Three Cell Biologists Win ASCB-Gibco Emerging Leader Prizes

Three cell biology researchers have won the first-ever ASCB-Gibco Emerging Leader Prizes. Each will receive $5,000.

**Clifford Brangwynne**, assistant professor at Princeton University, won for discovering that non–membrane-bound cellular compartments can form by liquid–liquid phase separation, which has launched a completely new research field at the interface of biology and physics.

**Ahmet Yildiz**, assistant professor at the University of California, Berkeley, won for research that advances the field of single molecule biophysics, including his work on understanding the mechanism of the motor protein dynein and maintenance of telomeres.

**Meng Wang**, assistant professor at Baylor College of Medicine, won for her work on metabolism and aging, especially her discovery that fat metabolism plays an important role in regulating lifespan.

*Gibco, continued on p. 6*

**ASCB 2015 Keynote Speakers: Biology on Global, Microscopic, and Political Scales**

The keynote speakers at ASCB 2015, Jane Lubchenco and Sallie “Penny” Chisholm, illustrate the increasing unhelpfulness of pigeonholes in science. Lubchenco and Chisholm could be lumped together as marine biologists, although this would explain little about the science they practice today. True, they both study ocean life, its mechanisms, its evolution to the present, and its worrisome prospects for the future. But their work spans disciplines and spans scales from the global to the microscopic, thus portending where science will be going in the mid-21st century.

*Keynote, continued on p. 18*
Recognizing the profound influence that concepts and technologies from the physical and computational sciences are having on cell biology, ASCB and Molecular Biology of the Cell (MBoC) are pleased to present this special issue with a focus on those topics.

The 2nd Annual Molecular Biology of the Cell Special Issue on Quantitative Biology
(with expanded focus on Big Data)

Issue Co-Editors: Jennifer Lippincott-Schwartz and Charles Boone

Informative, Thought-Provoking Perspectives

Analyzing the dynamics of cell cycle processes from fixed samples through ergodic principles
Richard John Wheeler

Biosecurity in the age of big data: A conversation with the FBI
Keith G. Kozminski

Quo vadis, big data...Genomics in C. elegans
Harald Hutter, Donald Gordon Moerman

The role of functional data in interpreting the effects of genetic variation
David Loren Young, Stan Fields

Single-cell phenomics in budding yeast
Yoshikazu Ohya, Yoshitaka Kimori, Hiroki Okada, Shinsuke Ohnuki

Reproducible quantitative proteotype data matrices for systems biology
Hannes Luc Röst, Lars Malmström, Ruedi Aebersold

Quantitative nature of overexpression experiments
Hisao Moriya

Original Research Reports from These Authors and Many More

John J.M. Bergeron
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Remember, every ASCB Member has a free personal subscription to MBoC.
ASCBC Chemistry: Reactions of a Proud Catalyst
by Stefano Bertuzzi

Writing my last Executive Director’s Column for the ASCB Newsletter is bittersweet. The bitter part comes from reflecting on the end of my time leading this fabulous organization. I know I will miss so many ASCB people with whom I have closely interacted. That includes the Society’s leadership, its staff, and the many members whom I have had the privilege of meeting. It was an honor to have had a chance to work so closely with so many inspiring science leaders and practitioners, along with a talented national office staff. All of you have enriched my experience, my job, and my vision of what science must be in the mid-21st century.

So, what’s the sweet? The sweet comes from looking ahead to my new role at the American Society for Microbiology, where from January 1 will be the new Chief Executive Officer. I look forward to joining the scientific community and practitioners, along with a talented national office staff. All of you have enriched my experience, my job, and my vision of what science must be in the mid-21st century.

The New Cell Biology: A Central and Vital Discipline

From a scientific perspective, cell biology is in the midst of radical transformation, moving from a self-standing discipline toward becoming an “embedded” discipline in other, more specialized fields. Many scientists who are clearly cell biologists now belong de facto to more narrowly self-identified communities such as cancer biology, neuroscience, synthetic biology, and many others. Paradoxically, the centrality of cell biology has never been more powerful.

During my tenure, I saw the Lasker Award go to ASCB members in three separate years. In 2012, the Albert Lasker Award for Basic Medical Research went to ASCB members Ron Vale, Jim Spudich, and Mike Sheetz. In 2013, it went to ASCB member Richard Scheller (together with Tom Südhof). And in 2014, ASCB member Peter Walter (who will be ASCB President in 2016) shared the prize with Kazutoshi Mori. The year 2013 was memorable as well for what I call the Nobel Prize in Cell Biology, which went to ASCB stalwarts Randy Schekman and Jim Rothman as well as to Tom Südhof for “discoveries of machinery regulating vesicle traffic, a major transport system in our cells.” You see? The Nobel Prize in Cell Biology, not in Medicine or Physiology!

In the last three years, I also saw several ASCB members being elected to the National Academy of Sciences, receiving other important prizes. I am deeply suspicious of those who use statistical rankings (e.g., journal impact factors) to evaluate science, but I do regard these high-level recognitions as an indicator that our field, our people, and our science are vital elements in the big scheme of things. I also recognize the great value of day-to-day research by our members who identify key mechanisms, tease out cause from correlation, and brick by brick...
construct the edifice that is our knowledge of the cell.

Still, a major challenge for cell biology and for ASCB is not to rest on our laurels but to capture the future of science and nurture the young scientists who will build it. On this front, I think we have moved the needle in a positive direction over the past three years. We have extended the rubric of cell biology and drawn in new disciplines, new technologies, new energy, and new people. We can’t stop here. But I believe that the ASCB Council, staff, and the next Executive Director will press on.

The New ASCB: Learning about Ourselves

In this changing environment, I am reminded of a quote from Jack Welch, who ran GE for many turbulent years. Welch said that when the rate of change outside an organization is greater than the rate of change inside the organization, the end is near. By this measure, the end of ASCB is NOT near. The rate of internal change at ASCB over the past three years has been exhilarating. It has been painful at times, but we have put in place the outlines of what I call “organization learning,” a professional society version of machine learning. ASCB is learning how to learn about itself, about our members’ needs, about the wider horizon of scientific trends, and about our generational differences. This has allowed ASCB to focus on key strategic changes. It would be tedious to enumerate all the changes and new initiatives ASCB has undertaken in the last three years, but let me look at them on the aggregate level.

An important focus of the ASCB is on young scientists, who are facing unprecedented challenges in today’s environment. We want them to be better off because of what ASCB does for them, so we have focused on their “value proposition.” What’s in ASCB for them? It’s a fair question. The days of belonging to a scientific society for the sake of belonging are gone.

First, ASCB responded to their needs by offering students and postdocs a seat at the leadership table. The ASCB Council also invited them to form their own committee, COMPASS, and Council has since watched as that committee exploded into the most dynamic and energetic committee of the modern-day ASCB.

Second, ASCB established new programs to recognize young scientists for their excellence both in and outside academia. We believe that an academic bench career is no longer the default career path in cell biology. Still, research excellence is the hallmark of great scientists. To highlight research achievements and options for younger members, we established the Kaluza Prizes for graduate students, the ASCB-Gibco Emerging Leader Prizes for new independent investigators, and the ASCB-KGI Biotech Course for young scientists thinking of a career in the biotech industry.

We also developed closer relationships with scientists in other countries. To recognize this accelerating internationalization while still maintaining the “A” in ASCB, we added the tagline “an international forum for cell biology” to our logo. It has long been in our mission. Now it’s right out front.

I am proud to say that all these changes and new initiatives have made a difference at the membership level. Thanks to the efforts of the dynamic ASCB Membership Committee and to key ASCB staff, we have greatly slowed or even reversed worrisome trends. In the past two years, we have had double-digit percentage increases in postdoc and graduate student memberships and have seen a strong improvement in regular member retention. These are particularly comforting results.

Partnerships

New initiatives like those described above all required significant resources. We found them by partnering with companies and outside organizations where we could identify a common ground and a common interest. In all cases, ASCB has controlled the scientific agenda. Financially, these new initiatives have paid for themselves, for the staff time involved, and beyond.

We have also increased the value proposition for our invaluable allies, the companies that exhibit at the ASCB Annual Meeting. In 2014, we created the ASCB Learning Center, shifting
the accent from a passive exhibit of products to a venue for active learning. This resulted in an enhanced experience for exhibitors, attendees, and members alike. It’s also generated new traffic—and new discussions—along ASCB’s legendary “poster alleys,” which are still the heart of the hall.

