Newsletter
Biophysical Society JUNE 2017

DEADLINES

Meetings 2017

Emerging Concepts in Ion Channel Biophysics
October 10–13
Mexico City, Mexico

June 23
Early Registration

Meetings 2018

62nd Annual Meeting Biophysical Society

February 17-21

July 1, 2017
Abstract Submission

2017 Election Opens

Voting in the 2017 Society elections began on June 1.

The 2017 slate includes two candidates for President-Elect: *David Millar* of Scripps Research Institute and *David Piston* of the University of Washington, St. Louis.


David Millar
Scripps Research Institute


David Piston
University of Washington, St. Louis

The President-Elect will serve a one-year term, beginning February 2018, followed by a year as President, starting February 2019.

This year there are eight candidates for Council, shown below. The four members who receive the most votes will serve a three-year term on Council beginning February 17, 2018.

Full biographical sketches and candidate statements are available at www.biophysics.org. All regular Society members with 2017 dues paid by May 31, 2017, are eligible to vote. Eligible members may vote electronically until August 1, 2017, through the secure site found at www.biophysics.org.


Linda Columbus
University of Virginia


A. Keith Dunker
Indiana University


António Guia
AVIVA Biosciences Corporation


Dagmar Klostermeier
University of Munster


Ramón Latorre
Universidad of Valparaíso, Chile


Jennifer Ross
University of Massachusetts, Amherst


David Stokes
New York University School of Medicine


Pernilla Wittung-Stafshede
Chalmers University of Technology, Sweden

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Biophysical Society

The *Biophysical Society Newsletter* (ISSN 0006-3495) is published eleven times per year, January-December, by the Biophysical Society, 11400 Rockville Pike, Suite 800, Rockville, Maryland 20852. Distributed to USA members and other countries at no cost. Canadian GST No. 898477062. Postmaster: Send address changes to Biophysical Society, 11400 Rockville Pike, Suite 800, Rockville, MD 20852.

Biophysicist in Profile

JEAN CHIN

Jean Chin

Many Biophysical Society members and meeting attendees will recognize *Jean Chin*, retired Program Director in the Division of Cell Biology & Biophysics at the National Institute of General Medical Sciences (NIGMS), from the National Institutes of Health (NIH) grant workshops she has organized and chaired for the Annual Meeting over the past ten years. "I remember meeting [former BPS president] Ken Dill when he was visiting NIH and offering to do a workshop, and being surprised when he accepted. I had written a demonstration study section meeting script and thought it would work as a teaching tool. I recruited and organized my 'reviewers' and chaired the 'review' session, thinking it would be a one-time session, but the committee kept inviting me back," she says. "When there were so many changes at NIH, I organized panel discussions to present and discuss these changes and new opportunities at NIH. The last one in New Orleans elicited lots of questions and discussions."

Chin, who retired from the NIH in March 2017, was born in Worcester, Massachusetts, to parents who had emigrated from China. Her father worked in the restaurant business and her mother worked in the home. By the time she was to enter second grade, the family moved to Boston. "Growing up in the city was very different and challenging to a seven-year-old but soon I was walking everywhere," she shares. "One especially favorite weekend outing was to walk to the magnificent Boston Public Library in Copley Square with neighborhood friends, to explore and return home with a stack of books to read."

She enjoyed childhood singing and piano lessons, but realized that she would not have a career in music. "Luckily a distant relative who visited my family told me about her biochemistry research. At twelve, I liked the sound of the word and the combination of biology and chemistry so I decided that I would become a biochemist," she says.

After graduating from Girls' Latin School, she attended Simmons College in Boston, majoring in chemistry. "From there and after a few detours to work in a couple of great research labs, I completed my PhD research at Dartmouth College with *T.Y. Chang* on the coordinate regulation of cholesterol and unsaturated fatty acids metabolism in CHO cells," Chin says. "Most of the enzymes involved were membrane proteins in the endoplasmic reticulum. I first found that compactin, the basis of the current statins on the market, caused a dramatic decrease in the half-life of HMG-CoA reductase, the rate-limiting step in cholesterol biosynthesis. I also saw that compactin caused massive accumulation of lipid vacuoles in cells. My thesis work was supported by an American Heart Association predoctoral fellowship."

Chin has a great admiration for her father, who despite not finishing high school stressed the importance of education and hard work in all endeavors, big or small. "He also kept me humble," she says, "by asking me to explain to him in plain English what I had learned in class. When I had

trouble, he would chastise me and insist that I should be able to teach anyone whatever I learned."

Following completion of her PhD studies, she worked in the lab of *Konrad Bloch* at Harvard University as a postdoctoral fellow. Her work focused on the role of a supernatant protein factor in the regulation of lipid metabolism and was supported by an American Heart Association postdoctoral fellowship and then by an F32 grant from NIH.

"During my training, lipids were considered messy and to be avoided but they are so important and necessary for membrane structure, integrity, activity and function of membrane proteins. Lipids were not a 'hot' area then, but I persisted and learned as much as I could," she says.

Chin had trouble finding an academic position focused on lipids in the New England area following her postdoc. In addition to running his lab at Harvard, Bloch was a consultant with a small biotechnology company in Cambridge and suggested that she consider working in the biotech industry, which she did. "I was hired to manipulate yeast metabolism for desired products. The biotech world was very different but I learned a lot about the different kinds of benefits and challenges faced," she explains. "Later, this experience would help me appreciate what small businesses faced when applying for SBIR and STTR grants to support their research. "

She then accepted a position as an instructor at Harvard Medical School in pathology and at the Center for Blood Research and focused on characterizing a protease inhibitor. Not long after she began working there, her husband, *Don Schneider*, moved from Dartmouth Medical School to the Center for Scientific Review at NIH. For the previous ten years, they had maintained a long-distance marriage between Boston and Hanover, New Hampshire, and Schneider hoped that she would join him in moving to Bethesda. "After much thought, I applied for and accepted a position as a Senior Staff Fellow at NIH and NICHD with *Rick Klausner*," she says. "There I focused on characterizing the relationship between iron sulfur clusters and regulation of RNA motifs."

