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American Society for Biochemistry and Molecular Biology

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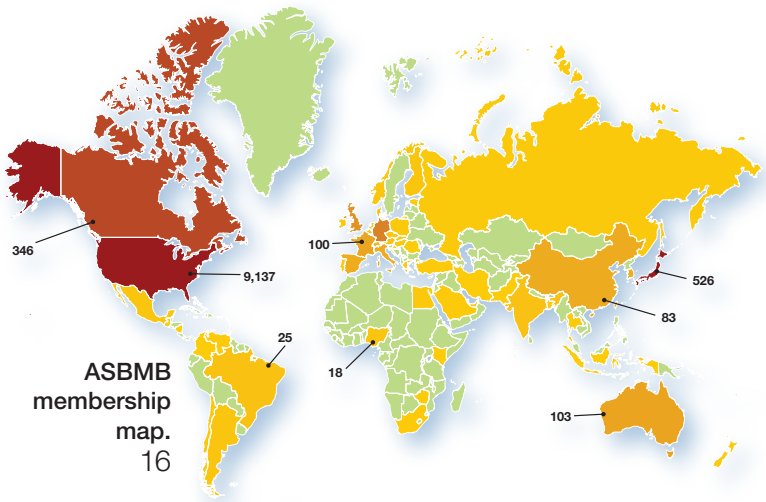

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You can find several interactive maps with data on ASBMB members and journals, such as journal acceptance statistics, on the ASBMB Today Web site at **www.asbmb.org/asbmbtoday**

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ASBMB Today

Nicole Kresge *Editor*
nkresge@asbmb.org

Nick Zagorski *Science Writer*
nzagorski@asbmb.org

Nancy J. Rodnan *Director of Publications*
nrodnan@asbmb.org

Barbara Gordon *Executive Director*
bgordon@asbmb.org

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letters *to the editor*

Climate Change

Greg,

Thanks for the article you wrote on climate change in ASBMB Today (February 2010). I've been watching both the scientific press (C&E News, Nature, etc.) and the popular press on this issue, not to mention blogs and the like. Your article was useful and thoughtful — unlike some of the stuff coming from the "science" press.

I now am retired from my deanship at Sacramento State and am working as a fundraiser for the department of global ecology at the Carnegie Institution for Science in Palo Alto, Calif. Our department mainly is concerned with climate change, and our director coordinates the work of Working Group II of the International Panel on Climate Change. So, we are right in the middle of all of this climate change controversy. It's saddening, because it's not the way we, as scientists, were taught to think, and the rules of engagement are very foreign to us.

I like your bottom-line analysis of why we should think about climate change, but I have a different one: There is both a firm theoretical basis (going back 100 years to the work of Arrhenius) and firm experimental evidence that as the concentration of carbon dioxide in the atmosphere increases, the temperature increases; the only question is the slope of the line. Everything else is just detail.

The ultimate worry here is how this new attitude toward science may infect other areas of science. We scientists have enjoyed a privileged relationship with the general public, and there is worry that this relationship is changing. Perhaps that is a subject for you for another day…

Best,
Marion O'Leary
Carnegie Institution for Science
Stanford, Calif.

Managing a Laboratory

Dear Dr. Petsko,

Your article in the March 2010 issue of ASBMB Today matches my thoughts and experiences.

I had always planned on going to medical school. However, in my senior year at college, I did a research project in biochemistry. In those days, biochemistry was a tiny part of chemistry at Stanford University. I suddenly realized that I really liked dealing with things, rather than with people, which I would be doing as a doctor. I enjoyed research and went on to receive my doctoral degree in biochemistry from the University of California, Berkeley.

After a few years, however, I soon had students and postdoctoral fellows and no longer spent time in the lab. I was not trained to deal with people and administration. So, as you said, I had to "stumble my way along by trial and error — mostly error."

A big lab is considered to be a sign of success, but you lose what you originally wanted to do, which was to work in the lab. Now you are a teacher and must take pride in what your students do in the lab. Is the trade-off worth it? Yes, but you have to get used to it, and a little training in administration and dealing with people would have helped.

I think it's great that there are now courses to train graduate students on how to manage their own laboratories.

Regards,
Kendric C. Smith
Stanford University
Stanford, Calif.

No Stone Unturned*

BY GREGORY A. PETSKO

Last month, I wrote about what I consider to be one of the most serious problems facing the life sciences in the age of genomics: the increasing polarization between those who do what they call "basic research" and those who do what is termed "translational research." I argued that we have created this problem ourselves by accepting this divisive terminology and using it in everyday discourse. And, I asserted that we should abandon, forever, what I believe is an artificial and inaccurate distinction.

But, such a change raises a potential problem. Support for what we will no longer call basic research has, for quite some time, piggybacked on the support for what we will no longer call translational research, which was what scientific leaders presented to governments and laypeople as the raison d'etre for public support of biomedical research. Generally, they didn't talk much about basic research at all, believing that the public wouldn't understand it very well and therefore wouldn't support it. They understood its importance themselves, so they paid for it, but they didn't advertise it. National Institutes of Health Director Francis Collins's now-famous remark that, "We're not the National Institutes of Basic Sciences" is but one example of this mentality. If we now are to talk about all research using the same language, how do we justify the support of projects that don't have an obvious clinical relevance and may never have one?

This problem is becoming more acute because we have oversold some big science projects to gain the huge financial support they require. The human genome sequencing effort, which really was a basic research project, was presented as a faster route to diagnosis and cures for a host of diseases, although it typically takes decades for research results to lead to clinical advances. Congress and the public, having bought the original sales pitch, now are asking, "So, where are the cures?"

Three articles in the March 17 issue of the Journal of the American Medical Association highlight this increasing impatience. They concern the war on cancer, a huge increase in both funding and responsibilities for the National Cancer Institute (one of the institutes that make up the NIH) that was started by President Richard Nixon in 1971. Ignoring the fact that the language of the legislation implied that cancer was one disease, which it most assuredly is not, and therefore should have one cure, which it most assuredly does not, the war has led to $100 billion dollars in research funding in the last 40 years, much of which has been spent on "basic" research in cellular and developmental biology. Now, as Susan Gapstur and Michael Thun point out (1), the cancer war has become a lightning rod, even for some who support its goals. "Frustration about the pace of its progress," they write, "has led some critics to dismiss advances that have been made," and "nearly 1 in 2 men and more than 1 in 3 women will be diagnosed with cancer given the current lifespan." The annual cost to the United States of all cancers, as given by Elena Elkin and Peter Bach in an accompanying article (2), is more than $90 billion a year. (By comparison, the entire NIH budget is just a little more than $30 billion.) As more families face cancer-associated medical costs that can wipe out a lifetime of savings in a single year, the demand that scientists deliver on their promises is growing from a rumbling to a chorus.

Of course, there have been many successes in the cancer war, most of them resulting from fundamental discoveries about how cell growth is regulated and how cancer starts. Miracle drugs have turned testicular cancer and gastrointestinal stromal cancer and chronic myelogenous leukemia, to name but a few, into treatable diseases in many cases. But there are more than 100 different forms of cancer, and most of them still have no cure if the disease is not caught at

its earliest stages. Faced with this reality, the instinct of many scientific administrators and researchers is to make even more promises and to push even harder for more applied research. Writing in the same issue of JAMA, John Niederhuber (3), the current director of the National Cancer Institute, does exactly that: "To realize a future of personalized medicine, the translation of genomic and functional biology discoveries into clinical practice is essential."

So, you see what we're up against. We should talk about research as a seamless whole, a continuum of effort that flows from fundamental discoveries with no obvious application inexorably to the prevention and treatment of human diseases. Yet, to justify it to the public, we have created a distinction that could ultimately tear the biomedical community asunder. How do we make people understand why it is in their best interest for us to do things that have no apparent connection to their concerns?

An old joke encapsulates the problem. A drunkard is looking for his lost car keys at night under a lamppost. A passer-by offers to help and asks exactly where he lost them. "Over there," he replies, pointing off into the darkness. "But then, why are you looking for them here?" says the puzzled samaritan. The drunkard explains, "Because the light's better here."

If the only kind of research we do is based on what we already know, we are looking where we already have light. If it turns out that's where the keys are, fine. But we usually aren't sure where the keys are, so we also need to go looking into the darkness. "Basic research" is the light that shines in that dark.

Now, I realize that basing support for all forms of research on a joke may not be the most politically astute of ideas — although I bet it would be a pretty good tactic if you have to explain biomedical research to a gathering of laypeople. Besides, in this age of 10-second sound bites, we need something more immediately memorable and digestible. But, the metaphor of hunting for what is lost provides the answer.

The greatest reassurance we can offer people with life-threatening or crippling illnesses is that we are leaving no stone unturned in our efforts to find them a treatment. If we only do research that applies discoveries we already have made, we are only looking under stones that have already been turned. That we must do, but if it's all we do, it's not enough. We also need to turn over new stones, because we have no idea where the answers lie. I think anyone can understand that and appreciate it. This metaphor makes clear the value, and continuity, of all forms of scientific research. And it allows us to discard the "basic" and "translational" dichotomy once and for all.

When I go onto the NIH Web site, which includes the National Institute of General Medical Sciences (that's "Basic Sciences," in fact), I notice that this gigantic human endeavor has no motto. (It says "The Nation's Medical Research Agency" as a subtitle, but any marketing expert would turn his or her nose up at such a dull and unmemorable phrase.) I think it needs one. It should be something that any layperson can immediately grasp, something that speaks to the dedication, commitment, passion and effort of biomedical scientists to do everything in our power to better their lives. It should be not just NIH's motto, but our motto as well. What could be better than "No Stone Unturned."

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*This article originally appeared in Genome Biology (2010) 11, 112 and was reprinted with permission from BioMed Central.

FASEB Focuses on Scientific Training

BY CARRIE D. WOLINETZ AND JENNIFER A. HOBIN

The Federation of American Societies for Experimental Biology recently has been engaged in a number of activities relevant to graduate and postdoctoral trainees and the next generation of scientists.

Postdoctoral Stipends

In a letter to National Institutes of Health Director Francis Collins, FASEB urged the agency to incorporate into its future budget requests an increase in stipends for postdoctoral researchers supported by Ruth L. Kirschstein National Research Service Awards. In 2001, responding to a National Academy of Sciences report stating that NRSA stipend levels are "unduly low," the NIH recommended a $45,000 stipend for postdocs and noted that it would incorporate 10 to 12 percent annual increases in its budget requests until that level is reached. These increases were realized in 2002 and 2003 — the tail end of the doubling of the NIH budget — but the agency was not able to meet its target in the following years as funding for science declined. Stipends for entry-level postdocs currently stand at $37,740.

FASEB also expressed appreciation for recent stipend increases, as well as for President Obama's request for an additional six percent increase in 2011. However, FASEB cited concern that even with that proposed boost, compensation for postdocs is not commensurate with their education, experience and contribution to the biomedical research enterprise. To that end, FASEB recommended raising stipends for entry level NRSA postdocs to $43,000 — the approximate level at which stipends would be set at had they been adjusted annually for cost of living since the program's inception — and providing annual cost of living increases thereafter.

Noting that many institutions benchmark pay for all of their postdocs to the NRSA level, FASEB recommended that the NIH develop a mechanism by which investigators could request supplemental funding to increase compensation for postdocs supported on research grants if NRSA stipends are raised beyond the cost of living. This would be a step toward ensuring that postdocs supported on research grants receive the recommended level of compensation, encourage parity in postdoctoral salaries within institutions and allow investigators to absorb additional training costs without drawing on funds budgeted for research equipment and supplies.

Career Resources

In addition to advocating for trainee stipends, FASEB has been developing tools to help postdoctoral scientists prepare for the next stages of their careers. FASEB staffer Jennifer Hobin worked closely with the National Postdoctoral Association to create their core competencies. This guidance on the skills necessary for an array of career options is designed to serve as a self-evaluative tool as well as a framework for seeking out additional training opportunities working with mentors, institutions and advisers. In a similar vein, FASEB is working on updating and enhancing its individual development plan for postdoctoral scholars, which outlines a planning process to help postdocs identify their short- and long-term career and professional development goals and serves as a tool to facilitate communication about these goals between postdocs and their mentors.

Finally, FASEB recently has launched a Web site that provides information on the programs, activities and resources developed by FASEB and its member societies aimed at enhancing diversity in science.

Carrie D. Wolinetz (cwolinetz@faseb.org) is director of scientific affairs and public relations for the Office of Public Affairs at FASEB. Jennifer A. Hobin (jhobin@faseb.org) is associate director of scientific affairs for FASEB OPA.

For more information:

- FASEB's letter to Francis Collins asking to increase stipends for postdoctoral researchers: http://tinyurl.com/yl2zs3e
- The National Postdoctoral Association's core competencies: www.nationalpostdoc.org/competencies
- FASEB's individual development plan for postdoctoral scholars: http://bit.ly/9y4AUz
- FASEB's resources for underrepresented minority students and scientists: http://bit.ly/aeCWxV

Yes, We CAN: Healthcare Law Includes New NIH Grant Program

BY PETER FARNHAM

President Obama signed the new healthcare law in March, and, while most of the raucous year-long debate focused on costs, level of federal control over the economy, death panels, creeping socialism and other broad issues both real and imagined, a little-noticed provision is in the new law due to an amendment inserted in the bill last summer during Senate debate. The author was Sen. Arlen Specter, D-Pa., and the new National Institutes of Health program is called the "Cures Acceleration Network" or CAN.

If fully funded at the authorized level, the program will be a significant one: The authorization level is $500 million the first year, and at comparable amounts for the next decade.

The goal of CAN is to "award grants and contracts to eligible entities…to accelerate the development of high need cures, including through the development of medical products and behavioral therapies." A "high need cure" is a product that "is a priority to diagnose, mitigate, prevent, or treat harm from any disease or condition; and for which the incentives of the commercial market are unlikely to result in its adequate or timely development."