**Policy and Publishing**

We also focused on public policy and advocacy. ASCB has a long, distinguished tradition in science policy. To this, we added more of a “think tank” flavor by exploring controversial topics and producing white papers that can provide new science policy guidelines. With the invaluable help from strong leaders such as Larry Goldstein and Mark Winey, ASCB produced white papers on the future of stem cell research and on the thorny issue of data reproducibility. These reports were widely noted by federal science agencies, the news media, and other science organizations. They added to ASCB’s ongoing reputation on Capitol Hill and in the executive branch as a “go to” group for insights and reliable information.

On the scholarly publishing front, we exercised strong leadership in convening several publishers and editors to start the anti–impact factor insurrection known as DORA (or, more formally, the San Francisco Declaration on Research Assessment). I have immensely enjoyed working with *Molecular Biology of the Cell* Editor-in-Chief David Drubin and the “DORA team of insurgents.” Changing bad habits and bad incentives is very tough work, and the road is still long and curvy. However, I am encouraged by the over 12,000 individuals and the 592 organizations who signed DORA. Wherever I travel around the world, I am approached by people who know and speak about DORA. There is much to be done, but I think ASCB has already moved the needle in an effective way on this important front.

**Communications**

At ASCB, we live in a community of great scientific stories. To tell them and to talk among ourselves, ASCB needed to move to new digital platforms and online communities. In the last three years, ASCB has dramatically extended its communication reach through new media and old.

I am very proud of our website, which is now rich in content with blogs and timely news in the ASCB Post. Our meeting pages are faster and more useful. Our meeting app is a glamorous necessity. Many ASCB committees such as COMPASS now conduct nearly all their business through online “hang outs” and cloud-based documents. Our scholarly publications continue to pioneer online publishing. But we still produce and circulate our popular *ASCB Newsletter* on PAPER! (But we also have a new, digital edition of the *ASCB Newsletter*. Don’t worry; the printed version is not going away.)

**The Chemistry of ASCB**

I could write about the many other things that we have tackled and many that still remain as challenges, but I have a more important point to make in closing. Of course, I did not do this alone. At best, I think of myself as a recycled catalyst, now three years older. But catalysts need reactants. At ASCB, I was fortunate in reacting well with a series of past, present, and just-elected ASCB Presidents. I captured electrons and formed covalent bonds with many talented ASCB Council members, committee chairs, and “ordinary” ASCB members who seemed to spring out of the woodwork whenever a difficult project materialized.

But particular praise for my staff is in order. Change is difficult—frightening in the beginning, messy in the middle, and, if all goes well, sweet at the end.

As I said at the outset, this is a bittersweet moment—much accomplished, much more still ahead. But I am proud to say that through all the stormy changes I felt ASCB had to face in the last three years, the ASCB staff rose to the challenge. They worked incredibly hard and with great passion toward a vision for a bigger and better ASCB. Every ASCB member should be very proud and grateful to have such a team working on his or her behalf. And so for ASCB staff, for ASCB members, and, I hope, for myself, *ad maiora!*

Questions and comments are welcome and should be sent to sb@ascb.org


Council has since watched as [COMPASS] exploded into the most dynamic and energetic committee of the modern-day ASCB.
ASCB introduced the prizes to honor not-yet-tenured independent investigators with outstanding scientific accomplishments and strong publication track records. Only ASCB members are eligible. The prizes are underwritten by Gibco, a brand of Thermo Fisher Scientific.

The selection committee said Brangwynne’s, Yildiz’s, and Wang’s research is driving cell biology into exciting and emerging fields. All three are also exceptional mentors and educators, the committee noted. Seven additional ASCB-Gibco finalists will be invited to attend a special event with leaders in their field at the 2015 ASCB Annual Meeting in San Diego. All 10 winners and finalists will be recognized before the E.B. Wilson Lecture on Tuesday, December 15.

The seven additional finalists are:

**Nels Elde**, assistant professor at the University of Utah, for his research on the evolutionary influence of pathogens on the diversification of cellular processes, including his work revealing the evolutionary battle for iron between pathogens and primates.

**Melissa Gardner**, assistant professor at the University of Minnesota, for her research on the molecular mechanisms and forces involved in mitotic spindle assembly, including her discovery that a molecular motor influences mitotic spindle length.

**Dmitri Kudryashov**, assistant professor at Ohio State University, for his work on defensins as immune and therapeutic factors. He discovered the mechanism by which defensins neutralize bacterial toxins.

**Kelly Monk**, assistant professor at Washington University, for her research on the role of G protein–coupled receptors (GPCRs) in myelin development, maintenance, and regeneration. She discovered the mechanism for the essential role of GPCR Gpr126 in myelination.

**Guangshuo Ou**, associate professor at Tsinghua University, for his work on neuroblast development in *Caenorhabditis elegans*. Recently he uncovered a novel pathway in neuroblast cell migration.

**Antonina Roll-Mecak**, investigator at the National Institute of Neurological Disorders and Stroke, for her research on the function of tubulin posttranslational modifications. Recently she revealed how tubulin-modifying enzymes tag tubulin and microtubules with various amino-acid tags.

**Hari Shroff**, chief at the National Institute of Biomedical Imaging and Bioengineering, for developing optical microscopy techniques that enable the study of living tissues at high resolution while minimizing deleterious effects, such as photobleaching and photodamage.

—Christina Szalinski
ASCB Forms Executive Director Search Committee

The Council Executive Committee has named a search committee to identify the next Executive Director of the ASCB. Thoru Pederson, University of Massachusetts Medical School, will chair the committee, and he will be joined by Arshad Desai, University of California, San Diego; Cynthia Godes, ASCB Senior Director of Finance and Administration; Tom Misteli, National Cancer Institute; Jodi Nunnari, University of California, Davis; Ron Vale, University of California, San Francisco/HHMI; and Xiaowei Zhuang, Harvard University/HHMI. ASCB President Shirley Tilghman, Princeton University; 2016 ASCB President Elect Peter Walter, University of California, San Francisco/HHMI; and 2017 ASCB President-Elect Designate Pietro Di Camilli, Yale University/HHMI, will serve as ex officio members of the committee. “I am honored to serve, especially with such a stellar committee,” said Pederson.

The committee will be working this fall to generate and vet a pool of candidates for the position of Executive Director. Suggestions of potential candidates and applications for the position are welcomed and should be submitted to Cynthia Godes (cgodes@ascb.org). Once finalists are identified, they will be interviewed by the search committee and the ASCB Executive Committee, who will submit a recommendation to the full Council for approval.

ASCB’s current Executive Director, Stefano Bertuzzi, announced on September 9 that he will be leaving at the end of his contract after the ASCB Annual Meeting in San Diego this December to become Chief Executive Officer of the American Society for Microbiology. Godes will serve as Interim Executive Director after Bertuzzi’s departure and until a new Executive Director takes the helm.

Carrero-Martínez to Co-Chair Minorities Affairs Committee

The ASCB Council has appointed Franklin Carrero-Martínez, Program Director, Office of International Science and Engineering at the National Science Foundation, to be the next co-chair of the Minorities Affairs Committee (MAC). Carrero-Martínez was previously associate professor of biology at the University of Puerto Rico, Mayagüez. In 2012, he was selected as the American Association for the Advancement of Science Roger Revelle Fellow in Global Stewardship at the Department of State, where he served prior to taking his current position.

Carrero-Martínez has been a member of ASCB since 2006 and a member of the MAC since 2010. He comments, “I am happy to bring my experience in academia, science policy, and diplomacy to help advance the interest of the Minorities Affairs Committee and the community we serve through our programs and activities.” Carrero-Martínez’s term will begin on January 1, 2016. He will succeed Renato Aguilera and will serve alongside continuing MAC co-chair Andrew Campbell.

Barber Named Chair of Women in Cell Biology Committee

The ASCB Council has named Diane Barber, professor and chair, Department of Cell and Tissue Biology at the University of California, San Francisco, to be the next chair of the Women in Cell Biology (WICB) committee. She is a long-time ASCB member and has been a member of the WICB committee since 2012.

Barber remarks, “I am honored to serve as chair of WICB. WICB exemplifies ASCB’s support of activism in issues of gender equity and in promoting the careers of all investigators. I hope to help our extraordinary committee meet current and emerging challenges for professional development.” Her term will begin on January 1, 2016, when she succeeds current chair Sandra K. Masur.

