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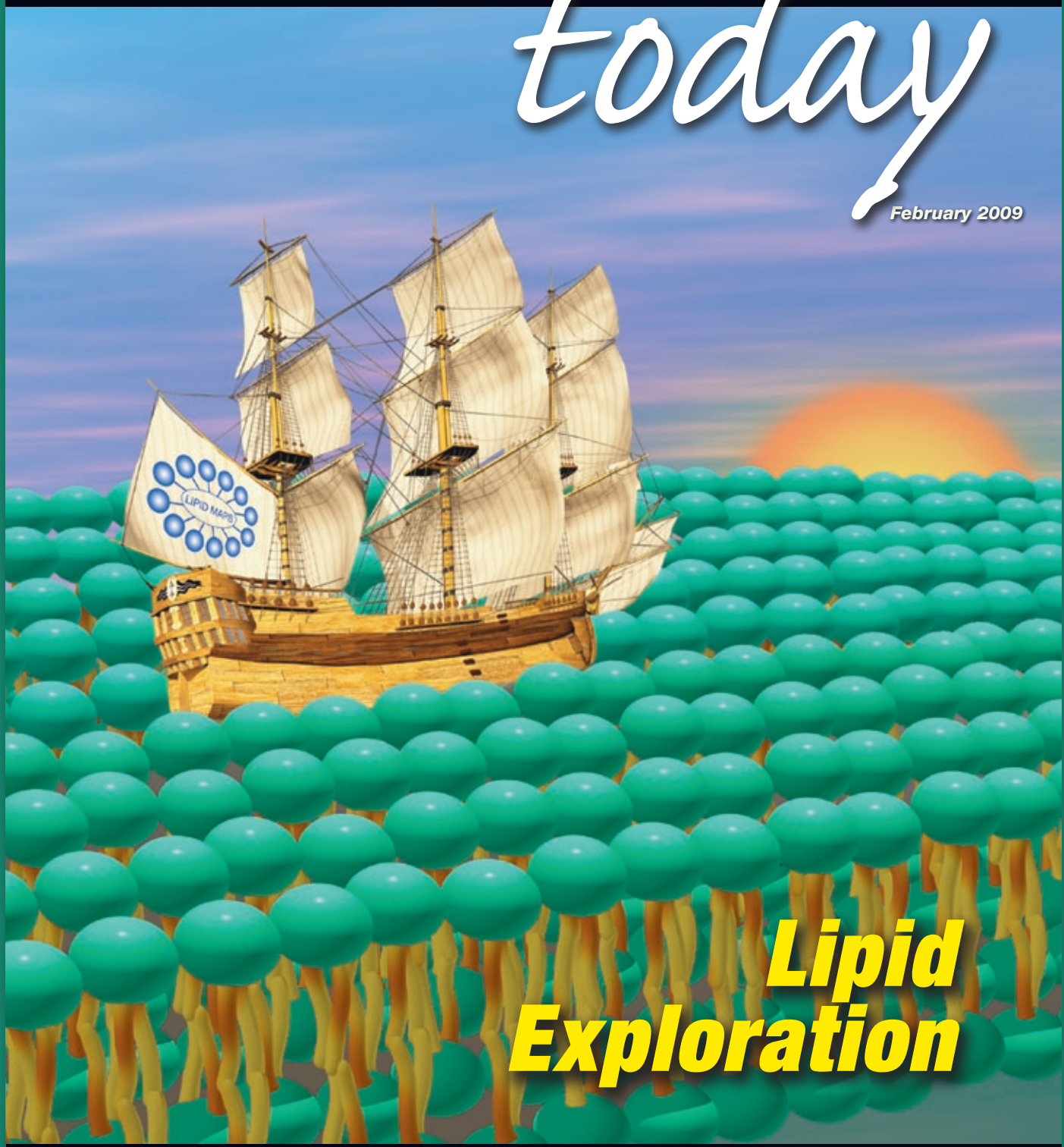
ASBMB today

February 2009



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Neurodegenerative Diseases: New Molecular Mechanisms, Keystone, CO*
Axonal Connections: Molecular Cues for Development and Regeneration, Keystone, CO*
The Neurobiology of Pain and Analgesia, Santa Fe, NM
B Cells in Context, Taos, NM
Complications of Diabetes and Obesity, Vancouver, BC*
Dissecting the Vasculature: Function, Molecular Mechanisms, and Malfunction, Vancouver, BC*
Chromatin Dynamics and Higher Order Organization, Coeur d'Alene, ID

March 2009

Regulatory T Cells, Keystone, CO
Genome Instability and DNA Repair, Taos, NM
The Molecular Basis of Schizophrenia and Bipolar Disorder, Keystone, CO*
Epigenetic Basis of Neurodevelopmental Disorders, Keystone, CO*
Chemical Senses: Receptors and Circuits, Tahoe City, CA
Extrinsic Control of Tumor Genesis and Progression, Vancouver, BC
Cardiac Disease: Development, Regeneration, and Repair, Asheville, NC
Drug Discovery for Protozoan Parasites, Breckenridge, CO

March 2009

Prevention of HIV/AIDS, Keystone, CO*
HIV Immunobiology: From Infection to Immune Control, Keystone, CO*
Cell Death Pathways, Whistler, BC*
Mitochondrial Dynamics and Physiology, Whistler, BC*
Antibodies as Drugs, Whistler, BC*
Targeted Cancer Therapies, Whistler, BC*
Pattern Recognition Molecules and Immune Sensors of Pathogens, Banff, AB*
Dendritic Cells, Banff, AB*

April 2009

Common Mechanisms in Arrhythmias and Heart Failure, Keystone, CO
The Future of Biofuels, Snowbird, UT
Stem Cell Niche Interactions, Whistler, BC
PI 3-Kinase Signaling in Disease, Olympic Valley, CA*
Complex Lipids in Biology: Signaling, Compartmentalization, and Disease, Olympic Valley, CA*
The Biology of RNA Silencing, Victoria, BC

May 2009

Human Immunology and Immunodeficiencies, Beijing, China

June 2009

Protein Dynamics, Allostery, and Function, Keystone, CO
MicroRNA and Cancer, Keystone, CO
Deregulation of Transcription in Cancer, Killarney, Ireland

October 2009

Telomere Biology and DNA Repair, Ashmore, Australia
Overcoming the Crisis of TB and AIDS, Arusha, Tanzania, Africa

* Indicates joint meeting. Registration for one allows attendance at the other, pending space availability.

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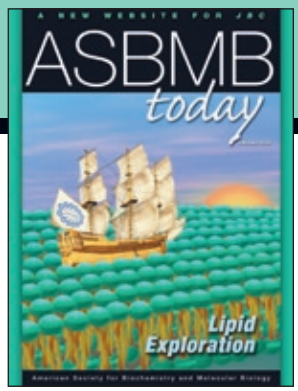

FEBRUARY 2009

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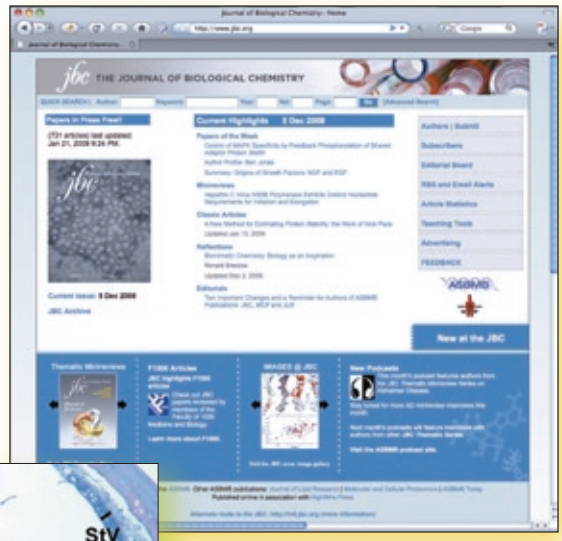

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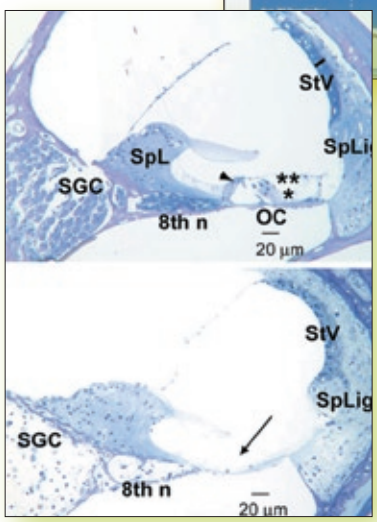

Polyamines and Hearing. 30

podcast summary

This month in ASBMB podcasts (www.asbmb.org/Interactive.aspx), look for more interviews with *JBC* Thematic Minireview contributors.

You can view the Thematic Minireview Series at www.jbc.org/thematics.

ASBMB today

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2008 APEX AWARDS FOR PUBLICATION EXCELLENCE

letters to the editor

Training Future Scientists

Dear Editor,

I applaud your effort in promoting the training of our future scientists, as illustrated in the November 2008 issue of *ASBMB Today*. I wanted to bring your attention to a program we have here in Frederick, MD, as the year 2009 will mark its 20th anniversary. The Werner Kirsten Student Intern Program permits high school juniors in Frederick and Washington Counties (Maryland) as well as juniors from one West Virginia high school to compete for internships in National Cancer Institute-Frederick laboratories. If matched with a laboratory, the students work full-time for nine weeks in the summer following their junior year and then work a minimum of three hours a day during their senior year (many spend more than four hours a day in the lab). The students contribute to ongoing lab projects and are responsible for their own projects as well.

Participants in the program have been winners of the Frederick County Science Fair and have successfully represented the county in national and international science fairs. Others have made it as semifinalists in the national Intel science competition. Many students often spend multiple summers in NCI labs and then go on to attend graduate or medical school. We believe that this program is unique in the country and offers students the opportunity to participate in cutting-edge research at a very young age.

We are very proud of this program, and the Frederick County School system considers it a premier partnership. We currently have 52 interns in the program (during the very first year, there were only six), and I estimate that more than 750 students have been interns.

Sincerely,
Howard A. Young
National Cancer Institute
Frederick, MD

An Alzheimer Wildcard

To the Editor,

Nice summary on the apostrophe controversy in *ASBMB Today*. As for searching, I have long used "Alzh*" (or the appropriate wild card) to search. Of course, that might have been as much for the "i" before "e" or "e" before "i" rules that I worry about in my spelling.

Kenneth E. Neet
Rosalind Franklin University of Medicine and Science
North Chicago, IL

Looking at Men in Science

Dear Dr. Kresge,

While it is important to understand who persists through the academic career and the reasons why fewer women occupy the higher academic offices, I take issue with

CORRECTION: The article on p. 22 of the January 2008 issue of *ASBMB Today* titled, "Vision and Change in Biology Undergraduate Education" was written by Ann Stock as well as J. Ellis Bell.

the sole focus on women.

Case in point: Figure 1 of the article titled, "Keeping Women in Science" in the December 2008 issue of *ASBMB Today*. This figure nicely illustrates the different points in the academic career where women, in particular women with families, decide to focus on something different than the stressful life as an independent scientist. However, the study failed to do the proper comparison. What happens to men in similar family situations? Scientists should be able to utilize the scientific method even when studying scientists, should we not?

Best regards,
Hans Johansson (proud father of two who decided that family comes first but who still enjoys being a scientist)
Biosearch Technologies, Inc.
Novato, CA

Having an Impact

Dear Gregory Petsko,

I just read your very amusing comment "Having an impact (factor)." It gave me great pleasure to read this funny and also poignant story.

I fully agree that relying on a single number for summing up a scientist's career is nuts. In fact, this is the opinion of the European Association of Science Editors (EASE), published as an official statement in EASE's journal European Science Editing in November 2007. I trust you endorse the position of EASE on this subject and hope that you will help to circulate our statement.

Yours truly,
Arjan K. S. Polderman
President, European Association of Science Editors

Response:

Thanks for the kind words and for the very important document which is reprinted here. I not only endorse your statement, but I'll try to see that it gets circulated to the members of the American Society for Biochemistry and Molecular Biology, of which I am President.

Gregory A. Petsko

EASE Statement on Inappropriate Use of Impact Factors

The journal impact factor was developed as a means to measure the impact of scientific journals.[1, 2] Over time, its use has been extended to measuring the quality of scientific journals, the quality of individual articles, and the productivity of individual researchers.[3, 4] Impact factors are nowadays even used in academic appointments, to evaluate grant applications, and to allocate other financial support for research programs.[5, 6]

The impact factor, however, is not always a reliable instrument for measuring the quality of journals.[7, 8] Its use for purposes for which it was not intended causes even greater unfairness.[9–12]

Therefore the European Association of Science Editors recommends that journal impact factors be used only—and cautiously—for measuring and comparing the influence of entire journals, but not for the assessment of single papers, and certainly not for the assessment of researchers or research programs either directly or as a surrogate.

FOOTNOTES:

1. "The impact factor is similar to the quantitative measure obtained by Gross in evaluating the relative importance of scientific journals." Garfield, E. (1955) Citation Indexes for Science. A New Dimension in Documentation through Association of Ideas. *Science* **122**, 108-111.
2. "Measures of citation frequency and impact factor should be helpful in determining the optimum makeup of both special and general (library journal) collections." Garfield, E. (1972) Citation Analysis as a Tool in Journal Evaluation. Journals Can Be Ranked by Frequency and Impact of Citations for Science Policy Studies. *Science* **178**, 471-479.
3. "While the IFS (impact factor score) was designed to assess journals, there are frequent mentions in the literature of the IFS being used as an indicator of the eventual impact of a scholar's work." Holden, G., Rosenberg, G., Barker, K., and Onghena, P. (2006) Should Decisions about Your Hiring, Reappointment, Tenure, or Promotion Use the Impact Factor Score as a Proxy Indicator of the Impact of your Scholarship? *Medscape General Medicine* **8**, 21.
4. "The Higher Education Funding Council in Britain came to understand that it was assessing science in a fundamentally unscientific way by using the impact factor of journals as a surrogate for the impact of articles published in them." Smith, R. (2006) Commentary: the Power of the Unrelenting Impact Factors. Is It a Force for

continued on page 4

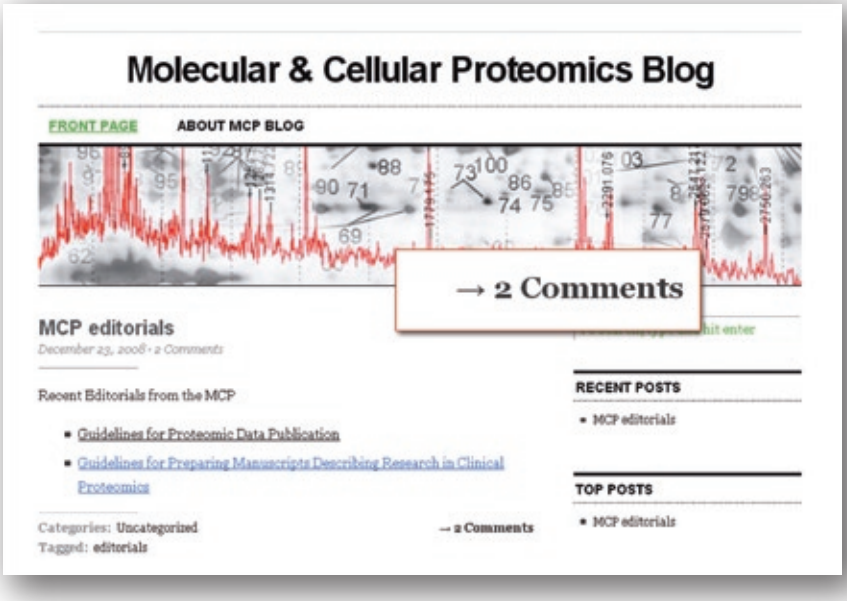
EASE statement *continued from page 3*

Good or Harm? *International Journal of Epidemiology* **35**, 1129-1130.

