal function that adjacent cells within human tissues exchange small molecules through special channels called gap junctions which are assembled from connexins (Cx). In the last couple of decades, mutations in over half of the 21 connexin gene family have been linked to human disease conditions including heart defects, neurodegeneration, skeletal abnormalities, skin disease, stroke, epilepsy, optic disorders and millions of cases of hereditary sensorineural deafness. In the new millennium, a family of three proteins, pannexins, were discovered. These large-pore channel forming proteins share functional overlap with connexin hemichannels in releasing small molecules to the extracellular environment that serve a role in paracrine signaling. Among other roles, pannexins have been described as ATP release channels. Signaling through pannexin channels contributes to seizures under ischemic or epileptic conditions, leads to inflammatory bowel disease, promotes melanoma disease progression and facilitates osteoarthritis.

Presentations:

1:00–1:05 pm	Opening Remarks. **Dale W. Laird**, University of Western Ontario, Canada
1:05–1:20 pm	Pannexin 2 localization at ER-mitochondria contact sites sensitizes cells to apoptosis. **Maxence Le Vasseur,** University of British Columbia, Vancouver, Canada
1:20–1:35 pm	ATP evokes pannexin 1 endocytosis to endosomal compartments. **Andrew K.J. Boyce,** University of Victoria, BC, Canada
1:35–1:50 pm	The role of pannexins in fat accumulation and metabolism. **Vanessa R. Lee,** Western University, London, Ontario, Canada
1:50–2:05 pm	Cx46 drives self-renewal and CSC function in glioblastoma. **Masahiro Hitomi,** Cleveland Clinic
2:05–2:20 pm	Targeting gap junction stability to modulate tissue remodeling during pancreas cancer. **Joell L. Solan**, Fred Hutchinson Cancer Research Center
2:20–2:35 pm	Regulation of the connexin 26 gene during epididymal differentiation. **Daniel G. Cyr,** Institut National de la Recherche Scientifique, Quebec, Canada
2:35–2:50 pm	Connexin 43.4 functions as a hemichannel in left-right development in Zebrafish. **Jordan M. Welker,** Iowa State University, Ames
2:50–3:00 pm	Stretch Break **Moderator: TBA**
3:00–3-15 pm	Modeling Cx43-linked pathologies in the human context. **Jessica Esseltine**, Western University, London, Ontario, Canada
3:15–3:30 pm	Alternate translation initiation regulates gap junction losses during epithelial-mesenchymal transition. **James W. Smyth,** Virginia Tech Carilion Research Institute
3:30–3:45 pm	GJA1-20k contributes specificity to gap junction delivery. **Shan-Shan Zhang,** Cedars-Sinai
3:45–4:00 pm	Compartment specific actions of Cx43 and Cx45 in bone modeling and homeostasis. **Roberto Civitelli,** Washington University in St. Louis
4:00–4:15 pm	The cataract related mutant N188T in Cx46 inhibits formation of functional gap junction channels by impairing docking process of Cx46 hemichannels. **Anaclet Ngezahayo,** Leibniz Universität, Hannover, Niedersachsen, Germany
4:15–4:30 pm	Alpha-type Cx43 function is restored with 4-PBA treatment in cyctic fibrosis airway epithelial cells that express misfolded F508del-CFTR protein. **Samuel A. Molina**, Emory University
4:30–4:45 pm	Acetylcholine prevents the expression of connexin hemichannels in denervated skeletal myofibers. **Juan C. Saez, Pontificia Universidad Católica de Chile**
4:45–5:00 pm	The gap junction protein, Cx43, forms supramolecular complexes through non-overlapping binding sites for drebrin, tubulin and ZO-1. **Cinzia Ambrosi,** University of California, San Diego

Subgroup E: Cytoskeletal and Membrane Protein Dynamics at the T Cell Immunological Synapse

Organizers: **John Hammer,** National Heart, Lung, and Blood Institute, NIH; **Xufeng Wu,** National Heart, Lung, and Blood Institute, NIH; and **Larry Samelson,** National Cancer Institute, NIH **Room 23B**

Upon contact with an antigen presenting cell (APC), T lymphocytes undergo rapid reorganizations of their microtubule and actomyosin cytoskeletons. These rearrangements serve to polarize the T cell's secretory system in the direction of the bound APC and to drive the centripetal movement of T cell receptor and integrin clusters to form the mature immunological synapse. All of these events are required for robust T cell signaling and for the full expression of T cell effector functions. Recent efforts to understand the molecular mechanisms underlying these complex cytoskeletal and signaling phenomena have benefited greatly from the application of three approaches: uper-resolution imaging, in vitro reconstitution, and single-molecule biophysics. This subgroup will focus on recent results gleaned from the application of these three approaches.