Desirée L. Salazar, Scientific Program Manager
ASCB Announces Third Annual Kaluza Prizes for Excellence in Graduate Student Research

Pavithra Aravamudha

The ASCB, in collaboration with Beckman Coulter Life Sciences, has announced the winners of the 2015 Kaluza Prizes for academic excellence in graduate student research. The three top finalists will receive cash prizes of $5,000, $3,000, and $1,000. In addition, seven other finalists have been named winners of the ASCB Beckman Coulter Distinguished Graduate Student Achievement Prize and will receive travel awards to attend the ASCB Annual Meeting in San Diego. All 10 finalists have been invited to speak at a Minisymposium supported by Beckman Coulter at the ASCB Annual Meeting.

- **Guangbo Chen**, is the 2015 winner of the $5,000 Kaluza Prize. He won for his discovery that aneuploidy can be caused by increased cell stress and for showing that cells with stress-induced aneuploidy can be eradicated by a dual-stress “evolutionary trap” that could be used to treat cancer and fungal infections. He did the work in Rong Li’s lab at the Stowers Institute.

- **Uri Ben-David**, now a postdoc at the Broad Institute at Harvard University and the Massachusetts Institute of Technology, was selected as the winner of the $3,000 Kaluza Prize. He won for his work in Nissim Benvenisty’s lab at Hebrew University of Jerusalem developing methods to analyze the genetic stability of human induced pluripotent stem cells and linking the genetic instability of some cells to their likelihood of becoming cancerous. Ben-David also developed strategies to eliminate the tumor-causing cells.

- **Pavithra Aravamudha** won the $1,000 Kaluza Prize for discovering the mechanism of the spindle assembly checkpoint, a critical signaling pathway that monitors the attachment between chromosomes and spindle microtubules. Her work was done in Ajit Joglekar’s lab at the University of Michigan.

The ASCB Kaluza Prizes were launched in 2013 as part of a partnership between ASCB and Beckman Coulter to support excellence in science. The competition is open to ASCB members who are current graduate students or have graduated within two years at the time of application.

The selection committee said that the work of Chen, Ben-David, and Aravamudha moves cell biology research in new and important directions. All three are poised to become leaders in cell biology, according to the committee. All 10 winners and finalists will be recognized at a special presentation just before the Keith R. Porter Lecture on Sunday, December 13.

The seven finalists, who are winners of the ASCB Beckman Coulter Distinguished Graduate Student Achievement Prize, are:

- **Lindsay Case**, for her discovery that specific proteins organize into distinct nanodomains, which regulates protein activity within focal adhesion complexes. She did her work at the National Heart, Lung, and Blood Institute.

- **Lukas Chmatal**, for developing a system to study the translocation of part of a chromosome to another nonhomologous chromosome (Robertsonian fusion) during...
meiosis. He found that increased microtubule binding leads to a gene transmission advantage during meiosis. His work was done at the University of Pennsylvania.

- **Phillip Dumesic**, for identifying a new function for introns and the spliceosome in genome defense. His work raises the possibility that introns are pervasive in eukaryotic genomes because of their contribution to self/non-self recognition. His work was done at the University of California, San Francisco.

- **Laura Gaydos**, who showed epigenetic transmission of genomic information from parent to offspring and through cell divisions by studying proteins that modify histone tails and chromatin. Her work was done at the University of California, Santa Cruz.

- **Ryan Flynn**, who identified important regulators of RNA and RNA synthesis and determined the molecular functions of 7SK snRNA. His work was done at Stanford University.

- **Kailin Mesa**, who established that environmental signals can lead to various stem cell behaviors as well as allow cells to remain flexible to variable demands on the tissue. His work was done at Yale University.

- **Graham Walmsley**, for discovering a lineage of skin cells responsible for scarring, and a small molecule that inhibits those cells’ activity and reduces scarring. His work was done at Stanford University School of Medicine.

> —Christina Szalinski
ASCB, GSA, ASPB Collaborate on Promoting Active Learning & Mentoring Network Grant

The National Science Foundation has funded a new mentoring initiative jointly organized by the ASCB, Genetics Society of America (GSA), and American Society of Plant Biologists (ASPB). The Promoting Active Learning & Mentoring (PALM) Network was established to spark sustained biology education reform at diverse institutions through one-on-one long-term mentorships for faculty new to approaches based on Vision and Change recommendations.

PALM provides faculty and postdoctoral fellows with resources that allow them to gain hands-on experience and long-term mentorship support to bring evidence-based, active learning strategies into their own classrooms. The longer term goal is to lead enduring change that will positively influence the teaching culture at each PALM Fellow’s institution.

PALM offers up to $2,000 per Fellow; a $500 mentor stipend; and up to $1,000 for meeting travel (for each Fellow and mentor). The 2016 application deadlines are January 15 and June 15. The application site, at www.ascb.org/PALM, will open on January 1, 2016; more details are available on the site now.

PALM Fellows will:

- Identify and secure partnership with experienced mentors who have already reformed their classrooms. A successful application will define how Fellows will visit the mentor’s site to observe and participate in teaching redesigned classes. This will allow Fellows to experience first-hand and begin to put into practice the full scope of pedagogical and cultural shifts needed to achieve effective change.
- Submit a complete proposal.
- Schedule dates to complete the identified work within 6 months of receiving the award notification.
- Develop an active learning based module for one of their classes with guidance from their mentors, and implement it, thus demonstrating how they have incorporated active learning approaches.
- Submit videos of their teaching before and after their mentoring experience for analysis.
- Consider best options and timing for disseminating their materials to others in their institutions and in the greater scientific community, including publication (e.g., CourseSource).
- Report on their activities to colleagues at the year-end gathering of the PALM Network, as well as at a national, regional, or sectional meeting of their respective scientific societies.
- Participate in surveys over several years so the PALM Network can assess the extent and persistence of change in classroom practice.

Applicants must:

- Be or become members of organizations that belong to the PALM Network.
- Demonstrate an abiding/sustainable interest in undergraduate biology education.
- Establish a mentor relationship before formally applying.
  - Mentors must belong to (or join) one of the PALM Network organizations.
  - Assistance with mentor matching is available (PALM Steering Committee can make recommendations based on geography and specific teaching interests).
  - Explain alternatives if they have no immediate access to their own teaching setting.

Networking Works

The PALM Network is designed to combine the shared educational interests of scientific organizations working for Vision and Change. PALM founders will expand the network by bringing in other organizations seeking collaborations based on reform efforts as they work hard to promote the principles of Vision and Change. The PALM Network Steering Committee contains members representing three professional societies, minority-serving...
Managing Science in the Biotech Industry

In July 2015 ASCB and the Keck Graduate Institute (KGI) offered Managing Science in the Biotech Industry: An Intensive Course for PhD Students and Postdocs. EMD Millipore provided generous funding for the course. Here one student discusses her experiences in the course.

The business side of science encompasses a breadth of disciplines and people, has the potential to broadly impact society and science, and allows you, the scientist, to be in the driver’s seat of change. This summer, I participated in the ASCB-KGI course Managing Science in the Biotech Industry. There were 40 participants, including graduate students and postdocs with various interests in consulting, intellectual property, and business development.

For two weeks, we were immersed in the business landscape of science. In the mornings, we reviewed and discussed case studies with KGI faculty members and associates. Following that each day was an afternoon session on professional development. During most of the afternoon sessions, a panel of professionals engaged in various facets of industry provided insights into their career paths and tips on how to explore various career options. The career panels provided an opportunity for graduate students and postdocs to make vital contacts in industry and gain insight into the day-to-day life of successful industry professionals.

One of the many things that made the ASCB-KGI course so valuable was its combination of classroom discussions with practical applications of business concepts through team projects. The team project was one of the most valuable experiences for me during the course. The ability to work in a team environment is becoming increasingly important in industry, and teams are often used to address certain tasks. The benefits of working with talented graduate students and postdocs from around the world are immeasurable. We were able to share diverse perspectives on commercialization from our previous experiences and build great relationships that may help us to propel one another toward our future professional goals.

For the project, we worked collaboratively in teams of five to create an opportunity analysis of a diagnostic biomarker based on scientific validation, market potential, and economic and patient value. The project provided an opportunity to bounce ideas around and think about the pros and cons of each marketing approach. At the end of the course, we presented our analysis along with an investment recommendation to a panel of KGI faculty and guest industry professionals. This provided an excellent opportunity to develop stronger business communication skills and receive feedback on how to improve critical elements of our project from business professionals.