CAN's functions include conducting and supporting revolutionary advances in basic research and translating scientific discoveries from bench to bedside; awarding grants and contracts to eligible entities; providing the resources necessary for government agencies, private companies, academic institutions and investigators to develop high need cures and reducing the barriers between laboratory discoveries and clinical trials for new therapies.

The law also mandates an increasingly close relationship between the Food and Drug Administration and NIH. Another CAN function is to facilitate review in the FDA for the high need cures funded by CAN through activities such as regular and ongoing communication with FDA; assuring that such activities are coordinated with FDA approval requirements with the goal of expediting product development and approval and connecting interested individuals with FDA technical assistance programs.

A New Board

A CAN Board also will be established. The board will consist of 24 members serving four-year terms. At least one eminent individual in each of the following fields must be appointed to the board: basic research, medicine, biopharmaceuticals, discovery and delivery of medical products, bioinformatics and gene therapy, medical instrumentation and regulatory review and approval of medical products.

An additional four individuals from private venture capital firms also will be appointed, as well as eight representatives of disease advocacy organizations.

Finally, ex officio members will include a representative from the NIH, the Assistant Secretary of Defense for Health Affairs, the National Science Foundation and the FDA.

The Board will advise the NIH director on significant barriers to successful translation of basic science into clinical application. It also will provide recommendations to the director if such a barrier is identified. If the NIH director does not accept the recommendations, he or she must explain to the board why he or she has not done so.

Grants

The CAN will set up a series of grant programs designed to facilitate the development of high need cures that are in compliance with FDA standards regarding the drug development and approval process. Eligible entities include private or public research institutions, academic institutions, medical centers, biotechnology or pharmaceutical companies, disease or patient advocacy organizations and academic research institutions.

There are three types of awards. **Cures Acceleration Partnership Awards** provide up to $15 million per project for the first year in one lump sum. It appears that additional increments of up to $15 million can be applied for in subsequent fiscal years (not clear whether more than one additional year of funding is allowed). The recipient also must come up with nonfederal matching funds in a ratio of $1 for each $3 of federal funds received. The matching-fund requirement can be waived by the director.

Cures Acceleration Grant Awards also are funded at up to $15 million the first year, with at least one follow-

up funding cycle with up to an additional $15 million possible. There is no matching requirement for this type of award.

Cures Acceleration Flexible Research Awards allow the NIH director to use "other transactions" besides contracts, grants or cooperative agreements to carry out the goals and objectives of the award program. No more than 20 percent of the total funds available for the CAN program can be spent in this manner, however.

Concerns have been expressed about the nature of this new program at NIH, and it will be interesting to learn more about what NIH officials think of it in the coming months. (We already are hearing rumblings that it is worrisome to certain IC directors, who wonder where the funding is going to come from in a tight money environment.) The main fear is that this program will become yet another unfunded mandate that NIH is expected to fund out of its existing budget. Another concern is that the program appears to be redundant: There already are programs at NIH designed to implement the goals of this program.

The new 24-member board sets up yet another bureaucratic structure to which the NIH director must report, and the membership seems heavily tilted away from traditional basic research. The trend is even more obvious by the requirement that NIH form a closer relationship with the FDA, which is not necessarily a bad thing, but it does seem to indicate a lessening of interest by Congress in NIH maintaining its historic focus on basic biomedical research.

Nevertheless, the CAN program is now enshrined into law, and the task of the biomedical research community is to make sure it functions in a way that is the least damaging to basic research. For starters, making sure that it is funded adequately with new money will be a goal in the coming year.

Peter Farnham (pfarnham@asbmb.org) is director of public affairs at ASBMB.

PAAC Visits Hill, NIH in Busy but Productive Week

BY PETER FARNHAM

The American Society for Biochemistry and Molecular Biology Public Affairs Advisory Committee's spring meeting was held from April 11 to 14, in Washington, D.C. Attendees spent a day doing committee business and then two days doing advocacy on the Hill and information gathering at the National Institutes of Health and the National Science Foundation.

There were 30 scheduled visits with members and staff in the both the House and Senate. Almost everyone on the PAAC met with his or her member of Congress and two senators (or staff representatives). We also met with several key committee staffers in both the House and Senate appropriations committees.

While most of the committee was walking the halls of Congress, four members spent a soggy day walking around the NIH campus, visiting with senior institute staff from the National Eye Institute, the National Institute on Deafness and Other Communication Disorders, the National Institute of General Medical Sciences, the National Institute on Alcohol Abuse and Alcoholism, the National Institute of Allergy and Infectious Diseases, the National Institute of Arthritis and Musculoskeletal and Skin Diseases, the National Institute of Child Health and Human Development, and the National Institute of Dental and Craniofacial Research. This makes the total 13 institutes that the PAAC has visited over the past year. The committee hopes to meet with all the other NIH institute directors during the next year.

We encouraged the NIH to continue to provide robust support for investigator-initiated research. We also discussed the recently passed healthcare bill, specifically the "Cures Acceleration Network" discussed in the article on p. 6 of this issue.

Two members of the PAAC met with senior staff at the BIO Directorate at NSF, as well as with the director of legislative affairs. These meetings were productive and helpful, although there was a surprising lack of understanding of the amount of advocacy ASBMB has done for the NSF over the years.

ASBMB President Gregory Petsko's testimony on the NSF budget for fiscal year 2011 went extremely well; U.S. Acting Subcommittee Chairman Mike Honda, D-Calif., spoke with Petsko for an extended period of time. He agreed that even though the President's request for NSF was a good one this year (an 8 percent proposed increase), the NSF could use more money — our testimony characterized it as one of the most underfunded agencies in the Federal government.

Finally, the week's events wrapped up with our participation in the Coalition for National Science Funding's Exhibit Day. This annual event features a reception in the Rayburn House Office Building with posters presented by NSF-supported scientists from the various organizations that are members of the CNSF. Daniel Weinreich, Brown University, presented a poster on behalf of ASBMB.

Committee Considers Role of Basic Science at DOE

BY KYLE M. BROWN

During a March 25 hearing of the House Science and Technology Committee's energy and environment subcommittee, members of Congress debated the role of basic science research at the Department of Energy. As the committee considered initial sections of the 2010 America COMPETES Act, several members were concerned that changes to the DOE would jeopardize the basic science mission of the Office of Science.

U.S. Rep. Vernon J. Ehlers, R-Mich., said he was concerned that the bill specifically included "commercial application activities" as part of the Office of Science's research mission. Although Ehlers said he recognized the importance of commercializing discoveries, he offered an amendment to define the Office of Science's research mission around basic science.

Several members of the committee defended the bill's mention of commercial applications. Subcommittee Chairman Brian Baird, D-Wash., said witnesses at several committee hearings had testified about the economic importance of applying discoveries to create new products.

U.S. Rep. Judy Biggert, R-Ill., said that she supported DOE's commercial-application activities because she is concerned about the "valley of death" — the difficult process by which basic science discoveries become marketable products.

Ehlers said he wanted to make sure the bill didn't move the primary focus of the Office of Science away from basic science. He said his amendment merely preserved language used in previous bills and that the basic science focus does not preclude a role for the Office of Science in the application of discoveries.

But, some members remained unsatisfied. U.S. Rep. John R. Garamendi, D-Calif., said he wasn't interested in maintaining the status quo and that the subcommittee needed to ensure that the Office of Science focus on applications.

Full committee Chairman Bart Gordon, D-Tenn., tried to bring the subcommittee together on the issue.

"We are all on the same page," Gordon said, emphasizing that the members agreed that the primary responsibility of the Office of Science should be basic science. At Gordon's suggestion, the committee adopted Ehlers' amendment and committed to revisit the issue before the legislation is considered by the full committee.

Other members expressed concern that excitement over the Advanced Research Projects Agency — Energy, known as ARPA-E, might divert resources away from basic science research in the Office of Science.

U.S. Rep. Bob Inglis, R-S.C., introduced an amendment that would have prevented budget increases at ARPA-E unless the Office of Science also received an increase during the same year.

But Gordon said much of the research done at ARPA-E is basic science and cautioned against tying the fortunes of one agency to that of another.

"We still are seeing generous growth" at the Office of Science despite funding ARPA-E's programs, Baird said.

Although Biggert expressed her support, the committee rejected Inglis' amendment.

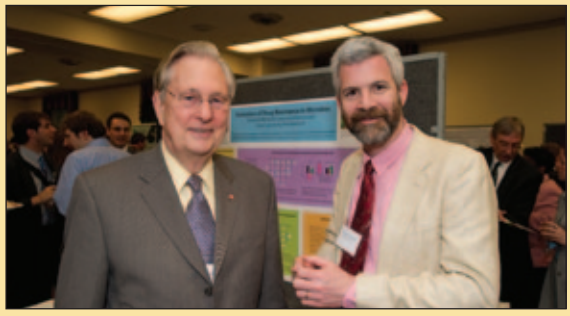
During the hearing, the subcommittee considered three sections of legislation that eventually will become part of the final America COMPETES bill. The sections would reauthorize research components of the Department of Energy, including the Office of Science and ARPA-E.

Two other subcommittee hearings are expected on sections of COMPETES before the full committee considers the entire bill at the end of April.

Text of the legislation considered at the March 25 hearing is available on the House Science and Technology Committee's Web site. You can find more information about recent hearings related to the America COMPETES Act in the April edition of ASBMB Today.

Kyle M. Brown (kmbrown@asbmb.org) is an ASBMB science policy fellow.

Coalition for National Science Funding



National Science Foundation Director Arden Bement and Daniel Weinreich at the Coalition for National Science Funding's annual exhibition. PHOTO CREDIT: DAVID SCAVONE.

Retrospective: Gary M. Bokoch (1954–2010)

BY KLAUS M. HAHN

Gary M. Bokoch passed away last January, after a long struggle with kidney and cardiovascular illness. It is a testament to his strength of character and selflessness that he kept his illness largely a secret for years while soldiering on, until he passed away at age 55. Bokoch was a seminal figure in GTPase biology — for his discoveries, for founding meetings that put the young field on the map, for the impact he had on his colleagues and for the many young scientists that will tell stories about both his tangible and intangible support.

Growing up in Erie, Pa., Gary was the first scientist in his family. He was a graduate student with Peter W. Reed at Vanderbilt University, where he worked on neutrophil activation by chemotactic peptides. As a postdoctoral fellow, he worked with Nobel laureate Alfred Gilman, and purified and characterized the inhibitory component of adenylate cyclase, Gi. This began his focus on G proteins. His graduate and postdoctoral work led to seven first author papers in the Journal of Biological Chemistry, including four back-to-back papers on fundamental characterization of arachidonic acid pathways, and a Cell paper, which was the first to demonstrate cAMP-independent G protein participation in receptor-mediated signal transduction. Gary transitioned to independence in the laboratory of Charles Cochrane at the Scripps Research Institute, and rose through the ranks to become a professor in the departments of immunology and cell biology in 1998.

Gary's work spanned such a broad range of topics that it is hard for anyone to appreciate his impact on all of the fields he touched. In general, he focused on GTPases, exploring a wide range of biological roles, with a major emphasis on neutrophil chemotaxis, the NADPH oxidase burst in leukocytes and regulation of the actin cytoskeleton. Gary's group also made important contributions to fundamental aspects of GTPase biochemistry, including regulation of GTPase cycle components. He will be remembered for elucidating the role of Rac in NADPH oxidase function, Pak's control of Lim kinase and myosin light chain kinase, GDI protein regulation and the role of GEF H1 in microbule-actin cross talk.

It is, perhaps, sad to summarize a person's career with a few statistics, but Gary left some impressive ones behind. He published over 200 papers in top journals, over 40 review articles and book chapters and was presented with numerous awards, including National Institutes of Health graduate and postdoctoral fellowships, the Young Investigator Award from the Society for Leukocyte Biology, the Established Investigator Award from the American Heart Association, and a Visiting Scientist Fellowship from the Swedish National Research Council.

For those of us who knew Gary and watched him interact with his colleagues and friends, it is, of course, his personal side that we remember most. He had a quiet toughness and a wry sense of humor. As several folks in his lab said after his passing, he was also a big kid at heart whose lab was like a second family. After he passed away, his friends heard stories from people he barely knew who had received encouragement and support. Gary once famously donated his speaking slot at a meeting, on the spur of the moment, to a young investigator with exciting new data.

Gary's career can be an example to all of us, and it is with sadness and an appreciation of his legacy and our great loss that we bid him farewell.

Klaus M. Hahn (khahn@med.unc.edu) is the Thurman professor of pharmacology at the University of North Carolina, Chapel Hill.

Friends and family have established a travel award in Gary's name to send graduate students with financial need to the annual ASBMB meetings. Donations can be sent to ASBMB Gary Bokoch Travel Award 9650 Rockville Pike, Bethesda, MD 20814.

asbmb member spotlight

For our global science issue, the American Society for Biochemistry and Molecular Biology asked some of its international members to answer questions about themselves and about science in their countries. We will be featuring more of these spotlights in upcoming issues and online.

IVAN DIKIC

Goethe University
School of Medicine
Frankfurt, Germany

1. How long have you been an ASBMB member?
I became a member of ASBMB in 2003 when I was elected as a member of the Journal of Biological Chemistry editorial board.

2. How do you feel ASBMB could best help young scientists in your country?
I think ASBMB is engaged in multiple international projects, including supporting young scientists who come to the labs in the U.S. for short visits and supporting students who attend ASBMB annual meetings.

3. What do you study?
We study ubiquitin-signaling networks at the biochemical, structural, molecular and genetic level. We are interested in understanding how ubiquitin signals control physiological and pathophysiological conditions in cells.

