Newsletter
Biophysical Society JUNE 2015

DEADLINES

Awards & Contests

June 15
Changing Our World Submissions

Thematic Meetings

Biophysics of Proteins at Surfaces: Assembly, Activation, Signaling
October 13-15
Madrid, Spain

June 23
Early Registration

Polymers and Self-Assembly: From Biology to Nanomaterials
October 25-30
Rio de Janeiro, Brazil

June 22
Abstract Submission

July 27
Early Registration

Biophysics in the Understanding, Diagnosis and Treatment of Infectious Diseases
November 16-20
Stellenbosch, South Africa

July 20
Abstract Submission

August 24
Early Registration

2015 Slate of Candidates

Candidates for President-Elect


Linda Kenney


Lukas Tamm

Voting in the 2015 Society elections began on June 1. The slate includes two candidates for President-Elect. They are *Linda Kenney*, University of Illinois at Chicago, and *Lukas Tamm*, University of Virginia. The President-Elect will serve a one-year term, beginning in February 2016, followed by a year as President, beginning in February 2017.

The eight candidates for Council are *Baron Chanda*, University of Wisconsin-Madison; *Jane Clarke*, University of Cambridge, United Kingdom; *Bertrand García-Moreno*, Johns Hopkins University; *Jonas Korlach*, Pacific Biosciences; *Arthur G. Palmer*, III, Columbia University; *Joanna F. Swain*, Bristol-Myers Squibb; *Andreea Trache*, Texas A&M University; and *Sotaro Uemura*, University of Tokyo, Japan.

Candidates for Council


Baron Chanda


Jane Clarke


Bertrand García-Moreno


Jonas Korlach


Arthur G. Palmer, III


Joanna F. Swain


Andreea Trache


Sotaro Uemura

The four who are elected will serve for three years, beginning in February 2016. Full biographical sketches and candidate statements are available on the website.

All regular Society members with 2015 dues paid by May 31, 2015, are eligible to vote. Eligible members may vote electronically by August 1, 2015, through the secure site found at www.biophysics.org.

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Biophysical Society

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Biophysicist in Profile

ILYA BALABIN

Ilya Balabin, a scientist at Lockheed Martin, was born and raised in Zhukovsky, Russia. The small town just outside of Moscow was established after WWII and named in honor of *Nickolay Zhukovsky*, an aerospace research pioneer. Like most of the city's residents at the time, Balabin's parents were aerospace engineers. Both worked on *Yuri Gagarin's* first manned space flight. His grandfather had also been a mechanical engineer, designing and building railroad bridges and tunnels.

Balabin's inspiring high school physics teacher, *Lev Gurevich*, was a big factor in Balabin's decision to pursue a career in physics. Gurevich was "a brilliant enthusiast who showed his students how beautiful and exciting physics can be. His ability to explain great ideas in simple yet meaningful terms was admirable, and his passion for physics was just contagious. Being his student was hard but extremely rewarding," Balabin says. He attended Moscow State University and earned his Master of Science degree in physics in 1985. He began reading biophysics books and journal articles at this time, though his studies were not biophysics-focused. His Master's thesis research focused on unified geometric field theories in multidimensional space, predecessors of contemporary supersymmetry theories. It was at this time, he explains, "that I began to realize the enormous potential of applying theoretical physics methods to problems in biology."

> "Biophysics combines the best of two worlds: physics, with its rigorous mathematical methods, and biology, with plenty of exciting systems to apply these methods to."
>
> **– Ilya Balabin**

Balabin began a PhD program in *José Onuchic's* lab at the University of California, San Diego (UCSD). "Moving from Russia to Southern California in the 1990s was a big change, and life at UCSD was unbelievably interesting," he says. His PhD research focused on exploring how the electronic donor-to-acceptor coupling in redox proteins is sensitive to the protein conformation details and thermal atomic motion. "I identified electron transfer pathway interference as the key factor that controls the sensitivity of the electronic coupling and developed a novel descriptor, the coherence parameter that characterized where the coupling is predominantly controlled by the protein structure or by thermal atomic motion," Balabin elaborates. "My thesis research concluded with an application of the developed approach to two electron transfer reaction steps in bacterial photosynthetic reaction centers that was published in *Science*."

Balabin completed his PhD in physics in 1999 and began a postdoctoral position at the University of Illinois, Urbana-Champaign, in the laboratory of *Klaus Schulten*. There, his research focused on theoretical analysis and computer simulations of functional motions in the F0 ATPase protein pump, a key element of the energy conversion in cells. This was a challenging question to address, because it required both extensive structural modeling as well as large-scale parallel simulations including modifications to the modeling and simulation programs VMD and NAMD. "It was great to have the opportunity to interact with their developers, most notably *John Stone* and *Justin*

Gullingsrud," Balabin says, "from whom I learned a lot about best software design and development practices."