The ASCB-KGI course was a rewarding experience that has changed the way I view my research and its potential contributions to the biotech industry. Overall, my personal experience in industrial research and technology licensing and the MBA-style case-based teaching and market analysis strategies that I encountered during the ASCB-KGI course have equipped me with a diverse skill set that will be conducive to my career transition from academia to industry.

—Delira F. Robbins, St. Jude Children’s Research Hospital

Questions? Please email grant PI Sue Wick at swick@umn.edu.

PALM is funded by National Science Foundation Research Coordination Network in Undergraduate Biology Education grant #1539870.
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Interested in making a transition to biotech or pharma, or know someone who is? Then you’ll be delighted to hear that ASCB is partnering with Keck Graduate Institute and Biocom to offer a one-day mini-course designed to help basic scientists become more competitive for jobs in industry. The short course, Managing Science in the Biotech Industry, will be held in San Diego on December 11, 2015—the day before the ASCB Annual Meeting.

The course will introduce students and postdocs to bioscience commercialization processes through case study analysis and group problem-solving exercises. There will also be a number of interactive sessions on how to combine your scientific, business, and social skills to make you competitive for a professional career.

Registration is capped at 100 graduate students and postdocs on a first-come, first-served basis. The cost is $125, which includes tuition, curriculum material, and a networking lunch with representatives from Biocom member companies.

Register at www.ascb.org/mini-course

Where to Find Research Funding Opportunities

Check out ASCB’s new online resource for information and advice about funding sources: http://ascb.org/find-funding.

Volunteer to Review CVs

We are always looking for volunteers, including ASCB members in academia and industry, to help review cover letters, CVs, and resumes of young ASCB scientists. We will match you, and will only ask you to review two or three times a year. If you can help, please contact Thea Clarke at tclarke@ascb.org.

Volunteer to Review CVs
Symposia topics will cross disciplines, spatial scales, and systems within broad scientific question areas. All speakers will address different spatial scales.

**Pushing the Limits: Visualization of Hidden Biological Processes**
Supported by Biology of the Cell, Wiley
Eric Betzig, Janelia Research Campus/HHMI
W.E. Moerner, Stanford University
Xiaowei Zhuang, Harvard University/HHMI

**Wisdom of Crowds: Collective Decision-Making by Cells and Organisms Supported by Sanofi**
Deborah M. Gordon, Stanford University
Roberto Mayor, University College London, United Kingdom

**Embraces across the Species Barrier: Complex Cell Interactions**
Rachel Dutton, University of California, San Diego
Forest Rohwer, San Diego State University
William Sullivan, University of California, Santa Cruz

**Like Oil and Water: New Principles Governing Cell Organization**
Tony Hyman, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany
Michael Rosen, University of Texas Southwestern Medical Center

**Minisymposia**
Sunday, December 13, 4:00 pm-6:25 pm

- **Minisymposium 1: Cell Migration in Tissues**
  Co-Chairs: Celeste Nelson and Alissa Weaver

- **Minisymposium 2: Cellular Decision-Making**
  Co-Chairs: Naama Barkai and Jennifer Nemhauser

- **Minisymposium 3: Chromosome Segregation**
  Co-Chairs: Daniela Cimini and Mary Dasso

- **Minisymposium 4: Genome Organization and Stability**
  Co-Chairs: Sarah Elgin, Sui Huang, and Steven Kosak

- **Minisymposium 5: Mechanisms for Shaping Membranes**
  Co-Chairs: Marko Kaksonen and Karen Davies

- **Minisymposium 6: Molecular Motors and the Cytoskeleton: Measurement, Manipulation, and Mechanics**
  Co-Chairs: Zev Bryant and Samara Reck-Peterson

**Education Minisymposium: Teaching How to Teach and Learn**
Supported by CBE—Life Sciences Education
Co-Chairs: Jennifer Hood-DeGrenier and Anthony Koleske

Visit www.ascb.org/2015meeting for more detailed session information.
UPCOMING DEADLINES

Monday, November 19
- Meeting Registration Cancellation (to be eligible for a refund)
- Room-Share Request
- Hotel Cancellation via onPeak, ASCB’s Official Housing Partner

Microsymposia Topics

**Sunday, December 13, 1:25 pm – 2:35 pm**
- Microsymposium 3: Membrane Dynamics and Visualization
- Microsymposium 4: Cell Division and Cytokinesis

**Sunday, December 13, 2:50 pm – 4:00 pm**
- Microsymposium 5: Mechanics in Cellular Maintenance and Disease

**Monday, December 14, 12:00 pm – 1:10 pm**
- Microsymposium 7: Microtubule Dynamics: From +TIPs to Membrane
- Microsymposium 8: The Role of Cytoskeleton in Disease and Repair

**Monday, December 14, 1:25 pm – 2:35 pm**
- Microsymposium 9: Membrane Trafficking
- Microsymposium 10: Applications of Cell Biology in the Real World

**Monday, December 14, 2:50 pm – 4:00 pm**
- Microsymposium 11: Nucleus Biology and Disease
- Microsymposium 12: Signaling in Differentiation and Cancer

**Tuesday, December 15, 12:00 pm – 1:10 pm**
- Microsymposium 13: Morphology of the Cytoskeleton Leading to Morphology in Development
- Microsymposium 14: Actin Cytoskeleton Dynamics

**Tuesday, December 15, 1:25 pm – 2:35 pm**
- Microsymposium 15: Membrane Regulation and Signaling
- Microsymposium 16: Cell Biology of Genetic Information

**Tuesday, December 15, 2:50 pm – 4:00 pm**
- Microsymposium 17: Spindle Assembly and Chromosome Dynamics
- Microsymposium 18: Cell Mechanics and Adhesion

**UPCOMING DEADLINES**
- Monday, December 14, 4:00 pm – 6:25 pm
  - Minisymposium 7: Centrosomes and Spindles
  - Co-Chairs: Daniela Cimini and Mary Dasso

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- Monday, November 19
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  - Minisymposium 7: Centrosomes and Spindles
    - Co-Chairs: Daniela Cimini and Mary Dasso
Plan to arrive Saturday afternoon to attend a Special Interest Subgroup!

This is where ASCB members totally drive the scientific agenda; the focus of Saturday afternoon is on a wide range of topics self-organized by groups of interested scientists. These are among the most popular scientific sessions at the ASCB meeting.

**Saturday Subgroups**

1:00 pm–5:00 pm

**Subgroup A: Autophagy in Disease and Survival**  
Organizers: Nihal Altan-Bonnet and Rosa Puertollano, National Heart, Lung and Blood Institute, NIH

**Subgroup B: Building the Cell**  
Organizer: Suzanne Rafelski, University of California, Irvine and Allen Institute for Cell Science, Seattle

**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

**Subgroup D: Connexins and Pannexins in Disease**  
Organizer: Dale Laird, University of Western Ontario, Canada

**Subgroup E: Cytoskeletal and Membrane Protein Dynamics at the T Cell Immunological Synapse**  
Organizers: John Hammer, Xufeng Wu National Heart, Lung and Blood Institute, NIH; and Larry Samelson, National Cancer Institute, NIH

**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

**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

**Subgroup H: Extracellular Vesicles—Biogenesis and Function**  
Organizers: David Katzmann and Tushar Patel, Mayo Clinic

**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

**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

**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

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

**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

**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

**Subgroup O: Quantitative Microscopy & Image Analysis: Measuring Cellular Organization & Dynamics**  
Organizers: Hunter Elliott, Talley Lambert, Harvard Medical School; Thomas L. Schwarz, Boston Children’s Hospital and Harvard Medical School; Evgeny Shleevkov, Boston Children’s Hospital and Harvard Medical School; and Jennifer Waters, Harvard Medical School

**Tuesday Subgroup**

3:00 pm–6:30 pm

**Subgroup P: The Cellular and Molecular Basis of Invasive Metastatic Cancer**  
Organizers: Mark A. McNiven, Mayo Clinic; Laura M. Machesky, Beatson Institute, Cancer Research UK; and Alissa M. Weaver, Vanderbilt University

Check [www.ascb.org/2015amprogram](http://www.ascb.org/2015amprogram) at any time for updates to the Program.
NEW THIS YEAR! Three Exciting Large-Scale Data Workshops

Recognizing that modern research in cell biology relies increasingly on quantitative analysis of large datasets, we are offering a series of three workshops that provide practical skills training to do just that. Each workshop will begin with a one-hour introduction on the topic open to all registered attendees, followed by a hands-on 2.5 hour workshop (preregistration is required for the hands-on portion).