4. What are some hot research areas in your country?
Biochemistry, molecular biology, neuroscience and chemistry historically are very strong research areas in Germany.

5. Where do you see research going in your country in 5 to 10 years?
I think science is undergoing a change in enabling us to address big, often technologically driven, projects. These projects are providing enormous sets of data and can describe biological processes with greater scale and resolution. Yet, much of the data is not yet used efficiently, and we can expect significant contributions from quantitative and computational biology in future.

6. Do you collaborate internationally? Are there any barriers to collaboration?
Yes. We collaborate with scientists all over the world and never have had any problems in establishing successful partnerships. Our aim is to bridge science regardless of the geographic location. It is all about being excited about our research, and if we can transfer the same enthusiasm to collaborators, the distance is not an issue at all.

7. Where do you get most of your funding?
Most of my funding comes from Deutsche Foruschung Gemeinschaft and different EU programs like the European Research Council.

8. How do you think research in your country differs most from research in the United States?
In Germany, there has been a continuous increase in investment in competitive science in the last decade. New changes introduced in the German science system helped identify the high quality research from quantity-based measures in science. This mostly is done thanks to the leadership policies of the DFG. They use very high standards in reviewing grants and programs, and the voice of scientists is very influential in shaping their future programs.

9. Did you do any of your training abroad?
I was originally trained as a medical doctor at the University of Zagreb, Croatia, finished my doctoral and postdoctoral tenure at the New York University and then became a group leader at the Ludwig Institute for Cancer Research in Uppsala, Sweden.

10. Do you publish your research in non-English journals?
I am a member of the German Society for Biochemistry and Molecular Biology and have published in their journal, BioSpectrum. In addition, I frequently write articles in Croatian newspapers and magazines about science and education of young talented students.

ARMANDO J. PARODI

Fundación Instituto Leloir
Buenos Aires, Argentina

1. How long have you been an ASBMB member?
I joined in 1997. Why did I join? Why not? JBC is one of the journals that best represents my research interests.

2. How do you feel ASBMB could best help young scientists in your country?
By providing fellowships for attending meetings in the U.S. and/or for short stays in American labs.

3. What do you study?
Protein glycosylation and glycoprotein folding in the ER.

4. What are some hot research areas in your country?
Neurobiology, plant biology, RNA transcription, parasite molecular biology and so on and so forth. There is a relatively high fragmentation of research interests in Argen-

tina. This is a reflection of the fact that most established investigators have done their postdoctoral training abroad and have continued working on their postdoctoral fields of research back in Argentina.

5. Where do you see research going in your country in 5 to 10 years?
This is a good question. Probably to areas related to plant biology, as Argentina mainly is a food-producing country, but we are so unstable from an economic point of view that I'm a bit afraid of making predictions.

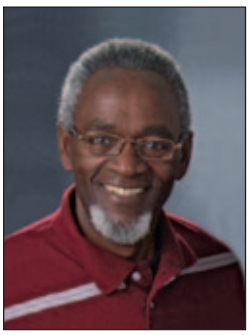
6. Do you collaborate internationally? Are there any barriers to collaboration?
Yes, from time to time. There are no barriers for collaboration at all.

7. Where do you get most of your funding?
Eighty percent is from the U.S. and 20 percent is from the federal government of Argentina.

8. How do you think research in your country differs most from research in the United States?
a) Much poorer funding, especially for heavy or more expensive equipment; b) salaries for investigators and fellowships for graduate and postdoctoral students are paid by the federal government, independently from grants; c) the universe of scientists is much smaller than in the U.S.; and, d) we have poor building and research facilities.

9. Did you do any of your training abroad?
Yes – two years as a postdoc at the Pasteur Institute in Paris and two years as a research associate at Duke University.

10. Do you publish your research in non-English journals?
No, never.



CHRISTOPHER J. CHETSANGA

University of Zimbabwe
Mount Pleasant, Harare, Zimbabwe

1. How long have you been an ASBMB member?
I have been an ASBMB member for 35 years. I joined the society when I was a professor at the University of Michigan because of the society's reputation of organizing scientific meetings on current biochemical topics each year. I have benefitted greatly from the professional contacts that I have established at these meetings.

2. How do you feel ASBMB could best help young scientists in your country?
By offering opportunities for collaborative and sabbatical leave postings in the U.S. Such arrangements would be most helpful if they came with research fellowships.

3. What do you study?
I work on DNA damage and the enzymology of DNA repair, as well as gene cloning in the molecular biology of hepatitis B virus. We have studied cases of hepatocelluar carcinoma in Zimbabwe.

4. What are some hot research areas in your country?
Some of the hot research areas in Zimbabwe are on the search for malaria and HIV/AIDS vaccines.

5. Where do you see research going in your country in 5 to 10 years?
I see the research on malaria and HIV/AIDS vaccines continuing to draw attention in the next five to six years. This will be accompanied by research on genetically modified organisms in both the agricultural and medical fields.

6. Do you collaborate internationally? Are there any barriers to collaboration?
I have been doing limited collaboration internationally. As a scientist in Zimbabwe, I welcome such research collaboration opportunities. However, the limited funding of research in this country limits the scope of research activities that one can engage in internationally.

7. Where do you get most of your funding?
I have received most of my funding from Sweden.

8. How do you think research in your country differs most from research in the United States?
The major difference between the research activities in Zimbabwe and the U.S. is the large amount of funding available in the U.S. compared to the very small level of research funding available in Zimbabwe. The other difference is the intensity of research activity and the number of graduate students, as well as the diversity of research areas covered; both of these areas are on a much smaller scale in Zimbabwe.

9. Did you do any of your training abroad?
I did all of my training in North America; I received my Bachelor's degree from Pepperdine University, my Master's and doctorate degrees from the University of Toronto and did a postdoctoral fellowship at Harvard University.

10. Do you publish your research in non-English journals?
I publish all of my research work in English journals.

ASBMB's International Flavor

BY NICK ZAGORSKI

Although the American Society for Biochemistry and Molecular Biology is ostensibly an American-based enterprise, ASBMB, like the science it represents, is truly an international entity. Whether they are born or trained abroad, undertaking international collaborations or sabbaticals or just traveling to conferences outside the U.S., ASBMB members continually interact with the larger scientific world. Beyond even that, ASBMB counts among its 12,000 members a significant proportion of researchers who carry out first-rate basic research at institutions abroad. In recognition of this global reach, we present profiles of some of these international men and women of ASBMB.

Jennifer Martin

Institute for Molecular Bioscience, University of Queensland, Brisbane, Australia

In the movies, destiny always seems to step in at the last possible instant. Such moments are usually not as timely in real life, although Jennifer Martin did have a cinematic experience at a pivotal point in her career.

She recently had completed her masters' degree in pharmacy in Melbourne with Peter Andrews, where she had used computational tools to study opioid analgesics, and was about to board a flight on her way to the United Kingdom to begin her next career phase — although she wasn't exactly sure what that career would be.

"I didn't know whether I wanted to be a pharmacist or a scientist," she says, "so I left it in the hands of fate. I applied for numerous scholarships and decided that if I was awarded a scholarship I would continue as a scientist, studying for a doctorate in structure-based drug design with Peter Goodford at Oxford University. If I missed out on a scholarship, I figured that I wasn't destined to be a scientist, and I would instead work in England as a pharmacist."

Having received only rejections, Martin seemed ready to pursue the latter option as she passed through security, but, right at the gate, the staff flagged her down. They informed Martin that the dean of her pharmacy college had requested she contact him urgently; she called from a public phone with her last twenty-cent piece and was told that she just had won a prestigious scholarship.

"Here I was, at a life-changing moment," says Martin, "and I had no one to share it with because I had to board the plane."

In another twist, the Laboratory for Molecular Biophysics where Goodford was based was almost entirely devoted to protein crystallography. As a result, Martin's doctoral research combined both drug design and protein crystallography — the latter supervised by Louise Johnson — and her research has followed a similar path ever since.

Now an Australian Research Council laureate fellow and professor in structural biology at the University of Queensland's Institute for Molecular Bioscience, where she has

The Queensland Bioscience Precinct — the building that houses UQ's Institute for Molecular Bioscience.

been since 1993 (previous stops included an appointment at Australia's Bond University and a postdoc with John Kuriyan at Rockefeller University), Martin continues to focus on the relationship between protein structure and drug action. As someone who always has been interested in puzzles and how things piece together, teasing out this structure-function relationship is a perfect fit.

Much of Martin's work centers on proteins involved in insulin signaling and diabetes, and her recent efforts have focused on understanding the regulation of SNARE proteins, which are involved in the insulin-stimulated trafficking of the GLUT4 glucose transporter. For instance, she discovered that the regulatory protein Munc18c can accelerate SNARE complex formation and vesicle fusion by binding to a short N-terminal peptide on the SNARE protein syntaxin4 and that this interaction is conserved in almost all SNARE systems.

Martin also recently was awarded a program grant from Australia's National Health and Medical Research Council to work alongside cell biologists, metabolic scientists and clinicians to identify novel proteins associated with diabetes and to characterize these proteins at a structural and functional level.

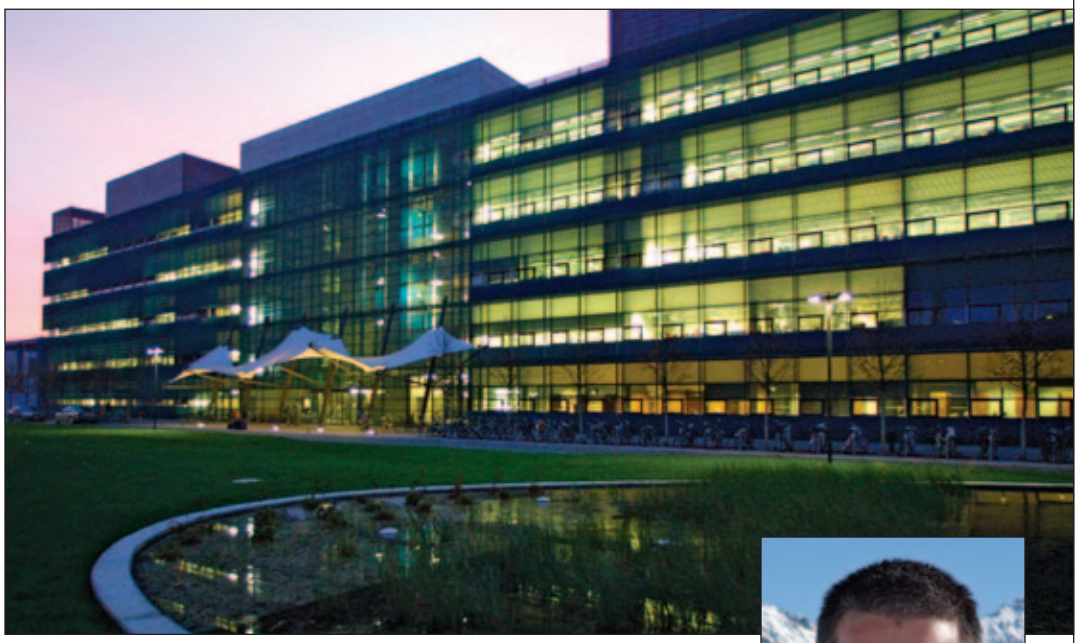
In addition to her own group's work, Martin has been instrumental in nurturing Australia's structural biology presence through work on various scientific committees.

"Protein crystallography has grown tremendously in Australia since I first started my lab in 1993," she says. "There were maybe six or seven groups back then, but today, that number has grown to over 40."

The growth in protein crystallography is a welcome trend, especially considering Australia's history in this field, adds Martin, who is a bit of a history buff. Australia's first ever Nobel laureate was Lawrence Bragg in 1915. He won the award at age 25 alongside his father, William Bragg, for solving the first ever x-ray crystal structure (of sodium chloride).

And, because of the efforts of Martin and her colleagues, today's Australian and New Zealander crystallographers can achieve their own breakthroughs much more easily, thanks to the 2007 opening of the Australian Synchrotron in Victoria. Previously, synchrotron data measurement required time-consuming and expensive trips to the U.S., Japan or Europe, but now, researchers have a much more convenient destination, as well as a centralized area where the burgeoning crystallography community can converge.

Of course, some part of Martin may miss the frequent airline travel; after all, you never know what kind of life-changing experience you might have while waiting to board a plane.



The MPI-CBG building at night.

Andrej Shevchenko

Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany

A decade ago, if you asked Andrej Shevchenko his opinion on lipids, his answer would not be too flattering. "I was a 100 percent protein guy," he says, "and, as an analytical protein chemist, lipids were synonyms for trouble. Whenever I saw mass spectra that didn't look right, I suspected that the scientists did not delipidate their samples fully."

However, over the past few years, Shevchenko, a group

leader at the Max Planck Institute of Molecular Cell Biology and Genetics, one of the newest of the 80 research institutes set up by the Max Planck Society, has come around. Lipids are no longer just greasy and cloudy contaminants or solvents for hydrophobic proteins; they're integral biological molecules that warrant their own study.

So, while he continues to work on protein analysis, for example, identifying protein interaction networks in yeast or developing programs that can characterize the proteomes of organisms that are related very distantly to organisms with sequenced genomes, Shevchenko has begun to apply his skills to better quantify the lipid composition of various organelles, cells and tissues.

And, at the MPI-CBG, Shevchenko has found an ideal home to pursue these ideas. Surrounded by top-level cell biologists and an environment that encourages exploratory research, Shevchenko continually is moving from one exciting project to the next, adding his analytical mind to various collaborative efforts.

Born and educated in Russia, Shevchenko developed strong interests in both organic chemistry and analytical chemistry in school and gravitated naturally toward mass spectrometry analysis. In 1994, he moved to the European Molecular Biology Laboratory in Heidelberg, first, as a visiting scientist with noted proteomicist Matthias Mann, and, later as a staff scientist.