Balabin then moved to Duke University, in a second postdoctoral position, which turned into a research scholar position, with *David Beratan*. He extended his thesis research to explore how the structure and dynamics of the tunneling medium control the electronic coupling in a variety of biological and engineered molecular systems. Near the end of his time at Duke, Balabin started an independent project that aimed to understand and explain how structural motions in protein receptors mediate signal transduction. "I developed a novel descriptor that quantified allosteric interactions in receptor proteins," Balabin explains, "and used it to describe allosteric effects in two G-protein coupled receptors, bovine rhodopsin and human beta2-adrenergic receptor."

Rocky Goldsmith, who was a graduate student in Beratan's lab while Balabin was a postdoc, fondly remembers his time working there alongside Balabin, "[Ilya] was direct, energetic, pragmatic, and knew how to identify the essentials to get something done. He is also exceptionally gifted at coding, scripting, and at breaking down complex problems into easy steps." Because they had worked so well together during that time, Goldsmith thought of Balabin when he was seeking collaborators later on. "When I ended up a federal scientist for the US Environmental Protection Agency (EPA), Ilya was one of the first people I suggested to come on board. He joined a few years ago as a Lockheed Martin Information Scientist in a team of about a dozen supporting well over double to triple their staffing (probably 24-50 federal scientists), solving many of the problems that the agency scientists cannot."

In his current position at Lockheed Martin, Balabin works with EPA scientists on developing novel computational methods for screening the influence of environmental chemicals on human health, and prioritizing those chemicals for further testing. "While the EPA runs a state of the art robotic testing facility that works around the clock, experimental testing is still prohibitively slow and expensive for exhaustive screening," Balabin explains. "What I hope for is to develop a new generation of computational models based on concepts of geometry rather than the established machine learning-based models. While we are in the very beginning of the journey, preliminary results indicate high potential of the new models."

Balabin on a family ski trip to Sugar Mountain, North Carolina.

Balabin's career has led him through a broad range of research topics, from theoretical physics, to computational biophysics, and computational pharmacology and toxicology. "My interests have been gradually moving from an academic understanding of biomolecular processes per se towards exploring possibilities to utilize and control these processes for medical purposes," he says. These transitions from one field to another have been rewarding, offering opportunities to pursue new questions, but have also come with challenges. When entering a new field of research, Balabin has responded by learning as much as possible so that he could perform the work with confidence. "In the end, the reward is well worth the effort," says Balabin.

Even when Balabin is outside of the lab, he finds that his curiosity and focus do not let up. "It may sound shocking, but doing science is not something I can turn on or off at will," he remarks. "When I have a difficult problem to solve, it stays in my mind 24/7 until a solution is found. That can happen—and has happened —when I am spending time with my family at home, reading a book, or outdoors hiking, cross-country running, swimming, downhill skiing, or biking."

"Biophysics combines the best of two worlds: physics, with its rigorous mathematical methods, and biology, with plenty of exciting systems to apply these methods to," Balabin says. He has two pieces of advice for early career biophysicists: "First, do not be afraid of taking on new and challenging problems as they emerge. Second, try to learn new methods and techniques all the time. Whereas doing incremental research is safer and easier, it would never be anywhere as useful or rewarding."

Profilee-at-a-Glance

Company
Lockheed Martin

Area of Research
Theoretical and computational biomedical research

2016 BPS Thematic Meetings

Mark your calendars for three exciting meetings that will explore focused topics in depth from varying perspectives.

Engineering Approaches to Biomolecular Motors: From in vitro to in vivo
Vancouver, Canada
June 14-17, 2016

Over the past several decades, scientists and engineers in fields ranging from nanotechnology to cell biology have contributed to our understanding of the basic physical principles and biological functions of energy-consuming macromolecular machines. This meeting will bring together researchers from diverse disciplines who are developing novel ways of measuring and controlling biomolecular motors inside and outside of cells, synthesizing artificial molecular motors inspired by biology, harnessing motors for applications in devices, or developing theories that cut across biological and synthetic systems. Set in beautiful Vancouver, Canada, this meeting seeks to promote promising directions and techniques while catalyzing frontier research on exploiting biological building blocks for novel function in biology and beyond.

Liposomes, Exosomes, and Virosomes: From Modeling Complex Membrane Processes to Medical Diagnostics and Drug Delivery
Ascona, Switzerland
September 11-16, 2016

This meeting will cover recent developments for investigating biochemical reactions and networks at, in, and across membranes of artificial and plasma membrane-derived vesicles. Some of the themes the meeting will address include imaging membrane proteins and their biochemical reactions by light- and electron-optical and force microscopy at small ensemble and single molecule levels; lipid and protein micro-/nano-domains in artificial and biological membranes; transmembrane signalling in cell-derived vesicles; modeling in-plane and trans-membrane reactions; vesicles as ultrasmall containers for (bio-)chemical reactions; vesicles as artificial cells and for synthetic biology; extracellular vesicles (exosomes) as diagnostic biomarkers; viral envelopes (virosomes) and vesicles for targeted drug delivery; and membrane networks and tissue engineering.