5. "Evaluationsgrundlage sind die Impactfaktoren (bzw. die Journal-Reihungen) aus der unveranderten Impactfactor-Liste des ISI, jeweils letzte verfagbare Ausgabe zum Zeitpunkt des Einreichsdatums zur Habilitation. Die Publikationen der/s Habilitand/in/en werden getrennt nach Erst- und Koautorschaften." [The bases for evaluation are the impact factors (respectively the journal rankings) from the unchanged impact factor list of ISI, always the most recent available issue at the time of submitting the application. The publications of the applicant are distinguished in first authorship and co-authorship]. Habilitationsrichtlinien der Medizinische Universitat Wien [Guidelines for qualification as a university teacher at the Medical University of Vienna]. Wien: Medizinische Universitat Wien; 2004 May.
6. "Universities in Germany, for instance, regularly plug the impact factor of journals in which scientists publish into formulae to help them determine departmental funding. The Italian Association for Cancer Research requires grant applicants to complete worksheets calculating the average impact factor of the journals in which their publications appear. (In Finland) government funding for university hospitals is partly based on publications points, with a sliding scale corresponding to the impact factor of the journals in which researchers publish their work." Adam, D. (2002) The Counting House. *Nature* **415**, 726-729.
7. "All citation studies should be adjusted to account for variables such as specialty, citation density, and half-life." Garfield, E. (2006) The History and Meaning of the Journal Impact Factor. *JAMA* **295**, 90-93.
8. "Apart from being non-representative, the journal impact factor is encumbered with several shortcomings of a technical and more fundamental nature. Pure technicalities can therefore account for several-fold differences in journal impact." Seglen, P. O. (1997) Why the Impact Factor of Journals Should Not Be Used for Evaluating Research. *BMJ* **314**, 498-502.
9. "The IFS (impact factor score) was the best predictor of both short- and long-term impact (of journal articles), yet even when the IFS was combined with other predictors, the overall amount of variance in both short- and long-term impact was less than 13 percent." Holden, G., Rosenberg, G., Barker, K., and Onghena, P. (2006) Should Decisions about Your Hiring, Reappointment, Tenure, or Promotion Use the Impact Factor Score as a Proxy Indicator of the Impact of Your Scholarship? *Medscape General Medicine* **8**, 21.
10. "Indeed, of 38 million items cited from 1900-2005, only 0.5 percent were cited more than 200 times. Half (of the published articles) were not cited at all. The skewness of citations is well known and repeated as a mantra by critics of the impact factor. The use of JIFs (journal impact factors) instead of actual article citation counts to evaluate individuals is a highly controversial issue. Granting and other policy agencies often wish to bypass the work involved in obtaining citation counts for individual articles and authors. Thus, the JIF is used to estimate the expected count of individual papers, which is rather dubious considering the known skewness observed for most journals." Garfield, E. (2006) The History and Meaning of the Journal Impact Factor. *JAMA* **295**, 90-93.
11. "(In Finland) a single paper published in a journal with an impact factor of three, rather than two, could have boosted a hospital's funding by about US$7,000 in 2000." Adam, D. (2002) The Counting House. *Nature* **415**, 726-729.
12. "Even the uncited articles are then given full credit for the impact of the few highly cited articles that predominantly determine the value of the journal impact factor. However, the correlation between journal impact and actual citation rate of articles from individual scientists or research groups is often poor." Seglen, P. O. (1997) Why the Impact Factor of Journals Should Not Be Used for Evaluating Research. *BMJ* **314**, 498-502.

New ASBMB Online Journal Developments

Recently, the *Journal of Biological Chemistry* premiered its new homepage (www.jbc.org). New features of the page include an updated look, search bar and advanced search, and a place to highlight new *JBC* features and content. The homepage redesign is the first in a series of steps the journal is taking to enhance its entire online presence. Look for new changes to the article layout and interaction experience in spring 2009.



Also this month, *Molecular and Cellular Proteomics* launched its Issues in Proteomics blog at mcpblog.mcponline.org. The blog invites readers to comment on posted items from the journal and is intended to engender discussion of hot topics in proteomics in the community.

A Seat at the Table*

BY GREG PETSKO

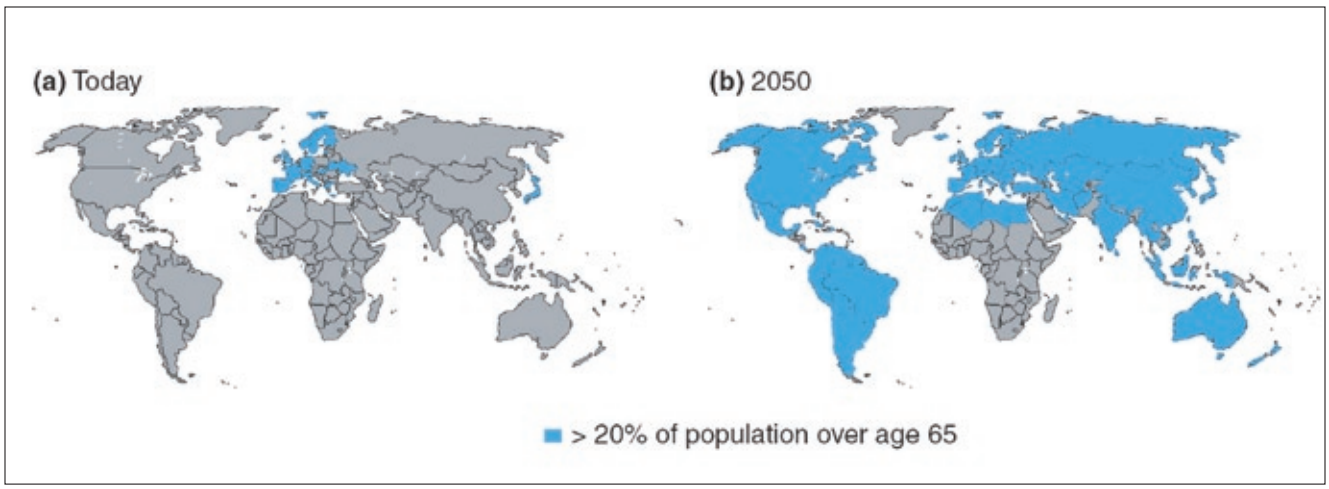
I should start with a disclaimer: I was a strong supporter of Barack Obama during the recent U. S. presidential campaign, and I remain a strong Obama supporter today. That may open me to charges of bias as far as this particular column is concerned, because I'm going to be lauding one of his recent decisions. But another disclaimer I probably should include is that I am a life scientist and that admission may reveal additional prejudice, because what I am going to say will be self-serving in that it is meant to promote the life sciences. However, I think my argument will stand up to objective scrutiny. See if you agree.

I learned in mid-December that President-elect Obama would choose, for the dual position of presidential science advisor and head of the Office of Science and Technology Policy (OSTP), Dr. John Holdren, a Harvard physicist as well as an outspoken critic of the Bush administration's science policies. Dr. Holdren's primary appointment is not in the physics department—he is the Teresa and John Heinz Professor of Environmental Policy at the Kennedy School of Government at Harvard University and also Professor of Environmental Science and Public Policy in the Department of Earth and Planetary Sciences. He earned a bachelor's degree in physics from MIT in 1965 and worked as a consultant on reentry vehicles in the 1960s at Lockheed Martin before receiving a Ph.D. in plasma physics at Stanford University in 1970. Since then, his work has focused largely on science policy rather than on fundamental physics, with emphasis on global environmental change, energy technologies and policies, nuclear proliferation, and science and technology policy in general. He is a prominent and vigorous advocate for a strong response to the global climate crisis. Dr. Holdren is also director of the Woods Hole Research Center in Woods Hole, Massachusetts.

…what I am going to say will be self-serving in that it is meant to promote the life sciences

In many respects, this looked like a fine choice. Dr. Holdren has a very distinguished record. Before moving to Harvard in 1996, he was Professor of Energy and Resources at Berkeley for over 20 years. He was president of the American Association for the Advancement of Science in 2006. He is the author of over 300 articles and papers, mostly on policy issues, and has co-authored or co-edited 20 books and book-length reports. He is a member of the National Academy of Sciences and the National Academy of Engineering and was a member of President Bill Clinton's science advisory team from 1994-2001. When the Pugwash Conferences on Science and World Affairs won the Nobel Peace Prize in 1995, he delivered the acceptance speech in Stockholm. He's spent much of his career trying to save the planet. Sort of a scientist's Al Gore, if you will. It's likely that he has more combined expertise on climate science and clean energy technology than anyone, with the possible exception of Obama's nominee for Secretary of Energy, Nobel Laureate Steve Chu. But when I heard of his likely appointment, I was disappointed.

I wasn't disappointed because I have anything against Dr. Holdren—he's certainly highly qualified, and I love his positions on issues like climate change. He'll probably do a terrific job. I was disappointed because he's a physicist. No disrespect to Dr. Holdren, but I am wary of physicists as presidential science advisors. Nearly all have been so. It's partly a legacy from the days when they knew how to make nuclear weapons, and partly, I think, because when most non-scientists think about scientists, they tend to think of physicists (call it the Einstein Effect). Most of the physicists I know, and certainly all recent presidential science advisors, have little knowledge of or feel for the life sciences, believe physics to be superior to all other sciences (with the possible exception of higher mathematics), and tend to think in terms of big science programs



as opposed to individual investigator-initiated research. Certainly physics is important in issues such as energy policy and response to climate change, and I suspected that the Holdren appointment was meant to emphasize the significance the Obama Administration attaches to those issues, but we already have someone of cabinet rank with direct access to the President with exactly the same qualifications and mission as Dr. Holdren: a strong physics background and a track record of vigorous advocacy for alternative energy. I refer to the aforementioned Dr. Steve Chu, the nominee for Energy Secretary. I didn't understand why we needed to duplicate that expertise and focus, when the Presidential Science Advisor seemed to me the best opportunity to bring someone knowledgeable about the life sciences into the President's inner circle. And if we ever needed people in the government to listen to the voices of the life scientists, we need them now.

I believe it's essential that there be people in Washington who can explain to President Obama, for example, the science that must be done to combat a coming global crisis that is comparable in its effects to the climate crisis: the rapidly aging population. The figure here shows what I mean. On these maps I have colored in blue every country in which more than 20 percent of the population is over 65 years of age. The map on the left is the world we live in. The map on the right, where virtually every country is blue, is the world our children will live in. In most of the developed world, by 2050 at least a quarter of the people will be older than 65, and in some countries that figure will exceed 40 percent. In the U. S. alone, there are more than 10 million people over the age of 80 today; by 2050, there will be more than 30 million, and half of them will have some degree of dementia. Another 3 million, at least, will have Parkinson Disease. Millions more will suffer from stroke. The incidence of all three of these disorders rises exponentially after age 65. The total cost of age-related neurologic diseases in the United States is currently more than $300 billion a year. In 40 years, the annual cost will exceed a trillion dollars. Yet the federal expenditure on AIDS research in 2008 is more than four times the federal expenditure on Alzheimer Disease research, despite the fact that there are ten times more new Alzheimer cases per year than there are AIDS cases. (This is not meant to imply that we're spending too much on AIDS research; my point is that we're not spending nearly enough on research into age-related neurologic diseases.) Heart disease and cancer rates, too, are likely to increase in coming years, since the vast majority of new cases of both occur in people over age 65.

Aging of the population is a time-bomb that is ticking in most of the world—an impending medical crisis of a magnitude similar to global warming. Health care reform, as important as it is, will not solve this problem. Alternative energy, as important as it is, will not solve it. The only thing that will solve it is biomedical research, both basic and applied.

I'm emphasizing the coming biomedical crisis because it is the nature of people, and politicians, to focus on crises, but there are many other reasons why the life sciences deserve a seat at the table of power. The post-genomic revolution in our understanding of biology has the power to transform all of our lives. One of the answers to the climate crisis, and to the problem of energy independence, is biofuels. Another answer, which could wean us away from petroleum-based plastics, is biomaterials. Basic biomedical research is essential to arm our pharmaceutical

and biotechnology companies for the fight against weapons of biological warfare, as well as the increasing threat from emerging infectious diseases. The life sciences have central roles to play in addressing the collapse of the environment, the disappearance of species, and our efforts to combat developmental disorders, to name but a few areas of importance. But when I started to write this column, I was afraid that there would be no advocate for biomedical research at that table where policy makers sit down to decide the nation's priorities.

Then something (well, actually, someone) told me to wait until after the President-elect's next radio address. I just finished listening to it, and I urge you to read the transcript (you can find it, and a video, at tinyurl.com/8tgukp); it's so unlike anything we've heard from recent U. S. Presidents as to be almost revolutionary. Here are just two excerpts:

"Whether it's the science to slow global warming; the technology to protect our troops and confront bioterror and weapons of mass destruction; the research to find life-saving cures; or the innovations to remake our industries and create 21st century jobs—today, more than ever before, science holds the key to our survival as a planet and our security and prosperity as a nation. It is time we once again put science at the top of our agenda and worked to restore America's place as the world leader in science and technology."

"…Promoting science isn't just about providing resources— it's about protecting free and open inquiry. It's about ensuring that facts and evidence are never twisted or obscured by politics or ideology. It's about listening to what our scientists have to say, even when it's inconvenient—especially when it's inconvenient. Because the highest purpose of science is the search for knowledge, truth, and a greater understanding of the world around us. That will be my goal as President of the United States…"

President-elect Obama then went on to name the key members of his science and technology team. One, as I already expected, was John Holdren as Assistant to the President for Science and Technology and Director of the White House Office of Science and Technology Policy. He would also, as is customary, chair the President's Council of Advisors on Science and Technology—or PCAST, a board that advises the President on all matters pertaining to science and technology. (Under George Bush, PCAST had consisted almost entirely of CEOs of big corporations. It had almost no scientific expertise at all.) But then came the surprise: PCAST would have two additional co-chairs, and both of them would be distinguished life scientists.

One is Dr. Harold Varmus, recipient of the 1989 Nobel Prize in Medicine or Physiology for his work on cancer genes and former Director of NIH during the Clinton Administration and during the completion of the Human Genome Project. Arguably the most effective NIH director in decades, Dr. Varmus is currently president of the Memorial Sloan-Kettering Cancer Center in New York City. The other is Dr. Eric Lander, professor of Biology at MIT, member of the Whitehead Institute, the Founding Director of the Broad Institute at MIT and Harvard, and one of the driving forces behind the mapping and sequencing of the human genome.

Dr. Varmus probably needs no introduction from me, but some of my readers may be a little less familiar with Dr. Lander. He is one of those rare individuals who might just be as smart as he's supposed to be. A mathematical prodigy, he did his doctoral work at Oxford University as a Rhodes Scholar. He then taught economics at Harvard Business School before, looking for new worlds to conquer, he did a postdoc in genetics with David Botstein at MIT, joining the Biology faculty there afterwards. He is—get ready for it—a genome biologist, the first to have the ear of a President. Now you might think, or even fear, that a genome biologist, especially one who has built a mighty institute for large-scale genomics, would not be an ideal friend for individual investigator-initiated research, but let me set your mind at ease. The "big" science that Eric Lander has pioneered has always been in the service of hypothesis-driven "small" science, and his track record as director of the Broad Institute has been one of encouraging young investigators, providing tools and information to the broader biological community, and promoting basic as well as applied research.

Two better appointments could scarcely be imagined. Both men are vigorous advocates for basic biomedical science, both men know how the industry-academic partnership is suppose to work, both men understand the way the age of genomics is transforming the life sciences, and both men are not so far removed from running research laboratories of their own that they will not appreciate the problems of the average scientist.

So for the next few years, at least, when policy makers in the Obama Administration sit around that table to plan the future of the country, the life sciences will have a seat alongside the physical sciences. And a President who promises to listen to the voice of science will be hearing the full scope of that voice at last.

*Reprinted with permission from *Genome Biol.* (2008) **9**, 113.