"However, they don't have tenured appointments at the EMBL, so after a few years, I had to move on," he notes. Fortunately, at that time, Max Planck was setting up their new CBG campus in the former East German city of Dresden, and several of Shevchenko's former EMBL colleagues were slated to join. "And, they asked if I would be interested to come with them and set up a bioanalytics lab," he says.

Shevchenko notes one of his big fears was that he would end up doing proteomic analysis of a primarily technical or service nature, which would eventually become boring; however, given this invitation by scientists he knew and respected, his decision was a "no-brainer."

Situated near Germany's border with the Czech Republic and Poland, the MPI-CBG is a highly interactive and dynamic institute that hosts scientists of more than 35 nationalities, and, with that broad diversity and the fact that all institute meetings and seminars are held in English — "or what we believe to be English," Shevchenko says jokingly — one may sometimes forget where they are.

Which would be a shame, Shevchenko adds, because the surrounding city of Dresden is quite energetic and worth visiting.

Of course, there is plenty of energy in the lab as well, as can be expected from a field like proteomics that has been rapidly advancing; technical issues that were bottlenecks just two years ago have been resolved, notes Shevchenko, who can follow advances closely as an editorial board member for the ASBMB journal, Molecular and Cellular Proteomics.

"The "omic" sciences are becoming much more quantitative than descriptive now," he says, "and we are really beginning to understand the molecular aspects of these proteins, complexes or networks that we study. In addition to pure numbers, proteomics also has moved forward by now being able to track measurements in both time and space, which is especially exciting."

Shevchenko is hoping to use these new advances to tackle an ambitious project aimed at marrying lipidomics with developmental biology. As organisms grow and develop from a single cell, newly differentiated tissues require their own unique membrane lipid composition, and Shevchenko hopes to characterize these tailored changes to better understand how inherited defects in lipid metabolism cause disease.

And, to think, a few years ago, lipids was just another dirty word.

Anthony H. Futerman

Weizmann Institute of Science, Rehovot, Israel

Although he often dreamed of pursuing an academic career during his youth in England, Anthony H. Futerman notes that the deal was officially sealed when he got a hold of a certain iconic biochemistry textbook.

"Blame Lehninger," he says. "I was given a copy of that book by my high school teacher, and I found it so fascinating that, right then and there, I decided to become a biochemist, at the age of 16," he says. Futerman enjoyed the book so much, in fact, that he purchased his own copy two years later when he went to the University of Bath for undergraduate studies, a copy he still displays proudly on his office shelf at the Weizmann Institute of Science.

Fittingly, a book also would play a prominent role in leading Futerman to this renowned scientific institution in Rehovot, Israel. He found an article about the Weizmann Institute in the Encyclopedia Britannica when he was young, and, after his university adviser mentioned that Weizmann might be a good destination for graduate school, Futerman decided that was where he wanted to go.

Three decades later, Futerman, now the Joseph Meyerhoff professor of biochemistry, is still going strong at Weizmann — although he did travel abroad for a short postdoctoral fellowship with Richard Pagano at the Carnegie Institute in Baltimore — studying the biochemistry of sphingolipids, an important lipid class with functions in both membrane biology and cell signaling, and their role in lysosomal storage diseases like Gaucher and Tay Sachs.

"It's not too surprising, since historically, education and Jewishness always go together, but there is a wonderful scientific culture here at Weizmann," Futerman notes of this somewhat unusual research university that solely offers graduate and postdoctoral education. "And that was even before we had our first Nobel Prize winner this past year (Ada Yonath). But, I think that helped make us even more visible on the international scientific map."

Add the fact that Futerman, along with about half of Weizmann's 250 international faculty members, gets to live on the picturesque campus and only has a short walk to his lab, and one can understand the appeal.

A view of the Weizmann Institute campus featuring the futuristic Koffler nuclear accelerator in the background.

The only downside is that Futerman is the sole lipid specialist at Weizmann (his colleague and fellow international ASBMB member Mordechai Liscovitch recently passed away), although Futerman has remedied that through numerous external collaborations with labs all over the world, such as Al Merrill's group at Georgia Tech, and frequent travel to meetings.

Futerman's graduate studies centered on GPI-anchored proteins, but after completing his degree, he attended a Federation of the Societies of Biochemistry and Molecular Biology (FEBS) summer school and spoke to a number of lipid scientists who stimulated his interests in lipid cell biology. This eventually led to his postdoctoral position with Pagano as well as his first taste of sphingolipid research.

Since returning to Israel in 1990, Futerman's lab has focused on two main areas: understanding the mechanistic basis for lysosomal storage diseases to identify new therapeutic applications and characterizing the biosynthesis of sphingolipids, particularly ceramides. His group has brought forth some important contributions in this arena, such as determining the first crystal structure of the enzyme mutated in Gaucher disease, acid β-glucosidase (together with Weizmann colleagues Joel Sussman and Israel Silman) and discovering that glycosphingolipids can regulate calcium homeostasis in neurons.

Currently, he's looking at how the accumulation of specific sphingolipid species translates to specific diseases and phenotypes, as well as examining how the length and saturation of sphingolipid acyl chains — the molecular tails that range from 14 to 32 carbons long — affect function in signaling activity and membrane fluidity.

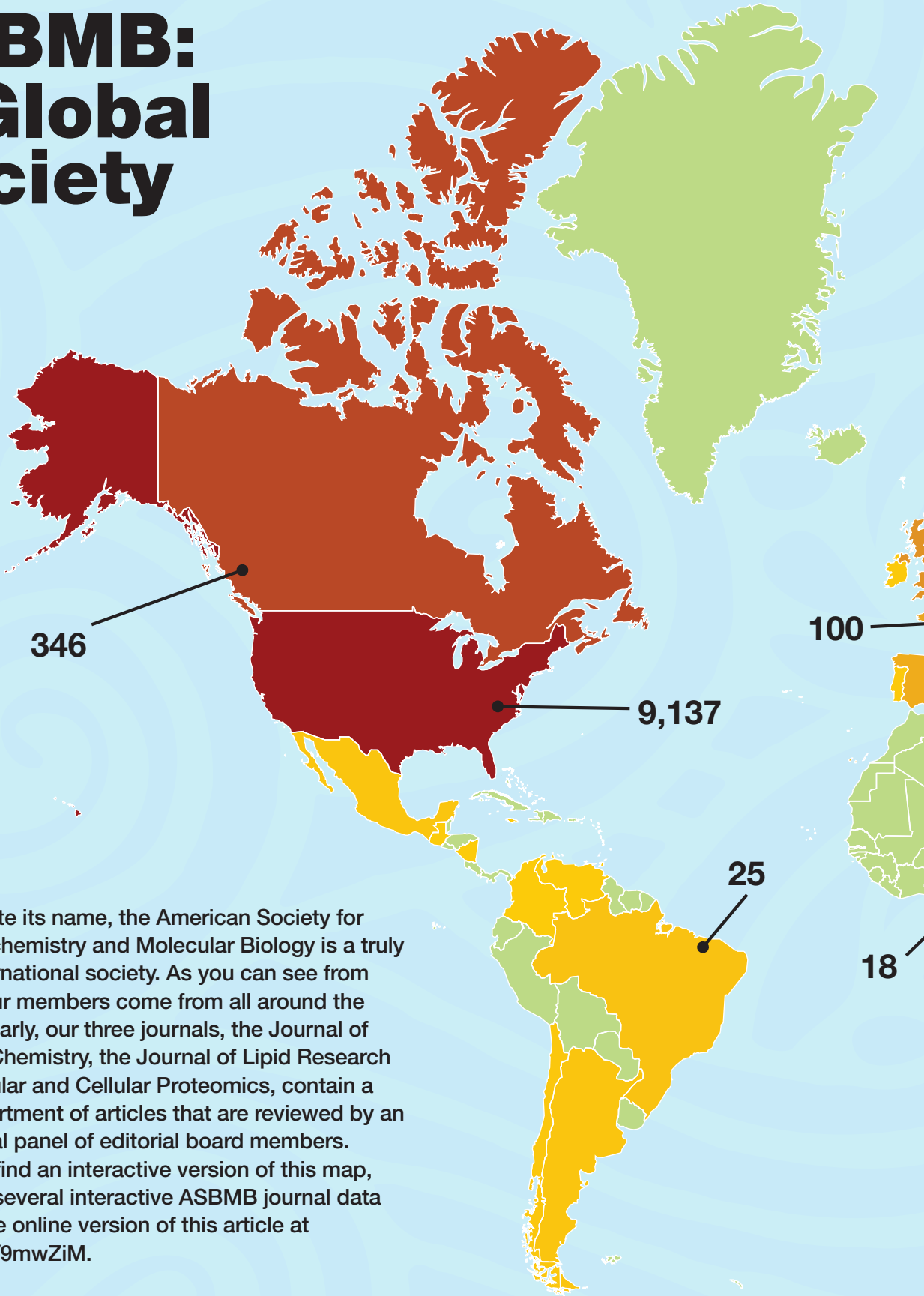
Futerman also has been a member of the Journal of Biological Chemistry editorial board since 2000. "Since I started, I've noticed the board has been becoming more international, which I think is very important," he says. "The JBC may be American-published, but in looking at the articles each week, it's clearly an international journal, and it's nice for these authors to know that their international colleagues are involved in the selection process."

Nick Zagorski (nzagorski@asbmb.org) is a science writer at ASBMB.

Suggestions?

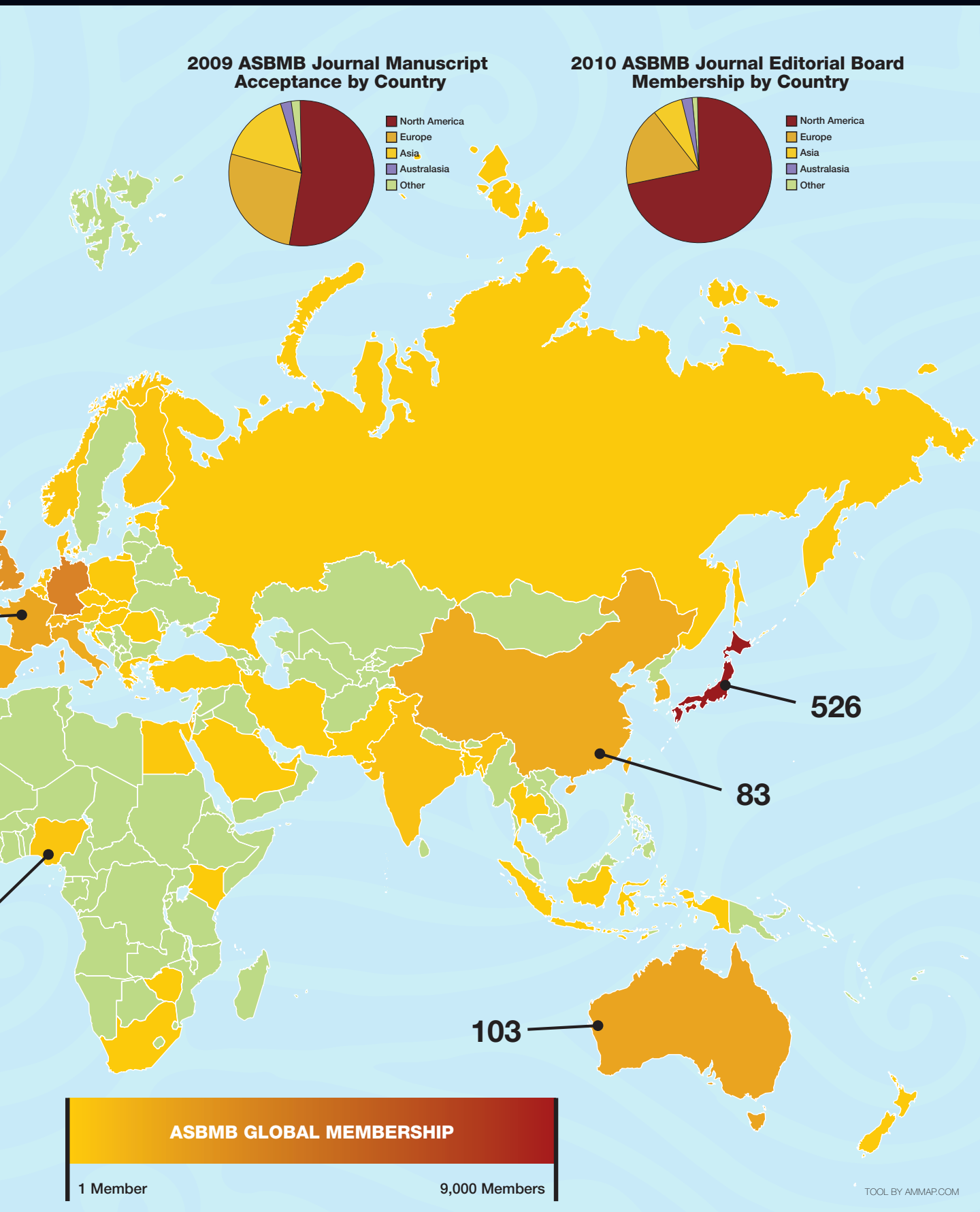
If you have any suggestions for international story topics, please email us at asbmbtoday@asbmb.org.

ASBMB: A Global Society



Despite its name, the American Society for Biochemistry and Molecular Biology is a truly international society. As you can see from the map, our members come from all around the world. Similarly, our three journals, the Journal of Biological Chemistry, the Journal of Lipid Research and Molecular and Cellular Proteomics, contain a global assortment of articles that are reviewed by an international panel of editorial board members.

You can find an interactive version of this map, along with several interactive ASBMB journal data maps, in the online version of this article at http://bit.ly/9mwZiM.