1:00–1:05 pm	Introduction. **John Hammer,** National Heart, Lung, and Blood Institute, NIH; **Xufeng Wu,** National Heart, Lung, and Blood Institute, NIH; and **Larry Samelson,** National Cancer Institute, NIH
1:05–1:25 pm	Negative regulation of T cells: reconstitution and visualization of the PD-1 signaling pathway. **Enfu Hui[1]*, Jing Zhu[2], Jeanne Cheung[2], Xiaolei Su[1], Marcus Taylor[1], Jeong Kim[2], Ira Mellman[2], and Ronald Vale[1].** [1]University of California, San Francisco, [2]Genentech Inc.
1:25–1:45 pm	Mechanical forces in B cell synapses. **Pavel Tolar**, The Francis Crick Institute, London, UK
1:45–2:05 pm	Structured illumination microscopy of the immune synapse reveals novel insights into actomyosin network formation and function. **Srich Murugesan[1]*, Jinsung Hong[1], Jason Yi[2], Dong Li[3], Lin Shao[3], Xufeng Wu[1], Eric Betzig[3], and John A. Hammer[1].** [1] National Heart, Lung, and Blood Institute, NIH, [2]National Cancer Institute, NIH, [3]Janelia Farm HHMI
2:05–2:25 pm	Cooperative TCR–pMHC–CD8 catch bond distinguishes thymocyte positive versus negative selection. **Jinsung Hong[1]*, Chenghao Ge[1], Ke Bai[1], Baoyu Liu[1], Loice Chingozha[1], Yun Zhang[2],**

	Hang Lu[1], Khalid Salaita[2], Brian D. Evavold[2], Alfred Singer[3], and Cheng Zhu [1]. [1]Georgia Institute of Technology, [2]Emory University School of Medicine, [32]National Cancer Institute, NIH,
2:25–2:45 pm	Dynamic modulation of cortical actin at the immunological synapse controls cytotoxic granule secretion. **Alex T. Ritter[1,2]*, Gillian M. Griffiths[2], and Jennifer Lippincott-Schwartz[1].** [1]National Institute of Child Health and Human Development, NIH, [2]Cambridge Institute for Medical Research, Cambridge, UK
2:45–2:55 pm	General questions and answers
2:55–3:15 pm	Break
3:15–3:35 pm	Dynamics and regulation of extracellular vesicle formation in the immunological synapse. **Michael L. Dustin,** University of Oxford, Oxford, UK
3:35–3:55 pm	Multiplexed super-resolution imaging of the immune synapse in T cells. **Jason Yi[1]*, Valarie Barr[1], Asit Manna[1], Jennifer Hong[2], Keir Neuman[2], and Lawrence Samelson[1].** [1]National Cancer Institute, NIH, [2] National Heart, Lung, and Blood Institute, NIH
3:55–4:15 pm	The nanoscale organization of synaptic actin and NK cell receptors. **Daniel M. Davis,** anchester Collaborative Center for Inflammation Research, Manchester, UK
4:15–4:35 pm	Reconstitution of TCR signaling on model membranes. **Jonathon A. Ditlev[1,2]*, Xiaolei E. Su[1,3], Darius V. Köster[1,4], Anthony R. Vega[2], Enfu Hui[1,3], Julia Okrut[1,3], Sudeep Banjade[1,2], David S. King[5], Jack Taunton[1,3], Khuloud Jaqaman[2], Satyajit Mayor[1,4], Ronald D. Vale[1,3], and Michael K. Rosen[1,2].** [1]The HHMI Summer Institute, Marine Biological Laboratory, [2]University of Texas Southwestern Medical Center, [3]University of California, San Francisco, [4]National Centre for Biological Sciences, Bangalore, India, [5]University of California, Berkeley
4:35–5:00 pm	General questions and answers

*Speakers

Subgroup F: Diverse Roles of Glycans and Glycan-Binding Proteins in Human Diseases

Organizers: **Wei-Sheng Chen**, Tufts University; and **Christopher J Fisher**, University of California, San Diego **Room 17A**

Glycans, the carbohydrate component of glycoconjugates, are rapidly being considered as a third biological language in addition to nucleic acid and protein sequences. Recent studies have demonstrated that glycans and glycan-binding proteins play a crucial role in the pathogenesis of human diseases including but not limited to tumor metastasis, viral and bacterial infection, cardiovascular disease, and myopathy. Furthermore, glycan-mediated interactions have been shown to be critical in the treatment of disease, and play a particularly important part in vaccine development. In this Special Interest Subgroup meeting, we focus on 1) the fundamental difference between glycan-protein and protein-protein interactions, 2) glycosylation as a dynamic process that modulates several cellular responses, and 3) opportunities and challenges to develop glycan-based therapies. We bring together researchers from different fields of glycobiology to share their views on this specialized, yet broadly impactful area of cell biology research.