FASEB Unveils Advocacy Guide to Freshman Class of the New Congress

BY KIMBERLY MCGUIRE

Since the historic Nov. 4th election, FASEB has been compiling information on the more than 60 freshman members of the 111th Congress with whom FASEB leaders will work on a range of issues including biomedical science funding, stem cell research, animal research, education, and regulatory issues. In support of these efforts, FASEB has released a new web-based directory that features information about the new members' districts and states, as well as their positions and statements on issues important to the biomedical research community. FASEB hopes that this directory will be a resource for the educational and advocacy activities of FASEB society members.

The freshman class includes nine (and counting) new senators (four of whom are former governors) and 56 new representatives who come from a variety of professional backgrounds including medicine, philanthropy, farming, state-elected office, the military, and even a veterinarian. With the addition of the freshmen, a record number of women (17 in the Senate and 74 in the House) will now be serving in both chambers. The youngest member of the class is just 27, and the oldest is 66.

The directory has been compiled from candidates' websites and statements to the press as well as from statements made in response to election questionnaires issued by Research!America and Scientists and Engineers for America (SEA). FASEB co-sponsored the SEA effort. Information on states and districts has been compiled with data from NIH and the National Science Foundation (NSF).

Many of the freshman members have already shown leadership on science issues, either in the other chamber or in another role in public or community service. For example, newly elected Sen. Mark Udall (D-CO) distinguished himself in the House of Representatives for his support of the successful NIH doubling as well as the more recent America COMPETES Act. Udall has also co-sponsored legislation to expand federal funding for stem cell research. Another outspoken advocate of stem cell research joining the Senate in 2009 is Mark Warner (D-VA), who speaks often about his mother's Alzheimer disease and his hope for stem cell research in developing treatments for debilitating medical conditions. Warner also highlighted the need to reinvest in biomedical research in his speech at the Democratic National Convention earlier this year. Two Ohio representatives, Steve Driehaus (D-OH) of the first district and John Boccieri (D-OH) of the 16th district, have made public statements expressing their commitment to increasing funding for NIH. Alan Grayson (D-FL) has been a leader in the patient advocacy community as a co-founder of the Alliance for Aging Research, a group that advocates for increased funding for NIH and biomedical research.

Other members of the freshman class have called attention to a range of science and research priorities. Kathy Dahlkemper (D-PA), elected to represent Pennsylvania's third district, has pledged to restore funding to the U.S. Department of Agriculture. Mark Begich (D-AK), who unseated Sen. Ted Stevens (R-AK) in the high-profile Alaska Senate race, pledged on the campaign trail to support fishery research. Glenn Nye (D-VA), elected to Virginia's second district, and Glenn Thompson (R-PA) of Pennsylvania's fifth district, both support increased funding for Veteran's Affairs biomedical research.

While not all of the freshman members have been outspoken advocates of science and research, many have been elected to represent districts with a strong stake in these issues. Collectively, the freshman class represents over 10,000 FASEB society members, and many of the nation's top research institutions reside in their districts. Warner will represent a state (Virginia) that in 2007 received $271 million from NIH and $455 million from NSF. Marcia Fudge (D-OH) will represent Ohio's 11th district, home of Case Western Reserve University and over $257 million in annual NIH funding. Bobby Bright (D-AL) has been elected by the people of Alabama's second district, home not only to University of Alabama at Birmingham and $234 million in NIH dollars, but also to FASEB President, Richard B. Marchase, Ph.D. The directory may be accessed at: opa.faseb.org/pages/Publications/FreshmanClassDirectory/main.htm.

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ASBMB Comments for the Obama NIH Transition Team

BY PETER FARNHAM

In a wide-ranging Jan. 5th memorandum to the incoming administration's NIH Transition Team, ASBMB President Greg Petsko commented extensively on a variety of NIH-related issues of vital concern to ASBMB and its membership.

Among the points made:

- **President Obama should appoint a new NIH Director as soon as possible after the inauguration.**
- **The Director should be a strong supporter of individual investigator-initiated research.**
- **The new Director should work closely with NIH institute, center, and division directors to protect research funding from severe fluctuations in funding levels.**
- **The new Director should work with ICD directors to eliminate duplicative and wasteful research programs so more deserving research can be funded.**
- **The new Director should take steps to reverse the trend at NIH toward top-down priority setting of research goals and objectives.**

ASBMB's Comments on NIH Issues

The comments below were submitted to the NIH Transition Team on Jan. 5, 2008.

Thank you very much for the opportunity to comment on issues associated with NIH as the Obama Administration prepares to take over responsibility for this vitally important agency on Jan. 20.

First, ASBMB strongly urges the appointment of an NIH director as soon as possible after Inauguration Day (that afternoon would not be too soon!). It is very important that the agency not languish under temporary or interim leadership, as it has under previous administrations, going back to the 1980s.

Equally important as filling the position, however, are the qualities the Director should have. The new Director needs to be a strong supporter of research initiated by individual investigators. Historically, this type of research has been the most productive in terms of leading to new knowledge that is useful in improving the health of the American people.

The new Director should also work closely with Institute, Center, and Division (ICD) Directors to protect NIH research funding from the kind of severe fluctuations investigators have endured the past 15 years. Through the early and mid-1990s, the NIH budget fluctuated dramatically from year to year, with some years seeing very good increases and others little or no increase. To address this issue, biomedical scientists, working in cooperation with the Congress and the Clinton administration, adopted a policy to double the NIH budget over five years. This began in 1999. Although the annual 15 percent increases NIH received during this period were of course most welcome and did a lot of good, the predictability associated with how much money to expect in the coming year was just as important. However, starting in fiscal year 2004, all growth in the NIH budget stopped, and in the six fiscal years since, the NIH budget has actually lost about 13 percent of its purchasing power. So, in a fifteen year span, the NIH budget has gone from annual fluctuations, to very generous increases, to not keeping up with inflation. This is, of course, a nightmarish situation for researchers to have to confront when making any kind of long-term plans. In our view, the agency would be better off with steady, long-term growth at a predictable, moderate rate, than continuing the fluctuations of the kind we have seen since 1992.

The new NIH Director should be committed to helping ICD Directors find ways to phase out programs that are not delivering quality research. As is typical in large bureaucracies, programs at NIH are almost never discontinued; many simply recast their objectives, resulting in more deserving science being funded inadequately. There has been a growth in large programs for which outcomes assessment has been inadequate. This occurred when NIH funding was doubled (during the 15 percent increases), but these programs have not all been sustainable or justifiable without affecting those that have delivered quality peer-reviewed research.

In recent years, there has been a trend towards research being supported by "top-down" programs initiated by the NIH or by small cadres of scientists. Because such programs often (though not always) do not compete in open study sections with individual investigator-initiated research, there is a danger that American science will come to resemble the hierarchical scientific establishments of Europe and Japan, rather than the more free form approach to conducting biomedical research that has held sway in the United States, at least until recently. The new NIH director needs to take a close look at how

- **NIH should encourage science that bridges programs between the somewhat narrowly defined ICDs.**
- **NIH should take the lead in encouraging biomedical research to focus on pathways and processes, not just on classical, symptom, and organ-based definitions of disease.**
- **ASBMB is also concerned about the growing need for infrastructure funding. Historically, technological innovation to enable new insights into biomedical research has been underfunded.**
- **Finally, a divide is growing in American biomedical science between supporters of "basic", and "translational" or "applied" biomedical research. These types of research are on a continuum and feed off and reinforce each other. The growing divide must be eliminated.**

All of these points are amplified in ASBMB's comments, which appear in the box on this page. The comments also appear on the incoming administration's transition website, www.change.gov.

The NIH Transition Team is headed by four well-known individuals: Alta Charo, a law and bioethics professor at the University of Wisconsin, Madison; Francis Collins, former director of the National Human Genome Research Institute; Greg Simon, a longtime aide to former Vice President Al Gore and now the head of a group called Faster Cures; and Harold Varmus, Memorial Sloan-Kettering Cancer Center and former NIH Director.

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research priorities are established and, ideally, take steps to reverse this trend. ASBMB would be pleased to provide data on this troubling trend if you wish to see it.

NIH should encourage science that bridges programs between the somewhat narrowly defined ICDs. The NIH Roadmap was originally intended to help with that, but it seems to have evolved into a program to translate basic research into clinical developments. While this is not an unworthy objective, it still leaves research support Balkanized by the traditional, phenotypic classification of diseases. This is archaic and hinders progress.

NIH should be taking the lead in encouraging biomedical research to focus on pathways and processes, not just on classical, symptom and organ-based definitions of disease. For example, people with Alzheimer and Parkinson Diseases have greatly reduced risk for nearly all forms of cancer, except for melanoma, for which their risk is much greater. This fascinating connection is, to my knowledge, not being worked on by any labs, because it would cover two vastly different traditional diseases and would require cooperation between the National Cancer Institute and the National Institute for Neurologic Diseases and Stroke. The Roadmap should be reconfigured to address cross-disciplinary problems such as this.

We also are concerned about the growing need for infrastructure funding. The Clinical and Translational Science Awards program, for example, is eating up enormous resources at the National Center for Research Resources, such that smaller infrastructure programs are not being funded. Not all research programs need CTSA levels of funding; however, many could benefit from smaller grants to support new infrastructure and instrumentation. Historically, technological innovation to enable new insights into biomedical research has been underfunded. Efforts to address this problem, and the disparity between large and small infrastructure and instrumentation programs, would be very helpful.

Finally, a divide is growing in American biomedical science between supporters of "basic," and "translational" or "applied" biomedical research. This divide leads to competition over what to fund and sends the wrong message to non-scientists and government officials. The distinction between types of research is in many ways artificial and unproductive.

Biomedical research is a continuum between the most fundamental forms of inquiry on the one hand and the most clinically oriented science on the other. Without fundamental, curiosity-driven science, there would be little novelty, breakthroughs would be rare, and applications would progress incrementally. Conversely, without efforts to translate those fundamental discoveries into inventions, products, treatments, and cures, human health would improve slowly, if at all, and public support for all forms of science would wane. The whole of the continuum is necessary, and the polarization that is taking place must stop.

It would be our hope that this historical election of the first African American president, running on a platform of change, will yield a president that would incorporate into his action plans a mechanism to ensure sustainable growth of the NIH budget. This change is essential if the United States is to continue its leadership role in biomedical research, provide a stable environment for future scientists, and continue the rapid improvement in the diagnostics for and treatments of human disease.

We hope these comments are useful to you as you prepare for the new Administration.

Research Issue Updates

BY ALLEN DODSON

While most eyes in Washington focused on the presidential transition and the 111th Congress, policy makers continued to work on issues that affect biomedical research. Here are updates on some of the topics that ASBMB is monitoring.

Peer Review and Early Stage Investigators

In his December President's Message, ASBMB President Greg Petsko described a new NIH policy for peer review of grants from Early Stage Investigators, noting that we need to be most concerned about young scientists because they are "the lifeblood of our profession." NIH has since released additional details on the policy.

NIH defines a "new" investigator as any researcher who has not previously received NIH funding, and "Early Stage Investigators" (ESIs) as new investigators who are within 10 years of their doctorate (or meeting certain exceptions). The NIH eRA Commons website, where investigators file their applications, will automatically identify ESIs. Their applications will be "identified to reviewers so that appropriate consideration of their career stage can be applied during review." These proposals will be discussed together at the beginning of each study section meeting ("clustered").

In an additional change, the Institutes will aim to fund new investigators (including ESIs) at the same success rate as established investigators. The goal will be for ESIs to represent the majority of new investigators funded, in the hope of protecting the next generation of scientists. This measure has raised some controversy—in times of tight funding, additional funds for any one group, such as ESIs, means less funding for others—but NIH feels that this move is needed as the average age of new investigators is now over 42.

Dual Use Research Education

NIH's National Science Advisory Board for Biosecurity (NSABB) has been working to develop a policy regarding dual use research of concern, legitimate research that has the potential to be misused to threaten the public health or national security. At its December 2008 meeting, NSABB presented plans to recommend that education on these issues become mandatory—for example, through current NIH-mandated ethics training for graduate students and postdocs or via web-based courses, similar to radiation and chemical safety training programs—in order to raise awareness of the threat.

In the wake of recent biosecurity problems, including the case of Bruce Ivins, a researcher suspected of carrying out the 2001 anthrax attacks, NSABB officials think education may help prevent future attacks—and remove the need for harsher restrictions on research later.

We continue to hear encouraging news about biomedical research being included in the stimulus package

Financial Conflict of Interest (COI)

COI issues have been simmering at NIH for months, in part due to the investigations of Sen. Charles Grassley (R-IA) into undisclosed payments from pharmaceutical companies to physicians. Most prominently, Emory University psychiatrist Charles Nemeroff allegedly failed to disclose over $1.2 million in payments from the drug maker GlaxoSmithKline (GSK) while administering clinical trials of a GSK drug. The investigation led to the suspension of the $9.2 million clinical trial, and NIH temporarily froze all research grants at Emory until the university was able to certify that it had collected COI information from its researchers.

The Department of Health and Human Services plans to issue an Advance Notice of Proposed Rulemaking to draft a policy on managing financial conflicts of interest.

ASBMB, and our colleagues at FASEB, will be monitoring these proceedings and will keep you informed in these pages and in other ways as needed.

Democrats Consider Stimulus Spending

At a meeting on Jan. 7 in one of the largest hearing rooms on the House side of Capitol Hill, the Democratic Steering and Policy Committee held a "forum" to consider the size and scope of the stimulus spending package that is going to be the first order of business of the new Congress once President-elect Obama takes office. The forum was opened by Speaker Nancy Pelosi (D-CA) and co-chaired by Rep. George Miller (D-CA) and Rosa DeLauro (D-CT). Almost 100 Democratic members of Congress (few, if any, Republicans were in evidence) were sitting in the audience along with the usual collection of lobbyists, staff, press, and other Washington operatives usually drawn by such an event.

The five witnesses, all economists, spent two hours discussing the scope and size of the proposed stimulus package. All supported the idea of a stimulus, and most recommended a mix of tax cuts and spending hikes in the range of $750–$900 billion, although a total package in the range of well over $1 trillion is easily possible once markup, slated to begin in mid-January, is completed.

Science spending was repeatedly mentioned during the forum as a key way to stimulate the economy.

We continue to hear encouraging news about biomedical research being included in the stimulus package, including a request that NIH's Institute, Center, and Division directors provide the House appropriations committee with information on how they would use money they might receive under stimulus plans of varying sizes.

Although there clearly is going to be a lot of negotiating between Congress and the Obama administration about the final shape of the package—Congressmen and Senators are notoriously adverse to being told what to do by the White House—Speaker Pelosi and Sen. Majority Leader Harry Reid (D-NV) have both indicated they intend to have a stimulus package on President Obama's desk by the President's Day recess on Feb. 16, threatening to cancel the recess if work on the bill is not complete.

Additional Information:

- **The most recent news on changes to peer review can be found at the NIH peer review website: enhancing-peer-review.nih.gov.**
- **Additional information on dual use research policy is available at NSABB's website: oba.od.nih.gov/biosecurity/biosecurity.html**
- **Financial COI was discussed at the December meeting of NIH's Advisory Committee to the Director: acd.od.nih.gov/slides/12052008slides.asp**

Please email the author with any suggestions on these topics, which will be passed along to the ASBMB Public Affairs Advisory Committee for discussion.

Allen Dodson is an ASBMB Science Policy Fellow. He can be reached at adodson@asbmb.org.

Alberts Honored with Carl Brändén Award

Bruce Alberts, Professor in the Department of Biochemistry and Biophysics at the University of California, San Francisco, has been awarded the 2009 Carl Brändén Award from the Protein Society.

The Brändén Award, sponsored by Rigaku Corporation, is given to an outstanding protein scientist who has also made exceptional contributions in the areas of education and/or service to science. The 2009 award will be presented to Alberts this June for his national and international commitment to the promotion of educational principles as well as the "creativity, openness, and tolerance that are inherent to science."