2009 ASBMB Journal Manuscript Acceptance by Country
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The Global State of Science Funding

Recession hits the research budgets of some nations especially hard.

BY LESLIE W. CHINN

While federal science funding has remained relatively stable in the U.S. through the recent worldwide financial crisis, scientists in other nations have seen alarming headlines. "Financial crisis squeezes African science funding," reported the Science and Development Network last October (1). "Spain poised to chop science funding," proclaimed the Science|Business Network (2). And, in December, from The Guardian: "Cuts mark 'sad day for British science'" (3).

After the pessimistic predictions regarding science budget cuts last year, however, 2010 brought good news to some nations: decreases in funding for science education and research have been less drastic than once thought, and, in some cases, have even been avoided altogether.

Good and Bad News for the EU

In Spain, for example, the national economy has been reeling from a high unemployment rate and climbing government debts. But, despite the threat of science cuts, the most recent budget will keep science funding at a similar level as last year. The Spanish science budget may have been saved in part by Spain's assumption of the presidency of the European Union in the first half of 2010, which put pressure on the Spanish government to conform to stated EU goals regarding research support. "We see the European innovation plan and the launching of the 2020 Strategy [including an investment in knowledge and technology] as opportunities to place science and innovation firmly at the heart of Europe's future," declared Cristina Garmendia, Spain's minister of science and innovation, at a February meeting of EU research ministers (4).

However, not all EU member countries have fared as well. In the United Kingdom, for example, the national budgets for higher education, science and research are all facing substantial decreases by 2013, according to the prebudget report released in December by the chancellor of the exchequer (5). Responding to the cuts, predicted to be at least £600 million ($903 million), representatives of several British universities wrote a letter to The Guardian, stating, "[W]e are deeply concerned that cuts of this magnitude in overall funding will erode the sustainability of our research and affect even the most outstanding universities" (6).

In recent years, researchers in the U.K. have been relatively fortunate in terms of funding. According to the National Science Foundation's Science and Engineering Indicators 2010 report (7), the U.K. was seventh worldwide in research and development expenditures in 2007 (the latest year for which data are available), putting its R&D spending at 1.8 percent of its gross domestic product. This was similar to Canada's R&D/GDP ratio of 1.9 percent, but lower than that of the U.S. (2.7 percent), and substantially less than those of Japan and South Korea (3.4 and 3.5 percent, respectively).

Slowing Funding in Asia

Asian nations, in particular, have been increasing their research expenditures over the past decade. China, for example, had an R&D/GDP ratio of 1.5 percent in 2007—comparatively low, but impressive, given its 2.5-fold increase since 1996. Demonstrating its commitment to research despite the

recession, the Chinese government announced an increase of 8 percent to the national science and technology budget next year (compared to a 30 percent increase in 2009 (8)). And, despite fears of drastic budget cuts, Japan's 2010 science budget remained largely stable, although certain programs, such as a project to build a next-generation supercomputer, will face deeper cuts (9).

Little Money for Research in South America and Africa

Even as the pace at which nations increase science funding slows in Asia, Europe and North America, in terms of gross expenditures, these regions still invest far more in research and development than South America, Africa and Oceania. The UNESCO Institute for Statistics reported that Australia spent 2.2 percent of its GDP on research and development in 2006, but the highest R&D/GDP ratios in Latin America and sub-Saharan Africa approached only 1 percent in Brazil and South Africa, respectively (10).

In fact, Africa's leaders have committed to increasing their research and development expenditures to at least 1 percent of GDP. But, the recession has hurt the economies of developing countries to an even greater extent than it has the developed world. In October of last year, TWAS, the Academy of Sciences for the Developing World, held its 11th General Conference in Durban, South Africa. More than 400 attendees gathered to mark the increasing importance of science and technology in Africa, but amid the celebration, there was concern. Because of the global recession, there has been a decrease in science funding from some sources, commented Jean-Pierre Ezin, commissioner for human resources, science and technology for the African Union. "The future is worrying for all."

Making Their Voices Heard

If there is a bright side to the recent decreases in science funding, it's that people who understand the importance of investing in science are making their voices heard. The University of California system is struggling with steep cuts to research budgets, faculty furloughs and increased student fees resulting from California's fiscal crisis. In September, UC faculty, students and staff members participated in a system-wide walkout to protest the budget cuts (11). "I actually think the students ought to be angry," remarked Mark G. Yudof, UC president, at a Board of Regents meeting last September.

Elsewhere, protesters have issued letter-writing campaigns to denounce decreases in science funding — and in some countries, their message is getting through. Spain and Japan restored science funding this year following a public outcry, led by the scientific community, over budget proposals that slashed resources for research and education.

Worldwide, policymakers are coming to the realization that continued investments in science and technology are crucial for future economic stability and success. "When we fail to invest in research, we fail to invest in the future," declared President Obama last September. If only every nation's science budget could reflect that sentiment.

Leslie W. Chinn is a postdoctoral fellow at the National Cancer Institute.

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Coming to America

It's fairly common for international scientists to come to the United States for training. In fact, most labs are very multicultural, with their members representing several countries. Below, two international scientists tell their stories about coming to America.

My Brain Is Not American

BY CAROLE SOURBIER

Most people I speak to react very positively when they learn that I am originally from France. But, they usually have very little understanding as to why I came to the United States or why I wish to stay.

I came here to work, not to escape an unfriendly country or to follow the American dream. I had no expectations about the U.S. or any thoughts about a potential immigration. I had a great opportunity to work in a great lab, so I came. Filling out administrative papers to get a visa was not complicated, and, within a few months, I was able to move here.

From the beginning, on a work-related side, I have been totally fulfilled. I love doing research in the U.S. I thought that the research environment would be superior to that in France, and it is even better than I expected. I have had no trouble acclimating to my new lab, and my integration has gone smoothly. After all, Western blotting is the same in France as it is in the U.S. The main difference, for me, is the variety of opportunities to communicate science, meet outstanding researchers and set up collaborations. These opportunities have created a very stimulating environment, and I have learned a lot — from general science to very specific topics. I also have the impression that I am part of the "big picture" in my field of research. I guess that it is what a postdoctoral position is supposed to teach, and I am getting the best of it.

Although I came to the U.S. for work-related reasons, my move obviously has had an impact on my personal life. I came by myself, without family or friends, with only two bags and very poor English skills. I was not prepared at all to move to a foreign country, so you can imagine that, at the beginning, every day was difficult to get through. For the first month, my main concerns were about practical things, such as where to find a bed (sleeping on the floor was not a long term solution) or where to open a bank account.

But, after sorting these problems out, I was settled and ready to communicate with people around me. My inadequate English was never an issue for work-related matters; the lab was international enough to be "accent-friendly." However, it turned out to be a problem for everything else. Fortunately, my colleagues were very helpful for practical things, such as making phone calls for me and giving me rides when I needed them. But, I felt that the conversations I had were very superficial, and I was not able to express what I meant. One of the worst things was feeling like an idiot because I could not understand what was happening in social situations. Most of the jokes were like big black holes, and I was unable to make any jokes myself.

It was a very frustrating period. So, I worked on my English skills. After a couple of months, my grasp of the English language improved, and I started being able to communicate with people. During that time, I noticed that the way people interact in the U.S. is different than in France. Not bad, just different. French culture may not differ from American culture as much as other cultures, but I still had to learn American etiquette and other "do's and don'ts."

I also had an unsettling feeling of not being myself when I was speaking. At first, I thought this was due to my lack of vocabulary and cultural references. But, now that my English is no longer a limiting factor, I sometimes still have this odd feeling. I think that it is because some words and expressions cannot be translated adequately. But, I've realized that they are part of me and my culture.

Someone told me that the way your brain works is influenced by the language you grew up with. I think this is true. My brain is not American. While this does sometimes make things more difficult for me, I consider it one of my strengths. The U.S. is a melting pot of people with multiple backgrounds and multiple ways of seeing and approaching the world. This is what makes the United States an attractive and enriching country for me. And, isn't that what research is all about? Giving a new vision of sciences and of the world? XXXX

Carole Sourbier (soubierc@mail.nih.gov) received her master degree in pharmacology in 2004 and her doctorate in pharmacology in 2007 from Louis Pasteur University in Strasbourg, France. Her dissertation focused on the development of new targeted therapies for kidney cancers. In 2007, she joined the urologic oncology branch at the National Cancer Institute as a postdoctoral fellow to conduct translation research targeting hereditary forms of kidney cancers.

Moving to the U.S. for a Postdoc, a Partner's Tale

BY TERTIUS DE KLUYVER

Rachel and I met while she was an undergraduate student and I was completing my doctoral degree. We married, and, as I had no desire to move from my hometown, we settled in Brisbane, Australia, and began to develop our careers there. The next 12 years were intellectually stimulating for both of us, but fairly routine; the odd trip overseas, holidays on the coast with my parents or in the country with hers. Then, a most unusual Christmas present for me, a glass name plaque with "Drs. Tertius and Rachel de Kluyver" inscribed on it. Our life together was to become interesting indeed.

American Bureaucracy

Four years later, Rachel, doctoral degree in hand, and I stood in the chill of a January evening outside Washington-Dulles International Airport waiting for our taxi. It was the week of President Obama's inauguration, and the Australian currency had collapsed against the greenback, 60 cents to the dollar. The taxi fare was a shock and our hotel bill more so.

After a week of hotel living and eating out, we were able to sign a contract for an apartment. This, in itself, was no mean feat as most property managers require social security numbers as part of the vetting process of prospective tenants. We had just arrived and were still sorting out Rachel's National Institutes of Health contract. SSNs?

Of course, a SSN also was required to establish an account with the NIH financial institution. This caused us some anxiety as we were relying on an NIH advance to stop the hemorrhage out of our Australian account. What were we to do? Cash the check and hide the money under our mattress? This was problematical in itself. Our household goods, which had been packed two months previously, were still on a dock in Australia.

When it comes to driving, we are "lefties" in Australia. I signed up for driving lessons to orient myself on American roads. Once confident that I wouldn't make an ass of myself during a driving test, I sat for the Maryland driver's license. More money spent, including the driver's course, the drug and alcohol education course, hiring of the "test" car, photo and the license application fees.

By the time March came around, we were footsore from carrying our weekly shopping about a mile to our apartment and were ready to buy a car. Our financial institution offered us a good deal on a car loan, but now we came across a new and unexpected twist. Although Rachel is the breadwinner, I had to apply for the car loan because I was the one with an American driver's license. I then had to open up a separate account from which loan repayments could be made, and Rachel had to sign on as my guarantor.

Finding Work

We knew from our research that I would not be eligible for work immediately. As Rachel's "dependent," I was granted a J2 visa, which allowed me to apply for an "Employment Authorization Card," once I was in the U.S. This process can take up to three months.

The question of work for the noncontracted partner is the biggest consideration for any couple contemplating a

move overseas for an extended period of time. I researched the job market extensively before we made the decision to come, as well as in the months leading up to the move itself. As an environmental scientist and manager, I was confident that I would find employment. But then, we were taken by surprise by the speed of the financial collapse and the depth of flow-on effects on employment. Certainly federal jobs were out there, but not for a non-U.S. citizen. In the private sector, I was told by one manager, "we are having problems retaining staff."

Despite these difficulties, I kept trying, and work did come. I am currently an adjunct professor at Hood College, where I lecture in the graduate environmental science and policy course. My teaching keeps me very busy indeed, and I now have two graduate students starting projects with me.

Moving overseas for any reason is a big step. Rachel and I prepared as well as we could, and we were still caught by surprise in a number of different ways. But then, that is what gaining experience is all about, in both life and work. Are we disappointed with our choices? No! We are leveraging our professional qualifications and experience to follow a dream and experience what the world has to offer and to make new friends and stories that we really can write home about. XXX

Tertius de Kluyver (dekluyver@hood.edu) has undergraduate degrees in biology and biochemistry and studied for his doctorate at the Queensland University of Technology, Australia. He has worked as an environmental scientist, academic and manager in the public and private sectors and was a senior environmental manager with the Queensland Government. Tertius came to the U.S. in support of his wife's postdoctoral position with the National Institutes of Health. He now teaches environmental science and policy at Hood College.

New column

In gathering articles for this global science issue, we realized there are a lot of interesting international ASBMB stories that we want to continue to highlight. Stay tuned for articles on South American biofuels and India's emerging biodevelopment.

The Humboldt Foundation

BY NICK ZAGORSKI

Alexander von Humboldt was a man who was ahead of the curve. A 19th century naturalist, explorer and geographer, Humboldt left a lasting legacy, not only from his countless scientific discoveries, but also his holistic vision of science. As detailed in his masterwork, Kosmos, Humboldt believed that understanding natural phenomena required that scientific disciplines operate with unity.

That same philosophy now underlies the foundation that bears his name. The Alexander von Humboldt Foundation, re-established after World War II (previous incarnations had existed at various times since 1860) to help facilitate and accelerate West Germany's reintegration into the international community, has long been at the forefront of promoting international cooperation and collaboration among scientists and scholars.

The Bonn-based foundation achieves this lofty goal principally through generous fellowships (which can be applied for) and awards (which require nomination) given to international researchers at all levels and in all disciplines as a mechanism to bring them to Germany for sabbaticals and collaborations.

Two notable awards include the Humboldt Research Fellowship, which finances young academics to work for up to 24 months with a German host, and the prestigious Humboldt Research Award (also known as the Humboldt Prize), which recognizes career achievements and allows established scientists to work with a German colleague on a collaborative project. Many American Society for Biochemistry and Molecular Biology members have been among the approximately 100 scholars chosen each year for this latter honor, including, most recently, Ellen Fanning of Vanderbilt University, who won the award last year for her groundbreaking work on DNA replication.