The meeting will bring together experts in membrane biophysics, diagnostics, pharmacology, and pharmaceutical formulation and will appeal to academic scientists and researchers in pharmaceutical industry. Bringing together different approaches to this multidisciplinary topic will allow an intense scientific exchange of ideas and will highlight the field from different views. This will provide a basis for a molecular understanding about the use of cell-derived and artificial model membranees, deliver the newest technical approaches, and stimulate further developments as well as future collaborations.

Mechanobiology of Disease
Singapore
September 27-30, 2016

This meeting will explore the role of cell mechanics from basic research to clinical applications. Participants will discuss mechanosensing in various pathological states, including bacterial infections and host-pathogen interactions, cell migration and cancer metastasis, chromatin abnormalities and gene regulation, and tissue architecture and pathology.

Call for 2017 Thematic Meeting Proposals

Submissions Due July 10

The Biophysical Society's Thematic Meetings are unique and exciting because they bring together researchers who do not otherwise attend the same events, allowing for the exploration of shared topics of interest from a variety of perspectives. These meetings must be proposed and chaired by Society members; the Society provides all logistical and management support. All 2015 members are eligible to submit a proposal for consideration. This is a wonderful opportunity to propose that unique meeting related to your work that you always wanted to attend…if it only existed! For more details on how to submit a proposal visit www.biophysics.org and click 'Thematic Meetings.'

Publisher's Forum

Public Access: Where Are We Now?

The literature that should be freely accessible online is that which scholars give to the world without expectation of payment—Budapest Open Access Initiative

It has been almost two and a half years since the Office of Science and Technology Policy (OSTP) issued the February 22, 2013, memorandum, *Increasing Access to the Results of Federally Funded Research*, which directs each federal agency with more than $100 million in annual research and development expenditures to develop a plan to increase public access to research results funded by the federal government.

This year, several plans for public access have been rolled out.

In February 2015, the National Institutes of Health released its *Plan for Increasing Access to Scientific Publications and Digital Scientific Data from NIH-Funded Scientific Research*. The agency policy states:

> The Director of the National Institutes of Health (NIH) shall require in the current fiscal year and thereafter that all investigators funded by the NIH submit or have submitted for them to the National Library of Medicine's PubMed Central an electronic version of their final, peer-reviewed manuscripts upon acceptance for publication, to be made publicly available no later than 12 months after the official date of publication: Provided, that the NIH shall implement the public access policy in a manner consistent with copyright law.

There were no surprises here as the PubMed Central repository has been established for some time now and authors and publishers have been routinely depositing manuscripts as required.

In March 2015, the National Science Foundation (NSF) announced a public access plan titled *Today's Data, Tomorrow's Discoveries* that will go into effect January 2016. At that time, NSF-funded articles in peer-reviewed journals and papers accepted for conference proceedings will need to be deposited into a NSF-designated public repository within 12 months of publication. NSF will initially use the Department of Energy's Public Access Gateway for Energy and Science as the agency's public repository and it will be available for NSF-funded authors to use on a voluntary basis by the end of calendar 2015.

The Department of Energy (DOE) recently announced the signing of an agreement with Clearinghouse for the Open Research of the United States (CHORUS) to ensure public access to "the best available version of the article," which is defined as the version of record hosted by the publisher. DOE will host a portal and a search tool, the Public Access Gateway for Energy and Science (PAGES), to facilitate discoverability of scholarly publications resulting from DOE funding. All researchers receiving DOE funding will be required to submit metadata and a link to the full-text accepted manuscript (or the full text itself) to the DOE Office of Scientific and Technical Information.

Public Access Summary

Institution	Embargo Period	Repository
NIH	Within 12 months	PubMed Central (PMC)
NSF	Within 12 months	Public Access Gateway for Engineering and Science (PAGES)
DOE	Within 12 months	PAGES
Gates Foundation	Within 12 months until 2017 then immediate open access	Specified in Foundation Grant
RCUK	No more than 6 months for STEM; preference for immediate open access	Specified in grant from individual Council

And in January 1, 2015, the Bill and Melinda Gates Foundation released its policy, which requires that all publications will be deposited in a specified repository(s) with proper tagging of metadata and that all publications will be published under the Creative Commons Attribution (CC-BY 4.0) or an equivalent license. This will permit all users of the publication to copy and redistribute the material in any medium or format and transform and build upon the material, for any purpose (including commercial) without further permission or fees being required. The foundation will pay reasonable fees required by a publisher to effect publication on these terms. After a transition period (until January 2017), the Foundation will require immediate open access, without any embargo period.