Although she enjoyed the research, after a while she felt that it was time to move on, and applied for a Program Director position at NIGMS. The position allowed her to return to her first and constant research passion, membranes and membrane proteins. In 1994, she began with a small portfolio of about 60 grants, and by the time of her retirement this year, she had built up the program to around 250 grants focused on structure, function, and dynamics of lipids, membranes, and membrane proteins.

Chin and her husband on Bike to Work Day.

This work was very rewarding for her, as she saw the growth and development of the membrane protein field and the success of applicants, grantees, and their trainees in her and other portfolios. She is extremely excited about the amazing approaches, tools, and reagents developed over the past 20 years to study the membrane proteins. After working with this community for 23 years, Chin will especially miss talking with the investigators.

She advises grant applicants: "Ask important questions you really want to answer, even if they are challenging and might take a long time to address. Prepare and submit only when you and your project are ready; don't be a shotgun applicant. The goal is not to submit as many applications as possible but to submit your best application and to focus on your important biologically driven questions."

Now that she is retired, Chin plans on playing the piano again, taking more photos, volunteering, tutoring, and perhaps consulting. First and foremost, she looks forward to spending more time with her husband on their tandem bicycle. "We tried riding single bicycles together, but he is a strong rider and was always waiting for me to catch up," she says. "Since buying our first tandem in 1994, we've traveled all over the United States and abroad with our tandem. One reason to retire this year was that I signed us up for more trips than normal, so I didn't have enough vacation days."

Profilee-at-a-Glance

Institution
NIH, Retired

Area of Research
Structure, function, regulation, and dynamics of membranes and membrane proteins.

Public Affairs

BPS Members Take on Capitol Hill

On April 25 and 26, Biophysical Society members *Kathleen Hall*, Washington University, St. Louis, and *Christy Gaines*, University of Maryland Baltimore Campus, joined over 250 other scientists, engineers, and business leaders making visits on Capitol Hill as part of STEM on the Hill Congressional Visits Day. This annual event is sponsored by the Science-Engineering-Technology Work Group, of which the Biophysical Society is a participant. The purpose of the visits was to educate Congress about the important role federal funding plays in research and innovation and to express support for sustained and predictable federal funding for research. This year's Hill visits were especially timely given that they were a few days after the March for Science and a few days before Congress needed to pass a budget to fund the government for the rest of fiscal year (FY) 2017.

Hall (center) and Gaines (right) meet with Pauline Jamry, legislative director for Wm. Lacy Clay.

Hall, a member of the BPS Public Affairs Committee and Gaines, a PhD student, are very interested in advocacy, and this event gave them an opportunity to explore those interests and ideas on how they can be science advocates after the event is over. They also had the opportunity to learn about the federal budget for science agencies, the appropriations process, and the legislative process from a panel of speakers that included representatives from the Senate, the House of Representatives, and the American Association for the Advancement of Science.

Hall and Gaines, along with BPS staff member *Ellen Weiss*, met with staff in the offices of Senators *Roy Blunt* (R-MO), *Claire McCaskill* (D-MO), *Tom Udall* (D-NM), *Martin Heinrich* (D-NM), *Thom Tillis* (R-NC), and *Richard Burr* (R-NC); and Representatives *Wm. Lacy Clay* (D-MO), *Ben Ray Lujan* (D-NM), *Elijah Cumming* (D-MD), and *Robert Pittinger* (R-NC). The message shared with all offices was that science needs predictable, sustainable, and robust funding, with an emphasis on the FY 2017 and FY 2018 budgets.

Congress Approves Funding for the Rest of FY 2017

Congress finally came to an agreement on how to fund the federal government through September 30, 2017, during the first week of May — seven months after the start of the fiscal year. The bipartisan bill included $2 billion for the National Institutes of Health (NIH). While both Republicans and Democrats in Congress had expressed support for an increase to NIH, the White House had suggested cutting several billion dollars in FY 2017 to help pay for increases in defense spending and the construction of the border wall between the United States and Mexico. President *Trump* backed down from this request, indicating he would work on securing funding for these priorities in the FY 2018 budget.

The National Science Foundation received a small increase of $8.7 million over FY 2016 levels, with the increase allocated to Major Research Equipment and the Office of Inspector General. Funding for research and related activities was funded at the FY 2016 amount of $6.033 billion. The Department of Energy Office of Science also received a small increase, with an additional $39 million to spend in FY 2017. Within the Office of Science, advanced computing gets the biggest bump with an extra $10 million, and the US contribution to ITER, the international fusion reactor under construction in France, takes a hit with a $65 million decrease.

The Society put out a statement applauding Congress for its support of science, in particular NIH, when the spending bill was released. The statement is available in the newsroom on the Society website www.biophys.org/aboutus/newsroom.

Innovation Progress Report Rates Congress

Following up on their call for Congress and President Trump to enact critical measures to ensure the United States maintains its role as global innovation leader, the organizers of a coalition of more than 500 businesses, scientific organizations — including the Biophysical Society, and universities in all 50 states, issued a progress report that charges Congress and the White House must do more to maintain and expand America's innovation advantage. While the report, *Innovation: An American Imperative*, details some important achievements, the report writers "warn that the United States risks falling behind other nations that are doubling down on investments in research, science, education, and other innovation-related policies."

The progress report details the status of seven key science, research, and innovation policy priorities. It applauds Congress for reaffirming the merit-based peer review process and making permanent the Research and Development Tax Credit. The report expresses increasing concern over US visa policies that must be revised to attract and retain the best and brightest students and researchers in an increasingly competitive global market, noting that the country appears to be taking significant steps backwards on this front.

The entire report can be read at http://www.amacad.org/pdfs/2017-Innovation-Imperative-Progress-Report.pdf/.

NIH Announces Plan to Limit Funding per PI

In an effort to more equitably divide NIH's extramural research funds and to maximize research output, NIH announced plans to limit funding per PI to the equivalent of no more than three R01 grants. The change will affect only 6% of NIH investigators, but is estimated to free up funds to make an additional 1,400 awards per year. Research demonstrates that incremental productivity begins to decline at this level of funding.

To calculate funding levels, NIH is developing a new tool, the Grant Support Index (GSI). During May and June, the Index will be presented at all NIH Institute Council meetings and the Director's Office will be collecting feedback on exactly how the GSI should be calculated. The Director's office will also be collecting input from the scientific community over the summer. Issues to consider include how to weigh commitments such as training grants, which do take a lot of effort on the part of the PI, but also represent a huge service component by that individual.