Presentations:

1:00–1:03 pm	Introduction
1:03–1:26 pm	Unusual features of human sialic acid biology: implications for disease. **Ajit Varki,** University of California, San Diego
1:26–1:49 pm	Human disorders of sialic acid synthesis: pathway and prospects for therapy. **Marjan Huizing**, National Human Genome Research Institute, NIH
1:49–2:12 pm	The 'dark matter' of cellular signaling: *O*-GlcNAc and disease epigenetics. **John Hanover,** National Institute of Diabetes and Digestive and Kidney Diseases, NIH
2:12–2:35 pm	Control of COPII vesicle trafficking by intracellular protein glycosylation. **Michael Boyce,** Duke University
2:35–2:58 pm	Glycocalyx engineering to analyze the effects of sialoglycan presentation on early stage influenza infection. **Kamil Godula,** University of California, San Diego
2:58–3:03 pm	Break
3:03–3:26 pm	Convergent glycan evolution—meet your inner owl monkey. **Pascal Gagneux,** University of California, San Diego
3:26–3:49 pm	Cancer vaccine development. **Chi-Huey Wong,** Academia Sinica and Scripps Research Institute
3:49–4:12 pm	Glycan-dependent recognition of broadly neutralizing antibodies to HIV: implications for vaccine design. **Ian Wilson,** Scripps Research Institute

4:12–4:35 pm	Galectin ligand-binding, specificity, mechanism and function. **Hakon Leffler**, Lund University, Lund, Sweden
4:35–4:58 pm	Glycosphingolipids and lectins in fundamental and biomedical research on how to build endocytic pits without clathrin. **Ludger Johannes**, Institut Curie, Centre de Recherche, Paris, France
4:58–5:00 pm	Concluding remarks

Subgroup G: Dynamic Interplay between Lipids, Curvatures, and Diseases of Biological Membranes

Organizers: **Takanari Inoue**, Johns Hopkins University; and **Guillaume Thibault**, Nanyang Technological University, Singapore **Room 28D**

The past decade has underscored the enormous complexity of cellular functions, where not only biochemical reactions but also physical properties play critical roles. Among these, biological membranes have emerged as a driving force in which lipid composition and membrane curvature are interconnected and influence numerous biological pathways. Highlighting the importance in biological functions, numerous pathologies have been linked to biological membrane dysregulation. Only recently has a new generation of tools begun to emerge with sufficient power to peer into biochemical and physical membrane properties and dynamics. This special interest subgroup will bring together investigators from different disciplines that have made contributions to these emerging fields. In this session, we will cover molecular and cellular mechanisms regulating biological membranes and cell stress responses to lipid perturbation. In addition, emerging technologies to both visualize and manipulate membrane curvatures will be discussed. Speakers will stress how long-standing and fundamental biological questions are beginning to yield through the application of this new generation of tools. Biological questions will relate to a wide array of vital processes, including endocytosis and exocytosis, cell migration, neuronal plasticity, cellular stress responses, metabolic diseases, etc. Due to the multidisciplinary nature of the studies, the theme targets an extremely diversified audience in the fields of cell biology, biotechnology, nanotechnology, method development, chemical biology, material science, general chemistry and engineering, computational biology, and synthetic biology. A session under this theme will facilitate exchange of ideas among this unusually diverse community, thus offering lively, inspiring opportunities for unconventional research discussions.

Presentations:

1:00–1:05 pm	Opening remarks. **Takanari Inoue**, Johns Hopkins University, and **Guillaume Thibault**, Nanyang Technological University, Singapore
1:05–1:25 pm	Role of membrane-bending proteins in cell polarity formation. **Toshiki Itoh**, Kobe University, Japan
1:25–1:30 pm	Discussion
1:30–1:50 pm	ER protein quality control and lipid homeostasis: unexpected functional connections. **James Olzmann**, University of California, Berkeley
1:50–1:55 pm	Discussion
1:55–2:15 pm	Membrane bending dynamics during clathrin-mediated endocytosis revealed by pol-TIRF microscopy. **Adam Hoppe**, South Dakota State University
2:15–2:20 pm	Discussion
2:20–2:40 pm	Golgi PI4P is a lipid pH biosensor that regulates gene expression and cell growth in response to changes in cytoplasmic pH. **Christopher Loewen**, University of British Columbia, Canada
2:40–2:45 pm	Discussion
2:45–3:05 pm	Differential control of actin polymerization dynamics via nanoscale membrane curvature. **Milos Galic**, University of Münster, Germany
3:05–3:10 pm	Discussion
3:10–3:30 pm	lpin-1 is necessary for low-PC activation of SBP-1/SREBP-1. **Amy Walker**, University of Massachusetts Medical School
3:30–3:35 pm	Discussion
3:35–3:55 pm	Synthetic and physiological approaches to membrane curvatures in cell migration, **Allison Suarez**, Johns Hopkins University
3:55–4:00 pm	Discussion
4:00–4:20 pm	Destabilization of a subset of ER transmembrane proteins under lipid disequilibrium. **Guillaume Thibault**, Nanyang Technological University, Singapore
4:20–4:25 pm	Discussion
4:25–4:45 pm	F-BAR proteins as driving force for cortical wave propagation. **Min Wu**, Mechanobiology Institute, National University of Singapore, Singapore
4:45–4:50 pm	Discussion