Research Councils of the United Kingdom (RCUK) released the first independent review of its open access policy in March of this year. A number of recommendations have been made by the review panel to help improve implementation of the policy, specifically in relation to embargoes and licenses in particular disciplines; communication of the policy; the use and distribution of RCUK's block grant for open access; as well as the broader impact of the policy on different disciplines. This is the first independent review of the policy during the transition period (five years from the policy being introduced), and covers the first 16 months, April 2013 to July 1014, of the policy's implementation. A formal response to the recommendations will be made this summer.

Many more organizations and agencies continue to unveil their plans for open access to research data. Thankfully, the Open Access Repository Mandates and Archiving Policies (ROARMAP), a source of information about institutional and funder open access policies, has recently been revised and improved. Under a project by PASTEUR4OA, the database added more than 250 new entries. As of March 2015, the total number of policies globally was 663, of which 60 percent were from Europe (389 versus 145 for North America). Approximately two-thirds are institutional policies and about 10 percent are funder policies. More than half are mandatory.

For publishers, the OSTP memorandum moved the open access debate from "Should we do it?" to "How do we do it?" Much has been written on the subject of open access (a Google search on open access yields 652,000,000 results; search "open access in scholarly publishing," and you will get 2,520,000 hits) but the discussion of late has shifted to compliance. These discussions will continue as publishers such as the Biophysical Society continue to work with their authors to ensure that existing and future requirements are met as public access becomes cemented in policy.

Biophysical Journal

Know the Editors

Jeffrey Pang

Jeffrey W. Peng
University of Notre Dame
Editor for the Protein and Nucleic Acids Section

Q: What is your area of research?

My initial curiosity about biophysics was sparked in my senior year in college, when I learned about proteins as being complex, dynamic systems that could do amazing things at the nanometer scale. I asked various undergraduate advisors what I should do for graduate school, if I wanted to follow up on "proteins as dynamic systems." The consensus message I received: be an experimentalist and learn something called NMR. This beginning shaped my subsequent science career, which has included research in both the pharmaceutical industry and academics.

My current research is grounded on the view of proteins as "machines with moving parts," and that a full appreciation of their abilities demands an understanding of their structural fluctuations, and how they affect their interactions with other biomolecules.

We are pursuing two basic research themes. The first is to learn how protein conformational dynamics impacts intraprotein communication

(Continued on page 14)

Molly Cule

Professor Molly Cule is delighted to receive comments on her answers and (anonymized) questions at **mollycule@biophysics.org.** *Also, visit her on the BPS Blog.*

Molly Cule Advice

I'm a new PI. How do I go about staffing my lab?

First, congratulations on becoming a principle investigator! Now how do you make your laboratory successful and productive? Many resources exist to help get you started, one of which is a guide to scientific management called *Making the Right Moves*. This guide was developed by the Burroughs Wellcome Fund and the Howard Hughes Medical Institute (HHMI), and can be downloaded as a PDF from the HHMI website that provides resources to early career scientists: http://www.hhmi.org/programs/resources-early-career-scientist-development/making-right-moves. A full chapter of the guide focuses on staffing the laboratory, as well as managing a laboratory and developing a vision for your laboratory. Take advantage of this helpful resource.

> "Do not be afraid to be picky about who joins your laboratory,..."

An important step towards staffing the laboratory is considering what type of laboratory you want to run, which may be highly dependent upon your institution and startup package. As an example, there are big differences between the type of laboratory and laboratory personnel at a liberal arts college, a mid-sized research university, and a large medical school. This is where your vison for your laboratory comes in to play. A helpful exercise to establish this vision is to look around your department and institution and observe the types of laboratories that are successful, but also to recognize that it takes time to build a successful laboratory. In generating the vision for your laboratory, you must weigh the costs and benefits of hiring a technician vs. recruiting a postdoc or recruiting undergraduate vs. graduate students to your laboratory. These costs and benefits do include monetary costs and benefit packages, but they also

include differences in scientific acumen, capacity to work independently, and expected productivity. It is also important to recognize that technicians and postdocs are employees, but students are not. There are some subtle details that you will have to learn about related to these differences, but your departmental business manager or chair is usually a good resource for understanding these differences at your institution.

When I started my own laboratory, I thought the best place to start hiring was with a postdoc or lab technician. I wanted to hire a person with some knowledge of research, who would need minimal training, and ultimately be able to help get my lab up and running as quickly as possible. Next, I chose to proceed by acquiring students, who require more training. Do not be afraid to be picky about who joins your laboratory, it is okay to tell a student that he/she cannot join the lab. Although saying "no" can be difficult, it is necessary. Focus on quality, not quantity, in your hiring, particularly when you are just starting out.

Now that you've established where you want the laboratory to go and what types of people you want to have in the laboratory, you need to go out and get them. You will need to create a job description that you can distribute on the human resources site at your institution, on the website for

your laboratory, on email list serves, and on job boards hosted by scientific societies to which you belong. It is very important to write a job description that attracts the specific skill set that you need regarding techniques that will be required, areas of research that you study, any minimum requirements that will be required for the level of the position, etc.