The Society's Public Affairs Committee will be following developments with the GSI closely and will alert members when the opportunity to weigh in arises.

March for Science

Tens of thousands of people turned out at over 600 sites around the world for the March for Science on April 22. Estimated crowd sizes included 40,000 in Washington, DC, and Chicago, 20,000 in New York City, and 10,000 in Philadelphia, London, and Duluth. While each event was independently organized, the messages of these marches were consistent: Science affects people everywhere, policy decisions should be made based on evidence-based science, the public supports science, and government agencies worldwide play an important role in funding scientific research. The Biophysical Society is an official partner of the March for Science.

BPS member Harel Weinstein (far right) marched in New York City with fellow biophysicists and supporters.

BPS member Jill Trewhella showed her BPS pride at the march in Salt Lake City, Utah.

In an effort to capture the enthusiasm from the March, the Society launched six weeks of action immediately following the March. Members were encouraged to take an action a week and hopefully these actions will continue beyond those six weeks.

To see these actions, visit the March for Science page of the Biophysical Society website.

(Continued on next page.)

National Science Board on Career Opportunities for PhDs

The National Science Board (NSB) released a policy brief featuring an interactive infographic that allows users to see the number of doctorates employed in business, government, and academic jobs and how career paths change over time. Users can examine career outcomes by field, gender, and career stage. According to the data, of those holding a PhD in biochemistry or biophysics, 79% are engaged in research and development 5–9 years after obtaining their degree, 56% are engaged 10–14 years out, and 91% are engaged 15+ years out.

"We need to exorcise the notion that those who get a PhD in a science, engineering, or health field are limited to an academic career," said Geraldine Richmond, Chair of NSB's National Science and Engineering Policy Committee and lead in developing the brief. "The data show incredibly diverse jobs that PhD holders are in across all employment sectors. It's our hope that this brief helps raise awareness in students and faculty about the rich and varied career paths that these doctorates can take."

The brief and infographic can be accessed at https://www.nsf.gov/nsb/sei/infographic2/#nsb-statement.

Are You Running for Office?

There has been a push for scientists to get involved civically the last several years and chatter indicates that many are taking that plunge. Let us know if you are running for an elected position — school board, city council, state legislator, or Congress! Send information to Ellen Weiss at eweiss@biophysics.org.

By the Numbers

The Biophysical Society blog has an archive of over 40 articles offering career advice for biophysicists.

International Affairs

EU Science — Brexit and Globalization Opportunities

So, will European Union (EU)-funded science miss United Kingdom (UK) participation after Brexit? What does the future hold — will the UK be excluded from EU programmes? Can new opportunities be found for UK science without the "shackles" of Brussels? Will the UK seem as attractive for employment to families and scientists from the EU, without being formally part of the EU? Will EU science falter without formal UK participation and contributions of a major player, financially as well as with productivity?

Brexit has already had a significant impact on UK science. Currency exchange rates have resulted in increased (~25%) foreign equipment, contracts, and supply costs. No thought has yet been given to post-Brexit science by government (to be re-elected on June 8, 2017), and other non-scientific issues need to be negotiated first, not least is personnel mobility (a king-pin of EU philosophy) and free access to EU trade markets. Uncertainty and lack of clarity is destabilizing — we are all "on hold" about the formal outcomes, but the science will not stop to wait for politicians.

Already, unease at the potential exclusion from EU science networks, exclusion from use of EU facilities, and ineligibility to apply for major European Research Council applications (US$2M over five years), is causing real concern. Some UK network coordinators have been asked to step aside in favour of mainland EU team leaders for fear of prejudicing the outcomes of applications [1]. Successful applications will be funded by the (present, but outgoing) UK government until 2020 [2], but no commitments have been made beyond then, and such commitments can change with changes to the government. *Paul Nurse*, Nobel prize winner and director of the Francis Crick Institute, said Britain's scientists would have to work hard to counter the isolationism of Brexit if UK science was to continue to prosper. "This is a poor outcome for British science and so is bad for Britain," he told *The Guardian*. "Science thrives on the permeability of ideas and people, and flourishes in environments that pool intelligence, minimize barriers, and are open to free exchange and collaboration." [3].

Recruitment and retention of staff at every level into UK positions is in jeopardy: One in six UK faculty are non-UK EU-nationals [4]. Immigrants are already being used as "bargaining chips" in cutting deals for a post-Brexit UK. Even for those EU citizens already resident in the UK for decades, the future is unclear [5]. Families have real fears of being split up and it has already happened. The UK punches well above its weight internationally in science [6], as well as in securing disproportionately high success rates in EU funding [7], such that recruitment incentives include being part of that UK environment, coupled with access to EU funding opportunities. The attractiveness is now perceived to be less without clarity about EU funding access, and a "brain drain" is already underway [4]. Some non-EU countries (Switzerland, Scandinavia) have governments that have supplemented their national science budget for any EU collaborative research, a hoped-for outcome for the UK in the longer term.

Widening UK global interactions are already underway for trade and commerce (Theresa May is all over the world), but science is already global. UK scientists have always found ways of collaborating — usually organically developed and founded on the science need — with or without special funding initiatives. Post-Brexit conditions may exclude direct EU funding for collaborative opportunities for UK scientists. Historically (2007–2013) ~15% of UK science spending originates from the EU [7]: The UK government spends 1.66% of gross domestic product (~£8b/US$10b) on science, compared with the EU28 norm of 2.3% (United States is 2.73%; China is 2.01%) [8], so the extra annual £850M/US$1b [7] to the UK through EU grants has been a welcome addition, soon to be lost. Some universities are considering establishing campuses in mainland Europe to benefit from EU funding, although Ox-

ford has subsequently denied the plan [9]. We will need to be imaginative, and the science will drive solutions, with or without the oil of EU funding to ease the mechanism of collaborative science.

The European Biophysical Society, and other scientific societies, will still include UK participation, be inclusive and promote globalization — members are above the politics. But funding of common goals does cement collaborations. Our major task with any (new) UK government of 635 elected representatives, none of whom has ever been a practising scientist, which is in common with many other government officials, is to demonstrate the value of science (and STEM subjects at school) as part of an agenda and investment (not a cost) for a world power, with or without the EU.