Alberts is an accomplished biochemist with a strong commitment to the improvement of science and mathematics education. During his 12-year tenure as president of the National Academy of Sciences, he was instrumental in developing the landmark National Science Education standards. He is one of the original authors of *Molecular Biology of the Cell*, a preeminent textbook in the field that is now in its fourth edition (2007). Alberts currently serves on the advisory boards of more than 30 nonprofit institutions and is the immediate past-president of the American Society of Cell Biology as well as editor-in-chief of the journal *Science*.

Fields Named Paul Janssen Prize Winner

Stanley Fields, Professor of Genome Sciences and Medicine at the University of Washington School of Medicine, was named the 2008 Paul Janssen Prize in Advanced Biotechnology and Medicine winner.

The Paul Janssen Prize in Biotechnology and Medicine was established by Rutgers University and the Robert Wood Johnson Medical School to honor the achievements of Paul Janssen by recognizing outstanding contributions in biomedical research. Janssen, the first recipient of the award, was the founder of Janssen Pharmaceutical, Inc. and a visionary physician and chemist who developed many important drugs that are used extensively in various areas of medicine including mental illness, cardiovascular and gastrointestinal diseases, allergies, and infections.

Fields, who is also a Howard Hughes Medical Institute investigator, is internationally recognized for developing novel, simple, and highly facilitating technologies to analyze protein function. These include a yeast two-hybrid system for detecting protein-protein interactions, a screening strategy involving the use of leucine zippers to identify proteins that function in a common process, and a biosensor that reports the binding of small molecules. Among other things, he is currently working on developing a malaria protein array and using capillary electrophoresis and mass spectrometry to analyze the yeast metabolome.

Karsenty Awarded Lee C. Howley, Sr. Prize

Gerard Karsenty, the Paul. A. Marks Professor and Chairman of the Department of Genetics and Development at Columbia University College of Physicians and Surgeons, is the recipient of a 2008 Lee C. Howley, Sr. Prize for research in arthritis. Karsenty shares this Arthritis Foundation award with Michel Nussenzweig of Rockefeller University for their continued research advancements in the cure and control of rheumatic diseases.

Each year, the Howley Prize recognizes researchers whose contributions during the previous five years have represented a significant advance in the understanding, treatment, or prevention of arthritis and rheumatic diseases. The recognition that this program offers for excellence in arthritis research attempts to ensure that the search will continue for cures to more than 100 forms of arthritis and rheumatic diseases.

Karsenty is known for his research on the development and function of the skeletal system. Prior to his contributions to the field, little was known about the molecular basis of mammalian skeletal system development and differentiation. Now, a decade later, the field is burgeoning with a multitude of new transcription factors, co-activators, co-repressors, and signaling pathways that explain the development of the osteoblast from the mesenchymal stem cell, both during embryonic development and during postnatal bone formation.

Krulwich Wins William A. Hinton Research Training Award

Terry Ann Krulwich, Professor of Pharmacology and Biological Chemistry and Program Director of the Post-Baccalaureate Research Education Program at the Mount Sinai School of Medicine, has been honored with the William A. Hinton Research Training Award.

The award is given in memory of William A. Hinton, a physician/research scientist and one of the first African Americans to join the American Society for Microbiology. It honors outstanding contributions toward fostering the research training of underrepresented minorities in microbiology.

Krulwich is credited with revolutionizing the training of underrepresented minorities at Mount Sinai. She served as dean of the Graduate School of Biological Sciences from 1981 to 2002 and established and directed the medical scientist training program (MSTP). Well over 100 women and underrepresented students were mentored by Krulwich during this time. In 2001, she received funding from the National Institute of General Medical Sciences to establish the Post-Baccalaureate Research Education Program (PREP) to provide recent college graduates from underrepresented minority groups with one to two years of intensive mentored research to facilitate their pursuit of a Ph.D. or M.D./Ph.D.

Sharon and Spiro Get Lifetime Achievement Awards


SHARON


SPIRO

Nathan Sharon, Professor Emeritus at the Weizmann Institute of Science, and Robert G. Spiro, Professor Emeritus Harvard Medical School and Senior Investigator Emeritus at the Joslin Diabetes Center, have been selected to receive the Society for Glycobiology's 2008 Rosalind Kornfeld Award for Lifetime Achievement in Glycobiology.

The award was established in 2008 to honor Rosalind Kornfeld's distinguished scientific career and service to the society. The award is given to scientists who have, over their professional lifetimes, made significant contributions with important impact on the field.

Sharon has pioneered studies on glycoconjugates and lectins; he reported the first isolation of bacillosamine, established that carbohydrates serve as markers for immune cells, demonstrated that plants can glycosylate proteins by a pathway similar to that in animals, and was the first to show that legume lectins are members of a large family of homologous proteins.

Spiro's accomplishments include broadbased fundamental studies on glycoprotein structure, function, and biosynthesis that have had profound and long-lasting impact on the field of glycobiology. Highlights of his research include the first studies on the glyco portion of serum proteins, characterization of collagen glycosylation and basement membrane proteoglycans, and the first identification and characterization of an endomannosidase involved in glycan maturation.

Rees and Lindquist Receive HHMI Collaborative Innovation Awards


REES


LINDQUIST

Two ASBMB members received Collaborative Innovation Awards from the Howard Hughes Medical Institute. HHMI has started a $10 million per year program to fund eight teams of scientists doing "transformative" research. ASBMB members Susan Lindquist of the Whitehead Institute for Biomedical Research and Douglas C. Rees of the California Institute of Technology (both HHMI investigators) were chosen to lead two of the eight teams.

Lindquist and her four team members will look at new strategies to target the biological mechanisms that break down in Parkinson disease and other neurodegenerative disorders. Rees' four-person team will use the HHMI funds to develop a more efficient and accurate method for solving the three-dimensional structures of membrane proteins.

Maryanoff Garners Smissman Award

Bruce E. Maryanoff, Distinguished Research Fellow and Team Leader at Johnson & Johnson Pharmaceutical Research & Development, has been named recipient of the 2009 Edward E. Smissman Award, sponsored by Bristol-Myers Squibb. He will receive this award in the Division of Medicinal Chemistry at the 237th American Chemical Society (ACS) National Meeting in Salt Lake City this spring.

Maryanoff has made numerous contributions to medicinal and organic chemistry. He is an internationally renowned expert in drug design and discovery. From 1976–1992, he focused on central nervous system (CNS) therapeutics, with an emphasis on anticonvulsants and antidepressants. Maryanoff invented topiramate (Topamax®), a unique sugar sulfamate derivative, which is marketed worldwide for treating epilepsy and migraine headaches. Since 1991, he has pursued cardiovascular therapeutics while also seeking drugs for treating pulmonary inflammatory diseases, metabolic disorders, and epilepsy. In the past 15 years, his drug research has dealt with structure-based drug design; peptides and peptidomimetics; inhibitors of diverse enzymes, especially serine proteases and kinases; integrin antagonists; and ligands for G-protein-coupled receptors. His efforts have led to 23 compounds entering preclinical development, 13 of which advanced into human clinical trials.

ASBMB Members Named AHA Distinguished Scientists

Eight ASBMB members have been named 2008 American Heart Association Distinguished Scientists. Each year this distinction is proudly bestowed upon prominent AHA members whose work has advanced the understanding and management of cardiovascular disease and stroke.

The ASBMB members named Distinguished Scientists are:

- **GERALD S. BERENSON,** Director of the Tulane Center for Cardiovascular Health & Principal Investigator at Bogalusa Heart Study;
- **MARIO R. CAPECCHI,** Investigator at the Howard Hughes Medical Institute & Distinguished Professor of Biology and Human Genetics at the University of Utah School of Medicine;
- **ROBERT F. FURCHGOTT,** Distinguished Professor Emeritus in the Department of Pharmacology at the State University of New York Downstate Medical Center & Adjunct Professor of Pharmacology at the University of Miami School of Medicine;
- **DAVID GINSBURG,** James V. Neel Distinguished University Professor of Internal Medicine & Human Genetics at the University of Michigan Medical School, Human Genetics Warner-Lambert/Parke-Davis Professor of Medicine, & Investigator at Howard Hughes Medical Institute;
- **RICHARD J. HAVEL,** Professor Emeritus of Medicine at the University of California, San Francisco;
- **LOUIS J. IGNARRO,** Jerome J. Belzer Distinguished Professor of Pharmacology at the University of California, Los Angeles School of Medicine;
- **EDWIN G. KREBS,** Professor Emeritus in the Department of Pharmacology & Biochemistry at the University of Washington; and
- **FERID MURAD,** Director of the Cell Signaling Center at the Institute of Molecular Medicine & J. S. Dunn Professor at the University of Texas.

ASBMB Members Elected as AAAS Fellows

Several ASBMB members have been awarded the distinction of AAAS Fellow, an honor bestowed upon American Association for the Advancement of Science (AAAS) members by their peers. In 2008, of the 486 members elected as AAAS fellows, 42 are members of the ASBMB. The new Fellows will be inducted at the Fellows Forum in February during the 2009 AAAS Annual Meeting in Chicago. We congratulate the following ASBMB members for this achievement:

AAAS Biology Section

- **James U. Bowie**, University of California, Los Angeles
- **Jennifer A. Doudna**, University of California, Berkeley
- **Dale E. Edmondson**, Emory University School of Medicine
- **Susan A. Gerbi**, Brown University
- **Lorraine J. Gudas**, Weill Medical College, Cornell University
- **Christine Guthrie**, University of California, San Francisco
- **Tsonwin Hai**, Ohio State University
- **Michael Hampsey**, University of Medicine & Dentistry of New Jersey
- **Alan G. Hinnebusch**, Laboratory of Gene Regulation & Development, NIH
- **H. Ronald Kaback**, UCLA, David Geffen School of Medicine
- **Daniel J. Klionsky**, University of Michigan
- **Bruce McClure**, University of Missouri
- **Craig S. Pikaard**, Washington University, St. Louis
- **Douglas D. Randall**, University of Missouri
- **Anjana Rao**, Harvard Medical School
- **Jeffrey V. Ravetch**, Rockefeller University
- **Immo Erich Scheffler**, University of California, San Diego
- **Barry D. Shur**, Emory University
- **Jeffry Stock**, Princeton University
- **Jordan J. N. Tang**, Oklahoma Medical Research Foundation
- **Susan S. Taylor**, University of California, San Diego
- **Graham C. Walker**, Massachusetts Institute of Technology
- **Nancy C. Walworth**, University of Medicine & Dentistry of New Jersey
- **Michael R. Waterman**, Vanderbilt University School of Medicine
- **George M. Weinstock**, Washington University School of Medicine
- **Jeffrey Wilusz**, Colorado State University
- **Marc S. Wold**, University of Iowa Carver College of Medicine

AAAS Chemistry Section

- **Bridgette A. Barry**, Georgia Institute of Technology
- **Frank M. Raushel**, Texas A&M University
- **David A. Wink**, National Cancer Institute, NIH

AAAS Medical Section

- **Michael B. Brenner**, Brigham & Women's Hospital
- **David E. Clapham**, Boston Children's Hospital
- **Kuan-Teh Jeang**, National Institute of Allergy & Infectious Diseases, NIH
- **Daniel Ory**, Washington University School of Medicine
- **Alan R. Saltiel**, University of Michigan
- **Jean Elise Schaffer**, Washington University School of Medicine
- **Sarah Spiegel**, Virginia Commonwealth University School of Medicine
- **Li-Huei Tsai**, Picower Institute for Learning & Memory, MIT

AAAS Neuroscience Section

- **Ted Dawson**, Johns Hopkins University School of Medicine
- **Charles G. Glabe**, University of California, Irvine
- **Jochen Schacht**, University of Michigan

AAAS Pharmaceutical Sciences Section

- **Charles D. Smith**, Medical University of South Carolina

Retrospective: Mordechai Liscovitch (1951-2008)

Mordechai Liscovitch, known as Moti to all his friends and colleagues, passed away on Oct. 27, 2008. He was a longtime scientist at the Weizmann Institute in Israel and a leading figure in the field of phospholipase signal transduction.

Liscovitch earned his B.S. from Tel Aviv University (1976). In 1979, he moved to Weizmann Institute in Rehovot for his graduate studies with Yitzhak Koch. There he studied the effects of pituitary gonadotropin-releasing hormone and the mechanisms of pituitary receptor internalization. He then moved to Boston for his post-doctoral training with Richard Wurtman at the Massachusetts Institute of Technology. It was during his time at MIT that he first developed an interest in lipid signaling, publishing a series of studies on the mechanisms by which phosphatidylcholine metabolism leads to production of acetylcholine in neuronal cells.

In 1986, Liscovitch returned to the Weizmann Institute and took his first independent faculty position. He remained at the Weizmann Institute for the rest of his career. He continued to develop his newfound interest in lipid signaling, focusing on the enzyme phospholipase D (PLD). In 1993, Liscovitch took his first sabbatical position at Harvard Medical School with Lewis Cantley, a move that would prove to be pivotal. The Cantley laboratory had been studying phosphoinositide signaling for over a decade, and with their combined expertise they showed that PtdIns-4,5-P_2 is a cofactor for PLD. This work had a profound impact in the field and spearheaded a new direction in PLD signaling.[1] Additional work from Liscovitch and others provided evidence for a positive feedback loop in which the product of PLD activity, phosphatidic acid, stimulates the activity of phosphatidyl 4-phosphate 5-kinase, which in turn produces PtdIns-4,5-P_2, thus amplifying PLD activity. Subsequent to this discovery, Liscovitch continued to maintain an active interest in PLD biology. In more recent years, he developed an interest in mechanisms of multi-drug resistance and organization of lipid microdomains, particularly the function of caveolin and its role in cancer progression.

We extend our sympathies and thoughts to Liscovitch's family and friends. Below, as a tribute, we offer thoughts and reflections from several of his friends and former colleagues.

On two occasions, I had the pleasure of hosting Moti for sabbatical leaves. What I most remember from those days was the deep speculation about the evolution of lipid signaling pathways for the control of vesicle trafficking in eukaryotic cells, at a time when these ideas were not mainstream. These discussions were often over beers at the local Irish pub, and they generally moved on to lighter subjects, like politics

and saving the world. On all these topics, I felt that Moti was my soul mate. But my most memorable experience with Moti was our day together in the West Bank, the muddy dip in the Dead Sea, and the spectacular ruins at Masada. In my mind, I will always see him as he was on that day.

Lewis C. Cantley, Professor of Systems Biology at Harvard Medical School, Chief of the Division of Signal Transduction, and Co-Director of the Cancer Center at Beth Israel Deaconess Medical Center

Moti was definitely not a man of our time: ethical, reflective, humble, and respectful. He always had a peaceful aura, with a sweet smile that offered peace and optimism. To me, he was a colleague and a collaborator, but more than that, he was, and remains, my very best friend. To participate in any kind of discussion with him was always a fantastic experience; he was clever, a man of honor with a fantastic sense of humour. He did not impose these virtues but made them available to all that were willing to receive them. His loss has left an open wound. During our last conversation together, a few days before he passed away, I was telling him about the development of a project he had been helping me to create. Things were starting to work and he was happy. His comment was: "Excellent, the future looks bright!" His life was a gift. A gift that will be in my heart forever.

Paolo Pertile, Chairman and CEO, Cutech Srl, Italy

I had the pleasure of first meeting Moti when he was on sabbatical leave in the laboratory of Lewis Cantley. Moti left me with an indelible impression of scientific acuity, impossible charm, and a good-natured sense of humor. The many interactions I had with Moti, and ultimately his friendship, is one reason those years have left me with the fondest memories of my career. He approached science and life with an enviable mix of integrity, respect, enthusiasm, and passion. I recall one event that occurred during one of the many Cantley lab meetings. Someone asked him a question during his presentation, prefaced by the statement: "Do you not worry that…" Moti replied with two points: one a classical scientific explanation in response to the question at hand about the result of the experiment; and the second, "I am not the worrying type." In my mind, he was and always will be the quintessential scholar and gentleman.