Computational Methods for RNA Sequencing Analysis
Presenters: Manuel Garber and Alper Kucukural, UMASS Medical School
Sunday, December 13
3:00 pm-6:30 pm
The overview will focus on the main computational components of gene expression analysis. The hands-on portion of the workshop will illustrate the concepts discussed during the overview using a previously published dataset.

Quantitative Analysis and Visualization of Signaling Networks
Presenters: John Albeck and Michael Pargett, University of California, Davis
Monday, December 14
3:00 pm-6:30 pm
The overview will introduce tools for visualizing trends, calculating useful metrics, and performing basic statistical analysis with large datasets focused on signal transduction networks. The hands-on portion will walk participants through the process of analyzing a time-lapse microscopy dataset with thousands of individual cells expressing multiple signal transduction reporters.

Image Analysis in Quantitative Microscopy
Supported by Hamamatsu Corporation
Presenters: Mark Bray and Anne Carpenter, Broad Institute of Harvard and MIT
Tuesday, December 15
3:00 pm-6:30 pm
The overview will introduce biologists to the sorts of phenotypes that can be quantified in images and basic concepts of image analysis. The hands-on portion will instruct biologists in the use of CellProfiler (an open-source, freely downloadable software package designed for automated phenotypic image analysis) at both large- and small-scale, as well as CellProfiler Analyst.

Visit www.ascb.org/largescaledataworkshops/ for more information or to sign up for one or more of these workshops.

Manuel Garber
UMASS Medical School

Alper Kucukural
UMASS Medical School

John Albeck
University of California, Davis

Michael Pargett
University of California, Davis

Mark Bray
Broad Institute of Harvard and MIT

Anne E. Carpenter
Broad Institute of Harvard and MIT

www.ascb.org/2015meeting
#ascb15
Jane Lubchenco: Biology on the Ocean’s Edge and in the Public Eye

Lubchenco found her scientific life’s work at a place familiar to cell biologists, the Marine Biological Laboratory, where she attended the Invertebrate Zoology course as an undergraduate at Colorado College. Exposed in grad school to the tenets of a new kind of experimental and evolutionary ecology at the University of Washington, Lubchenco came to appreciate the intertidal zone as a living laboratory with steep physical and biological gradients, e.g., in temperature, kinetics, immersion time, UV, and exposure to predators, herbivores, or competitors—in short, a perfect system to test hypotheses about the relative importance of those factors in determining the distribution, abundance, and diversity of species on the shore.

“If one is interested in understanding the role of predators in a community, you can manipulate the sea stars that are the top predators in the system,” Lubchenco explains. “You can remove, transplant or cage them in or out much more easily than you could do the same for lions, for example. If your interest is in herbivores, you can manipulate sea urchins or snails—a heck of a lot easier than manipulating elephants! You can also transplant species from high on the shore to low on the shore or from wave-exposed to wave-protected places. You can tease apart the patterns you see in nature. You can find causes instead of just relying on correlations.”

Earning a master’s degree in zoology from Washington University and a PhD in marine ecology from Harvard, Lubchenco joined the Harvard faculty and after a few years moved to Oregon State University in Corvallis. While continuing to pursue her science, Lubchenco was becoming increasingly aware of the disconnect between scientific knowledge and policy or management decisions on environmental issues. She realized that few scientists had the skills or support system to share their science with nontechnical audiences, especially on controversial topics. “There weren’t that many ecologists who could talk about our science, so I began doing more and more of that,” she explains.

Lubchenco also co-founded the Leopold Leadership Program, now at Stanford University, which trains mid-career academics in environmental fields on how to explain their science to the public, politicians, government administrators, and business leaders. Then, as president of the American Association for the Advancement of Science in 1996–1997, Lubchenco issued a call for all scientists to come out of their labs and explain the process of science to Americans.

In 2009, the newly elected Barack Obama named Lubchenco as NOAA Administrator. She served four years and her term was productive and rewarding but stormy, literally. “From 2009–2013, we had the most extreme weather of any four years in U.S. history,” Lubchenco recalls, including Hurricane Sandy. There was also the so-called “Climategate” email scandal controversy and, most disastrously, the Deepwater Horizon oil platform blowout in the Gulf of Mexico. But she is proud of what she accomplished. “Creating a stellar scientific integrity policy, establishing the position of Chief Scientist, returning fisheries to sustainability and profitability, helping establish the country’s first National Ocean Policy—now those are fine legacy accomplishments!” she said.

Lubchenco will bring her call for public engagement of scientists to ASCB 2015. Science has never been more powerful, while the nature of evidence-based decision-making has never been so little understood or willfully ignored, she contends. Scientists have to become bilingual, she says, speaking the language of science and the language of lay people. “We need to change the culture of academia so that
public engagement and public scholarship are valued, rewarded, and supported.” That and more will be on Lubchenco’s agenda for ASCB 2015.

Sallie “Penny” Chisholm: Tiny Cell With Global Impact

Her latest description of her science is “cross-scale systems biology,” and for that, Sallie “Penny” Chisholm offers up Prochlorococcus, the marine cyanobacterium she had a hand in discovering in 1985 and which she has been grooming as a laboratory model system and studying as an extraordinarily diverse wild type. “The beauty of Prochlorococcus is that you can study it both in the lab and in the wild,” Chisholm believes. With Prochlorococcus, she says, “You can study the organism on all scales from the genome or the transcriptome up to the global biosphere. My hope is that it will serve as a model in all facets of an organism, its evolution, its physiology, its ecology, and then its genomic and molecular biology.”

Chisholm has been crossing scales and disciplines all her career. Take the discovery of Prochlorococcus. The word “discovery” usually sends Chisholm into a paroxysm of professional demurs and credit handoffs to colleagues and collaborators. But it was Chisholm and her former postdoc Rob Olson who, at sea on an oceanographic survey vessel where they were using a flow cytometer to study the 1.5-μm cyanobacterium Synechococcus, noticed red flashes of fluorescence from something even smaller—under 0.8μm. “It’s barely visible through normal light microscopy and even with epifluorescence or phase contrast, you won’t see it unless you know what you’re looking for,” says Chisholm.

It slowly dawned on Chisholm and Olson that the red flashes that kept popping up were not broken bits of something elsewhere but a free-living single-cell organism. Going back through the literature, Chisholm realized, “It turns out that it had been discovered two times,” but had been dismissed as a Synechococcus variant or as degradation products in seawater. “Looking backward and putting all these pieces together, we were able to say this is a different beast,” she says.

And there are a lot of them. Prochlorococcus is so far the most abundant photosynthetic organism on Earth (an estimated 10²⁷ cells total), and it has a massive impact on the oceans because of its numbers and because of its near ubiquitous range from 40°N to 40°S. Moreover, 10%–20% of global ocean photosynthesis is carried out by this single group.

While Prochlorococcus is commonly referred to as a species, its genetic diversity upends classic taxonomic definitions. In a recent paper the Chisholm lab reported on extensive single-cell genomic studies of Prochlorococcus samples that revealed hundreds of genetically stable—and genetically ancient—subpopulations co-existing within meters of each other, if not within the same drop of seawater. “It changes the way you think about what’s an organism,” says Chisholm. “Prochlorococcus would have been considered a separate species by traditional microbial standards, and yet it embodies enormous genetic and physiological diversity.”

So what is a floating mid-ocean Prochlorococcus bloom? “I’d call it a collective or a federation,” Chisholm says.

Living largely in the nutrient-poor tropical and subtropical open ocean waters, at different depths and different light levels, these subpopulations appear to stabilize the total population by containing strains adapted...
“Just as studies of *E. coli* revolutionized molecular biology, studies of *Prochlorococcus* could change the way we think about the forces that shape the broader dimensions of life on Earth.”

Chisholm has ambitions for *Prochlorococcus*. She believes that *Prochlorococcus* could become a gold standard organism for ecology and evolution in general. “Just as studies of *E. coli* revolutionized molecular biology, studies of *Prochlorococcus*—in all its dimensions—could change the way we think about the forces that shape the broader dimensions of life on Earth,” she says.