Once you have a set of applications, you will need to select candidates to interview. The interview is an important part of the hiring process, because

> "Remember, it is your laboratory and you need to assemble the best, most productive team possible to achieve the scientific vision that you've set out for your laboratory."

you will want to determine the quality and 'fit' of an individual with your particular laboratory. Spend time generating a list of questions to ask during the interview. Think about why you are asking these questions, and be able to articulate (in your head or out loud) how and why the candidates' answers to these questions are important to the future success of your laboratory. Be aware of any red flags that suggest a person may not be a good fit for the position. For me, personality and ease of engagement between a perspective member of my laboratory and me are critical components of the interview process. You may have the most qualified candidate on earth, but if you and that person cannot easily communicate or get along, the working relationship will suffer. Remember, it is your laboratory and you need to assemble the best, most productive team possible to achieve the scientific vision that you've set out for your laboratory.

Once you've determined who would be the best person to hire, you will have to make an offer. Many of the details related to these offers are less flexible that you may think, particularly when starting up a new laboratory. The pay scale may be dictated by the institution or tied to an offer letter related to your startup package. Hopefully these details won't get in the way of you hiring the best person for the job, but you may want to investigate these details at the start of your hiring process, when you are drafting the job description. Good luck in staffing your laboratory.

—*Molly Cule*

Grants and Opportunities

2015 Science & SciLifeLab Prize

Objective: To recognize one young scientist for outstanding life science research for which he/she was awarded a doctoral degree in the previous two years.

Who can apply: Eligible entrants must have been awarded their doctoral degree in 2013 or 2014, and the subject of their thesis should match one of the following subject tracks: Cell and Molecular Biology, Genomics and Proteomics, Ecology and Environment, or Translational Medicine.

Deadline: August 1, 2015

Website: www.sciencemag.org/site/feature/data/prizes/scilifelab/howto.xhtml?utm_src=email

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2015 AAAS Mentor Awards

Objective: To recognize an individual who has mentored and guided significant numbers of students from underrepresented groups to the completion of doctoral studies or who has impacted the climate of a department, college, or institution to significantly increase the diversity of students pursuing and completing doctoral studies.

Who can apply: The award is open to all regardless of nationality or citizenship. Nominees must be living at the time of their nomination.

Deadline: July 31, 2015

Website: http://www.aaas.org/page/aaas-mentor-awardsjsp?pims_id=501023

Public Affairs

House Science Committee Approves America Competes Reauthorization Bill

On April 15, Science, Space, and Technology Committee Chairman *Lamar Smith* (R-TX) introduced the America COMPETES Reauthorization Act of 2015, which would reauthorize the National Science Foundation (NSF), the Department of Energy (DOE) Office of Science, and National Institutes of Standards and Technology (NIST) for FY 2016 and 2017. The full Science, Space, and Technology Committee approved the bill on a party line vote on Wednesday, April 22.

> "Specifically, the bill funds NSF by directorate rather than as a whole, allowing Congress to direct funding to areas of science that it finds most worthy."

While the bill authorizes small increases for some research, it includes several provisions that the Biophysical Society finds troubling. Specifically, the bill funds NSF by directorate rather than as a whole, allowing Congress to direct funding to areas of science that it finds most worthy. In the case if this reauthorization bill, it significantly cuts funding for social and behavioral science and geophysical science research at the NSF. The bill also requires NSF to explain how each individual grant funded by the agency is in the national interest. At the Department of Energy, funding is to the Office of Energy Efficiency and Renewable Energy (EERE) would be cut significantly.

The Coalition for National Science Funding and the Energy Sciences Committee, both coalitions of which the Society is a member, released statements opposing the bill. The Society also sent a letter to the Chairman Smith and Ranking Member *Eddie Bernice Johnson* (D-TX) opposing the bill.

The bill was approved by the full House on May 20. There is currently no timeline for this bill or similar legislation to be introduced in the Senate.

Society Expresses Concern about Restrictions on Federal Employee Travel

On Tuesday, April 21, the BPS joined 125 other organizations in sending a letter to Congress expressing concerns about the impact of Administration regulations and legislative initiatives related to government travel on the science and engineering enterprise and the pace of innovation. The signatories on the letter collectively represent hundreds of thousands of scientists, engineers, and mathematicians—many of whom work for the federal government—across a broad spectrum of disciplines. The letter follows up a report by the General Accountability Office (GAO) that found the restrictions on travel have negatively impacted the federal scientific workforce and a Washington Post article on that report. Current policies are reducing government scientists' and engineers' participation in scientific and technical conferences while the administrative cost of overseeing these activities has increased significantly. In addition, government employees now must wait 3-9 months to get approval to attend a meeting, rather than a few weeks. The letter explains that these delays prevent many government scientists and engineers from accepting key speaking roles and lead to increased travel costs associated with last-minute bookings. Further, the reductions in

> "...government employees now must wait 3-9 months to get approval to attend a meeting rather than a few weeks ."

participation threaten the quality of research at federal labs, the stature of US science on the global stage, and agencies' abilities to recruit and retain the best and brightest researchers in their fields.