It is, however, the current uncertainty that is destabilizing the community — longer term planning is tough at the best of times, and now political sights will not be focussed on UK science for some years, at least until after cessation in 2019.

At least we, in Europe, still hold a position with politicians and in society as pervaders of truth and integrity, honesty and intellect, commitment and productivity, for the good of man.

Anthony Watts
Chair, British Biophysical Society
University of Oxford

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8. "Research and development expenditure (% of GDP)"; The World Bank, accessed April 28, 2017, http://data.worldbank.org/.

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The views expressed here are personal, and are not representative of any organization.

Funding for International Biophysics Meetings

Did you know the International Relations Committee supports biophysics meetings around the world?

Grants of up to $2,500 are provided to facilitate the organization of and attendance at biophysical meetings and courses in countries experiencing financial need. Funds must be used to provide travel support for students and early career researchers.

Planning a meeting for 2018? Submit your application today on www.biophysics.org.

Biophysical Society Thematic Meeting

Emerging Concepts in Ion Channel Biophysics

Mexico City, Mexico | October 10–13, 2017

This meeting will cover recent discoveries pertaining to the study of the structure and the function of ion channels and transporters and will bring together a diverse group of experts who use precise techniques to study an assortment of ion channels. Themes that will be addressed include leading knowledge on the function of voltage-, ligand- and mechanically gated ion channels and transporters, as well as the use of structural, optical, electrophysiological, biochemical, and modeling techniques to delimit fine structural interactions within ion channels as well as to study their regulation by different molecules.

The meeting will provide a positive environment for feedback and discussion between leaders in the field and junior researchers and students using different approaches to study the physiology of ion channels and transporters, stimulating interactions and collaborations among them.

Early Registration Deadline:
June 23, 2017

ORGANIZING COMMITTEE

Leon D. Islas, National Autonomous University of Mexico, Mexico
Froylan Gómez Lagunas, National Autonomous University of Mexico, Mexico
Tamara Luti Rosenbaum Emir, National Autonomous University of Mexico, Mexico

SPEAKERS

Richard Aldrich, University of Texas, Austin, USA
Andrea Alessandrini, CNR-Institute of Nanoscience, Italy
Francisco Bezanilla, University of Chicago, USA
Cecilia Bouzat, Instituto de Investigaciones Bioquímicas de Bahía Blanca, Argentina
Nancy Carrasco, Yale University, USA
László Csanády, Sammelweis University, Hungary
Cynthia Czajkowski, University of Wisconsin-Madison, USA
Raimund Dutzler, University of Zurich, Switzerland
Miriam Goodman, Stanford University, USA
Sharona Gordon, University of Washington, USA
Jorg Grandl, Duke University, USA
Toshinori Hoshi, University of Pennsylvania, USA
Ramón Latorre, University of Valparaiso, Chile
Polina Lishko, University of California, Berkeley, USA
Andrea Meredith, University of Maryland, USA
Vera Moiseenkova-Bell, Case Western Reserve University, USA
Ivana Nikic, Werner Reichardt Centre for Integrative Neuroscience, Germany
Crina Nimigean, Cornell University, USA
Uhtaek Oh, Seoul National University, South Korea
Yasushi Okamura, Osaka University, Japan
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Eitan Reuveny, Weizmann Institute, Israel
Montserrat Samso, Virginia Commonwealth University, USA
Frederick Sigworth, Yale University, USA
Lucia Sivilotti, University College London, United Kingdom
Tuck Wah Soong, National University of Singapore, Singapore
Justin Taraska, National Institutes of Health, USA
Werner Treptow, Universidade de Brasilia, Brazil
Thomas Voets, University of Leuven, Belgium
Bailong Xiao, Tsinghua University, China
William Zagotta, University of Washington, USA

Biophysical Society

For more information, visit www.biophysics.org

Career Development

Networking and Personal Branding

At the Biophysical Society 61st Annual Meeting in New Orleans, Louisiana, the Early Careers Committee sponsored a panel entitled, *Networking and Personal Branding: The Workshop*. The panelists were *Lisa Fauci*, Tulane University, *Jennifer Ross*, University of Massachusetts Amherst, and *David Warshaw*, University of Vermont. Much of the discussion is summarized below.

Q: I'm starting at a PUI and looking for ways to collaborate with people at R01s. How can I make myself an appealing collaborator?

First, make sure your science is good, because that is the most important thing, and then try to connect with people you're interested in collaborating with. Make the first overture: Researchers at an R01 probably won't think of you as a potential collaborator unless you make yourself known to them. Go to meetings and workshops to connect with people you may not interact with otherwise.

Q: If you have an idea but haven't written any papers on it yet, should you discuss the idea openly?

If you have an idea, chances are that ten other people have the same idea. Ideas belong to the field, and even if someone else works on the same idea, you have an intellectual stake in it. If you're discussing your ideas openly, someone might scoop you, but more likely is that they'll be on a grant panel and remember that you expressed the idea to them. Also, if you're creative, you'll always have another idea.

Q: How can I develop my personal brand with regard to my output, such as grant proposals and talks?

When putting together a proposal, remember that font and formatting makes a difference in how it is perceived. Make your proposal easy to read and your good ideas will stand out. This is a sign of your ability to communicate effectively. Spend the most time working on the first page, because this will be your first impression. Add a figure to each page — it will be a relief to the person who is reading it.

Practice giving talks. Get feedback slide by slide from your mentor and other students and postdocs, rather than just practicing in a mirror. Practice sessions for a ten minute talk can take up 5-10 hours of lab time, but are of utmost importance. Reputation is important, and when you give a talk, you are representing not only yourself, but also your lab.

Q: Do you have any tips for networking as an introvert?

Inform people that you are an introvert. When you're at a conference or a networking event, team up with an extrovert so that each of you can take advantage of the other's strengths.

Q: How important is it to differentiate yourself from your mentor's brand as a postdoc on the job market?

It is very important for the search committee to see evidence that you are not your PI. They need to know that you can operate independently. In order to establish yourself early in your career, do extensive networking at conferences; ask friends to let you give talks at their groups.

Q: How do you control extra-scientific aspects of your personal brand?