Alex Toker, Associate Professor of Pathology Beth Israel Deaconess Medical Center, Harvard Medical School

Moti Liscovitch was my friend, partner, and scientific mentor. In his calm way of guiding, he gave birth to new ideas that fueled my experimental work as well as that of other students and colleagues. After my postdoc, we had wonderful years of scientific partnership as we explored the field of multi-drug resistance. In addition to the wealth of scientific papers we published, we were motivated to apply our results in the clinic. We initiated a start-up company, STERALEX, for the development of inhibitors based on steroidal alkaloids. Above all, Moti was my friend. We shared dreams, ideas, and long hours either in Rehovot at his favorite simple restaurants or, in the Galilee villages that we both loved. Moti left me with a heritage of kindness, wisdom, and friendship that, together with his other friends, we will cherish and hold.

Yaakov (Kobi) Lavie, Former graduate student and research fellow

I sit by my desk, and the image of Moti is so alive in front of me that I simply refuse to accept that he is not with us any more. He smiles in his very special, quiet, modest, and slightly ironic way, and I almost want to say "So indeed you were right, Moti," and there is nothing to fret about. And then I try to accept that Moti is no longer with us, and this is simply impossible. A few months before Moti died I took a train ride with him. The knowledge of his dreadful disease hung in the air like an evil cloud. And then Moti, amazingly but in retrospect, not surprisingly, tried to calm me down. His open attitude of relaxed understanding and pleasant acceptance was so courageous and admirable. I even thought I saw a glimpse of his unquenchable scientific curiosity tickled by what was happening. I remember most of all his deep wisdom, humanity, and warmth, this inner peace that is so uniquely Moti. He is right here with me, as I write, in my office, and I have no doubt that Moti will stay with me, with us, for good.

Rafi Malach, Morris and Barbara Levinson Professor of Brain Research, Weizmann Institute of Science

Moti and I started as postdoc bench colleagues and quickly became close friends in a lab that was quite large with multiple exciting projects. It would have been easy for Moti to join in on one of them. But Moti wished to make independent contributions, and instead, he took time to read, to think, and to design a virtually new area of research. He showed that the turnover of phosphatidylcholine was accelerated by the stimulation of membrane receptors and that this generated phosphatidic acid and diacylglycerol. Notably, he found that the signal-activated phosphatidylcholine breakdown was catalyzed by phospholipase D. I was privileged to collaborate with Moti on multiple projects in this field, and I was a beneficiary of his insight, ingenuity, and rigor in experimental design. His deep understanding of biology permitted him to intuit molecular and cellular mechanisms of life with an amazing foresight.

Krzysztof Blusztajn, Professor, Boston University School of Medicine

Thirty two years ago, a young student entered my laboratory and asked to join us for his Masters studies. Several minutes of conversation were sufficient for me to realize that I was speaking with a potential scientist. Following the completion of his studies, Moti stayed in my laboratory for his Ph.D. and following his postdoc with R.J. Wurtman at MIT, he was offered a position at the Weizmann Institute. He built his laboratory and initiated experiments, and the results of these studies flourished and brought him scientific recognition and fame. Moti was not only an outstanding scientist but also an exceptional person. In addition to his liberal spirit, he had a total obligation to science. We have lost an outstanding scientist and a dear friend.

Yitzhak Koch, Professor, Weizmann Institute of Science

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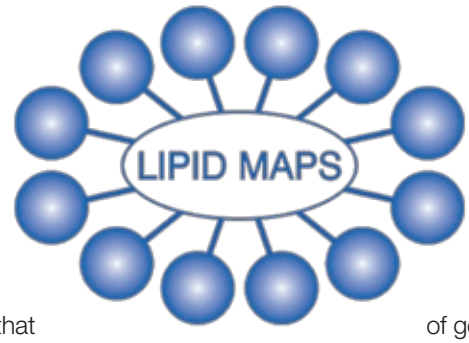
A MAP of the Lipid World

BY NICK ZAGORSKI



Some 500 years ago, intrepid explorers such as Christopher Columbus and Vasco da Gama braved the dangers of the open sea in search of new lands, treasures, and trade routes; their successes inspired many others to conduct their own voyages, ushering in an Age of Discovery that would keep cartographers busy redrawing world maps for centuries to come.

More recently, the success in sequencing the human genome has launched an exploration boom of a different sort. The age of "-omics" has swept through the scientific world, and researchers are frantically working to define and characterize all the components, pathways, and molecular interactions of cells.

And while most biologists viewed proteomics as the "next big thing" on the heels of genomics, Edward A. Dennis, distinguished professor of Chemistry, Biochemistry, and Pharmacology at the University of California, San Diego, and editor-in-chief of the *Journal of Lipid Research*, believed another uncharted land needed some cartography: lipids.

"Lipids are a broad class of molecules that not only are vital components of cell membranes but also important signaling molecules and metabolites," he says. "Genes and proteins may get most of the attention, but metabolites like lipids are really the direct cause of most disorders and diseases." Thus was born LIPID MAPS, an ambitious, multi-institute effort aimed at identifying the complete lipid profile of macrophages.

This grand project has now completed its initial five-year run during which LIPID MAPS (shorthand for LIPID Metabolites And Pathways Strategy) has identified countless new lipid species, provided a better understanding of cellular lipid interactions, and developed improved protocols for lipid separation, quantification, and classification. This past October, this success was rewarded with a renewal enabling the consortium to continue sailing the vast lipid sea.

Through his own lab's research, Dennis has long known about the biological and medical relevance of lipids. His group at UCSD works with phospholipase A_2, an enzyme that cleaves phospholipids to acid, which is modified into prostaglandins and other eicosanoids—major inflammatory agents. In fact, much of the pain and swelling arising from snake and insect bites is a result of activation of phospholipase A_2 in the venom that causes an increase in arachidonic acid production.

Dennis had been pondering the idea of generating a "lipidome" for a while and got his opportunity in 2002 when the NIGMS ("The branch of NIH that's most active in basic research," he says) announced its "Glue Grant" program aimed at funding large-scale collaborative research. Of course, when it comes to lipids, large-scale may be an understatement.

"Many people may not appreciate how diverse lipids are," Dennis notes. In terms of sheer numbers, there are probably tens of thousands of distinct lipid molecular species present in humans, making them even more abundant than the 20,000 to 25,000 genes and their respective encoded proteins. And unlike those macromolecules that have a discreet set of building blocks (four nucleic acids and 20 amino acids), lipids—from the long-chain fatty acids to the compact-ringed sterols—are considered harder to standardize.

To provide some level of organization, Dennis first divided lipids into six major categories; he then recruited the top expert in each category to join his team as a Lipidomics Core Director. All the candidates selected (Dennis for fatty acyls, Robert Murphy of the University of Colorado, Denver for glycerolipids, H. Alex Brown of Vanderbilt University, for glycerophospholipids, Alfred Merrill, Jr. of Georgia Tech for sphingolipids, David Russell of University of Texas Southwestern Medical Center for sterol lipids, and Christian Raetz of Duke University for prenol lipids) were excited to come aboard, though Dennis admits he did have to do a little arm twisting for one individual. "However," Dennis adds, "he's now one of LIPID MAPS' most ardent supporters."

Dennis then rounded out this all-star team with other Core and Bridge Directors to handle key tools and applications such as bioinformatics (Shankar Subramaniam of UCSD), mass spectrometric imaging (Nicholas Winograd of Penn State), lipid synthesis (Walter Shaw of Avanti Polar Lipids and Michael VanNieuwenhze of Indiana), oxidized lipids (Joseph Witztum of UCSD), and macrophage biology and genomics (Christopher Glass of UCSD)—paving the

The Lipid MAPS group. Front row (l to r): Christian R. H. Raetz, Nicholas Winograd, Robert C. Murphy, Edward A. Dennis, Walter A. Shaw, Jean Chin. Back row: Joseph L. Witztum, Alfred H. Merrill, Jr., Michael S. VanNieuwenhze, David W. Russell, Christopher K. Glass, H. Alex Brown.

way for the fun part, writing the Glue Grant.

To get a sense of the scope of that effort, Dennis notes that he first had to compete for a $25,000 planning grant to—yes—plan out his proposal. "We set up two all-day workshops for the team to meet and hash out the details of what would eventually become the 600-page LIPID MAPS grant application," he says. The group only had a few months to complete the application, leading to some stressful times, but in the end they were awarded a five-year, $35 million award in 2003 to initiate the LIPID MAPS project.

Since then, LIPID MAPS has made one unexpected discovery after another. As of now, they've probed hundreds of different lipid molecular species in macrophage cells, and each of the Lipidomics Core Directors has discovered novel lipids not expected to be present in macrophages. LIPID MAPS has also made lipid analysis easier for the scientific community than ever before by establishing protocols, creating analytical tools and identifying some 500 mass spectrometric standards which are now available to all investigators; before the project started there were none.

"When LIPID MAPS started, not even we appreciated how many different species of lipids are present in a cell," Dennis says, a realization that spearheaded one of Lipid MAPS most daunting efforts. "It quickly became apparent that the current classification system was too limited, so we had to design a completely new classification, nomenclature, and molecular drawing system for lipids." The new classification was introduced in *JLR* in 2005 (www.jlr.org/cgi/content/full/46/5/839), and an update by Dennis and colleagues will appear in April's special 50th anniversary issue (www.jlr.org/collections/anniversary/history).

As for the future, Dennis notes the group will continue profiling lipids in macrophages and foam cells (swollen, lipid-filled macrophages that contribute to cardiovascular disease), while also taking an integrative approach and comparing the genome, proteome, and lipidome of both cell line-derived and primary macrophages.

One of Dennis' main goals in this second round is to increase outside collaborations and to strengthen outreach efforts to share LIPID MAPS with the community more effectively. He notes that this year, LIPID MAPS will sponsor a lipidomics workshop at the ASBMB annual meeting (see p. 25 and www.asbmb.org/Page.aspx?id=1630) as well as "open the doors" to their own LIPID MAPS annual meeting this spring.

"We've always welcomed outside investigators to our annual meeting," Dennis notes, "but we decided now to start publicizing it more widely because we want to get the whole lipid and general biochemical community involved."

Dennis believes that once others learn more about LIPID MAPS, they may be inspired just like the adventurers of the past who heard tales of cities of gold in the New World and joined in the quest. In fact, research groups in both Europe and Japan have recently initiated their own lipidomics projects, perhaps signaling the start of an international groundswell ready to usher in the Age of Lipids.

To find out more, visit LIPID MAPS online at www.lipidmaps.org.

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The '08 Buzz on JBC, JLR, & MCP

BY NICK ZAGORSKI

Before we sweep away the last pieces of New Year's confetti, looking forward to bigger and better things in 2009, *ASBMB Today* would like to take a look back at 2008 and see what our members and other scientists were buzzing about around the centrifuge when it came to our journals. Glancing at the lists below, obesity, diabetes, stem cells, and breast cancer were on many scientists' radar.

Most read *JBC* research article of 2008:

Generation of insulin-secreting islet-like clusters from human skin fibroblasts

Keisuke Tateishi, et al. *JBC* **283**, 31601–31607

With continued efforts in Congress to ease their restrictions and a presidential election to provide a national forum, it's no surprise stem cells were much discussed last year. And in the wake of the groundbreaking 2007 studies demonstrating that human skin cells could be reprogrammed into stem cells, Zhang and colleagues at the University of North Carolina made a splash with this follow-up article. By demonstrating the ability to convert adult skin fibroblasts into functional pancreatic-like cells, this paper offers a potentially tremendous patient-specific treatment (and an ethically non-confounding one at that) for the millions affected by diabetes.

RUNNERS-UP:

2. **Programmed Cell Death 4 (PDCD4) Is an Important Functional Target of the microRNA miR-21 in Breast Cancer Cells** (*JBC* **283, 1026–1033**)
3. **Inter-domain Interaction Reconstitutes the Functionality of PknA, a Eukaryotic-type Ser/Thr Kinase from Mycobacterium Tuberculosis** (*JBC* **283, 8023–8033**)

Most Read *JLR* Research Article of 2008:

The Common rs9939609 Gene Variant of the Fat Mass- and Obesity-associated Gene FTO Is Related to Fat Cell Lipolysis

Kerstin Wåhlén, Eva Sjölin, and Johan Hoffstedt
JLR **49**, 607–611

Speaking of diabetes, one reason this disease continues to rise in incidence is that it goes hand-in-hand with another rising epidemic: obesity. A lot of effort has gone towards understanding the genetic elements underlying obesity risk, so it may be no surprise to find this article at the top of the list. Hoffstedt and colleagues at the Karolinksa Institute demonstrate that healthy women homozygous for the obesity-protective TT allele of FTO's *rs9939609* SNP have increased levels of circulating glycerol (independent of BMI) as well as more spontaneous glycerol release in adipocytes compared to other genotypes, indicating that altered fat cell lipolysis explains this SNP's role in regulating body weight.

RUNNERS-UP:

2. **Functional Analysis of Sites within PCSK9 Responsible for Hypercholesterolemia** (*JLR* **49, 1333–1343**)
3. **Biogenesis of HDL by SAA Is Dependent on ABCA1 in the Liver in Vivo** (*JLR* **49, 386–393**)

Most Read *MCP* Research Article of 2008:

Protein Profiling of Human Breast Tumor Cells Identifies Novel Biomarkers Associated with Molecular Subtypes

Anthony Gonçalves, et al. *MCP* **7**, 1420–1433

While obesity and diabetes rates climb, they still have a ways to go to reach the prevalence of cancer, which remains a leading killer worldwide. Considering cancer is such a heterogeneous disease underscored by a wide range of molecular abnormalities and diverse (and hard to predict) outcomes, getting a "big picture" view of cancers using proteomics seems like a natural fit. In this widely read article, a collaborative team of researchers in Marseille have done just that, integrating genomics and proteomics to discriminate complex breast cancer cell lines (BCLs) into "luminal-like" and "basal-like" subtypes, as well as identify some biomarkers that may hold great prognostic and/or diagnostic value.

RUNNERS-UP:

2. **The Identification of Potential Factors Associated with the Development of Type 2 Diabetes: A Quantitative Proteomic Approach** (*MCP* **7, 1434–1451**)
3. **Quantitative Proteomic Analysis of Protein Complexes: Concurrent Identification of Interactors and Their State of Phosphorylation** (*MCP* **7, 326–346**)

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Edward J. Wood: Supporter of Biochemistry and Molecular Biology Education

BY ELLIS BELL

On Dec. 14th, 2008, Edward J. Wood died. Ed was a tireless worker in the biochemistry and molecular biology education community, inspiring many to take education more seriously and approach it from a more scientific standpoint. His impact on biochemistry and molecular biology teaching was, and is, immense. For many years, he was editor-in-chief of *Biochemical Education* (1979-2000) and served on the editorial boards of a number of other journals. His involvement in education spanned from medical school teaching (at the University of Leeds, he chaired the committee involved in the revision of the medical school curriculum) to graduate education (he and Frank Vella helped rewrite the IUBMB Standards for the Molecular Biosciences Ph.D)[1] and undergraduate education.[2]

Ed was also a leading figure in education pedagogy, where he was involved in helping develop and promote innovations such as the use of "microcomputers" in education,[3] problem-based learning, and e-learning. His article in *Nature Reviews: Molecular Cell Biology*[4] is a must read for anyone interested in the changes that took place in biochemistry education during the second half of the 20th century.

In the United Kingdom, Ed set up the Learning and Teaching Support Network Center for Biosciences (www.bioscience.heacademy.ac.uk) which became part of the Higher Education Academy (www.heacademy.ac.uk) and was instrumental in developing the quality assessment process that is used in all biochemistry departments at English and Scottish universities.