The letter, which was organized by the American Association for the Advancement of Science (AAAS), can be read in its entirety at http://bit.ly/1KAMkla.

New Report Outlines Benefits of US Investment in Basic Research

On April 27, MIT released *The Future Postponed: Why Declining Investment in Basic Research Threatens a US Innovation Deficit*, outlining the negative impact the US's decreased investment in basic science is having on the economy. The report notes that as other countries have increased their investment in basic research, the percentage of the US federal budget devoted to research and development has fallen from around 10 percent in 1968 to less than 4 percent in 2015. The report was prepared by a committee of MIT researchers and research administrators.

To illustrate the effects, MIT faculty and researchers detail the specific impacts within their field and highlight the opportunities that could help the economy and benefit society.

"Although the benefit of any particular scientific endeavor is unpredictable, there is no doubt that investing in basic research has always paid off over time," *Marc Kastner*, a Professor of physics at MIT and president of the Science Philanthropy Alliance, said during a press conference in Washington, DC, where the report was unveiled. "Economists tell us that past investments in research and development account for a large fraction of our current GDP, and even if the future payoffs are not as large, there is no doubt that we will suffer if we do not keep up with those nations that are now making bigger investments than we are."

The report focuses on research in biology that could lead to tackling the threat of antibiotic- resistant bacteria, in neurobiology and aging that could lead to a better understanding and new treatments for Alzheimer's disease, and in synthetic biology that could lead to customized treatments for genetic disease or climate-friendly fuels.

The report is available in its entirety at http://dc.mit.edu/sites/default/files/innovation_deficit/ure%20Postponed.pdf.

Let BPS Help You Find the Perfect Job Candidate! Take Advantage of the Summer Special

Do you have an opening in your lab or company? The Society Job Board has hundreds of resumes of biophysicists looking for their next career opportunity.

To make listing your opening on the job board even more enticing, BPS is offering discounted postings in the month of June. Purchase a 60-day Job Board Posting for just $50. This is a savings of almost 40%.

To post a job go to www.biophysics.org and click on the 'Job Board' icon. Then select the 'Summer Savings' special when posting your job.

Subgroups

BIV

This year marked the 10th anniversary of a meeting that has traditionally had strong biopolymers in vivo representation: *The Midwest Conference on Protein Folding, Assembly and Molecular Motions*. Congratulations to *Patricia Clark*, the organizer and a BIV member!

Another summer meeting with BIV interests is the *Colorado Protein Stability Conference*, which will be held on July 21st in 2015. Attendance is limited to foster close discussions, so sign up soon if you are interested.

We'd love to hear from you if you are organizing biopolymers in vivo-related meetings unaffiliated with a large scientific society. Let us know about your meeting, and we'll inform our membership about it!

We remind you that goodies with the BIV logo are available at www.zazzle.com/biopolymers_in_vivo. Ten percent of proceeds fund BIV activities such as student awards or the BIV dinner. If you still need to renew your membership for 2015, go to www.biophysics.org/BIV and click on "Join a subgroup" or "Join a subgroup/student" to get started.

Our Program Chairs *Christian Kaiser* and *Ed O'Brien* have completed our subgroup program for the 2016 meeting. They will select an additional pair of early career speakers from among poster submissions to complement the program, which will have a theme of Translational dynamics and nascent proteome. We'll have more announcements once all speakers are selected and the schedule is finalized, but it will be an exciting day in Los Angeles, so **mark your calendars for February 27, 2016** now.

Amanda Brambila

In this month's issue, we highlight one of our youngest members: *Amanda Brambila*, who is majoring in biochemistry at San Diego State University (SDSU) and will be heading to graduate school this fall. She worked in the lab of *Paul Paolini* at SDSU on regulation of proteins in neonatal cardiomyocytes using siRNA. These "small interfering RNAs" can be used to knock down any gene of interest without its excision from the genome. This is a hot research topic with applications to antivirals or diseases resulting from hyperactive genes. Another interesting proof-of-concept application is Ebola-targeted siRNA, which was in the news recently as 100% effective in non-human primate studies.

—*Martin Gruebele*, Subgroup Chair

Join A Subgroup

Are you interested in being part of one of the twelve subgroups below? Visit the website for more details.

Bioenergetics
Biological Fluorescence
Biopolymers in vivo
Exocytosis & Endocytosis
Intrinsically Disordered Proteins
Mechanobiology
Membrane Biophysics
Membrane Structure & Assembly
Molecular Biophysics
Motility
Nanoscale Biophysics
Permeation & Transport

Members in the News

Carlos Bustamante, University of California, Berkeley, and Society member since 1984 and *Taekjip Ha*, University of Illinois, Urbana-Champaign, and Society member since 1998, have been elected members of the American Academy of Arts and Sciences.