But *Prochlorococcus* is not an easy organism to culture, although the Chisholm lab has developed reliable protocols, keeping clonal strains going for decades at MIT. “It’s a temperamental bug, and it’s not fully tamed,” she admits. It doesn’t like being isolated in pure cultures because it has evolved to rely on “co-bacteria,” separate species that are fulfilling certain functions that *Prochlorococcus* doesn’t do well for itself.2 And there’s an even graver problem. “Here’s the showstopper,” Chisholm says. “We can’t do genetics. It won’t take up foreign DNA.” Although new gene editing technologies give Chisholm hope that it will be possible to manipulate *Prochlorococcus*’ genes, she admits “… it will never be like *E. coli*...You have to be interested in new kinds of questions to work with *Prochlorococcus*.”

Asking new questions requires new models, new methods, and a new mix of disciplines in her lab. “My perspective is definitely ecological, but I have designed my lab to include people trained in everything from molecular biology to evolution to oceanography. They are all drawn to working on an organism in context.” And that context is the ocean.

—John Fleischman

Avoid Carrying Your Poster to the Meeting

Makesigns.com will be the ASCB’s poster printing service for the 2015 Annual Meeting. Makesigns.com will print posters 42 inches high by 66 inches wide on glossy paper or—new this year—on fabric. Information about the poster printing service will be sent to all poster presenters in their notification emails and is also available at mksgn.co/ascb15. The cost for each glossy paper poster is $68.94, and the cost for each fabric poster is $149.87. Shipping is free on orders placed by 12:00 pm CST on Wednesday, December 2. The last day to upload your poster for printing and pick-up at the Convention Center is December 7, 2015, at 12:00 pm EST.

ASCB Poster Competition Judges Needed

The ASCB Minorities Affairs and Education Committees are looking for judges for the ASCB Poster Competition that will be held during the 2015 ASCB Annual Meeting in San Diego, on Saturday, December 12, 2015, from 3:30 pm–5:30 pm. There will be 80–100 posters to judge, but no more than two or three per judge. The competition is open to undergraduate students who submit an abstract by October 14 and to all Minorities Affairs Committee travel awardees.

If you are interested in judging, please sign up at https://my.ascb.org/initiatives/#/apply/31.

If you have any questions, please contact Desirée Salazar at dsalazar@ascb.org.
The ASCB Learning Center
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Interact
Don’t just browse the products, talk to the scientists who make them and get your questions answered. Grab the chance to test drive the latest technology from your favorite vendors - visit the exhibit booths!

Startup Central—Learn about innovative products from startup companies

Fed Central—Find Program Officers here! Discuss collaborations, grants, future funding, peer review with NIGMS, CSR, and NASA.

Publisher’s Row—View the latest books and journals (Be sure to stop by Booths 1126 and 1128 to meet with editorial board members from MBoC and LSE)

Learn
Two dedicated theaters with a packed program of expert technical talks to help advance your science. Learn about the latest technology and how to use it.
This Way Up for ASCB’s All-Video, Mostly Selfies, 60-Second Elevator Speech Contest

You’re good at math. You’re great at chemistry. But how’s your ability to sell your science to a captive audience during a one-minute virtual elevator ride? It’s an essential skill for mid-21st century biologists. Fortunately you can pick up the basics and possibly win high-tech bling in San Diego by entering ASCB’s 2015 onsite All-Video, Mostly Selfies, 60-Second Elevator Speech Contest.

The premise is simple: The elevator door closes and you’ve got a trapped audience—a U.S. senator, your dean, or Taylor Swift. Go for it! Sell your science in 60 seconds. In San Diego, the Public Policy Committee’s Advocacy Toolbox Workshop on Monday, December 14, 10:30 am–noon, will teach you the essentials of elevator talking.

To enter the Elevator Speech Contest, take a video of yourself and then upload it to YouTube or Vimeo. Then go to www.ascb.org/elevatorspeech and fill out the form with the link to your uploaded video. Don’t have the means to record your video in San Diego? Come to the Public Information Committee’s (PIC) Elevator Speech Contest Video Collection Point at the ASCB Booth in the Learning Center on Tuesday, December 15, 10:00 am–12:00 pm. A camera awaits you. All entries must be in by Tuesday at 1:00 pm. The winner and runners-up will be shown at PIC’s 2015 Celldance Video Ceremony that afternoon at 3:00 pm in the Learning Center Theater 1.

Want to see what it takes to win the ASCB Elevator Speech Contest? Check out last year’s winners at http://bit.ly/1MFwFEK.

—John Fleischman

Be Sure to Visit the Learning Center for Tech Talks by These Companies*

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- Simons Foundation
  Wikipedia Edit-a-Thon
- International Foundation for Cell Biology (IFCB)
  Morning with the Editors Session
- Society for Neuroscience
  Enhanced Company Listing on Mobile App
- Worthington Biochemical Corporation
  Travel Awards

***As of October 21, 2015***
Sex Differences and Blood Pressure

Over the last 10 years or so, my collaborators and I have conducted a series of studies on the physiology of sex differences, aging, and blood pressure in humans. The short story is that things get especially interesting for women at and after menopause when blood pressure can rise pretty dramatically.¹

Our findings raise all sorts of questions at every level of biology all the way to population health. They can also be used to generate a linear narrative about how we systematically worked through a problem suggested by the epidemiology of blood pressure, sex differences, and aging. The reality is very different and represents how an experimental jigsaw puzzle came together. I believe our jigsaw puzzle experience might be useful for people thinking about scientific inquiry and professional development at every career stage.

Pieces of the Puzzle

Five main elements formed the milieu in which we were able to recognize the puzzle and discern the outlines of its solution.

First, in the early 2000s, Gunnar Wallin, a colleague from Sweden, asked if we could help him understand why large groups of normotensive people with vastly different levels of sympathetic vasoconstrictor nerve activity have the same blood pressure. Gunnar had evidence that those with high levels of sympathetic “tone” also produced high levels of the vasodilator nitric oxide (NO). We had the ability to make detailed measurements of heart function and we also had Food and Drug Administration approval to give humans arginine analogs that block the synthesis of NO.

Second, Nisha Charkoudian, whose lab was “next door,” was also expert at recording sympathetic activity in humans using the technique Gunnar had perfected in Sweden. She was enthusiastic about collaborating, and together the three of us decided to pursue the topic.

Third, both Nisha and I worked in a clinical research center funded by the National Institutes of Health and were encouraged to study subjects of both sexes. After we made some initial observations in men showing that those with high levels of sympathetic activity had low levels of cardiac output that kept blood pressure normal, we started to wonder if there were sex differences in these patterns.

Fourth, Emma Hart joined the team as a postdoc and started to pursue these questions with real passion. As Emma left for a faculty position in the UK at Bristol, Jill Barnes (now at the University of Wisconsin, Madison) joined us and continued to pursue the sex differences question. The success of Emma and Jill highlights the point that the drive of female trainees working on this topic has been a real force for our team.

Fifth, no matter the specific protocol, we always obtained some common baseline data in all of the subjects we studied. This approach facilitated our own studies and also allowed us to mix and match our findings with those from other labs in studies that required larger numbers of subjects. Most recently Ronee Harvey, an MD/PhD student, has taken a deep dive into why oral contraceptives raise blood pressure by about 5mmHg in women.²

So very general questions about sympathetic activity and blood pressure in humans served as the corners and edges of our puzzle, and importantly the interior of the puzzle grows and becomes more detailed as new questions emerge. Part of this is a general ethic about asking questions versus chasing answers.³ Of course when we write grants we generate nice tight “if we find A, then we conclude B” story lines, but in reality the grants have been a template, and usually after about a year or so we are pursuing related but different things.
From Puzzle to Narrative?
I would argue that if you actually deconstruct a lot of successful careers and experimental “lines of work” there is in fact a jigsaw puzzle element to most of them and that linear narratives usually emerge post hoc. Telling ourselves and those we work with (especially younger people) that these linear stories are how it really happened can be an anxiety-producing distraction. This then leads to an overly metric-driven, as opposed to a curiosity-driven, approach that is ultimately inhibitory.

To me it is important for senior members of any team to help everyone keep the big picture questions flowing and keep the anxiety at bay. I would also add that on a practical level an ecosystem in your department and institution that encourages collaboration is likely as important as the microenvironment in your own lab.

I also wonder if we are all working “too hard.” One of the advantages of doing complex studies in humans is that logistical limitations require at least a few days a week off from data collection. These built-in breaks provide a perfect excuse for idea-generating, coffee-fueled chats with trainees, colleagues, and collaborators.