"It's important to note that the Humboldt Foundation applies no quotes for either discipline or country," says Cathleen Fisher, executive director of the American Friends of the Humboldt Foundation, a professional partner group that promotes the foundation's fellowship opportunities in the U.S., helps organize meetings between the foundation and scientific or policy groups in Washington, D.C. and serves as a networking center for the 4,500 Humboldt alumni in the U.S. "Exceptional science is the only criteria."

The Humboldt foundation also supports other initiatives to engage in more networking; for example, the foundation encourages its members to organize special regional meetings known as "Kollegs," in which scholars in various fields can get together to discuss issues that span a variety of disciplines.

"The sponsorship of these Kollegs exemplifies how the Humboldt is special and unique," Fisher says. "They don't just see these fellowships as prizes, but rather, lifetime investments in individuals that should be nurtured," she continues. "That's a big reason so many Humboldt fellows have remained involved with the foundation throughout their careers."

ASBMB member A. Stephen Dahms can speak from firsthand experience. In 1979, as a rising young scientist at San Diego State University, he won a Humbdolt Research Fellowship, allowing him and one of his students to travel to the University of Munich to collaborate with Martin Klingenberg. It originally was a 16-month sabbatical, but, over the years, Dahms has returned to Germany on several occasions to revisit his scientific colleagues (and vice versa) and also has been involved with the Humboldt Foundation in other capacities.

"I like to joke to my colleagues that the Humboldt Foundation is like the mafia," Dahms says, "in that you join an organization from which they never let you resign."

Nick Zagorski (nzagorski@asbmb.org) is a science writer at ASBMB.

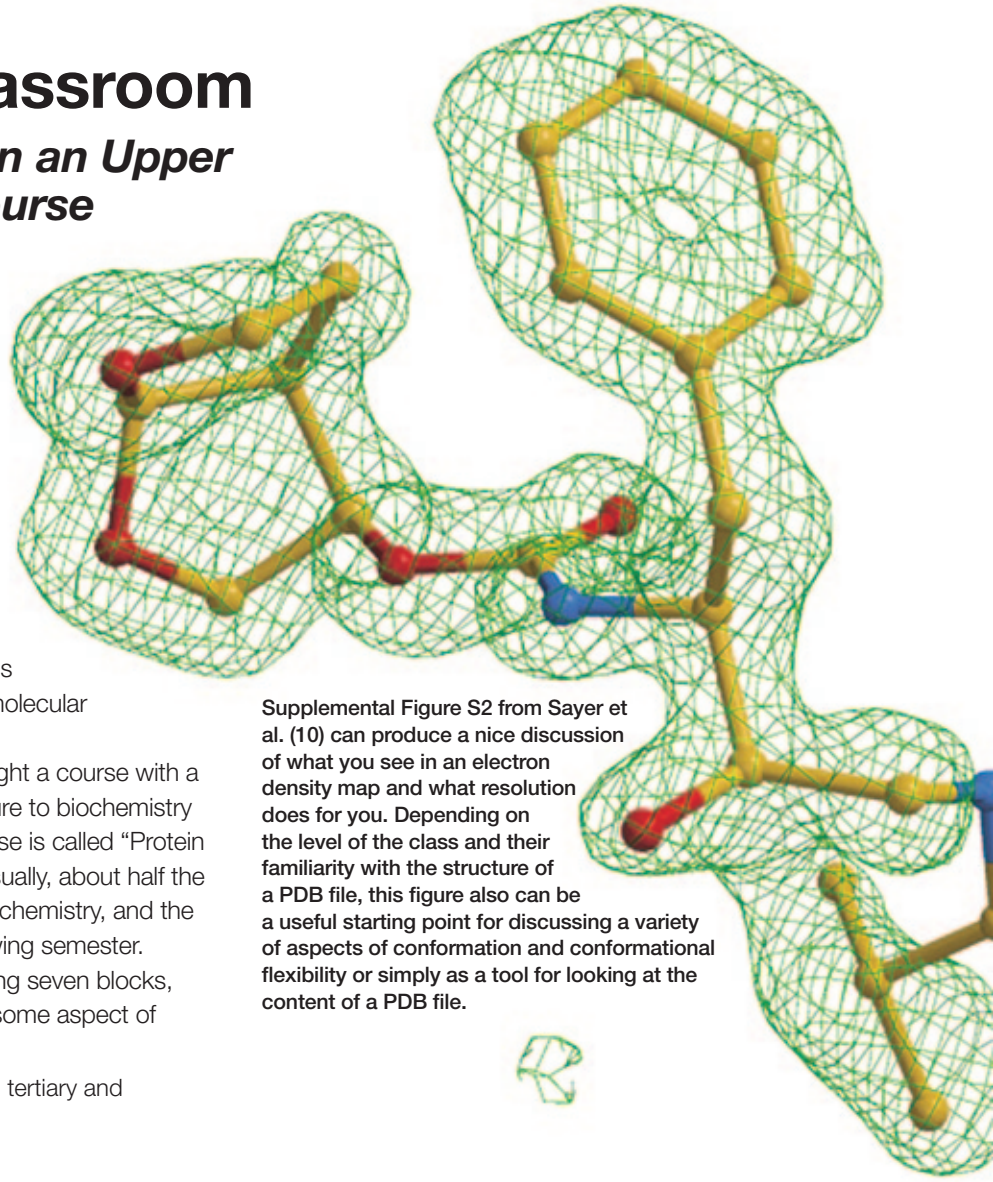
For more information:

- To learn more about the Alexander von Humbdolt Foundation, visit: www.humboldt-foundation.de/web/home.html.
- Information on the American Friends of AvH can be found at: www.americanfriends-of-avh.org/index.html.
- For a full list of ASBMB members who have won Humboldt awards, go to http://bit.ly/c7DEgA.
- Read about the experiences of a Humboldt Fellow in the Career Insights article on p. 30.

JBC in the Classroom

Using JBC Articles in an Upper Level Biophysics Course

BY J. ELLIS BELL



Supplemental Figure S2 from Sayer et al. (10) can produce a nice discussion of what you see in an electron density map and what resolution does for you. Depending on the level of the class and their familiarity with the structure of a PDB file, this figure also can be a useful starting point for discussing a variety of aspects of conformation and conformational flexibility or simply as a tool for looking at the content of a PDB file.

The challenges facing education in the molecular life sciences have been well documented (1–3). For a number of years, the biology community has advocated using primary literature (4–6), and much has been written about the effectiveness of journal clubs (7) or literature-based courses (8, 9). These courses are ideal for teaching both fundamentals and skills necessary for a major in biochemistry, molecular biology or biophysics.

For the past twenty years, I have taught a course with a significant component of primary literature to biochemistry and molecular biology majors. The course is called "Protein Structure, Function and Biophysics." Usually, about half the students in the class have had physical chemistry, and the other half is planning to take it the following semester.

The course is divided into the following seven blocks, each two-weeks-long, with a focus on some aspect of structure, function and biophysics:

1. Protein structure: primary, secondary, tertiary and quaternary structure
2. Enzyme kinetics
3. Ligand binding
4. Fluorescence spectroscopy and its uses in biochemistry and biophysics
5. Protein folding, stability and flexibility
6. Structure determination (NMR or x-ray crystallography)
7. Computational approaches (either molecular dynamics or QM-MM approaches)

Each block consists of a two-week lab and the following four lecture sessions:

1. Introductory material: lecture and discussion
2. Discussion of primary literature: small group work and report
3. Quantitative aspects: problem sets, small group work and report
4. Laboratory wrap-up and discussion

Using Primary Literature

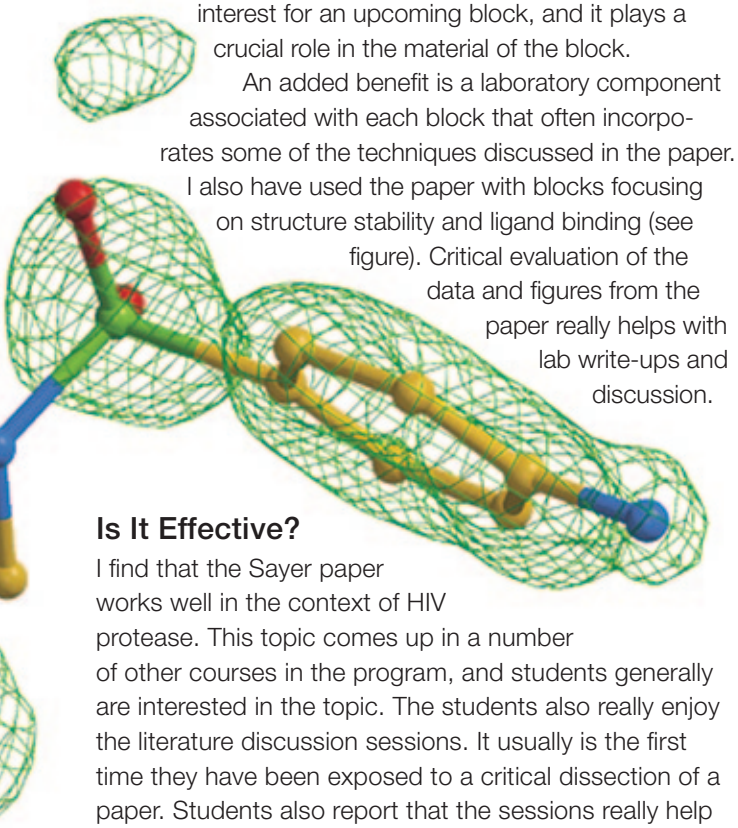
I usually assign a Journal of Biological Chemistry paper by Sayer et al., titled "Effect of the Active Site D25N Mutation on the Structure, Stability, and Ligand Binding of the Mature HIV-1 Protease" (10) as a follow-up to an HIV protease problem set that we developed (2). The students have to turn in a written report on the paper before Session 2 of each block using the steps in Box 1 (adapted from reference 11) as guidance.

At the start of the literature discussion class, we break into four groups of four students. Each group is assigned some part of the paper to discuss amongst themselves for about 20-25 minutes (in a 75-minute class). For this paper, I group Figures 1 and 7; Figures 2 and 8; Figures 3, 4 and 9; and Figures 5, 6 and Table 2. After a discussion

during which I float between the groups answering queries and asking provocative questions, each group has to explain, in detail, their assigned component to the rest of the class and answer questions. These presentations and discussions generally last about 10 minutes each.

The Sayer paper clearly brings in material from several blocks of the course, which is quite deliberate on my part. It helps to solidify student understanding and pique their interest for an upcoming block, and it plays a crucial role in the material of the block.

An added benefit is a laboratory component associated with each block that often incorporates some of the techniques discussed in the paper. I also have used the paper with blocks focusing on structure stability and ligand binding (see figure). Critical evaluation of the data and figures from the paper really helps with lab write-ups and discussion.



Is It Effective?

I find that the Sayer paper works well in the context of HIV protease. This topic comes up in a number of other courses in the program, and students generally are interested in the topic. The students also really enjoy the literature discussion sessions. It usually is the first time they have been exposed to a critical dissection of a paper. Students also report that the sessions really help them appreciate outside seminar speakers. (I usually try to correlate the papers with topics that I know will be presented in an outside seminar, and have even, on occasion, managed to have the author of the paper give a seminar the week of the discussion.) In at least one block during the course, I deliberately skip the literature discussion session for a paper, and, several blocks later, I have a pop quiz on the topics covered in the paper. I have been pleasantly surprised at how my students' analysis of a paper, even without the in-class discussion, has led to a more detailed understanding of a topic.

J. Ellis Bell (jbell2@richmond.edu) is professor of chemistry and chair of the biochemistry and molecular biology program at the University of Richmond. He is also chair of the ASBMB Education and Professional Development Committee.

Steps for Evaluating a Journal Article

1. What is the context of the paper?
2. What work by others is critical to the paper?
3. Identify three critical background references.
4. Summarize the big picture aspect of the work.
5. What is the central hypothesis being tested?
6. Identify preparative experiments.
7. What are the critical experiments that test the hypothesis?
8. Which is the most important figure in the paper?
9. What are the major conclusions reached?
10. What evidence are the major conclusions based on?
11. What is the reproducibility of the experimental data and how might this affect the conclusions that will be reached for each experiment?
12. What controls are used?
13. What are the potential pitfalls of the techniques used?
14. What is the next logical step suggested by the authors?
15. What additional experiments do these results suggest to you?

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A Holistic Approach to Math and Science Education

BY SAPHRONIA R. JOHNSON

Are there ways to enhance math and science educational experiences for K-12 students to ensure that there is a pipeline for the future STEM workforce, while simultaneously addressing the knowledge, interests and needs of their parents, their educators and the community at large? Yes, there are. The way to do it is to build a math and science education infrastructure that extends beyond the traditional classroom setting or state mandated standard. The infrastructure includes a continuum of learning: inside and outside of the classroom and formal and informal learning opportunities. Creating that continuum is why, in 2009, my business partner, Tokiwa T. Smith, and I established the Project Equilibria Mathematics and Science Educational Consulting Firm, LLC (Project Equilibria), based in the San Francisco Bay Area.

We believe there are three factors (or phases) that determine student achievement in mathematics and science: the student; the family and the community. If one component is out of phase, then we don't have balance (or equilibria) and our students are not going to achieve success in math and science. Project Equilibria believes balance can be attained by: 1) engaging students: allowing them not only to achieve but to have fun while learning; 2) engaging parents: providing support and education about creating an environment for learning at home; and 3) engaging the community: developing innovative and exciting math and science curricula for K-12 students and making the larger community aware of opportunities in science, technology, engineering and mathematics. Our holistic approach involves developing innovative programs and services for each phase.