Subgroup H: Extracellular Vesicles - Biogenesis and Function

Organizers: **David Katzmann**, Mayo Clinic; and **Tushar Patel**, Mayo Clinic **Room 29B**

Extracellular vesicles (EVs) are secreted by most cell types and have generated interest in the research community due to their impact on physiology. EVs serve as both a mechanism by which a cell can remove unwanted material, but also as a vehicle for cell-cell communication. Recent discoveries pertaining to the biosynthesis and function of EVs are linking these carriers to fundamental aspects of cell and organismal physiology and disease. This Special Interest Subgroup meeting will highlight these developments to ASCB meeting participants and the press, drive collegial interactions within the cell biology and beyond, and provide a forum for critical exchange. Thematic presentations will be followed by an interactive discussion involving all participants pertaining to present and future research areas. This meeting will be supported by the NIH Common Fund supported Extracellular RNA Communication Consortium and the activities and resources available through this consortium will be discussed.

Presentations:

1:00–1:10 pm	Introductory remarks. **David Katzmann**, Mayo Clinic
1:10–1:30 pm	Exosomes for the treatment of autoimmune and age-related diseases. **Paul Robbins**, The Scripps Research Institute, Jupiter, Florida
1:30–1:50 pm	Cell-free packaging of microRNAs into exosomes reveals Y-box protein I as a critical sorting factor. **Matthew Shurtleff**, University of California, Berkeley
1:50–2:10 pm	Quantitative proteomic comparison of subtypes of extracellular vesicles: definition of new subfamilies of exosomal and non-exosomal secreted vesicles. **Joanna Kowal**, Institut Curie, Paris, France
2:10–2:30 pm	Extracellular vesicle secretion from apical and basolateral domains of polarized human cholangiocytes. **Brian Davies**, Mayo Clinic
2:30–2:40 pm	Break
2:40–3:00 pm	Intercellular oncogenic pathways - pathological biogenesis of extracellular vesicles in cancer. **Janusz Rak**, McGill University, Quebec, Canada
3:00–3:20 pm	KRAS regulation of miRNA sorting into exosomes. **Alissa Weaver**, Vanderbilt University Medical Center
3:20–3:40 pm	A new mode of EGF receptor ligand signaling via exosomes. **Robert Coffey**, Vanderbilt University Medical Center
3:40–4:00 pm	The Leukosome: a biomimetic proteolipid vesicle derived from immune cells**. Ennio Tasciotti**, The Methodist Research Institute
4:00–4:20 pm	The NIH Extracellular RNA Consortium. **Tushar Patel**, Mayo Clinic
4:20–4:40 pm	Future directions in extracellular vesicle research, **Fred Hochberg**, University of California, San Diego
4:40–5:00 pm	Discussion

Subgroup I: Increasing Diversity in a Changing Research Landscape

Organizers: **Jana Marcette**, Harris-Stowe State University; **Gary McDowell**, Tufts University; **Tiffany Oliver**, Spelman College; and **Jessica Polka**, Harvard Medical School **Room 17B**

In response to a tight funding climate and evolving mechanisms for evaluating, sharing, and conducting research, groups of scientists across the U.S. are now discussing ways to improve the research enterprise. Within this research landscape, the goal of building and retaining a diverse workforce is pressing and necessary. People often hear that minorities are underrepresented in STEM and have their own hypotheses of why this may be. During this session invited speakers will review recent data and efforts to build diversity and respond to the changing landscape of research. This session will include formal presentations and audience-based roundtable discussions to directly address questions, propose solutions, and describe ways we can work to effect change. The session will take the shape of a dialogue rather than a formal lecture as audience input will be welcomed and inform discussion.

Presentations:

1:00–1:10 pm	Introduction. **Jana Marcette**, Harris-Stowe State University with fellow organizers **Gary McDowell**, Tufts University; **Tiffany Oliver**, Spelman College; **Jessica Polka**, Harvard University

1:10–2:10 pm	Increasing diversity in STEM: whose job is it, what needs to be done, and why should we care. **Andrew Campbell**, Brown University; **Tiffany Oliver**, Spelman College; **Graciela Unguez**, New Mexico State University
2:10–2:30 pm	Structured Breakout Discussions
2:30–2:45 pm	Reports from Breakout Discussions
2:45–3:00 pm	Break
3:00–4:10 pm	How can policy build a robust and diverse research enterprise? **Bill Bement**, University of Wisconsin-Madison; **Kenny Gibbs**, National Cancer Institute, NIH; **Gary McDowell**, Tufts University; **Chris Pickett**, American Society for Biochemistry and Molecular Biology (ASBMB)
4:10–4:30 pm	Structured Breakout Discussions
4:30–4:45 pm	Reports from Breakout Discussions
4:45–5:00 pm	Concluding Remarks, **Jana Marcette**, Harris-Stowe State University