All of us have to pay attention to things like tenure clocks and checking various boxes so we can move our careers forward. We also need to tell good and mostly linear stories in our papers and grants. However, let’s all remember that some of the best linear stories are based on nonlinear experiences, and when you are in the middle of one don’t let it raise your blood pressure too much.

—Michael J. Joyner, Mayo Clinic

References
On October 7, Francis Collins, National Institutes of Health (NIH) Director, issued a dire warning to Senate appropriators: “If Congress cannot come to a budget agreement and federal agencies are funded for a full year at FY15 levels, the impact on biomedical research funded by the National Institutes of Health would be devastating.” He further stated that the Precision Medicine Initiative would be put on hold for the year and progress on the BRAIN Initiative would be stalled, citing two programs with bipartisan support in Congress.

Currently, federal government programs are running on a stop-gap measure. The question looming large is, can Congress reach a budget agreement before that stop-gap measure expires on December 11?

On September 29, Senate Majority Leader Mitch McConnell (R-KY) announced that he, Speaker of the House John Boehner (R-OH), and President Barack Obama would take a stab at negotiating a budget agreement. It was hoped that the threesome—known in DC as old-school compromisers—would be able to hammer out a deal that would raise the strict sequester budget caps for the next two years, clearing the way for Congress to finalize the yearly funding measures for federal agencies.

Sounds easy for three well-established negotiators to come up with a deal that everyone involved can equally like and hate, right? Well, that was then (September), and this is now, when even by Washington standards it is hard to get anything done. First, Boehner announced that he was stepping down as Speaker and retiring from Congress. The likelihood that any agreement will come to fruition prior to his departure is extraordinarily small. These negotiators are good, but they aren’t that good. Complicating matters, the heir apparent to Speaker Boehner, House leader Kevin McCarthy (R-CA), suddenly took himself out of the race for Speaker. As of press time in mid-October, we simply do not know who will take Speaker Boehner’s place at the negotiating table, although Paul Ryan (R-WI) appears to be the frontrunner at the moment.

A second complication in the budget negotiations is the unrest in the House Republican Caucus. The same ultra-conservatives who led the charge to remove Speaker Boehner are adamantly opposed to any increase in the spending caps. While many Senate Republicans believe that shutting down the government is an ineffective way to govern, that view is not shared by House ultra-conservatives.
A third complication is the scope of the bill itself. There are many other issues that Congress has to address by the end of the year, including funding our transportation infrastructure, raising the debt ceiling limit, and extending some corporate taxes. Will these issues be included in the final package? Will the spending caps be raised? Will the leaders at the negotiating table be able to shepherd their respective members in support of a final package?

Meanwhile, as we draw near to December 11 with no real action taking place on the budget negotiations, the federal government faces yet another possible shutdown. If this happens, federal agencies like the NIH and the National Science Foundation will have to freeze operations for an undefined period of time, including closing labs, restricting travel, stopping the processing of grants, and suspending the use of government telephones and email.

So the question hanging over Capitol Hill is simple: Will they get this done or won’t they?

—Lynn Marquis
Postdocs/Grad Students

Do you want to organize a One-Day Local Meeting?

ASCB Financial Support Available

Build Community and Collaboration

ASCB helps fund and organize your local meeting. Such meetings will typically involve two or more local research institutions or colleges (within or outside of the USA). Topics may range from basic science to career development, with a clear relevance to the broadly defined field of cell biology.

For more information go to ascb.org/local-meetings or email aharris@ascb.org.

Deadline for Applications:
January 26, 2016
September 15, 2016

#ascblocal
Did You Know…?

You Can Renew Your Membership for Multiple Years and Save

The 2016 ASCB membership renewal reminder was sent out recently. If you think the email may have been blocked or are not sure if you have renewed for 2016, please contact Marta Chacon, Membership Manager, at MChacon@ascb.org.

Here’s some helpful information regarding your membership renewal:

- Regular members can pay for two years, or three years, at special discounted rates!
- Postdocs can pay for two years at a special discounted rate as well!
- Renew now to ensure you don’t miss an issue of the ASCB Newsletter or Molecular Biology of the Cell!
- You can also renew your subscriptions to the following journals at discounted rates when you renew your dues:
  - The latest volumes of Annual Reviews of Cell & Developmental Biology
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ASCB
MOLECULAR BIOLOGY OF THE CELL
SPOTLIGHT on Technology

Spotlight on Technology is a new section of the ASCB Newsletter in which scientists from ASCB’s corporate partners share their technical expertise with readers.

The Advantages and Difficulties of Working with Primary Cells

Cell culture studies provide a valuable complement to in vivo experiments, allowing for a more controlled manipulation of cellular functions and processes. For decades, cell lines have played a critical role in scientific advancements, yet researchers have become increasingly cautious when interpreting data generated from cell lines only. Factors such as misidentified and contaminated cell lines have spurred renewed interest in primary cells.1,2

Another disadvantage of cell lines is that they often differ genetically and phenotypically from their tissue of origin. In contrast, primary cells maintain many of the important markers and functions seen in vivo.3,4 Endothelial cell lines, for example, lack various functional markers, while primary endothelial cells retain these critical features.

Growing Primary Cells

Although primary cells offer many advantages, obtaining a pure population of primary cells can be a difficult and arduous process. Primary cells, in contrast to cell lines, are extremely sensitive, requiring additional nutrients not included in classical media. To optimize survival and growth, primary cells perform best in specialty media customized for each cell type. An endothelial cell, for example, has very different nutritional requirements than an epithelial cell or a neuron, and thus requires a unique medium.

Traditional cell culture media have relied on serum to provide the growth factors, hormones, lipids, and other, undefined components to support cellular growth. For primary cells, however, high serum levels can lead to differentiation or promote growth of contaminating cells like fibroblasts. In addition, the use of serum is plagued by rising costs and lot-to-lot variability. The use of specially formulated media with little or no serum circumvents these issues while enabling greater customization to promote growth of individual primary cell types.

Other practices, such as seeding primary cells on more physiologically relevant substrates rather than on synthetic polymers, can significantly improve cell attachment, growth, and purity.

Gene Expression Analysis

Gene expression analysis is critical for understanding the transcriptome profiles of primary cells and how they directly influence the cells’ functionality. Traditional reporter-gene assays and cDNA microarrays often require either transfection of exogenous material or large quantities of high-quality RNA. Primary cells,
however, are notoriously difficult to transfect, and the efficiency varies greatly among cell types. In addition, primary cells have a finite lifespan and limited expansion capacity, making it difficult to obtain a high yield of RNA.

These problems can be overcome with the use of quantitative PCR (qPCR) arrays that have been validated and optimized using primary cell cDNA. qPCR arrays enable researchers to directly measure protein expression patterns of primary cells, stem cells, tissues, and cell lines. Due to the high sensitivity and specificity of these assays, even genes with very low abundance can be analyzed.

Gene expression analysis of primary cells will enable researchers to better understand biological pathways and disease processes, such as cell cycle regulation, stem cell biology, cancer development, and neurological disorders. Primary cells are critical tools in the pursuit of future scientific breakthroughs and therapies.

— Jennifer Welser-Alves, ScienCell Research Laboratories

Note

The author is Associate Director, Scientific Affairs, at ScienCell Research Laboratories, which specializes in primary cell culture. Its products include primary cells, customized culture media, and GeneQuery™ qPCR array kits.

References


Upcoming Local Meetings

ASCB is pleased to provide funds for graduate students, postdocs, and community college instructors to organize one-day local meetings. Such meetings usually involve two or more institutions (within the United States or international), and topics can range from basic science to career development as long as there is clear relevance to the broadly defined field of cell biology.

The next deadline to apply for funds is **February 1, 2016**. Applicants must be or become members of the ASCB. For more information visit www.ascb.org and click on “Meetings.”

**BioImaging of Living Systems—Single Cells to Whole Organisms**
St Lucia, Queensland, Australia
November 10, 2015

**Bay Area Cilia Symposium**
San Francisco, CA
January 14, 2016

**Toronto Organelle Function and Dynamics (TOOFAD)**
Toronto, ON, Canada
February 2016 (date TBD)

**Non-Academic Careers for Life Scientists—Reach Out to Resources beyond Your Lab**
Baltimore, MD
March 16, 2016
TOP STORIES from the ASCB Post

Dining with Congress, Discovering CRISPR, Planning a Rescue
Visit ascb.org/ascbpost for more.