Biophysical Society Thematic Meeting

Biophysics in the Understanding, Diagnosis and Treatment of Infectious Diseases

NOVEMBER 16-20, 2015

SPIER WINE ESTATE, STELLENBOSCH, WESTERN CAPE, SOUTH AFRICA

This meeting will highlight contributions to the understanding of tuberculosis, malaria, HIV/AIDS, and other infectious diseases; to the diagnosis of these diseases; and, ultimately, to insights that could lead to innovative therapies. It will provide a unique opportunity for scientists from diverse backgrounds to meet and discuss the successes, opportunities, and challenges for biophysics in all facets of tuberculosis and HIV/AIDS research.

Biophysics has in the past significantly contributed, and will continue to do so in the future, to our understanding of the organisms that cause these diseases, their interaction with humans, and potential methods for diagnosis, disease prevention, and treatment. Many of the meeting contributions will focus on structural biology, molecular modelling, and high resolution optical techniques, but abstract submissions of work highlighting biophysics of any kind that contributes to our understanding of these diseases are highly encouraged.

The meeting will stimulate the growth and training in biophysics and will contribute to the development of laboratories using biophysical methods in Africa. It will also be a great opportunity for biophysicists to learn about the current hurdles in infectious disease research and possibly develop new collaborations to solve major problems.

ORGANIZERS

James Sacchettini, Texas A&M University, USA
Bryan Trevor Sewell, University of Cape Town, South Africa

SPEAKERS

Frederick Balagaddé, KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH), South Africa
Thomas Blundell, University of Cambridge, United Kingdom
Alberto Diaspro, Istituto Italiano di Tecnologia, Italy
Heinrich Dirr, University of the Witwatersrand, South Africa
Sarah Fortune, Harvard University, USA
John McKinney, École Polytechnique Fédérale de Lausanne, Switzerland
Muso Mhlanga, Council for Scientific and Industrial Research (CSIR), South Africa
Valerie Mizrahi, Institute of Infectious Disease & Molecular Medicine (IDM), South Africa
Pradipsinh Rathod, University of Washington, USA
Stefan Raunser, Max Planck Institute of Molecular Biology, Germany
James Sacchetini, Texas A&M University, USA
Helen Saibil, Birkbeck, University of London, United Kingdom
Wolf-Dieter Schubert, University of Peoria, South Africa
Trevor Sewell, University of Cape Town, South Africa
Michael Starnbach, Harvard Medical School, USA
Adrie Steyn, KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH), South Africa
Robert Stroud, University of California, San Francisco, USA
Sriram Subramaniam, NCI, NIH, USA
Frank Von Delft, University of Oxford, United Kingdom
Gabriel Waksman, University College London & Birbeck, University of London, United Kingdom
Timothy Wells, Medicines for Malaria Venture, Switzerland
Robin Wood, Desmond Tutu HIV Centre (UCT), South Africa
Peijun Zhang, University of Pittsburgh School of *Medicine,* USA

Additional speakers to be announced

IMPORTANT DEADLINES

Abstract Submission ..... July 20, 2015
Early Registration.....August 24, 2015

Biophysical Society

For more information, visit **www.biophysics.org/2015southafrica**

Obituary


Harry Fozzard

Harry A. Fozzard

Harry A. Fozzard, BPS member since 1979, died in his sleep on December 9, 2014. Fozzard was born April 22, 1931, in Jacksonville, Florida. He attended Washington and Lee University for three years and entered Washington University School of Medicine in 1952. He completed clinical training at Yale and Washington University and also was on active duty in the Marine Corps for two years. He did a research fellowship with *Silvio Weidmann* in Bern, Switzerland. He began his faculty career at Washington University, but joined the University of Chicago Cardiology faculty in 1966 as an associate professor, rising to professor and being named the Otho Sprague Distinguished Service Professor. He retired in 1998 and moved to North Carolina, but remained scientifically active.

Early in his scientific career Fozzard studied the ionic basis of the cardiac action potential, and he also published extensively on ion concentrations in cardiac myocytes using ion sensitive microelectrodes and on the biophysics of the Na/K pump. He is probably known best though for his studies of the cardiac Na channel, which occupied the bulk of his scientific attention from the mid-80s until his retirement. He served as the editor in chief of *Circulation Research*, was on the editorial boards of AJP (Cell and Heart), *AJC*, *Circulation*, and was on the board of reviewing editors for *Science*. He served as a member and chaired the Physiology Study Section (NIH), chaired the American Heart Association (AHA) cardiovascular study section, was the Vice President for Research and a Board member for the AHA, and was named a Distinguished Scientist by the Association He also was named to membership in the ASCI and the AAP, and he was recognized as a full member of the Physiological Society.

Fozzard was married to *Lyn Lane* and they had two sons, Richard and Peter. He is survived by his wife, a brother, his two sons, four grandchildren, and a large number of grateful trainees who benefitted from his mentorship to develop their own scientific careers.