While Ed may be best known for his educational contributions, he was a consummate scientist as well, having published more than 100 research papers. He earned his D.Phil. from the Oxford University Nuffield Department of Clinical Biochemistry. In 1972, he was appointed Lecturer in Biochemistry at the University of Leeds. He became Senior Lecturer in 1978, was made Reader in 1994, and was promoted to a Chair in Biochemistry in 1998. He served as Head of the Department of Biochemistry from 1991 to 1996.

At Leeds, Ed studied invertebrate respiratory proteins and made important contributions to the knowledge of their structure and functions. Subsequently his interests turned to wound healing where he quickly earned an international reputation as a leader in the field of skin biology. He was a founding member of the Interdisciplinary Skin Research Center at Leeds University. Ed continued to do research until his retirement as chair in biochemistry at the University of Leeds in 2006, venturing into the effects of enamel matrix proteins on collagen matrix reorganization.[5]

Ed was an outstanding role model for many in the education community worldwide, combining excellence in both research and education activities. His presence at meetings around the world will be greatly missed. His impact and influence on the education community in the molecular biosciences will continue.

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If It's the Year of the Ox, Why Do I Feel Like Such a Donkey?: U.S. State Department Security Advisory Opinions Will Do That to a Person![1]

BY LISA FELIX AND JEREMY SPOHR

The holiday season often means traveling to visit family and friends or for a well-earned vacation. For foreign scholars, the itinerary for an international trip home might also include an appointment at a U.S. consulate to apply for an entry visa stamp required for their return to the United States. The great majority of the world's citizens do require an entry visa before they can enter the U.S., whether for tourism or for a specialized purpose, such as conducting research at an American university.

The entry visa application can be an expensive and bureaucratic process, requiring careful planning and tasks months in advance. The majority of entry visa applications seem to be processed in a timely manner, enabling most to travel according to the planned schedule. However, it's not uncommon for the unsuspecting foreign traveler to be delayed by a mysterious species of American "wildlife" standing in the middle of their route. These "creatures" are sent to increase the security of the entry visa application process, and thereby the security of America's borders and homeland. Get out your binoculars, and we'll look at the donkeys, eagles, bears, ibises, condors, and mantises you might experience on your visa safari.

Condors and Mantises

The Visa Security program was established in the *Homeland Security Act of 2002* and applies additional scrutiny to the entry visa application process at U.S. embassies and consulates. The broad aim of the Visa Security program is to prevent terrorists, criminals, and other ineligible applications from receiving visas and thus from entering the United States.

The Visa Security program encompasses several types of extra checks, known as security advisory opinion(s) (SAO), to which an entry visa applicant may be subjected. The SAOs are given animal or character names (donkey, eagle, bear, etc. as mentioned above) to distinguish the type of check. SAOs are initiated by the consulate, and anyone may be subject to any of the checks at a consular officer's discretion. However, there are two types of SAOs to which foreign researchers in the United States might be especially prone:

Condor checks generally apply to males between 16 and 45 years old. Condor checks are usually triggered by information provided on one of the required entry visa application forms, Form DS-157, which documents an applicant's previous travel, education, employment, and military experience.[2]

Mantis checks are designed to ensure that sensitive technology is not stolen or inappropriately shared with those who would use it to harm the United States. The definition of "sensitive technology" is largely based on the Technology Alert list (TAL).[3] Mantis checks can be subdivided into Eagle and Donkey checks, indicating which government agencies participate in the screening.

SAO Delays

When an entry visa applicant is subject to an SAO, their name and other details are checked against a variety of American and international databases, including those of the Department of Homeland Security, the Department of State, U.S., foreign, and international intelligence agencies, the FBI, and of local and state law enforcement agencies.[4] Whereas entry visa applications that do not require SAOs might be processed in two to three days, applications warranting SAOs can take anywhere from two to eight weeks or more.

Criticisms that SAO delays disrupt academic and commercial activity seem to have significantly improved processing times in recent years. In addition, SAO results are usually valid for up to a year, as long as the applicant's circumstances (employer, position, and academic field) remain constant. On the other hand, entry visas may be valid for more than one year, meaning the applicant will be subject to a new SAO every time he or she applies for an entry visa, anyway, even when his/her circumstances remain unchanged.

There is little one can do to avoid or expedite an SAO. It is clear that the priority is on national security over any personal, academic, or commercial interests. Consular officials are advised to err on the side of caution. Therefore, a wise strategy is to be prepared for both the time necessary for and the content of an SAO.

Plan in Advance

Even when consular entry visa appointments are readily available at short notice, it is recommended that a traveler make his or her entry visa appointment as early as possible, up to several months in advance. Visa application Form DS-156 is submitted online. Submitting this information well in advance, too, may offer the consulate the opportunity to preview the applicant's name, birth date, home country, etc. (although consulates do not make their pre-screening processes, if any, publicly known).

If the traveler's academic field is listed on the Technology Alert list, it may be helpful to prepare a non-technical explanation of the academic field, the nature of the research, and the applications. Scholars with training or experience in militarily critical technologies should have backup travel and professional plans and should work with their colleagues at their home institution to prepare for delayed returns.

Finally, even something as simple as checking your spelling may help. Take care to spell your name the same way every time, matching the spelling in your passport. If you're sometimes Dimitry, sometimes Dmitry, sometimes Dimitri, and other times Dimitriy, the chances of your name appearing on some list somewhere are that much greater, and inconsistent documents may appear suspect.

Although this article has been aimed primarily at foreign scholars studying and working in the United States, travel and visa restrictions are tending toward increased security and reciprocity around the world. American citizens are advised to check travel restrictions and guidelines for their destination countries well in advance of international travel, too. It would be a shame to put all your liquids into 3 oz. containers; arrive at the international airport three hours early; remove your shoes, coat, belt, and laptop; and endure the seemingly mandatory flight delays, only to face an unexpected Mantis-like creature in your path. Other countries are increasingly invoking their own strict and/or reciprocal travel requirements to enhance their own security.

Lisa Felix and Jeremy Spohr are International Officers at the National Postdoctoral Association.

FOOTNOTES

1. The information in this article is not specific legal advice. Readers with questions about their own particular circumstances are advised to consult individually with a qualified immigration attorney.
2. Walsh, T. L. (June 2005) The Land of CLASS, TIPOFF, Mantis, Condors, and Donkeys: Demystifying Security Advisory Opinions, Biometrics, and Government Databases Involved in the Consular Processing Framework, in *Immigration & Nationality Law Handbook*, at 671 (Stephanie L. Browning ed.) 2005-2006 ed., American Immigration Lawyers Association 2005.
3. While the Foreign Affairs Manual indicates that "[t]he TAL is sensitive but unclassified (SBU)" and is not to be posted on the public internet, provided to non U.S. Government personnel, or otherwise reach public domain (9 FAM 40.31. Exhibit I, www.state.gov/documents/organization/86964.pdf), the TAL is widely available on many university websites.
4. Loke Walsh, *supra* note 3.

Making the Unconscious Conscious: How Bias Hinders Under-represented Talent in Science

BY ISHARA MILLS-HENRY AND ROBBIN CHAPMAN

Many people may be familiar with the study by Princeton economists pertaining to the importance of blind auditions when hiring women for symphony orchestras.[1] Historically, the number of female musicians has been extremely low, primarily because several audition candidates were handpicked by the conductor. To prevent this favoritism, auditions were advertised, and audition committees were expanded to promote fairness and objectivity. However, the number of women musicians did not increase until the identity of each candidate was concealed during the audition. This study revealed gender discrimination as a barrier which led to the sparse numbers of female musicians. Some discrimination was explicit and evidenced, for example, by conductor statements that the technique of female musicians was "too temperamental." However, studies also revealed an implicit form of discrimination called unconscious bias, triggered by the gender of person auditioning. In most work environments, it would be virtually impossible to utilize a physical screen to offset explicit and implicit discrimination; nevertheless, institutions must implement strategies, systems, and policies to minimize biased evaluations.

Unconscious bias is defined as a prejudice, attitude, or stereotype of an individual based on factors such as race, gender, religious affiliation, sexual orientation, or outward appearance that is without intention or awareness. Like explicit discrimination, implicit bias presents a huge barrier for under-represented talent in the workplace. Research has revealed most people display racial and gender bias toward individuals exhibiting similar skills or qualifications. For example, study participants evaluating identical vocabulary definitions rated definitions attributed to African Americans to be of lower verbal quality than from whites.[2] In another study, participants were asked to evaluate successful performances by male and female individuals. Study participants overwhelmingly attributed male success to skill and female success to hard work, luck, or assistance from others.[3] This type of bias has negatively impacted the evaluation, mentoring, hiring, and promotion of under-represented talent in companies and academic institutions.

Examples of Bias in Academia

In academia, unconscious bias often leads to a disparity in how individuals are treated and evaluated. For example, in a study of recommendation letters for medical students, letters for women applicants were on average shorter and included more statements that raised doubts about the candidate. The letters overwhelmingly portrayed female applicants as students and teachers, and male applicants as professionals and researchers.[4] In many instances, under-represented scientists are often stereotyped by their gender, race, or the undergraduate institution they attended as students or faculty. This is evidenced by comments such as "He was hired only because he was a minority," or "She will not be committed to her work after she has a baby," which are common perspectives articulated within academic environments. For under-represented talent, lack of respect and doubts about their scholarship has led to ineffective mentoring and improper evaluations in classroom and laboratory settings. These metaphoric "brick walls" have hindered career advancement and created additional barriers to building successful science careers. One scientist summarizes her experiences: "For other individuals, one assumes they are competent, but for under-represented individuals, first you have to prove yourself, often multiple times, before others consider you a colleague."

Understanding Unconscious Bias

Most of us intend to be fair. However, unconscious bias influences our judgments and evaluations of people and their work. Cognitive research has shown that the brain employs bias to make sense of complex situations by gathering, sorting, and filtering information. This is part of healthy cognitive function. When our bias function leads to inaccurate evaluations (termed cognitive errors), our resultant decisions often equate to discriminatory behaviors. Research demonstrates that even individuals who hold strong egalitarian values and believe they are not biased may still unconsciously or inadvertently behave in a discriminatory manner.[5] In order to minimize how unconscious bias impacts our evaluations, we must provide the diversity leadership and education that will

equip us with tools to identify and minimize such bias.

Over the years, Massachusetts Institute of Technology (MIT) has worked to increase representation of under-represented faculty within its faculty ranks. Over the last decade, MIT has realized only a 1 percent increase in under-represented faculty, which translates into a 6 percent representation within the 2007 MIT faculty pool.[6] "At the MIT, a diverse faculty is critical to remaining competitive and conducting creative and innovative research."[7]

The MIT School of Architecture and Planning (SA+P) has implemented several programs that emphasize diversity education and leadership. One program is the *SA+P Roundtable*, a monthly brown-bag lunch where department faculty, staff, and students engage in dialogue around various diversity-related issues. A program goal is for participants to gain fluency in recognizing and addressing policies and practices that create barriers to the successful recruitment and retention of under-represented talent. Roundtable topics include minimizing unconscious bias, unpacking privilege, cross-cultural communication, and ally-ship. Roundtable activities include hands-on practice and facilitated dialogue as participants develop contextualized action plans. Attendance over the course of the program has been equally distributed between faculty, staff, and students. SA+P roundtables have improved fluency of thought and action for increasing representation and inclusion of under-represented talent.

The Proactive Scholar

How do we identify our own unconscious biases? What are specific steps individuals can take to mitigate biased evaluations? To identify our own unconscious biases, an online software tool called Project Implicit (www.implicit.harvard.edu) can help measure and characterize our unconscious bias. Project Implicit is a joint project between Harvard University, the University of Virginia, and the University of Washington to address unconscious biases triggered by race, gender, etc. Various tests identify what biases may be harbored toward particular groups. Some well known bias triggers include fatigue, cognitive overload, time pressures, and perceived lack of accountability. Taking steps to mitigate biased evaluations requires us to heed those triggers that may result in cognitive errors. When preparing to conduct evaluations, first check for bias triggers and self-monitor reactions during the evaluative process. Engaging in the practice of identifying and monitoring unconscious bias is part of our continuing growth as scholars, scientists, mentors, and educators.

Hands-on ASBMB

What can ASBMB do to minimize unconscious bias within the Society and its member institutions? Some actions include: inviting diversity experts to speak and run workshops at the ASBMB annual meeting, providing diversity and inclusion materials for members to take back and use in their academic institutions, creating "red-flag" mechanisms and procedures for members to clarify instances of perceived bias, and implementing open evaluation systems and policies for selecting individuals for ASBMB distinguished awards.

Conclusion

As the American workforce becomes increasingly diverse, inspiring and capturing the minds of under-represented talent will be crucial to ensuring a successful future for ASBMB and the biochemistry and molecular biology communities. The promotion of a diverse scientific community will increase our capacity to answer future scientific challenges that plague our society. Involvement of ASBMB members is critical to promoting an inclusive and collaborative environment within our field. This will ensure that ASBMB can maintain and extend its leadership role in the biochemistry and molecular biology communities and continue to advocate for innovative and cutting-edge scientific research. Unless unconscious biases and other barriers to inclusion within our communities are addressed, our standing as scientific leaders in the 21st century will be jeopardized.

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From inside the Lab to inside the Beltway

BY CARRIE WOLINETZ

My boss sometimes jokes that I owe my career to the racehorse, Seabiscuit. I had moved to Washington, D.C. to finish writing my thesis, eager to find an opportunity to transition from the lab bench into a career in science policy. In between struggling to read my own handwriting in my lab notebook and wrestling with the perfect formatting of tables, I spotted an ad in the *Washington Post* for a science policy analyst at the Federation of American Societies for Experimental Biology (FASEB). In many ways, it was my dream job, and I thought I had no chance at all of being hired, but with my resume and cover letter ready to go, I decided to apply. Within a few hours, I had an interview, and it was during this interview that I was asked what books I had read lately. As I was reading a junky science fiction novel at the time, I fumbled to come up with another recent read before blurting out, *Seabiscuit*—a book I had enjoyed and was able to discuss. Little did I know, the director of the office had once owned racehorses, and my answer certainly caught his attention. In actuality, my background as an animal scientist and reproductive physiologist were a good fit for the policy issues the position was to cover, namely animal research and stem cells, and I had had experience with one of FASEB's member societies as a member and volunteer. In any event, I got the job and have loved what I do ever since that first fateful day.

> **"I am very fortunate in that my work for FASEB allows me to explore the full breadth of science policy."**

I am very fortunate in that my work for FASEB allows me to explore the full breadth of science policy. Mostly, I act as a liaison between the biomedical research community and the federal government. On some days, I spend a lot of time interacting with members of Congress or (more likely) their staff, working on specific pieces of legislation or just providing them with information about the needs of biomedical scientists.

Much more of my time is spent generating and communicating information: conveying the potential impact of what's going on in Washington to the scientific community or providing input to policymakers based on the views of the researchers I represent. This might include analyzing how a new regulation on animal research will affect scientists, following trends in research funding, or developing comments in response to a new policy proposal on security requirements for labs. I also communicate the importance of biomedical research to a variety of audiences through the writing of op-eds, educational articles, letters, and position papers. Although I still specialize in issues related to animal research, stem cells, and homeland security. My job has evolved over time to

Wolinetz

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incorporate a larger management and communication responsibility, which means that I have worked at some point on nearly every policy issue that FASEB follows.

Though I continue to find science policy to be a rewarding and challenging career choice, I could never have predicted that this is where I would end up. I actually started out as a zookeeper and entered Cornell University's animal science program thinking I would be a veterinarian. I dabbled briefly in primate behavioral research before deciding that because I liked teaching and working in the lab, I should become an academic researcher. Working on my Ph.D., I quickly learned that although I still loved science, many facets of academic bench research were just not appealing. But, for a long time, I didn't feel comfortable admitting that I had perhaps made the wrong choice.