The way you behave with students and postdocs, as well as with colleagues, is part of your brand and cannot be separated from your science. You are made by the people you make. Your students are a reflection of you when they go out into the world, so you need to invest in those relationships. The way you handle personal relationships is important, and this is important to remember, because your brand is diminished by bad word of mouth. You want people to want to work with you.

Q: What social media accounts should I focus on for networking?

Facebook is good for informal networking, to keep up with contacts so that you can plan to connect again at future conferences and events. Keep ResearchGate up to date with your publications. If you are in industry, or interested in a career outside of academia, use LinkedIn.

Q: How much can your brand evolve over time?

Science will evolve, and your personal brand will naturally follow. Your number one goal should be a reputation for good, reproducible work. Remember that your brand should reflect you — do not try to adopt a false persona.

Biophysical Journal

Know the Editors

Baron Chanda

Baron Chanda
Department of Neuroscience
University of
Wisconsin-Madison

Editor, Channels and Transportation

Q: What are you currently working on that excites you?

My lab broadly works on understanding the biophysical mechanisms that modulate the function of ion channels belonging to the voltage-gated ion channel superfamily. Many of these ion channels are at the crossroads of electrical and chemical signaling pathways. They serve as coincident detectors responding to a variety of chemical and physical stimuli to initiate downstream signaling. We are interested in understanding how some members of this superfamily become exquisitely sensitive to a physical stimulus such as temperature. Despite the fact that high-resolution structures of these channels have become available and that there is a wealth of structure-function data, the mechanisms that underlie temperature-dependent gating remain unclear.

These temperature-activated ion channels lack a well-defined structural feature that can be categorized as the temperature-sensing domain. Our current thinking is that unlike a ligand binding domain or an enzyme involved in substrate recognition, temperature sensing is not constrained by stereospecificity and therefore, these sensors may not be structurally conserved. In my group, we are developing model systems to elucidate the design principles that underlie gating of ion channels by temperature. This is very exciting for us because we believe that sensing of physical stimuli may not involve discrete recognition domains and thus may require a fundamental rethinking of the current framework of structural biology.

Q: Who would you like to sit next to at a dinner party? (Scientist or not)

I would like to sit next to *Jared Diamond* at a dinner party. I first read his book, *The Third Chimpanzee*, as an undergraduate and since then I have read many of his other books. I remain absolutely fascinated by his ability to draw insights and find connections between subject areas as diverse as physiology, geography, anthropology, and linguistics. To be a polymath in the modern era, when there is so much depth in any given discipline, is just phenomenal. Any conversation that I might have at that dinner table is going to memorable.

Publications

How to Write a Biophysics Article Worthy of Publication:

Part 2- From First Draft to Final Draft

William O. Hancock
Pennsylvania State University

"I have never thought of myself as a good writer. But I'm one of the world's great rewriters."
James A. Michener

Part 1 of this series covered the task of transforming data in your lab notebook and thoughts in your head into a first full draft of your manuscript. The next task is to convert this rough draft into a polished manuscript that you can publish and be proud of. This process requires streamlining your message, honing your logic, and achieving clarity and conciseness in your prose. You will likely work through a number of drafts, and revising will probably take significantly longer than writing your first draft, but this effort is essential to create a publication-quality manuscript. Here I detail the key steps of this process.

Revisit your story

Ask yourself: Have I achieved my goal of presenting a compelling story for a specific audience? Don't worry that the topic may have drifted far from where you started when you first sat down to write. Your story should be presented as a logical progression of experiments that build upon one another to convince the reader of your main point. Hence, consider the logic and try to think from the point of view of the reader. You may decide at this point to significantly re-sequence your figures and the subsections that make up the Results section. Don't be afraid of "major surgery" as moving big pieces is easy, and a smooth and logical flow is essential. You may also realize that one (or more) figures contributes little to the essential narrative and can therefore be deleted or demoted to Supplemental Information. If you find yourself holding on too tightly to your hard-won text or plots, keep in mind the following quotes:

"In writing, you must kill all your darlings."
William Faulkner

"The more you leave out, the more you highlight what you leave in."
Henry Green

Before setting out to revise your first draft, consult the Guide for Authors for the journal you are targeting, and follow word count, formatting, and figure guidelines. Doing this in advance will save you a lot of later work during the final journal submission steps.

Hone your writing

Now it's time to pick apart your text and to tighten up your writing to maximize the clarity and impact of your message. There are many good writing resources available, but here I'll highlight some key points:

- Each paragraph should make a single point that is ideally presented in the first sentence (the topic sentence). The last sentence of a paragraph should link it to the topic of the next paragraph. Some people write outlines with the first sentence of each paragraph written out and write a draft from there. That is a good practice, and when revising you can do this retroactively to track the overall organization of the manuscript.

- When writing, strive to be clear as well as terse. Don't use extra words (instead of "at this point in time" use "now;" instead of "a large majority of" use "most"). Don't use pompous language (replace "utilize" with "use;" avoid the phrase "needless to say"). Never use the word "believe" in scientific writing. Watch out for the word "prove;" instead use "suggest," "indicate," or "are consistent with." It is also best to use the active voice when writing.

- Avoid lab jargon. Consider renaming your constructs or methods from the terms that you routinely use in the lab to more specific terms that readers can understand and remember,

and that are consistent with previous use in the literature.

- Minimize acronyms because, although they save space, they are one more thing the reader must keep in their mind. So, err on the side of clarity and inclusiveness (broad readership), and when possible write them out.

Think about your audience

As you hone your writing, maintain a focus on educating and informing your reader — try to make it easy for them. In the Introduction, think of the essential background material they need to know in order to understand your study. In the Results, clearly explain what the data do and do not say and emphasize the most important data. In the Discussion, clearly explain the implications (as well as the limits) of the work and how it relates to what has been done before.

One way to help your reader understand and remember your message is through repetition. There is a useful old saying: "Tell 'em what you're gonna' tell 'em … tell 'em' ... tell em' what you told 'em." In the structure of a scientific manuscript this means that in the last paragraph of the Introduction you need to preview the results, in the Results you need to clearly present the findings, and in the Discussion you need to reiterate and expand on the findings.

A second strategy is to build up from the highly believable (established or simple) to the less believable (new) (Senturia, 2003). At the level of the entire manuscript, this means the Introduction sets up what is known (believable) and the Discussion allows for your speculation and making links to other work (less believable). This idea also applies to the Results — you should generally start with the simplest results and build up to the most novel and surprising. You are establishing the readers' (and reviewers') trust and providing them with a firm foundation on which to interpret your most exciting findings.