Subgroup J: Microtubule Networks in Differentiated Cells

Organizers: **Irina Kaverina**, Vanderbilt University; **Terry Lechler**, Duke University; **Evelyn Ralston**, National Institute of Arthritis and Musculoskeletal and Skin Disease, NIH; and **Melissa Rolls**, Pennsylvania State University

Room 32B

Microtubules form dynamic cytoskeletal networks with diverse functions. We have learned many underlying principles and effectors of microtubule organization from studies in cultured proliferative cells. Differentiation, however, changes cell function and morphology. In many differentiated cells, radial microtubule geometry is lost and non-centrosomal microtubule arrays form. Such differentiation-related microtubule reorganizations have been described for more than 25 years but remain understudied. This subgroup brings together a diverse set of investigators studying aspects of microtubule reorganization, dynamics, and function in differentiated cells and tissues. The goals are to identify both common and divergent mechanisms to regulate microtubule organization, encourage discussion of unexpected functions for microtubules in differentiated cells, and to enable the sharing of reagents for observing/perturbing microtubule networks. We hope that this will connect basic cell biologists with developmental biologists and physiologists to stimulate future studies and collaborations on microtubule functions in tissues.

Presentations:

1:00–1:10 pm	Introduction by the Co-chairs
1:10–1:30 pm	Microtubule transport in the axon – new frontiers. **Peter Baas**, Drexel University
1:30–1:50 pm	Motors, microtubules and axonal growth **Vladimir Gelfand**, Northwestern University
1:50–2:10 pm	Dendrite branch points are hubs for end-to-end control of microtubules**. Melissa Rolls**, Pennsylvania State University
2:10–2:30 pm	Organization of cortical microtubules in plants. **David Ehrhardt**, Carnegie Institute
2:30–2:50 pm	Control of non-centrosomal microtubule array assembly by end-binding proteins. **Karen Oegema**, University of California, San Diego
2:50–3:00 pm	Break
3:00–3:20 pm	Regulation of centrosomal MTOC activity during epidermal differentiation. **Terry Lechler**, Duke University
3:20–3:40 pm	Functions of Golgi-derived microtubules in pancreatic beta cells. **Irina Kaverina**, Vanderbilt University
3:40–4:00 pm	The contribution of perinuclear microtubules to muscle nuclear integrity. **Talila Volk**, Weizmann Institute
4:00–4:20 pm	MAPs and motors cooperate to form the paraxial microtubule array in differentiating muscle cells. **Anne Straube**, University of Warwick
4:20–4:40 pm	Skeletal muscle microtubules: in vitro, in vivo, and in silico exploration of healthy and diseased mammalian muscle. **Evelyn Ralston**, National Institutes of Heath
4:40–5:00 pm	Wrap up and Discussion

Subgroup K: Neuronal Cytoskeleton: Cytoarchitecture and Dynamics

Organizers: **Anthony Brown**, Ohio State University; **Stephanie Gupton**, University of North Carolina at Chapel Hill; **Laura Ann Lowery**, Boston College; and **Subhojit Roy**, University of California, San Diego

Room 33B

Nerve cells extend and maintain long and sometimes elaborately branched processes, axons and dendrites, which define the wiring pattern of the nervous system. This unique and highly polarized morphology is critically dependent on the cytoskeleton, including the specialized and regulated cytoskeletal machinery that generates the dynamic molecular architecture of axonal and dendritic microdomains such as growth cones, synaptic boutons, nodes of Ranvier, axon initial segments, branch points and dendritic spines. This session will highlight exciting findings on the dynamics and cytoarchitecture of the cytoskeleton in these regions of axons and dendrites and their function in axon guidance, extension and regeneration, and in dendritic plasticity and morphogenesis.

Presentations:

1:00–1:05 pm	Opening remarks. **Anthony Brown**, Ohio State University; **Stephanie Gupton**, University of North Carolina at Chapel Hill; **Laura Ann Lowery**, Boston College; and **Subhojit Roy**, University of California San Diego
1:05–1:25 pm	Interplay between the cytoskeleton and scaffolds at the axon initial segment. **Christophe Leterrier**, CNRS, Aix-Marseille Université
1:30–1:40 pm	Novel actin organization and dynamics in the axon shaft. **Archan Ganguly**, University of California, San Diego
1:45–2:05 pm	Coordination of axonal cytoskeletal dynamics by mitochondria. **Gianluca Gallo**, Shriners Hospitals Pediatric Research Center, Temple University
2:10–2:30 pm	Regulation of microtubule plus-end dynamics during axon outgrowth. **Laura Ann Lowery**, Boston College
2:35–2:55 pm	A filopodia stability switch for axon guidance. **Stephanie Gupton**, University of North Carolina Chapel Hill
3:00–3:15 pm	Break
3:15–3:25 pm	Slit stimulates filopodium formation and elongation to mediate repulsive axon guidance. **Russell McConnell**, Massachusetts Institute of Technology
3:30–3:50 pm	Conditioning drives axon regeneration by Cofilin-mediated actin turnover. **Frank Bradke**, German Center for Neurodegenerative Diseases (DZNE)
3:55–4:15 pm	Cytoskeletal dynamics of the regenerating axon. **Andrew Chisholm**, University of California, San Diego
4:20–4:30 pm	The Down syndrome critical kinase, Minibrain/Dyrk1a, controls dendrite morphogenesis through direct regulation of the microtubule cytoskeleton. **Kassandra Ori-McKenny**, University of California, Davis
4:35–4:55 pm	A new cytoskeletal model for trafficking material to dendritic spines during synaptic plasticity. **Erik Dent**, University of Wisconsin, Madison

Subgroup L: Nuclear Envelope Dynamics

Organizers: **Dennis Discher**, University of Pennsylvania; **Harald Herrmann,** German Cancer Research Center (DKFZ); **Megan King**, Yale University; **Patrick Lusk**, Yale University; and **Katherine Wilson**, Johns Hopkins University

Room 28B

This Subgroup will celebrate important advances in understanding the composition, structure, and function of the nuclear envelope, including the nuclear lamina. Speakers will present insights into how lamins impact genome organization and modulate nuclear mechanics. A major theme will be to explore mechanisms that support nuclear integrity despite dynamic nuclear envelope remodeling via 'machines' that contribute to nuclear envelope breakdown and reformation, nuclear pore biogenesis and "mega" RNP egress.

Presentations:

1:00–1:05 pm	Welcome – Organizing committee
1:05–1:20 pm	The assembly of A- and B-type lamins: polyelectrolyte-default and type-specific optional pathways. **Harald Herrmann**, Deutsches Krebsforschungszentrum, DKFZ/Heidelberg, Germany
1:20–1:35 pm	A remarkable complex of interwoven lamin meshworks is revealed by super-resolution microscopy. **Robert Goldman***, Northwestern University Feinberg School of Medicine; **Takeshi**

Shimi, Northwestern University; **Mark Kittisopikul**, University of Texas Southwestern Medical Center; **Joseph Tran**, Carnegie Institution for Science; **Anne E. Goldman**, Northwestern University; **Stephen A. Adam**, Northwestern University; **Yixian Zheng**, Carnegie Institution for Science; **Khuloud Jaqaman**, University of Texas Southwestern Medical Center

1:35–1:50 pm	The cell biology of lamins in development. **Yixian Zheng**, Carnegie Institute
1:50–2:05 pm	Metabolic regulation of lamin A. **Katherine Wilson**, Johns Hopkins University
2:05–2:20 pm	Regulation of signaling by inner nuclear membrane proteins. **Larry Gerace**, Scripps
2:20–2:35 pm	Functional genome organization at the nuclear lamina. **Karen Reddy,** Johns Hopkins University
2:35–2:50 pm	Lamin A mechanosensing: regulation and regulator. **Dennis Discher**, University of Pennsylvania
2:50–3:00 pm	Break
3:00–3:15 pm	Coupling nuclear structures to the cytoskeleton. **Brian Burke**, IMB Singapore
3:15–3:30 pm	Mechanical crosstalk between the nucleus and adhesions. **Megan King**, Yale University
3:30–3:45 pm	The mechanism of Torsin ATPase activation and its dysfunction in primary dystonia. **Christian Schlieker**, Yale University
3:45–4:00 pm	mRNP remodeling through the NE. **Vivian Budnik**, University of Massachusetts Medical School
4:00–4:15 pm	Losing integrity: nuclear envelope rupture in interphase. **Emily Hatch*** and **Martin Hetzer**, The Salk Institute for Biological Studies.
4:15–4:30 pm	Nuclear envelope rupture and repair during cell migration in confined 3-D environments. **Jan Lammerding**, Cornell University
4:30–4:45 pm	ESCRTs and nuclear envelope reformation. **Jeremy Carlton**, King's College, London
4:45–5:00 pm	Quality control at the nuclear envelope. **Patrick Lusk**, Yale University

*Speaker

Subgroup M: Nucleation Phenomena in Cell Biology

Organizers: **Clifford Brangwynne**, Princeton University; **Gary Brouhard**, McGill University, Montreal, Canada; and **Xiaolei Su**, University of California, San Francisco **Room 29C**

This Special Interest Subgroup will bring together researchers working on the nucleation of a variety of intracellular structures. Nucleation is a critical step in the de novo assembly of cytoskeletal polymers from monomeric subunits and also in the assembly of liquid-phase intracellular structures, including RNA/protein bodies in the cytoplasm and nucleus as well as cell surface micro-clusters. The biophysical mechanisms that drive nucleation phenomena in cell biology remain poorly understood. The speakers in this session will include leaders in the established field of cytoskeletal nucleation (actin filaments and microtubules) as well as leaders in the emerging field of phase transitions. The overarching goal of the session will be to establish the fundamental principles by which cells govern nucleation across systems.