When I made the decision to leave the lab, panic quickly set in—I had spent all these years training to be a researcher; what do I do now? It was while casting about for career options that I stumbled on the policy fellowships offered by the American Association for the Advancement of Science (AAAS), which are designed to provide federal policy opportunities for doctoral-level scientists. Reading the description of the fellowship was a "Eureka!" moment for me. I had never heard of a career in science policy previously, but the AAAS policy fellowship appealed to both my strengths and interests. Unfortunately for me, the deadline to apply was in January, and I would not be defending my thesis until May.

Undeterred, I threw myself fully into pursuing a career in science policy. Fortunately, my thesis advisor and committee members were supportive and allowed me to take advantage of opportunities that would add to my policy experience. As a member of the Society for the Study of Reproduction (SSR), I volunteered for the society's public policy committee, where I first became familiar with FASEB (SSR is a FASEB society member). At the university level, I volunteered for anything that sounded remotely "policy-esque" including the graduate student government and department curricular committee. As mentioned earlier, when my work in the lab was completed, I packed my bags and moved to Washington where I began to do informational interviews, talking to current science policy professionals about available opportunities.

"At the university level, I volunteered for anything that sounded remotely "policy-esque" including the graduate student government and department curricular committee."

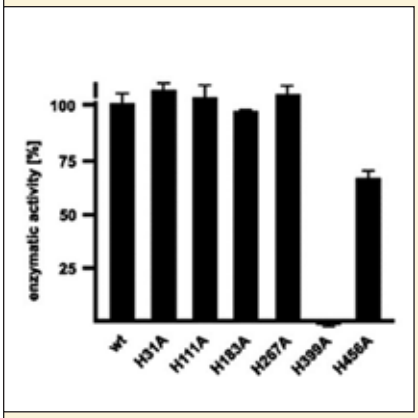
I never feel that I am wasting my science degree; in fact, I use the skills I learned during my Ph.D. nearly every day. I am still doing research and presenting my conclusions, although I now use different databases. I represent the biomedical researchers I serve well, because I understand the culture and scientific world in which they make their livelihoods. The translational ability honed from years of teaching is useful when explaining complicated scientific concepts to policymakers or the public.

However, there are key differences between my former life and current career as well. Many policy positions in the nation's capitol are staff jobs, which means you often exist as the person behind the leadership of the organization rather than the one who receives public credit. I spend much of my time ghost writing, and although I have been published many times in prestigious venues, my name never appears—a far cry from the "publish or perish" philosophy of scientific research. Writing for a variety of audiences, in fact, occupies a large portion of my time, and translating the world of science for non-scientific audiences is one of the most rewarding, and sometimes frustrating, parts of a science policy career.

I have never liked the phrase "alternative career" and strongly believe that while my path here was non-linear, it made sense every step of the way. There are occasional days when I miss being able to go to work in jeans and a sweatshirt. But those are vastly outnumbered by the days when I know I've made a crucial difference in a bill or regulation that will affect scientists nationwide, by the excitement of interacting with Nobel Laureates or powerful lawmakers, or the satisfaction of introducing a policymaker to the wonder of scientific discovery. I am serving science, and researchers, better than I ever could have with a pipette in my hand.

A Convergence of *O*-Acetylation

Neisseria meningitidis serogroup C is a human pathogen responsible for numerous cases of meningitis and sepsis worldwide. This particular serogroup is protected by an outer capsule of α2,9-linked polysialic acid that is further modified by *O*-acetylation. OatC, the enzyme that does the acetylating, shares no sequence similarities with other proteins, which led the authors of this study to purify recombinant OatC and perform a detailed characterization. They combined biochemistry, genetics, and *in silico* structural analysis to reveal that OatC belongs to the α/β-hydrolase fold family; the authors also identified the Ser-Asp-His catalytic triad and proposed a ping-pong model for the catalytic mechanism. This combination distinguishes OatC from all other bacterial sialate *O*-acetyltransferases known so far; other enzymes in this group belong to the hexapeptide repeat family and employ a different fold and reaction mechanism. These results suggest that sialate *O*-acetylation evolved independently in microorganisms using two distinct frameworks.



A radioactive incorporation assay of mutants of each OatC histidine identifies His-399 as a key catalytic residue.

The Polysialic Acid-specific *O*-Acetyltransferase OatC from *Neisseria meningitidis* Serogroup C Evolved Apart from Other Bacterial Sialate *O*-Acetyltransferases

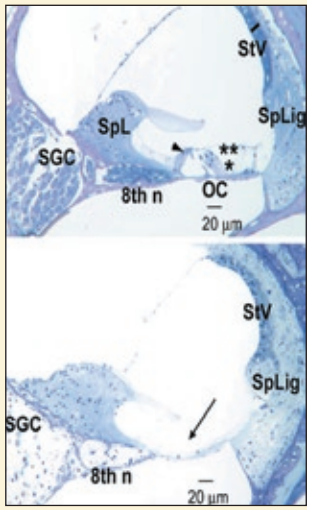
Anne K. Bergfeld, Heike Claus, Nina K. Lorenzen, Fabian Spielmann, Ulrich Vogel, and Martina Mühlenhoff

J. Biol. Chem. 2009 **284**, 6–16

jbc

Polyamines and Hearing

The polyamine spermine is essential for normal development in mammals, though the actual function of spermine has not been clearly established. Male gyro (Gy) mice, which have an inactive spermine synthase gene, display a host of abnormalities, including defects in hearing. As reversible hearing loss has also been reported as a side effect of the polyamine inhibitor α-difluoromethylornithine (DFMO), the authors of this study decided to study the role of spermine in auditory physiology more closely. They found that Gy mice had an almost complete loss of endocochlear potential in their ears, likely brought on by improper function of auditory potassium channels (K^+ channel regulation is a well documented role for polyamines). This defect resulted in total deafness but could be reversed through the expression of a spermine synthase transgene. Gy mice also had a profound toxic response to DFMO; within three days of exposure, they exhibited a catastrophic loss of balance, followed shortly by death. Like the hearing loss, death could also be prevented through transgenic spermine expression. This study underscores the importance of polyamines in maintaining proper hearing and balance.



A cross-section of the Scala media from a control (*top*) and gyro (*bottom*) mouse cochlea.

Spermine Synthase Deficiency Leads to Deafness and a Profound Sensitivity to α-Difluoromethylornithine

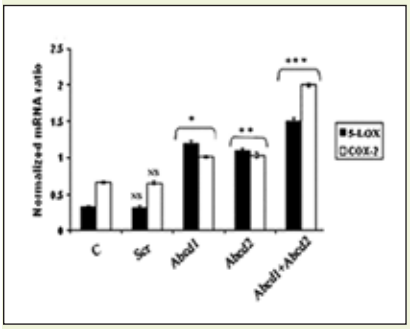
Xiaojing Wang, Snezana Levic, Michael Anne Graton, Karen Jo Doyle, Ebenezer N. Yamoah, and Anthony E. Pegg

J. Biol. Chem. 2009 **284**, 930–937

jbc

The ABCDs of Neuroinflammation

X-linked adrenoleukodystrophy (ALD) is a metabolic disorder arising from mutations in the ABCD1 gene, leading to defects in the peroxisomal oxidation of very long chain fatty acids (VLCFAs) and their subsequent accumulation. In cerebral ALD, VLCFA accumulation induces neuroinflammation that leads to a loss of oligodendrocytes and myelin and significantly shortens lifespan. In this study, the authors provide some of the first evidence linking the metabolic defects and the onset of inflammation. They found that siRNA-mediated silencing of ABCD1 and related ABCD2 genes in mouse primary astrocyte cultures resulted in VLCFA accumulation and induction of an inflammatory response characteristic of human cALD. ABCD silencing resulted in increased expression of COX-2, inducible nitric oxide synthase (iNOS) and several cytokines, and this response was mediated by transcription factors NF-κB, AP-1, and C/EBP.



siRNA silencing the Abcd1 and Abcd2 genes increases the expression of inflammatory agents 5-lipoxygenase (5-LOX) and cycloxygenase-2 (COX-2) compared to controls or cells given scrambled RNA.

Correcting the metabolic defect in the astrocytes using monoenoic fatty acids (Lorenzo's Oil) could downregulate the inflammatory response, thus pointing to a relationship between VLCFA accumulation and inflammation.

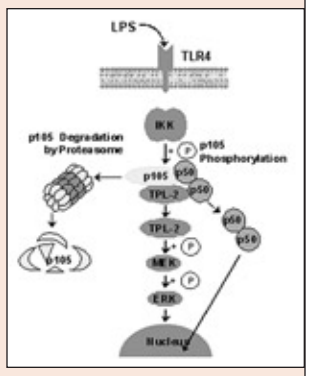
Silencing of Abcd1 and Abcd2 Genes Sensitizes Astrocytes for Inflammation: Implication for X-adrenoleukodystrophy

Jaspreet Singh, Mushfiquddin Khan, and Inderjit Singh

J. Lipid Res. 2009 **50**, 135-147

Analyzing Macrophage Rafts

Lipopolysaccharide (LPS), a glycolipid found on the outer membrane of Gram-negative bacteria, is a potent initiator of the innate immune response in macrophages and contributes to numerous diseases including sepsis, asthma, and atherosclerosis. LPS selectively recruits its downstream signaling proteins in cholesterol-rich membrane microdomains called lipid rafts. These rafts can be isolated as detergent-resistant membranes (DRMs), and the authors of this study combined this property with the power of proteomics to identify the events occurring in macrophage rafts during LPS exposure. Using a SILAC (stable isotope labeling with amino acids in cell culture)-based liquid chromatography-tandem mass spectrometry approach, they found that LPS causes selective activation of the proteasome in macrophage rafts and proteasome inactivation outside of rafts. Immunoblotting of DRMs revealed proteasome-dependent activation of MEK and ERK occurring in lipid rafts as well as LPS-enhanced proteasomal activity upon raft-localized p105 and that addition of the raft-disrupting agent nystatin could block this LPS-activated ERK cascade. Together, these findings indicate a critical and selective role for raft compartmentalization and proteasome regulation in the activation of the MEK-ERK pathway.



A schematic representation of the role of the proteasome in the regulation of LPS-activated ERK pathway

Quantitative Proteomics Analysis of Macrophage Rafts Reveals Compartmentalized Activation of the Proteasome and of Proteasome-mediated ERK Activation in Response to Lipopolysaccharide

Suraj Dhungana, B. Alex Merrick, Kenneth B. Tomer, and Michael B. Fessler

Mol. Cell. Proteomics 2009 **8**, 201-213

Joan Steitz: Advancing the Cause of Non-Coding RNA

BY NICK ZAGORSKI

While scientific research continually expands, alters, or even completely reverses what we think we know about molecules, cells, or organisms, there have always been some indisputable principles that guide scientists in preparing their experiments and interpreting their results.

Yet even these facts, often referenced as scientific dogma, can be challenged. Joan Steitz remembers firsthand one such instance when she was visiting one of her colleagues, Tom Cech, whose lab had been working on intron splicing in messenger RNA. "We were sitting over lunch, discussing some problems with his RNA, which was still being spliced in the absence of protein," she says. "And Tom kept wondering how some protein managed to remain in the samples because that could be the only logical answer. After all, we all knew that only proteins could act as enzymes."

As Cech soon realized, and as we now know, the RNA itself catalyzed the splicing, which brought forth the concept of ribozymes and made everyone rethink the dogma of enzymes.

And while Steitz was not directly involved with ribozymes, she has been one of the most instrumental researchers in reshaping the role of RNA from simple "genetic middleperson" to "vital functional entity." Her groundbreaking discovery of small nuclear ribonucleoproteins (snRNPs) helped spur subsequent advances in RNA splicing and ribozyme biology, and her scientific excellence continues to this day with her work on the biogenesis and gene regulation of microRNAs.

Along the way, Steitz, currently the Sterling professor of Molecular Biophysics and Biochemistry at the Yale School of Medicine and an HHMI investigator, has broken a dogma of a different sort. Growing up in a time when women did not advance in academia, Steitz, who has been awarded numerous honors and awards, including the extremely prestigious National Medal of Science, has been a shining example of just how faulty that belief was.

Small in Size, but Not in Stature

While Steitz has earned a well-earmarked place in history, she isn't one prone to looking back, not when a promising journey beckons ahead. "I've always thought that you have to be extremely passionate about discovery if you're going to spend a lot of time at the bench," she says. "And this RNA world still requires a good deal of exploration."

One case in point Steitz highlights is that of microRNAs, the ~20-30-nucleotide-long RNA fragments that help regulate gene expression. Although the discovery a decade ago that these short snippets could attach to messenger RNA and shut down protein translation was monumental in its own right (and along with the pioneering RNA interference studies, helped return RNA to scientific prominence), the story of microRNAs is far from over.

"It hasn't really pervaded the scientific community yet," she says, "but we are now realizing that microRNAs can positively regulate gene expression and not just inhibit translation as first reported." Steitz and her postdoc Shobha Vasudevan have recently published work detailing how a well-known microRNA called *let-7* can activate translation during cell growth arrest, but repress the same genes during cell proliferation, indicating that these small but increasingly complex molecules are integral in cell cycle control.

But microRNAs are not alone in the RNA world. With some estimates suggesting that 90 percent of the human genome is transcribed in some way (into coding or non-coding RNA), Steitz and other RNA researchers have a plethora of possibilities to choose from. Today, Steitz' s lab tackles a wide range of studies in addition to microRNAs, from processing of the 3'-end of histone messenger RNAs, which lack the polyA tails commonly associated with mRNA transcripts, to how small RNAs encoded by some herpes viruses interact with host proteins to promote disease progression.

"Scientists are starting to piece together clues as to how all these diverse transcripts get made and turned over," she says, "but we're still at a point where we are just beginning to understand what's going on with RNA."

Adding Seats to the RNA Table

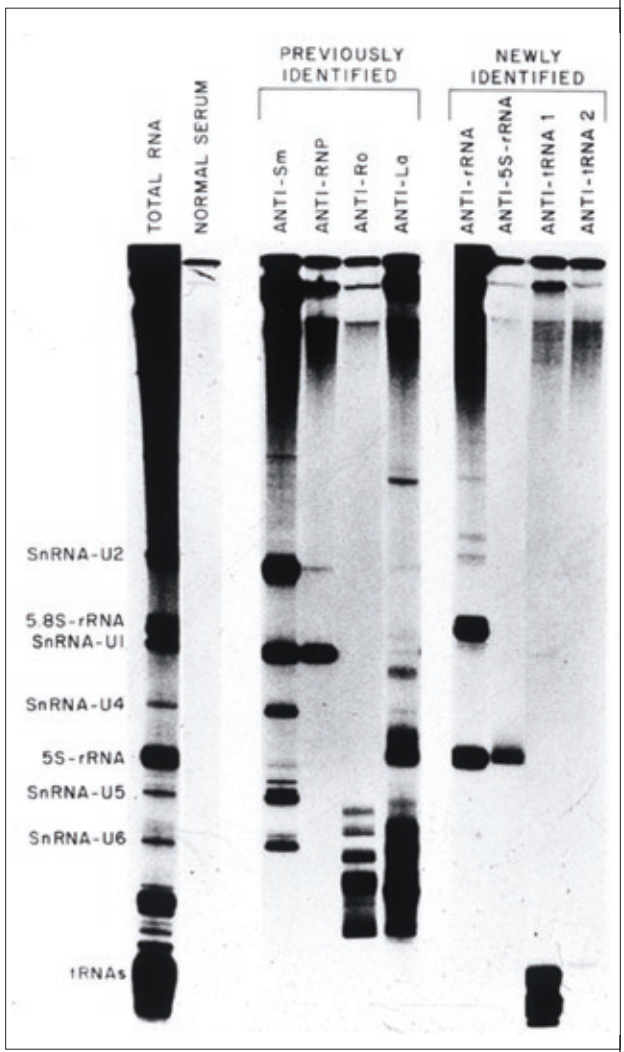
Steitz's comments are a far cry from the scientific perception of 30 years ago, when researchers thought they had a fair handle on RNA. As she notes, "Most everyone knew about the three 'textbook' classes of RNA—messenger, ribosomal, and transfer, and that's all there was to it." Steitz, however, was among those who believed that RNA molecules must have some other roles, especially considering the abundance of RNA present in the nucleus of eukaryotic cells, only a small portion of which was exported to the cytoplasm to fulfill one of RNA's three known functions. In many cases, small RNA molecules associated with nuclear proteins, though the significance, if any, of these complexes was unknown.