A final point is: Don't overestimate how much information a reader can absorb and remember. There is always a temptation to present all of your data and make as many points as possible. However, more data can paradoxically reduce the impact of a paper by diluting the message. If your results revolve around a single central point of the paper, you have a good chance of having the reader come away with that point and remember it hours, days, or weeks later. If you are trying to make three loosely related points, your odds go way down. Hence, consider cutting and demoting some data to Supplemental Information — or in extreme cases — even splitting a paper that is bursting at its seams into two.

Make your figures beautiful

Revisit your figures to ensure that they are informative and uncluttered, and that they connect tightly to the text in the Results section. Every panel of every figure should be referenced in the text (if you don't reference a panel, cut it). Think of the key point you want to get across in each panel, and use that to guide precisely how you want to plot your data. Can you remove non-essential data? Change symbols or add labels or lines to emphasize the key point? A few points to remember:

- Make your symbols sufficiently large to see, and make them consistent throughout the manuscript. Are the axes clearly labeled with sufficiently large fonts (keep in mind that figures may be reduced in size by the journal)? Consider the range — ideally start with zero at each origin and choose a maximum value on each axis that highlights the important variation of the data and also shows any plateau effect.

- Are you plotting the data in the optimal way? Bar plots are notorious; not only do they distill a

(Continued on next page.)

distribution down to a single mean but, because of equal spacing on the x-axis, they can obscure important time and concentration dependencies. For measurements that depend on a quantitative variable, consider an x-y scatter plot. Or, instead of presenting a simple mean or a "bar and whiskers" plot, consider using a "Bean Plot" for moderate N values to show every individual measurement, or a "Violin Plot" for high N values to show their distribution (Weissgerber et al., 2015; Spitzer et al., 2014).

- All images should have scale bars that are labeled with units on the figure or in the figure legend. Ask yourself whether you should crop to emphasize the key element in the figure. Avoid nonlinear contrast enhancement in images, gels, and blots.

- Consider what data to put into Supplemental Information. Are there raw data that can be presented that are informative? Are there key control experiments that are important but don't fit particularly well in the main results? The phrase "data not shown" should be avoided if possible (some journals even prohibit it), and the data instead should be included as Supplemental Data. However, avoid the temptation of putting extra data into Supplemental just because you did the experiments and you want to put it somewhere.

Honing specific sections

Introduction:

Does your first paragraph set up the paper? It should not be overly general background information; instead it should focus the questions being addressed. Is referencing correct throughout the Introduction? Apart from the most general statements, any time you state that something is "known" or you are stating a "fact," you need to reference it (using original research articles rather than reviews where possible). Avoid excessive self-referencing. Avoid long strings of references; a general rule of thumb is that no more than three references are needed for a given point. Finally, the last paragraph of the Introduction should briefly summarize the key results ("Tell 'em what you're gonna' to tell 'em"), and should serve as a transition to the Results section, and it should tie to the first paragraph of the Discussion.

Materials and Methods:

The theoretical goal is that the methods you write out should provide sufficient information for others to repeat your experiments, but this is difficult to do in practice. Minimize text by referencing previous work and by describing any alterations in the protocol(s) you used. Consider putting detailed methods and derivations into a Supplemental Methods section.

Statistics:

- Generally, every symbol in every figure should have an error bar that is defined in the figure legend and in the text. Standard Deviation describes the scatter in the sample, Standard Error of the Mean is used to determine statistical significance.

- Beware of R-squared, which is a statistical measure of how close the data are to the fitted regression line. It does not denote statistical significance and is inappropriate for nonlinear curve fits. Consider an F-test.

- Significant Digits (General Rule of Thumb): Experimental precision limits the significant figures. To allow for later calculations, present uncertainty in a measurement (SD or SEM) with two significant digits and present the mean with one significant digit beyond the largest digit in the uncertainty. So, 3.4471 +/- 0.238 should be 3.45 +/- 0.24.

Discussion:

The first paragraph of the Discussion should briefly summarize the Results ("Tell em' what you told 'em"), and it should set up the entire Discussion that follows. You should strive to extract as much insight from your data as possible by: (1) making links between different results that you present, (2) connecting your results to published work, and (3) modeling, simulating, or carrying out further analysis of your data, where possible. You have license to speculate, but it has its limits. Be sure to note the limitations of your study and

your methods. Be sure to properly cite your colleagues and competitors, and to site all relevant studies that came before. In the concluding paragraph avoid a generic call for more research, and instead place your work into a larger perspective and relate it to the original questions stated in the Introduction.

Getting feedback

Before submitting your polished manuscript to a journal, give it to lab mates and colleagues and solicit their feedback. Don't be defensive in responding to their constructive criticism. If there are key points that they do not understand, expect reviewers to have the same problems, and work to clarify your message. Finally, before submitting your manuscript, make sure that pages are numbered. And good luck with your submission!

References and Resources

S.D. Senturia. How to Avoid the Reviewer's Axe: One Editor's View. J. Micromechanical Systems, 12(3):229–232 (2003).

- A paper full of sage advice on organizing a paper and persuading your reader.

G.M. Whitesides. Whitesides' Group: Writing a Paper. Adv. Materials. 15(16): 1375–1377 (2003).

- An excellent guide that advocates generating paper outlines early and building them into full manuscripts.

W.A. Wells. Me Write Pretty One Day: How to Write a Good Scientific Paper. J. Cell Biol. 165:157–158 (2004).

- Gives good overview of structuring a paper and developing a narrative.

M. Spitzer, J. Wildenhain, J. Rappsilber, and M. Tyers. BoxPlotR: A Web Tool for Generation of Box Plots. Nature Methods, 11(2):121–122 (2014).

- Advocates for using bean and violin plots to show distributions, rather than bar charts with means or box and whiskers plots.

T.L. Weissgerber, N.M. Milic, S.J. Winham, V.D. Garovic. Beyond Bar and Line Graphs: Time for a New Data Presentation Paradigm. PLoS Biol, 13(4): e1002128.doi:10.1371/journal.pbio.1002128 (2015).