—*Dorothy Hanck*, University of Chicago

Biophysical Journal *(Continued from page 7)*

between distal functional sites. In particular, we are interested in the possibility of correlated motions as facilitators of long-range site-to-site communication. This possibility comes straight from basic notions of condensed matter physics and is quite old. But experimental evidence has been forthcoming only more recently, with NMR playing a central role. There are now increasing examples of "dynamic allostery," in which ligand binding at one functional site causes propagated changes in dynamics that affect other functional sites. These changes may occur without obligatory large-scale changes in the average structure, and may not be obvious from single static structural models. Using liquid-state NMR and computation, we want to understand how networks of dynamically coupled residues facilitate protein allostery.

The second research theme of my group is learning how protein evolution exploits inherent protein dynamics. This is important in efforts to rationalize why certain mutations lead to "gain of function" mutations that encourage drug resistance. We are hopeful that a more complete understanding of how sequence perturbations can reorganize functional protein dynamics will help us understand resistance mechanisms.

To pursue these themes, my group applies and develops NMR methods to profile changes in protein and ligand conformational dynamics related to long-range intraprotein signaling. Direct experimental measurements of correlated motions remains quite challenging. While NMR experiments can access motion at essentially all residues of a protein, coming up with the underlying atomic "movie" is quite challenging. For this, computational methods (molecular dynamics simulations) are crucial. We ask the question, Are there general principles in protein dynamics that will allow us to predict phenomena such as dynamic allostery and its evolution? Or, will individual details be so overwhelming that meaningful results will only come from case-by-case studies? We hope to get closer to answering this question in the coming years.

Biophysical *Journal*

Call for Papers

Special Issue: Electron Cryomicroscopy

Editors: Edward H. Egelman and Andreas Engel

Biophysical Journal will publish a special issue of the Journal with a focus on Electron Cryomicroscopy (cryo-EM). The Journal welcomes submissions that report on advances in the field of cryo-EM and its applications. Studies should further our understanding of cryo-EM imaging, cryogenic sample preparation techniques, or image analysis and reconstruction methods used in cryo-EM. The Journal aims to publish the highest quality work and articles should have sufficient importance to be of general interest to biophysicists, regardless of their research specialty.

Deadline for submission: July 1, 2015

- Please include a cover letter stating that you would like to be part of the special issue on Electron Cryomicroscopy
- Select "Special Issue: Electron Cryomicroscopy" when uploading your submission.
- Instructions for authors can be found at: http://www.cell.com/biophysj/authors
- Questions can be directed to the *BJ* Editorial Office at BJ@biophysics.org or (240) 290-5545.

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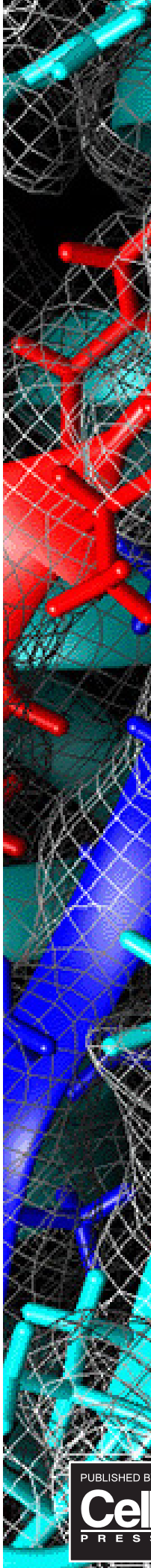

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UPCOMING EVENTS

August

August 10-15

NIMBioS Tutorial: Evolutionary Quantitative Genetics
Knoxville, TN
www.nimbios.org/tutorials/TT_eqg2015

August 10-12

International Conference and Exhibition on Antibodies
Birmingham, United Kingdom
http://antibodies.conferenceseries.com/

September

September 6-10

16th European Conference on the Spectroscopy of Biological Molecules (ECSBM) 2015
Bochum, Germany
http://www.ecsbm2015.de/

September 13-15

53th Annual Meeting of the Biophysical Society of Japan (BSJ53)
Kanazawa, Japan
www.aeplan.co.jp/jbp2015/en/index.html

October

October 5-7

3rd International Conference and Exhibition on Mechanical & Aerospace Engineering
San Francisco, California
mechanical-aerospace.conferenceseries.com

October 25-29

Diabetes: New Insights into Molecular Mechanisms and Therapeutic Strategies (T2)
Kyoto, Japan
www.keystonesymposia.org/index.cfm?e=web.Meeting.Program&meetingid=1419

November

November 1-2

6th Annual Undergraduate Research Conference at the Interface of Mathematics and Biology
Knoxville, TN
www.nimbios.org/education/undergrad_conf2014

November 2-4

Membrane Hydration: A Challenge to Nanosciences
Santiago del Estero Province, Argentina
http://membraneshydration.blogspot.com.ar/

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