Steitz hoped to study these proteins in more detail, but unfortunately could not raise antibodies against them. However, through a literature search and conversations with colleagues, Steitz came upon a potential breakthrough in the blood of individuals with the autoimmune disease lupus; patients with lupus harbored antibodies against an obscure nuclear substance called RNP (ribonuclear protein, so named because its activity could be abolished by RNase or trypsin) in their blood.

Together with graduate student Michael Lerner, Steitz used these lupus antibodies to identify and characterize five protein complexes, each of which contained a small piece of RNA, 100–200 nucleotides long, that was specific to that complex; thus, in 1979, snRNPs were born.

Around the same time Steitz was defining snRNPs, other researchers were demonstrating that newly transcribed eukaryotic messenger RNA comprised both gene-coding exons and non-coding introns which needed to be removed to yield the mature mRNA. For Steitz, a connection between snRNPs and this RNA splicing seemed clear, and soon her lab showed that indeed, snRNPs were vital for this process.

Other groundbreaking work in this area soon followed. While the five snRNPs initially uncovered by Steitz comprise the primary RNA-editing spliceosome, she subsequently identified other, less prevalent snRNPs that formed a second spliceosome, which edits out rare variant introns with nonstandard sequences. Her lab also found yet another class of snRNPs localized within the nucleolus (snoRNPs) that act in cleaving and modifying pre-



A representative example of some of the immunoprecipitation studies that Steitz has used to identify numerous small nuclear RNAs, such as (shown here) the major spliceosome components U1, U2, U4, U5, and U6.

ribosomal RNA to generate the functional products.

And as for the small RNA molecule nestled within each snRNP? "That was probably the most exciting realization of those experiments," Steitz says. "We discovered that the spliceosome (a larger complex of snRNPs and other protein factors that comes together) recognizes the junctions between introns and exons by means of RNA-RNA base pairing."

With a Little Help from James…

While the identification of RNA pairing in snRNPs was exciting, it wasn't completely surprising to Steitz, as she had discovered such a phenomenon previously, a breakthrough she acknowledges as perhaps the top highlight of her recognized career, and one that began her long love affair with non-coding RNA. This particular story began back in 1963 and features the most unlikely of characters, Nobel winner and double-helix discoverer James Watson.

That fall, Steitz began her biochemistry graduate studies at Harvard and later joined the research group of Watson, becoming his first female graduate student. It may seem like a difficult situation, being surrounded entirely by men, including one who has been perceived as sexist in some discussions; but, contrary to expectations, Steitz had a tremendous experience. "The Watson who was my mentor was far different than the man who may have commented about 'all the pretty undergraduate girls' in his book," she says. "He held a very professional standard in running his lab, and his belief was that everyone should be treated equally. He was definitely an inspiration for my continued success in science."

…she never envisioned she would someday rise to become one of the nation's most respected scientists

Watson introduced Steitz to the world of RNA in the form of bacteriophage R17 (a virus that replicates its proteins directly from its RNA template). While in his lab, Steitz studied the structure and function of a viral messenger RNA, which was a useful experimental model of protein synthesis in general. In 1967, she took that knowledge to her postdoctoral fellowship at the Medical Research Council (MRC) Laboratory in Cambridge, where she ended up in the division headed by Watson's partner, Francis Crick. Here, Steitz produced one of her first major discoveries, teasing out the three translation start points on bacteriophage R17 RNA, a finding that enabled her and her colleagues to identify the start and stop locations for all three genes of the R17 genome.

After setting up her own laboratory at Yale, Steitz decided to take on the challenge of uncovering how the messenger RNA worked together with ribosomes to initiate protein synthesis. "After all, even the tiny R17 viral genome has numer-

Out of Focus

Improved technology is usually a good thing and that's no exception in the molecular biology world (just ask any researcher what it was like manually sequencing DNA 20 years ago). But Steitz does point out that technology did keep microRNAs in the dark longer than they probably should have been. "Researchers were seeing microRNAs on their gels way back in the day," she says, "but since they were small and heterogeneous, they migrated at the front of the gel, and we naturally assumed they were a degradation product." Of course, Steitz is sure some enterprising scientist, through insight or luck, would have uncovered the truth, but then change happened. "Starting in the late 1970s, we went from direct methods of looking at RNA, actually labeling the molecules and seeing all the species present, to indirect Northern Blots, which only probe the RNA you are looking for. So microRNAs became essentially invisible for the better part of a decade." Fortunately, a combination of genetic analysis in *C. elegans* and the emergence of RNA interference eventually brought the truth to light.

ous potential AUG start codons," she notes. Just how do ribosomes identify the legitimate ones? The answer, as she deduced, was through recognition of specific sequences surrounding the AUG codon by the 3' end of the 16S ribosomal RNA fragment.

…and Joseph

Given all her accomplishments, it may come as a surprise to hear that when Steitz was growing up in 1950s' Minnesota, she never envisioned she would someday rise to become one of the nation's most respected scientists. She certainly enjoyed studying science at Antioch College in Ohio and even worked in several labs as part of a work-study program, but she knew that in the real world, only men ran scientific labs. "That was the atmosphere of the times," she says. "A woman excelling in science was an impossible route, so you didn't even think about starting it."

As an alternative, Steitz decided to pursue medicine. "Back then, I knew of a few female physicians," she says wryly, "so while it would be a difficult career, at least it was possible." Steitz therefore applied, and was accepted, at Harvard Medical School. The summer after graduation, she returned to her family home in Minneapolis and took a laboratory job at the University of Minnesota. Ostensibly, the job was to pass the time, save some money, and give Steitz one last hurrah at the bench.

However, a funny thing happened in the lab of cell biologist Joseph Gall; "In all my previous lab jobs, I was always assisting someone else, carrying out experiments they had designed," she says. "But Joe gave me my own project (Steitz explored whether ciliary basal bodies in *Tetrahymena* might contain their own DNA, like mitochondria) and the freedom to pursue it." Steitz became enthralled with research even more so than before and decided that despite the odds, she would try to succeed in science.

"That experience is the reason why I always give undergraduates in my lab their own project," she says. "Having a project that only moves forward if the student moves forward instills a better appreciation of research, and it may encourage them to continue in science." However, Steitz believes the bigger turnoff for prospective Ph.D.s occurs before many get into a lab, namely the size and anonymity of introductory biology courses and their associated "cookbook style" lab courses. "After all, who enjoys competing against 200 other—mostly pre-med—students?"

Speaking of medicine, Steitz was still scheduled to attend Harvard in the fall, and it was too late to apply elsewhere. Fortunately, Gall contacted his colleague Watson and found out that one of the incoming students in that year's graduate program in Biochemistry and Molecular Biology had decided not to attend, and Steitz was given the open slot, setting the stage for her to become the sole woman in that year's graduate class—a first step in her pioneering career.

The Long Road Ahead

Today, Steitz remains somewhat amazed at how far both she—and society—have come. "When I'm watching old movies from the 1950s or 1960s, I am still shocked by the portrayal of women in that era," she says. "The remarks and portrayals gave a clear message: women were not meant to be taken seriously."

However, while Steitz provides an excellent example of what women in scientific academia *can* achieve with dedication and hard work, she acknowledges that the path facing female scientists still bears many obstacles. "We've made great forward progress, though not enough. For years now, half of all science Ph.D.s have been women, yet currently only 15 percent of full professors are female," she notes, further adding that this discrepancy is not just an American problem; for all the talk of progressive European culture, their female professor rates are not much better than in the U.S.

Still, she remains optimistic about the future, citing some recent newsworthy events. "I remember when I was overseas at Cambridge, the women's movement began to take hold in the U.S., and while it did not address science *per se*, it did permeate to academia and improve female opportunities. Now, in addition to breaking a color barrier, this past election also highlighted the national potential of women in politics, and hopefully this progress will spread to academia as well."

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scientific meeting calendar

FEBRUARY 2009

Gordon Research Conference—Plant Lipids: Structure, Metabolism, & Function
FEBRUARY 1–6, 2009
GALVESTON, TX
www.grc.org/programs.aspx?year=2009&program=plantlipid

Molecular Targets for Cancer Prevention Conference
FEBRUARY 4–5, 2009
BETHESDA, MD
web.ncifcrf.gov/events/cancerprevention/2009/default.asp

The 14th Annual Proteomics Symposium
FEBRUARY 6–8, 2009
LORNE, AUSTRALIA
www.australasianproteomics.org

Pacific Lipid Association 3rd Annual Scientific Forum
FEBRUARY 20–22, 2009
SALT LAKE CITY, UT
www.lipid.org

US HUPO 5th Annual Conference
FEBRUARY 22–25, 2009
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E-mail: ushupo@ushupo.org
Tel.: 505-989-4876

Keystone Symposium–Complications of Diabetes and Obesity
FEBRUARY 24–MARCH 1, 2009
VANCOUVER, BRITISH COLUMBIA
www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=998

2nd International Conference on Advanced Technologies & Treatments for Diabetes (ATTD)
FEBRUARY 25–28, 2009
ATHENS, GREECE
www.2.kenes.com/attd/Pages/home.aspx

Biophysical Society 53rd Annual Meeting
FEBRUARY 28–MARCH 4, 2009
BOSTON, MA
www.biophysics.org/2009meeting

MARCH 2009

Deuel Lipid Conference
MARCH 3–6, 2009
BORREGO SPRINGS, CA
www.deuelconference.org

Enabling Technologies for Structural Biology
MARCH 4–6, 2009
BETHESDA, MD
meetings.nigms.nih.gov/?id=4931

Gordon Conference on Oxidative Stress & Disease
MARCH 8–13, 2009
LUCCA, ITALY
www.grc.org/programs.aspx?year=2009&program=oxidat

5th International Charleston Ceramide Conference (CCC5)
MARCH 11–15, 2009
CHARLESTON, SC
ceramide.musc.edu/conference

ACS Spring National Meeting & Exposition
MARCH 22–26, 2009
SALT LAKE CITY, UT
www.acs.org/meetings

APRIL 2009

3rd International Congress on Prediabetes and the Metabolic Syndrome—Epidemiology, Management, and Prevention of Diabetes and Cardiovascular Disease
APRIL 1–4, 2009
NICE, FRANCE
www.kenes.com/prediabetes

ASBMB Annual Meeting
APRIL 18–22, 2009
NEW ORLEANS, LA
www.asbmb.org/meetings.aspx

Keystone Symposium—Complex Lipids in Biology: Signaling, Compartmentalization, and Disease
APRIL 22–27, 2009
OLYMPIC VALLEY, CA
www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=961

Arteriosclerosis, Thrombosis, and Vascular Biology Annual Conference
APRIL 29–MAY 1, 2009
WASHINGTON, D.C.
www.americanheart.org/presenter.jhtml?identifier=3057022

The Stadtman Symposium—A Gathering to Honor Earl
APRIL 29, 2009
BETHESDA, MD
dir.nhlbi.nih.gov/stadtmansymposium/Default.aspx

2009 NLA Scientific Sessions
APRIL 30–MAY 3, 2009
MIAMI, FL
www.lipid.org

MAY 2009

Lipidomics Impact on Cell Biology, Structural Biochemistry and Immunopathology: 6th LIPID MAPS Annual Meeting
MAY 6–7, 2009
LA JOLLA, CA
www.lipidmaps.org

American Thoracic Society International Conference
MAY 15–20, 2009
SAN DIEGO, CA
www.thoracic.org

57th ASMS Conference on Mass Spectrometry
MAY 31–JUNE 4, 2009
PHILADELPHIA, PA
www.asms.org
E-mail: office@asms.org
Tel.: 505-989-4517

JUNE 2009

VIII European Symposium of the Protein Society
JUNE 7–11, 2009
ZURICH, SWITZERLAND
Organizer: Andreas Plückthun (University of Zurich)
www.proteinsociety.org

21st American Peptide Society Symposium
JUNE 7–12, 2009
BLOOMINGTON, IN
www.21staps.org

Cancer Proteomics 2009
JUNE 8–12, 2009
DUBLIN, IRELAND
www.selectbiosciencies.com/conferences/files/Agendas2009/CP2009_Agenda.pdf

3rd EuPA Meeting—Clinical Proteomics
JUNE 14–17, 2009
STOCKHOLM, SWEDEN
www.lakemedelsakademin.se/templates/LMAstandard.aspx?id=2529

VII European Symposium of the Protein Society
JUNE 14–18, 2009
ZURICH, SWITZERLAND
www.proteinsociety.org

XV International Symposium on Atherosclerosis
JUNE 14–18, 2009
BOSTON, MA
www.isa2009.org

International Conference on Cytochrome P450
JUNE 21–25, 2009
OKINAWA, JAPAN
www.p450meetings.com

Gordon Research Conference: Atherosclerosis
JUNE 21–26, 2009
TILTON, NH
www.grc.org/programs.aspx?year=2009&program=athero

SEB at Glasgow 2009
JUNE 28–JULY 1, 2009
GLASGOW, SCOTLAND
www.sebiology.org/meetings/Glasgow/glasgow.html

Gordon Research Conference: Stress Proteins in Growth, Development, & Disease
JUNE 28–JULY 3, 2009
ANDOVER, NH
www.grc.org/programs.aspx?year=2009&program=stressprot

JULY 2009

Gordon Research Conference: Molecular & Cellular Biology of Lipids
JULY 19–24, 2009
WATERVILLE VALLEY, NH
www.grc.org/programs.aspx?year=2009&program=lipids

23rd Annual Symposium of the Protein Society
JULY 25–29, 2009
BOSTON, MA
www.proteinsociety.org

Protein Lipidation, Signaling, and Membrane Domains
JULY 26–31, 2009
SAXTONS RIVER, VT
src.faseb.org

AUGUST 2009

ACS Fall 2009 National Meeting & Exposition
AUGUST 16–20, 2009
WASHINGTON, D.C.
www.acs.org/meetings

Kern Aspen Lipid Conference
AUGUST 22–25, 2009
ASPEN, CO
www.uchsc.edu/kernconference

18th International Mass Spectrometry Conference
AUGUST 30–SEPTEMBER 4, 2009
BREMEN, GERMANY
www.imsc-bremen-2009.de

SEPTEMBER 2009

World Congress on Oils and Fats and 28th ISF Congress
SEPTEMBER 27–30, 2009
SYDNEY, AUSTRALIA
www.isfsydney2009.com

OCTOBER 2009

3rd ESF Functional Genomics Conference
OCTOBER 1–4, 2009
INNSBRUCK, AUSTRIA
www.esffg2008.org

Bioactive Lipids in Cancer, Inflammation, and Related Diseases (11th International Conference)
OCTOBER 25–28, 2009
CANCUN, MEXICO
www.bioactivelipidsconf.wayne.edu

NOVEMBER 2009

20th International Symposium on Glycoconjugates
NOVEMBER 29–DECEMBER 4, 2009
SAN JUAN, PR
www.glyco20.org

APRIL 2010

ASBMB Annual Meeting
APRIL 24–28, 2010
ANAHEIM, CA
www.asbmb.org/meetings.aspx

JUNE 2010

8th International Conference on Hyaluronan of the International Society for Hyaluronan Sciences
JUNE 6–11, 2010
KYOTO, JAPAN
www.ISHAS.org

AUGUST 2010

14th International Congress of Immunology
AUGUST 22–27, 2010
KOBE, JAPAN
www.ici2010.org

2009 ASBMB Annual Meeting

Get Jazzed…

to Meet in New Orleans!

April 18–22, 2009

www.asbmb.org/annualmeeting.aspx

Early Registration Deadline:
February 9, 2009

ASBMB
American Society for Biochemistry and Molecular Biology