Presentations:

1:00–1:10 pm	Introductory Remarks. **Gary Brouhard**, McGill University
1:10–1:30 pm	Phase separation of signaling molecules promotes T cell activation. **Xiaolei Su**, University of California, San Francisco
1:30–1:50 pm	RNA transcription modulates phase transition-driven nucleolar assembly. **Stephanie Weber**, Princeton University
1:50–2:10 pm	Assembly and dynamics of stress granules. **Roy Parker**, University of Colorado, Boulder
2:10–2:30 pm	Mechanism(s) of actin nucleation essential to oogenesis. **Margot Quinlan**, University of California,Los Angeles
2:30–2:50 pm	Actin nucleation: what do we really know? **Bruce Goode**, Brandeis University
2:50–3:10 pm	Break
3:10–3:30 pm	A minimal microtubule organizing center. **Trisha Davis**, University of Washington
3:30–3:50 pm	Microtubule quaternary structure and nucleation. **Gary Brouhard**, McGill University
3:50–4:10 pm	From branching microtubule nucleation to mitotic spindle assembly: role and mechanism. **Sabine Petry**, Princeton University
4:10–4:30 pm	Cajal bodies shape genome conformation. **Miroslav Dundr**, Rosalind Franklin University
4:30–4:50 pm	Phase transitions in intracellular organization and disease. **Simon Alberti**, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany
4:50–5:00 pm	Concluding Remarks

Subgroup N: Polymerizing Enzymes: New Frontiers in Protein Compartmentalization and Localization

Organizers: **Justin Kollman**, University of Washington; **Ji-Long Liu**, University of Oxford, UK; and **Jeffrey Peterson**, Fox Chase Cancer Center **Room 30B**

An increasing number of enzymes have been discovered to dynamically and reversibly assemble into macroscopic filaments in response to changes in nutrient availability or other environmental cues. These filamentous structures represent a novel non-membrane-bound mechanism for compartmentalization and localization of enzymatic activity. Most enzyme filaments discovered to date are metabolic enzymes (e.g., CTP synthase, inosine monophosphate dehydrogenase, and phosphofructokinase), but other enzyme classes are also represented. The discovery of numerous enzyme filaments opens an exciting new field at the interface between cell biology and metabolism. Most enzyme filaments remain uncharacterized, but strong evolutionarily conservation of polymerization, from bacteria to humans, suggests the filamentous forms play fundamentally important functional roles. Where functional data do exist it is clear that the filaments are important for regulating enzyme activity and for maintaining cellular homeostasis. Important fundamental questions remain for many enzyme filaments: What are their structures and mechanisms of assembly? What is their biological function? How is their assembly regulated? The presentations in this subgroup will discuss recent advances in addressing these questions, both in vitro and in vivo, for a variety of polymerizing enzymes.

Presentations:

1:00–1:10 pm	Introduction and Welcome
1:10–1:30 pm	TBD. **Tim Mitchison**, Harvard Medical School
1:30–1:50 pm	Function and regulation of cytoplasmic filaments of CTP synthase and IMPDH. **Jeffrey Peterson**, Fox Chase Cancer Center
1:50–2:10 pm	Regulators of cytoophidium assembly. **Ji-Long Liu**, University of Oxford, UK
2:10–2:30 pm	Visualizing CtpS assembly as a single-cell reporter of metabolism. **Zemer Gitai**, Princeton University
2:30–2:50 pm	Quinary protein structure as regulator of cytoplasmic organization. **Simon Alberti**, Max Planck Institute of Molecular Cell Biology and Genetics, Germany
2:50–3:15 pm	Break
3:15–3:35 pm	The structural basis for CTP synthase filament assembly. **Justin Kollman**, University of Washington
3:35–3:55 pm	Redox regulation of *E. coli* CTP synthetase. **Enoch Baldwin**, University of California, Davis
3:55–4:15 pm	One-carbon metabolism on IMPDH assembly into rod/ring structures. **Edward Chan**, University of Florida
4:15-4:35 pm	Identification of a metabolic actin: building a bridge between metabolism and the classical cytoskeleton. **James Wilhelm**, University of California, San Diego
4:35-4:55 pm	Glucokinase polymerization may regulate glycolytic flux during environmental transitions. **Ethan Garner**, Harvard University
4:55-5:00 pm	Closing remarks

Subgroup O: Quantitative Microscopy and Image Analysis: Measuring Cellular Organization and Dynamics