A Little Something for Everyone at the Congressional Dim Sum Buffet
The Congressional Budget Office, the agency that provides nonpartisan budget analysis to members of Congress, released a review of the FY15 federal budget at the end of August. Like the dim sum menu at a Chinese restaurant, it had a little something for everyone.

Bending Nature or Learning from Nature? Jennifer Doudna Expands on CRISPR
The title, “Bending Nature to Our Purposes,” of the upcoming Symposium at ASCB 2015 is okay, says Jennifer Doudna. A Howard Hughes Medical Institute investigator and a professor of biochemistry, biophysics, and structural biology at the University of California, Berkeley, Doudna is most prominently a key player in the discovery and development of CRISPR Cas9. But Doudna thinks of her work less as “bending Nature” and more as “learning from Nature” what is possible. “It’s trying to figure out how Nature does things and every now and then realizing that I might harness this for another purpose,” Doudna says.

Leading ASCB Scientists Join Effort to Rescue Research
A team of prominent scientists have formed a coalition to address the crisis facing biomedical research. The initiative, called Rescuing Biomedical Research, is headed by 16 prominent scientists, many of whom are ASCB members, including ASCB President Shirley Tilghman and former ASCB Presidents Ron Vale, Mary Beckerle, Marc Kirschner, and Bruce Alberts. Others include ASCB Council member Tony Hyman, former ASCB Committee for Postdocs and Students co-chair Jessica Polka, and former ASCB International Affairs Committee chair Judith Kimble.

San Francisco

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12,616 individual signatures
592 institutional signatures

Coming soon: How to apply DORA principles in Search Committee discussions
Check out best practices at ascb.org/dora
Replication stress in early S phase generates apparent micronuclei and chromosome rearrangement in fission yeast
S. A. Sabatinos, N. S. Ranatunga, Ji-Ping Yuan, M. D. Green, and S. L. Forsburg
Unable to complete S phase, a fission yeast MCM mutant evades the mitotic checkpoint, causing aneuploidy, chromosome fragments, and bridges. The formation of apparent yeast micronuclei that are membrane bound is shown in real time; they develop DNA damage signals and may rejoin the parent nucleus.
Mol. Biol. Cell 26 (19), 3439–3450

A phosphoinositide-binding cluster in cavin1 acts as a molecular sensor for cavin1 degradation
V. A. Tillu, O. Kovtun, K.-A. McMahon, B. M. Collins, and R. G. Parton
Cavin1 degradation is mediated primarily by the ubiquitin proteasome system. The phosphoinositide-binding region in cavin1 acts as a molecular switch for cavin1 degradation upon release of cavin1s in cytosol. This mechanism may help to maintain low levels of free cytosolic cavins at steady state.
Mol. Biol. Cell 26 (20), 3561–3569

Hcm1 integrates signals from Cdk1 and calcineurin to control cell proliferation
H. E. Arsenault, J. Roy, C. E. Mapa, M. S. Cyert, and J. A. Benanti
The transcription factor Hcm1 is a key regulator of chromosome segregation and genome stability. The phosphatase calcineurin directly inactivates Hcm1 in response to environmental stress, which inhibits proliferation. Hcm1 functions as a rheostat, the phosphorylation state of which affects the rate of proliferation.
Mol. Biol. Cell 26 (20), 3570–3577

An early DNA replication defect causes abnormal mitosis. This time-lapse image shows disruption of normal cell division in a fission yeast cell with a mutation in the mcm4 helicase protein. The cell membranes are labeled in green and the chromatin (histones) in magenta. Despite the severe defects in DNA replication, the cell continues dividing multiple times, with abnormal phenotypes including multiple spindles, uneven chromosome segregation, and multiple, irregular nuclei. The few survivors in the population from which this cell came have increased rates of mutation and chromosome rearrangement. In mammals, mutations in MCM4 are associated with cancer and developmental abnormalities. See Mol. Biol. Cell 26, 3439–3450. (Image: Sarah A Sabatinos, Ryerson University, and Susan L Forsburg, University of Southern California)
The Cell: An Image Library is proud to announce that in just a little over five years we have served 500,000 unique visitors who have visited 650,000 times and viewed over 2.5 million pages. We thank all of you who have visited and encourage those who have not to take a look. We are also pleased to welcome the 217th country to access the Library, Guinea.

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The Cell: An Image Library-CCDB (www.cellimagelibrary.org) is a freely accessible, easy-to-search, public repository of reviewed and annotated images, videos, and animations of cells. The Cell-CCDB was developed by ASCB under a Grand Opportunities grant from the National Institute of General Medical Sciences. It now resides at the National Center for Microscopy and Imaging Research Cell Centered Database (CCDB), which manages the Library under a perpetual license from ASCB.

—David Orloff

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Are you publishing a book? If so, let ASCB know! Send the title, publisher, ISBN information, and a thumbnail (300 dpi) of the cover. We’ll include it in the ASCB Newsletter. This publicity is available only to ASCB members. Please send submissions to Thea Clarke at tclarke@ascb.org.
MEETINGS Calendar

A complete list of upcoming meetings can be found at ascb.org/global-meetings-calendar. No meetings have been added since the last issue of the Newsletter.

ASCB Annual Meetings

December 12–16, 2015. San Diego
December 3–7, 2016. San Francisco
December 2–6, 2017. Philadelphia
December 8–12, 2018. San Diego
November 18–20, 2019. Boston

MEMBER in the News

Jonathan M. Backer, an ASCB member since 1998, has become Chair of Molecular Pharmacology and Biochemistry at the Albert Einstein College of Medicine.

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Bombed My Defense!

Dear Labby,
My thesis defense started out fine. It was the usual seminar (with my husband, our five-year-old daughter, my parents, and my in-laws all sitting in the back) followed by some easy questions from the audience in this “public” part. After a short break, the committee convened and things went downhill in a hurry. The extramural member went first and had huge issues. I did my best to answer her questions, but I was clearly in trouble. None of the intramural members of my thesis committee came to my rescue, and this added to my angst. They had been so supportive all through my thesis research odyssey and now were so silent. After this horrible nadir, they did ask me some questions, which I handled fine, but I was still shell-shocked. At the end I was asked to step out and when called back was told that I was a “near-fail” but that a few key experiments and a significant rewrite could salvage my thesis.

Obviously I am setting out to do this. But the experience was humiliating. Will I forever wear a badge of (near) failure, like Hester Prynne in The Scarlet Letter? Maybe that’s apt because I am so embarrassed that my face has been pure $\lambda = 650$ nm ever since.

—Sandbagged

Dear Sandbagged,
Wow, you were indeed sandbagged. Why didn’t the external examiner bring up these issues with your adviser (and you) after first reading the thesis? And were the issues she raised ones your thesis committee had failed to bring up earlier? In any case, it may not be productive to seek an explanation for this puzzling attack. Instead focus on the most important aspects: you, your angst, and moving beyond this.

Thesis revisions are typical, so that is no stigma and you can relax. You will revise your thesis in response to valid points made, but you will never wear a scarlet letter, because the thesis defense records will be buried in the archives of your institution. Even if the new experiments and thesis revision knock you out of a planned spring 2016 graduation, many institutions allow a student still revising his or her thesis to “walk” at graduation. Soon you will move on to a postdoc position and this experience will fade into your past.

To lift your spirits, you should read the account of another PhD student who failed his defense (a “real fail,” until a key experiment was repaired). His name may be familiar to you. Labby encourages you to read his account1 and suspects you will feel much better.

—Labby

Reference

Got Questions?
Labby has answers. ASCB’s popular columnist will select career-related questions for publication and thoughtful response in the ASCB Newsletter. Confidentiality guaranteed if requested. Write us at labby@ascb.org.
The ASCB is grateful to the following donors whose contributions between October 1, 2014, and September 30, 2015, support Society activities.

**Gold ($1,000 and up)**

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X2 for CRISPR

TransIT-X2® Dynamic Delivery System

Now you can use the same transfection reagent for your knockout, knockdown or expression experiments. The TransIT-X2® Dynamic Delivery System takes CRISPR genome editing a step further with an advanced polymeric technology that efficiently delivers plasmid DNA, small RNAs such as siRNA and CRISPR guide RNA or RNP complexes. The TransIT-X2® Dynamic Delivery System delivers CRISPR/Cas components in multiple formats:

- DNA—deliver plasmid DNA expressing Cas9 or guide RNA
- RNA—deliver sgRNA or crRNA:tracrRNA
- Protein—deliver Cas9:gRNA RNP complexes