- Demonstrates how much information about distributions and outliers is lost when using bar graphs, and suggests alternative approaches.

Navigating peer review and the publication process will be the subject of Part 3, published in July.

Grants and Opportunities

Scholarships for Advanced School: ESPCA - Biophysical Methods to Study Biomolecular Interactions

Objective: To assist international early career scientists in attending EPSCA October 16-27, 2017 in São Paulo, Brazil. l. The school will be conducted in English, and will include case studies, lunch with the teachers, hands-on groups, poster sessions, and a visit to facilities of the Synchrotron Brazilian National Lab.

Who May Apply: Students and postdocs residing outside of Brazil.

Deadline: June 18, 2017

Website: http://www.fap.if.usp.br/~espcabio/

Research Innovations for Scientific Knowledge (RISK) for Musculoskeletal Diseases (R61/R33)

Objective: To encourage applicants to pursue unusual observations, test imaginative hypotheses, investigate creative concepts, and build groundbreaking paradigms, all of which deviate significantly from the current prevailing theories or practice. This opportunity is particularly designed to encourage the submission of projects that are considered too risky, premature, controversial, or unconventional for other National Institutes of Health mechanisms.

Who May Apply: Any individual(s) with the skills, knowledge, and resources necessary to carry out the proposed research is invited to work with his/her organization to develop an application for support.

Deadline: July 10, 2017

Website: https://grants.nih.gov/grants/guide/rfa-files/RFA-AR-17-009.html

Molly Cule

Funding Opportunities for Postdocs, New Faculty

Research funding is one of the most critical milestones researchers can achieve in their career development at every stage, especially early in their careers. Obtaining funding will not only provide resources to support your ongoing research, but also demonstrate that your research is appreciated by your peers. There are many funding mechanisms for researchers at different levels. I would like to group them into two major categories. One is institutional funding, the other is external funding.

Institutional funding is funding provided by your home institute. This is usually designed to provide initial support to generate key preliminary data so that you can obtain external funding, which we will discuss later. You can get information about these funding opportunities from different sources, such as the website of your school's research office, as well as e-mail funding announcements from your institution, department, and division, and even your colleagues. The success rate for institutional funding is relatively high, because the number of applicants is usually small. Institutional funding is a great choice for postdocs and new faculty.

The second funding source is external funding. When applying for external funding, you will compete with scientists from all over the country (sometimes even from other countries). One of the largest funding agencies in the world is National Institutes of Health (NIH). Depending on the type of research in your laboratory, in the United States you can also seek funding opportunities from other agencies, such as National Science Foundation (NSF), American Heart Association (AHA), American Diabetes Association (ADA), etc. Most countries have similar government funding agencies and private sources.

Before you apply, it is important to go through the funding agencies' websites to look for the funding mechanisms that are suitable for your situation. Another effective way to determine what type of grant is appropriate for you is to talk about it with more experienced colleagues, such as your postdoc advisor, your faculty mentor, or others who have successfully obtained external funding.

After you decide which agency you will apply to, you will write a proposal based on the guidance from the specific funding mechanism. There are several key points for the grant writing process:

1. Communication! It is important to remember that you are at the early stage of your career where training and learning are paramount. During grant writing, reach out and seek guidance from people with different areas of expertise. Communicate with your advisor or mentor to formulate the framework of your application. They usually have much more experience with grant applications and will give you critical suggestions and advice. You should also ask your grant officer if your application is suitable for their program. If not, they are likely to refer you to another program, which will significantly improve your application success rate.

2. Be clear! When you are writing a grant, always remind yourself that the reviewers of your application are usually the leading scientists in the research field, which means they will most likely read your application when they are weary from their busy daily schedule. As a result, if you don't explain your project succinctly, the chances for you to get a good application score are slim. A great approach is to summarize your proposal in a schematic figure. It is not a bad idea to keep your application a couple pages shorter than the limit, as long as you believe all of the messages have been clearly delivered.

In summary, be well prepared and succinct, then you will be closer to success in your grant application.

BPS Launches Student Chapters

Since its founding, the Biophysical Society has strived to serve as a resource to help students grow and develop throughout their careers. In order to continue this important mission, the Society is excited to announce the launch of the BPS Student Chapter program. The program aims to build active student chapters around the globe, increase student membership and participation within the Society, and promote biophysics as a discipline across college campuses through local activities organized by the chapters.

Chapters wishing to be recognized starting in the spring semester of 2018 must submit an Endorsement and petition form, chapter bylaws, and a chapter information sheet by November 1, 2017, for consideration. The BPS Education Committee will review each application to determine viability and approve the certification of each chapter.

For a complete list of instructions on how to form an official BPS Student Chapter, please refer to the BPS Student Chapter Organization Manual, which can be found at www.biophysics.org/StudentChapters.

Members in the News

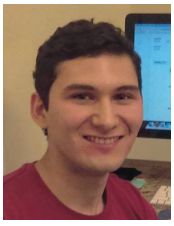
Lewis Kay, University of Toronto and Society member since 1998, received the Canada Gairdner International Award.

Lily Jan, University of California, San Francisco and Society member since 1997, was awarded the Vilcek Prize in Biomedical Science with *Yuh Nung Jan*.

Ahmet Yildiz, University of California, Berkeley and Society member since 2002, received the Vilcek Prize for Creative Promise in Biomedical Science.

Frances Separovic, University of Melbourne and Society member since 1985, was named the Deputy Director of the Bio21 Molecular Science and Biotechnology Institute.

Student Center



Manuel Ramos

Manuel Ramos
Department of Biology
University of Texas Rio Grande Valley

Q: What has been your favorite course while studying biophysics? Why?

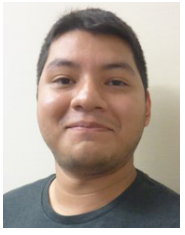
My favorite course while studying biophysics would have to be anatomy and physiology. The lecturing professor, *Dr. Robert W. Gilkerson*, introduced me to the role of mitochondria in metabolic disorders and cell homeostasis. Eventually Dr. Gilkerson became my research mentor and for three years we have been investigating mitochondrial bioenergetics and fusion/fission dynamics. Eventually, this directed my interest in protein structure and function, then I became interested in protein biophysics and I have not looked back. There is a vast amount of interesting research when you investigate biological problems through the scope of physics. It allows a creative and elegant approach to bring answers to some of the most mesmerizing problems in scientific research. For this reason, biophysics to me is one of the most interesting fields of study while still intimately influencing other scientific disciplines.