Organizers: **Hunter Elliott**, Harvard Medical School; **Talley Lambert**, Harvard Medical School; **Thomas L. Schwarz**, Boston Children's Hospital and Harvard Medical School; **Evgeny Shlevkov**, Boston Children's Hospital and Harvard Medical School; and **Jennifer Waters**, Harvard Medical School **Room 30D**

With the technological advances of the past two decades, modern optical microscopy offers tremendous analytical power. When careful image acquisition is paired with rigorous computational analysis, the potential exists to extract biological information at high resolution and precision, without bias and subjectivity. Methods such as high content screening, single molecule imaging and the latest advances in high resolution and high speed live imaging (e.g., lattice light sheet microscopy) rely on the development of complementary image analysis methods to allow the effective derivation of comprehensive descriptions of cellular organization and dynamics. Quantitative microscopy therefore often requires a collaborative effort across multiple disciplines, from biology, to physics, to computer science. This session highlights researchers from across these disciplines doing exemplary work in the fields of quantitative microscopy and image analysis.

Presentations:

1:00–1:05 pm	Introduction to Part 1, Organizers
1:05–1:35 pm	Examining anaphase dynamics in human cells using lattice light sheet microscopy. **Tarun Kapoor**, Rockefeller University
1:35–2:05 pm	Quantitative approaches to unravel the molecular mechanisms of clathrin-mediated endocytosis. **Julien Berro**, Yale University
2:05–2:35 pm	Forcing cells into shape: using optogenetics and micropatterns to measure cellular mechanics. **Patrick Oakes*** and **Margaret Gardel**, University of Chicago
2:35–2:55 pm	Break
2:55–3:00 pm	Introduction to Part 2, Organizers
3:00–3:30 pm	Quantitative single-molecule analysis of receptor dynamics and interactions. **Khuloud Jaqaman**, University of Texas Southwestern Medical Center
3:30–4:00 pm	Multiparametric analysis of particle transport for high-throughput screening. **Evgeny Shlevkov**, Boston Children's Hospital and Harvard Medical School
4:00–4:30 pm	Systems genetics and cell biology: mapping biological pathways in budding yeast. **Brenda Andrews**, University of Toronto
4:30–5:00 pm	Building models of cell organization, differentiation and perturbation directly from microscope images. **Robert F. Murphy**, Carnegie Mellon University

*Speaker

Undergraduate Program

2:15-3:15 pm **Ballroom 6A**

Translating Curiosity: Solving the Worm
Paul W. Sternberg
California Institute of Technology

In this discussion targeted to undergraduates, Paul Sternberg will discuss vignettes from his 30 years of work with *Caenorhabditis elegans* (The Worm) to illustrate how curiosity-driven science leads to translatable results. He will also discuss the prospects and challenges in trying to comprehend an organism in its entirety, with an eye toward our own biology. Sternbeg will undoubtedly make a series of tangential points relevant to your future as a scientist and a person.

Organized by the ASCB Education Committee

Poster Competition and Reception

3:30-5:30 pm **Ballroom 6A**

This session is optional for all undergraduates who submit an abstract by October 14 for the Annual Meeting and is required for all those receiving travel awards from the Minorities Affairs Committee. This session allows students to practice presenting their research posters before their main poster presentation in the ASCB Learning Center. Winners will receive cash awards. Everyone attending the meeting is welcome to stop by!

Organized by the ASCB Minorities Affairs and Education Committees

High School Program: Exploring the Microscopic World with Your Own Foldscope

4:00-5:30 pm **Room 5B**

Manu Prakash
Stanford University

What if every person in the world could carry a microscope around in his or her pocket? That is the idea behind the Foldscope, a 50-cent print-and-fold mass-produced paper microscope. Come build a Foldscope from scratch with developers from the Prakash Lab and ASCB scientist volunteers. Explore the hidden treasures of the microscopic world around you and gain a new perspective for the invisible world that makes everything tick.

Meet and Greet

5:00-5:45 pm **Room 24A-C**

All are welcome, especially first-timers. Come to network, and hear from some of the ASCB leadership. A cash bar and light refreshments will be available.

Keynote Symposium

6:00 pm **Ballroom 20BC**

Can the Science Paradox be Resolved?

Photo credit: Joy Leighton

Sallie W. Chisholm
Massachusetts Institute of Technology

Tiny Cell, Global Impact: A Journey of Discovery with a Microbe from the Sea

Photo credit: Richard Howard

The Honorable, Professor Jane Lubchenco
Oregon State University

● Posters on Display

6:00-8:00 pm **Learning Center**

● Opening Night Reception

Immediately following Keynote–10:00 pm **Sails Pavilion**

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

8:00-9:30 pm **Sails Pavilion**

Coordinator: **Cynthia Jensen**, University of Auckland

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!

Organized by the ASCB International Affairs Committee