The Student

Our student programs include after-school (the "Next Phase") and summer enrichment ("Connecting the Phases") programs that provide opportunities for hands-on learning and skill development in math and science. Our "Transition Phase: Academic Enrichment Workshop" student workshops are designed to encourage and promote self accountability for education and life as well as science, technology, engineering and mathematics career exploration.

The Family

Our family programs consist of interactive workshops that show how to create a supportive learning environment at home, and foster children's interest in math and science. Our "Parent University" is a year long course for parents and guardians. After completing the course, parents receive a certificate and become eligible to apply for the "Parental Support Educator Training Program." This program is a year long, and, upon completion, the individual is certified as a "Parental Support Educator" and is eligible to apply for a paid contract position.

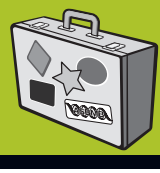
The Community

Our community programs and services are available for school districts, youth service community organizations and homeschoolers. We provide them with customized curricula, which can be based on state curriculum standards, that provide hands on math and science activities, standardized test preparation and scientific literacy skill development. Professional development workshops are available for K-12 educators (private, public or home-school), where the educators learn hands on math and science activities that can be easily implemented in their classrooms. School districts and community organizations can request any of our parent or student workshops to be conducted at their site. Local colleges and universities, corporations and government agencies that are looking to implement their corporate social responsibility or community outreach projects can also contract us to develop and implement those programs in their community.

Project Equilibria is doing its part to ensure the U.S. becomes a leader in inventions, engineering design and scientific breakthroughs by helping to create a math and science educational infrastructure that allows students to achieve academically and pursue STEM careers.

For more information, visit www.projectequilibria.com, or email us at info@projectequilibria.com.

Saphronia R. Johnson (sjohnson@projectequilibria.com) is chief executive officer of Project Equilibria Math and Science Educational Consulting Firm, LLC.



The Meeting Doesn't Stop in Anaheim

BY JLYNN J. FRAZIER

Before going to Anaheim, American Society for Biochemistry and Molecular Biology annual meeting attendees submitted their abstracts, made their travel arrangements and strategically planned out which sessions and events they would attend. In Anaheim, they moved through oral sessions, poster presentations, career workshops and the exhibition hall. At the ASBMB thematic receptions and informal gatherings they caught up with old friends and met many new ones interested in similar research specialties.

We are all familiar with the pre-meeting preparations and on-site meeting opportunities at the annual meeting, but, what happens after Anaheim? The resources below can help you make the most of your meeting experience long after the meeting's conclusion.

View Electronic Posters

All registered meeting attendees can view posters online through the e-poster link on the Experimental Biology 2010 Web site. This is a great opportunity to review posters across the various disciplines that you may not have been able to see at the meeting in Anaheim.

Complete a Meeting Survey

Check your inbox for the ASBMB post-Anaheim meeting survey. In just a few minutes, you can provide important insight into your experience as a meeting attendee. ASBMB evaluates all feedback we receive from attendees to further enhance future annual meetings.

Continue to Network

Throughout the meeting, you exchanged ideas and business cards and connected with current and future colleagues. Stand out from the crowd and demonstrate your initiative by sending an e-mail to thank a fellow attendee for their time and continue to engage in a conversation that began in Anaheim. To facilitate connecting scientists and building our biochemistry and molecular biology community, ASBMB has a group page on LinkedIn. This is a great resource for connecting with scientists, sharing your resume and building your professional network.

Stream an ASBMB Award Lecture

Visit the ASBMB Web site to stream video presentations of the ten award lectures on topics such as ways to implement strategies to engage emerging scientists and how to apply methods for mapping and analyzing molecular networks in cells.

Share Your Stories

Throughout the annual meeting, ASBMB and its fans will post photos and videos to share with our community. If you have not done so yet, now is the time to become a fan of ASBMB on Facebook, where you can post comments and share your favorite meeting experiences.

Actively Engage with the Scientific Community

Catch up on the latest stories and research by following ASBMB on Twitter. Continue to talk about the annual meeting by using the hashtags: #asbmb2010 and #eb2010. Twitter is a powerful way to become an active contributor to the ASBMB community by sharing comments and links to articles and news stories.

Jlynn J. Frazier (jfrazier@asbmb.org) is conference manager at ASBMB.

Where to…

- view electronic posters: **www.experimentalbiology.org**
- join ASBMB on LinkedIn: **http://bit.ly/b0gVZ9**
- stream award lectures: **www.asbmb.org/Interactive.aspx**
- become an ASBMB Facebook fan: **www.facebook.com/asbmb**
- follow ASBMB on Twitter: **http://twitter.com/asbmb**

Viral Inactivation at Work

Successful replication of viruses requires that they overcome a number of hurdles inside host cells. APOBEC3G (Apo3G) is a human protein that interferes with the replication of HIV-1 by mutating viral cDNA by deoxycytodine deamination. While the antiviral effects of Apo3G make it important to understand the mechanism of this protein, structural and biochemical analyses have been impeded by the oligomeric state of highly purified Apo3G. Here, the authors used structure-guided predictions to identify two amino acids at the non-catalytic CD1-interaction domain of Apo3G. When mutated at these sites, Apo3G was primarily purified as a monomer, demonstrating that the CD1-interaction domain is crucial to the dimerization of Apo3G. Monomeric Apo3G efficiently bound several nucleic acid sequences and exhibited 3→5′ deamination polarity and processivity, suggesting that the monomer is biochemically similar to the native protein. Simultaneously, Apo3G's CD1 domain appeared to be essential for the catalytic activity of Apo3G's CD2 domain, suggesting that CD1 enhances CD2-mediated catalysis. Together, these results provide a structure-based model to explain the catalytic behavior of Apo3G, informing the mechanism of its antiviral activity.

Model showing how an APOBEC3G monomer's CD2 domain (wheat) causes deoxycytodine deamination of 5' located cytodines (red).

A Structural Model for Deoxycytidine Deamination Mechanisms of the HIV-1 Inactivation Enzyme APOBEC3G

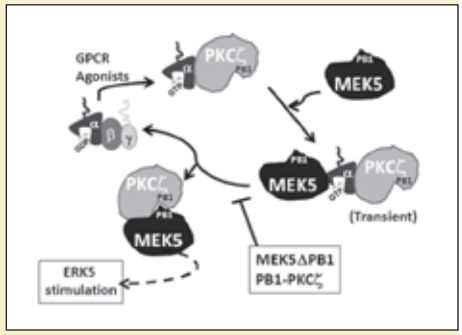
Linda Chelico, Courtney Prochnow, Dorothy A. Erie, Xiaojiang S. Chen and Myron F. Goodman

J. Biol. Chem., published online March 8, 2010

jbc

A New Trick for Gaq

Signal transduction cascades allow cells to regulate coordinated responses to extracellular stimuli such as heat, hormones and mitogens.



A model for the structural relationship of the Gαq-PKCξ-MEK5 complex in controlling ERK5 activation.

Surface-associated G protein-coupled receptors (GPCR) respond to extracellular molecules, activating signal transduction pathways that direct changes in cellular responses, such as gene expression. Stimulation of the Gq-coupled GPCR leads to the activation of extracellular signal regulated kinase-5 (ERK5) through a previously unknown mechanism. In this study, the researchers elucidate the signal transduction network between a Gq-coupled GPCR and ERK5.Their research shows that an atypical protein kinase C, PKCζ, is required for GPCR-mediated ERK5 activation. Most interesting, perhaps, is that PKCζ and MEK5, which is an activator of ERK5, are shown to physically interact via the G protein subunit, Gαq. Upon GPCR activation, the trimeric MEK5-Gαq-PKCζ complex appears to be required for ERK5. Together, this work demonstrates a novel function for Gαq as an adaptor protein that facilitates GPCR signaling by mediating MEK5-PKCζ protein-protein interactions. Furthermore, Gαq may serve as an adaptor protein in other PKCζ-mediated signaling cascades, a possibility that enhances the current view of cellular signal transduction.

Gαq Acts as an Adaptor Protein in Pkc-mediated ERK5 Activation by GPCR

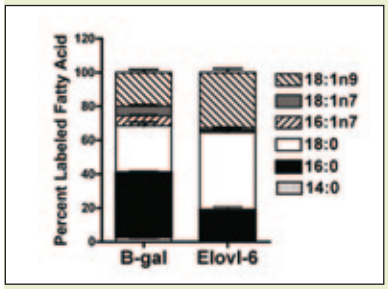
Garlota Garcia-Hoz, Guzmán Sánchez-Fernández, Maria Teresa Díaz-Meco, Jorge Moscat, Federico Mayor and Catalina Ribas

J. Biol. Chem., published online March 3, 2010

jbc

Balancing the Saturation

Diets high in carbohydrates are known to alter fatty acid metabolism, promoting the conversion of glucose into fatty acids for storage as triglycerides and cholesterol esters. It is known that, following synthesis of saturated FAs from glucose, elongase and desaturase enzymes catalyze the conversion of SFAs into monounsaturated FAs (MUFAs). However, the exact role of FA elongases in determining the end products of *de novo* FA synthesis largely has been speculative. In this study, the researchers conducted a comprehensive analysis of the effects of both decreased and increased expression of the elongases Elovl-5 and Elovl-6 on FA synthesis in mammalian cells. Elovl-5 knockdown decreased the elongation of palmitoleate (16:1,n-7), while its overexpression increased synthesis of vaccenate (18:1,n-7), although this was dependent on stearoyl-CoA desaturase activity. Knockdown of Elovl-6 decreased the elongation of both palmitate (16:0) and 16:1,n-7, while overexpression preferentially drove synthesis of stearate (18:0) and oleate (18:1,n-9) but not 18:1,n-7. The findings reveal a significant role for FA elongase activity in regulating the synthesis of *de novo* derived MUFAs to establish a balance between 16:1,n-7, 18:1,n-7 and 18:1,n-9 species.



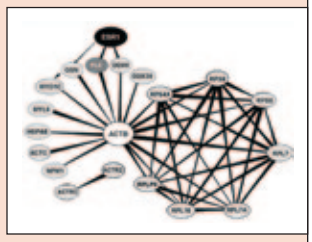
Increased expression of the elongase Elovl-6 expression alters de novo FA synthesis in INS-1 cells.

Role of Fatty Acid Elongases in Determination of De Novo Synthesized Monounsaturated Fatty Acid Species

Christopher D. Green, Cansel G. Ozguden-Akkoc, Yun Wang, Donald B. Jump, and Lawrence Karl Olson

J. Lipid Res., published online March 12, 2010

An Estrogen-Actin Network



Map of the ERα and β–actin interactions identified in hormone-stimulated MCF-7 cells.

Estrogen receptor is a member of the steroid/nuclear receptor family of transcriptional regulators that, upon estrogen binding, induces a series of genomic and extragenomic effects that regulate many cellular functions. Along the way, ERα interacts with numerous transcriptional co-regulators and other binding partners. Identifying these molecular partners and interactions is required to define the basis of estrogen function, especially in mammary cells where estrogen is a potent tumor inducer. In this study, the researchers used affinity purification to map and characterize the ERα interactome in hormone-responsive human breast cancer cell nuclei. The analysis of purified ERα-containing complexes uncovered a ligand-dependent multiprotein complex comprising β-actin, myosins and several proteins involved in actin filament organization, actin dynamics and actin-mediated transcriptional and translational regulation. These ERα and actin complexes assembled in the nucleus shortly after receptor activation and gene knockdown studies showed that gelsolin and the nuclear isoform of myosin 1c are key determinants for complex assembly and/or stability. This work suggests that the actin network plays a role in ERα nuclear activity in breast cancer cells, including coordinating target gene activity, reorganizing chromatin and promoting ribosome biogenesis.

Identification of a Hormone-regulated Dynamic Nuclear Actin Network Associated with Estrogen Receptor a in Human Breast Cancer Cell Nuclei

Concetta Ambrosino, Roberta Tarallo, Angela Bamundo, Danila Cuomo1, Gianluigi Franci, Giovanni Nassa, Ornella Paris, Maria Ravo, Alfonso Giovane, Nicola Zambrano, Tatiana Lepikhova, Olli A. Jänne, Marc Baumann, Tuula A. Nyman, Luigi Cicatiello and Alessandro Weisz

Mol. Cell. Proteomics, published online March 22, 2010

One in a Land of 1,338,612,968

BY ANDREA STITH

I am the only foreigner and native English speaker in my department and the first foreigner hired as an employee of my university. I also am one of 100,000+ expatriates living in Shanghai, a city of 16 million. And, I am still amazed, despite my many experiences in expansive and intimidating crowds, that I am living and working in a country with more than one billion people. Living in China as an African-American, scientist and teacher has its surprises, trials, adventures and delights. Most importantly, it also has a purpose.

One of the reasons I sought this opportunity is that I want to lead a life that is challenging and full of new experiences. I also want to add to my career in a way that is meaningful, unique and advantageous. I hope that my experiences and the knowledge I glean from my immersion in China will allow me to gain a nuanced understanding of the country and its academic, political and value systems, as well as its perspectives on global issues in education, science and technology.

Making a Change

Accepting a position as a research fellow in the Graduate School of Education at Shanghai Jiao Tong University seemed like a necessary and natural next step when I made it. After having left the career path of a laboratory scientist, I've found a new path that suited me quite well. Positive experiences and the consideration of my true ambitions, interests and desires allowed me to shift my priorities and made a stint in China seem like a golden opportunity.

Before moving to China, I had been in Washington, D.C., doing policy for just over eight years: Right after receiving my doctorate in biophysics from the University of Virginia, I received a fellowship through the American Association for Advancement in Science Science and Technology Policy program and spent a year at the National Science Foundation. I then continued my work in policy at the Federation of American Societies for Experimental Biology, the Howard Hughes Medical Institute and the Association for Women in Science.