Summer Research Program Begins

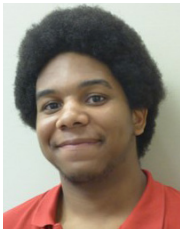
Twelve students from diverse academic, cultural, and geographic backgrounds were selected for an opportunity to spend this summer at the University of North Carolina-Chapel Hill (UNC) studying biophysics. The Biophysical Society Summer Research Program: Case Studies in the Physics of Life, in its ninth year, began on May 9. During the 11-week course, which is funded by the National Institute of General Medical Sciences, students immerse themselves in biophysics-related research projects in the labs of mentors they have selected. In addition to the many hours spent on lab research, students will gain confidence and competence through a variety of professional development opportunities, including sessions on topics such as writing a personal statement and applying to graduate school, a day at the UNC Outdoor Challenge Course, and several tours of labs located in the nearby Research Triangle Park. Throughout the summer, students also attend lectures and seminars by UNC faculty and visiting speakers from biophysics programs around the country.

Program Co-Directors and Society members *Mike Jarstfer* and *Dorothy Erie* lead the program and will be assisted this summer by teaching assistants *Kevin Knight*, *Candice Crilly*, and *Mike Pablo*, all currently graduate students at UNC. Applications for the 2018 program will open in the fall. For program updates, including the 2017 course syllabus and lecture materials, visit biophysics.org, or contact *Daniel McNulty* at dmcnulty@biophysics.org.

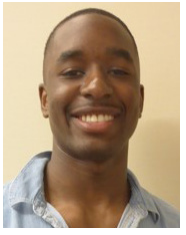
Eun Ae Park
California State University, Long Beach



Ernesto Alva Sevilla
University of Texas, San Antonio

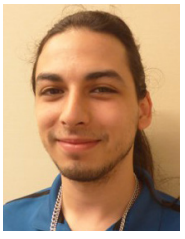


Harold Arrington
University of North Carolina – Pembroke



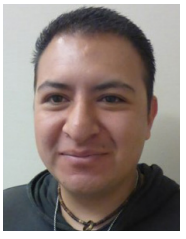
Xavier Bonner
Morehouse College

Suleyman Bozal
University of Connecticut

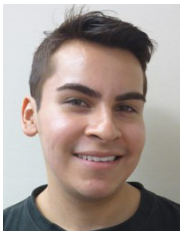


Alexander Dieguez
Florida International University

Jonathan Eicher
Humboldt State University

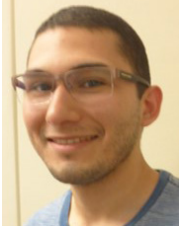


Javier Muniz
El Paso Community College

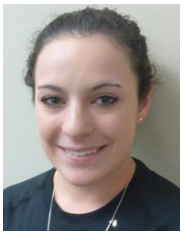


Francisco Padron
University of Illinois, Chicago

Andrew Puente
Wabash College



Manuel Ramos
University of Texas, Rio Grande Valley



Kyrsten Thibodeau
Bay Path University

Call for 2019 Thematic Meetings

Proposals for 2019 thematic meetings are now being accepted

This is a unique opportunity for you to organize a meeting on a topic you care about, while receiving administrative support from the Society.

Three to four thematic meetings will be selected on focused topics that have not been recently presented. The Society underwrites each meeting up to $10,000 and provides complete meeting management, including all web and onsite components. What makes these meetings unique and exciting is that they bring together researchers from disparate disciplines to work on a common problem, which is the essence of biophysics. The meetings have taken place throughout the world, reaching communities that often cannot attend the Society's Annual Meeting.

Criteria for meetings sponsored by the Biophysical Society are:

- Organizers must be Society members;
- Topics must be timely, not recently addressed, and should foster interdisciplinary and international research;
- Each must be a standalone meeting, not a satellite to another meeting or an established small meeting that already meets periodically;
- Speakers must present new and exciting research;
- The proposed list of speakers must represent the geographic, gender, and ethnic diversity of Society membership; and
- Domestic and international sites are appropriate.

Complete submissions must include names and emails of the organizers, a proposed meeting title, a description of meeting's topic and theme, an explanation of the topic's timeliness and importance, the proposed meeting location and site rationale, the proposed meeting dates and projected number of attendees, any potential funding sources, and all potential conflicting meetings.

Previous and upcoming thematic meetings can be viewed at www.biophysics.org/Meetings/Thematic-Meetings/UpcomingThematicMeetings/tabid/3864/Default.aspx.

Only complete proposals submitted throught he online submission site (https://www.surveymonkey.com/r/2019ThematicMeetingProposals) will be considered by the Thematic Meetings Committee

Submission deadline for proposals is July 17, 2017.

Biophysical Society

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UPCOMING EVENTS

July

July 16–22

25th Annual International Conference on Composites/Nano Engineering
Rome, Italy
http://www.icce-nano.org/

July 30–August 4

GRC: Organellar Channels & Transporters
West Dover, VT
https://www.grc.org/programs.aspx?id=16867

August

August 7–9

World Heart, Lung and Blood Conference
Stockholm, Sweden
http://heartandlung.thconferences.com/

August 7–11

NIMBioS Tutorial: RevBayes: Bayesian Inference of Phylogeny
Knoxville, TN
http://www.nimbios.org/tutorials/TT_revbayes_flyer.pdf

September

September 21–22

International Conference on Osteoporosis, Arthritis, and Musculoskeletal Disorders
Madrid, Spain
http://osteoporosis.cmesociety.com/

September 24–28

Second Adriatic Symposium on Biophysical Approaches in Biomedical Studies
Split, Croatia
http://www.babs-symposium.com/

October

October 1–3

Cell Symposium: Emerging and Re-emerging Viruses
Arlington, VA
http://cell-symposia.com/emerging-viruses-2017/

October 15–19

Keystone Symposium: Regenerative Biology and Applications: Cell Differentiation, Tissue Organization and Biomedical Engineering
Pok Fu Lam, Hong Kong
http://www.keystonesymposia.org/17T3

Please visit www.biophysics.org for a complete list of upcoming events.