While I've always loved traveling, my work never included a true international component. Domestic policy, specifically focused on graduate and postdoctoral education, was my area of focus and growing professional interest. As I learned more about the impact of foreign talent on U.S. research, I wanted to see whether I could combine these interests.

With the encouragement of friends and colleagues, I applied for, and ultimately received, a German Chancellor Fellowship with the Alexander von Humboldt Foundation. The program's support structure, which includes language lessons, visa assistance and travel funds, made the fellowship quite appealing. On the other hand, after leaving bench science, I had built a solid career foundation and was unsure about accepting a temporary post.

Andrea Stith is currently a research fellow in the Graduate School of Education at Shanghai Jiao Tong University in Shanghai. Her work at SJTU is a continuation of her work as a German Chancellor Fellow at Humboldt University Berlin and Ludwig Maximillians University in Munich. Prior to her fellowship, Stith was a program officer in the office of grants and special programs at the Howard Hughes Medical Institute, a science policy analyst at FASEB and a AAAS/NSF Science and Technology Policy Fellow. She received her doctorate in biophysics from the University of Virginia in 2001 and her bachelor's degree in physics from the University of Delaware in 1995.

Life "On the Road"

Despite my apprehensions, I took the leap. I left my post, renewed my passport, packed my bags and

hopped on a plane to Bonn, Germany. Once there, I enjoyed my new international colleagues and relished the opportunities to learn about the many facets of German life, culture and history by traveling on my own or as part of a formal group.

Professionally, I always had been involved with science and education policy. In Germany, I was able to learn how the Germans orchestrate their science system, but I also had free reign to explore issues more broadly related to science and technology and education policy. In China, I focus my energies on the Chinese postdoctoral system. This system is interesting to learn about and try to characterize given its short 25-year history in a country that is developing so rapidly and forcefully.

In China, I try to be conscientious about building on my experience in Germany. I came here on my own initiative, seeking additional experiences in a nation that is on the rise, is in the news and is largely unfamiliar to me. In Germany, many professionals emphasized how culture impacts education — something I previously was not sensitive to. I am seeing this again in China as the nation works to build a globally competitive and integrated system "with Chinese characteristics."

More so than when at home in the U.S., I find that how I choose to spend my personal time impacts my professional well-being. I knew from my time in Germany that an important element of a life abroad is learning the language. Despite being "wise" to this, my initial attempts to learn Mandarin were casual, somewhat haphazard and, as a result, inadequate. Formal schooling, while time-consuming and difficult to fit into my daily life, has improved my speaking skills and my quality of life drastically. The most significant impact has been on my relationship with my colleagues. Although I still work exclusively in English, being able to understand even a little of the conversation in more social work settings has helped me feel more integrated and at ease. Moreover, my colleagues are interested in my progress. Often, after asking how I am doing, they inquire about my Chinese!

"Despite my apprehensions, I took the leap."

Building Relationships

Guanxì, or relationships and networks, is an important aspect of Chinese life. I have benefited from it in so many ways. In my work environment, I often can't manage the smallest tasks without it. Even when presented with a problem in my personal life, a solution almost always begins with a phone call to a work friend.

As my personal and professional network expands beyond the workplace, I am amazed by the diversity of people with whom I have common interests. Especially amongst the community of expatriates, I find that fostering new relationships is a way of life. This network is valuable to me here in China, and I expect that a number of these relationships will continue to hold value as I move on in life and work.

The Future

In some ways, I wish I could be writing this article a couple of years from now — speaking with assurance about how my international escapades have impacted me. Currently, I am in the middle of this journey, immersed in an experience that I know will shape my life and career.

I am open to the opportunities that lie ahead. However, after my return to the United States in the next year, I will remain committed to the international element of my work. It is the skills, knowledge and perspectives that I have gained from my years abroad that I want to build upon in my future.

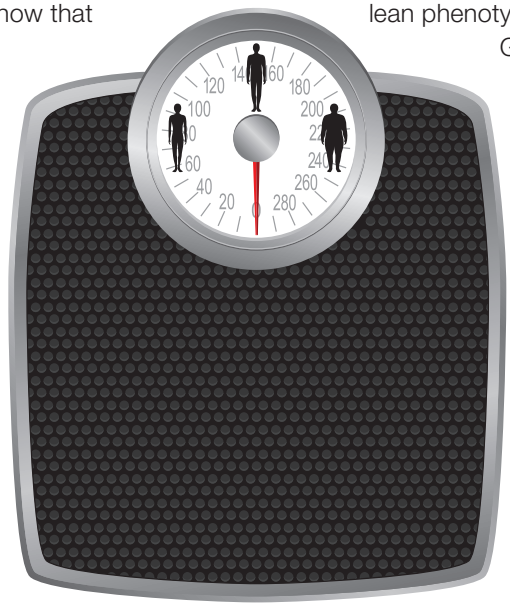
Germany and China

Both Germany and China have, in recent years, launched major national higher education and research initiatives that focus both on science infrastructure development and science and technology human resource (HRST) development. How these HRST initiatives are designed to overcome systemic and situational handicaps and boost national competitiveness is what intrigues me. Furthermore, my instincts to come to China originated when I noticed serious efforts to build Sino-German partnerships. It was clear that Germany, a strong science nation with robust aspirations, sees much advantage in strong partnerships with China. Now that I am in China, the evidence of international collaboration — including with Germany — is impossible to miss.

Role of Skin Stearoyl-CoA Desaturase in Regulating Obesity

BY JAMES M. NTAMBI

Obesity has reached epidemic proportions globally and is a major contributor to the global burden of chronic disease and disability. Often coexisting in developing countries with under-nutrition, obesity is a complex condition, with serious social and psychological dimensions, affecting virtually all ages and socioeconomic groups. We now know that obesity is a multifactorial condition stemming from a combination of genetic, dietary and lifestyle factors and the interaction between these components. The microsomal enzyme stearoyl-CoA desaturase-1 (SCD1) is a critical control point in the development of metabolic diseases, including obesity and insulin resistance. SCD1 catalyzes the biosynthesis of monounsaturated fatty acids (MUFA) palmitoleate (16:1n-7) and oleate (18:1n-9) from saturated fatty acids palmitate (16:0) and stearate (18:0), respectively, that are either synthesized de novo or derived from the diet. These MUFAs (mainly 18:1n-9) are abundant in various kinds of tissue lipids, including phospholipids, triglycerides, cholesterol esters, wax esters and alkyldiacylglycerols. Apart from being components of lipids, MUFA also serve as mediators of signal transduction, cellular differentiation and metabolism. Palmitoleate (16:1n-7) recently has been found to be an important lipokine that controls energy homeostasis and insulin resistance in mice.

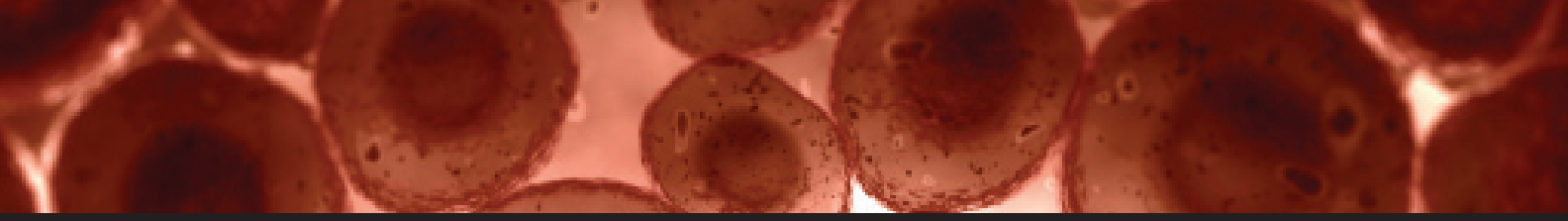


Mice lacking the SCD1 enzyme globally (GKO) are lean and protected from diet-induced and leptin deficiency-induced obesity. Because SCD1 is expressed in multiple tissues, including liver, brown and white adipose tissue, skeletal muscle and skin, it has been difficult to determine the relative contributions of the various tissues to the dramatically altered metabolic phenotypes of global SCD1 knockout mice. Using Cre recombinase-mediated inhibition of hepatic Scd1, we reported that chronic deletion of SCD1 specifically in liver protects mice from high carbohydrate-induced weight gain but does not protect against high fat diet-induced obesity, suggesting that extrahepatic tissues may play a more prominent role in mediating the lean phenotype.

Given the changes in skin lipids of the sebaceous glands of the GKO mice that we had reported previously, we generated mice with a skin-specific deletion of SCD1 (SKO). We found that a major part of the hypermetabolic phenotype and protection against diet-induced obesity and insulin resistance of global SCD1 deletion in mice is mediated by loss of SCD1 in the skin. To the best of our knowledge, these mice represent the first model of skin-specific deletion of a lipogenic enzyme resulting in global changes in energy homeostasis.

Although the mechanisms of protection against high fat-induced obesity and insulin resistance because of SCD1 deficiency in skin are yet to be determined, it is tempting to speculate at this time that SCD1 deficiency leads to secondary elevations in skin-derived circulating factor(s) that interact with peripheral tissues that alter systemic energy homeostasis. Numerous studies have always focused on liver and adipose tissue as the primary sites of lipid metabolism and regulation of obesity. Our studies of skin SCD1 illustrate an example of cross talk between the skin and peripheral organs and resurrect the importance of skin lipids in the regulation of whole body energy metabolism.

James M. Ntambi (ntambi@biochem.wisc.edu) is Katherine Berns Von Donk Steenbock professor in the department of biochemistry at the University of Wisconsin-Madison.



October 14 – October 17, 2010

Biochemistry and Cell Biology of ESCRTs in Health and Disease

Snowbird Resort, Snowbird, UT

Organizers:

James Hurley
National Institute of Diabetes and Digestive and Kidney Diseases

Phyllis Hanson
Washington University School of Medicine

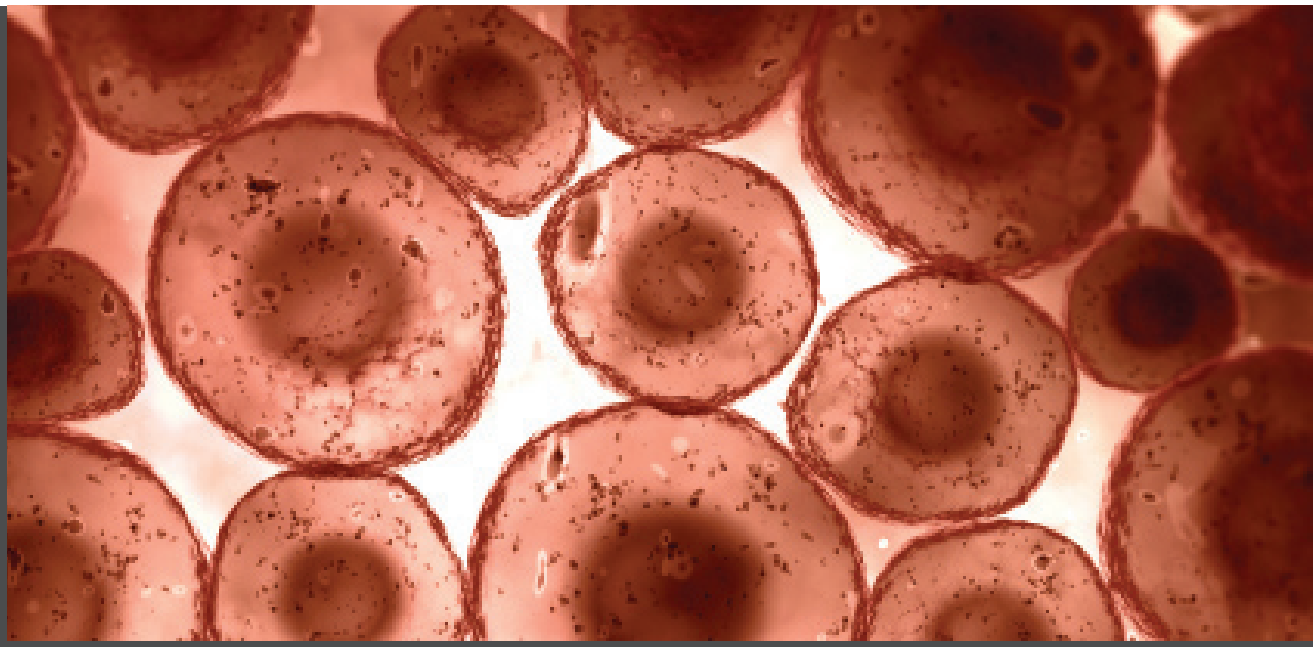
Keynote Speaker:

Jennifer Lippincott-Schwartz
National Institute of Child Health and Human Development

Invited Speakers:

Phyllis Hanson (St. Louis, MO)
Chris Hill (Salt Lake City, UT)
Markus Babst (Salt Lake City, UT)
Greg Odorizzi (Boulder, CO)
Rob Piper (Iowa City, IA)
Carol Carter (Stony Brook, NY)
Eric Freed (Frederick, MD)
Marisa Otegui (Madison, WI)
Sasha Sorkin (Denver, CO)
Craig Blackstone (Bethesda, MD)
Fen-Biao Gao (San Francisco, CA)
Juan Martin-Serrano (London, UK)
Anne Simonsen (Oslo, Norway)

2010 ASBMB Special Symposia



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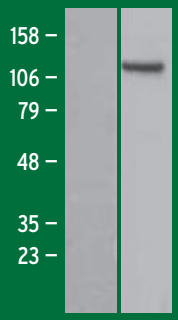

HEK293 were transfected with L) empty vector R) TrueORF for Myc/DDK-tagged hTERT(Cat# RC217436). The lysates were analyzed using anti-DDK antibody to show over-expression of hTERT. *DDK is the same as FLAG.

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