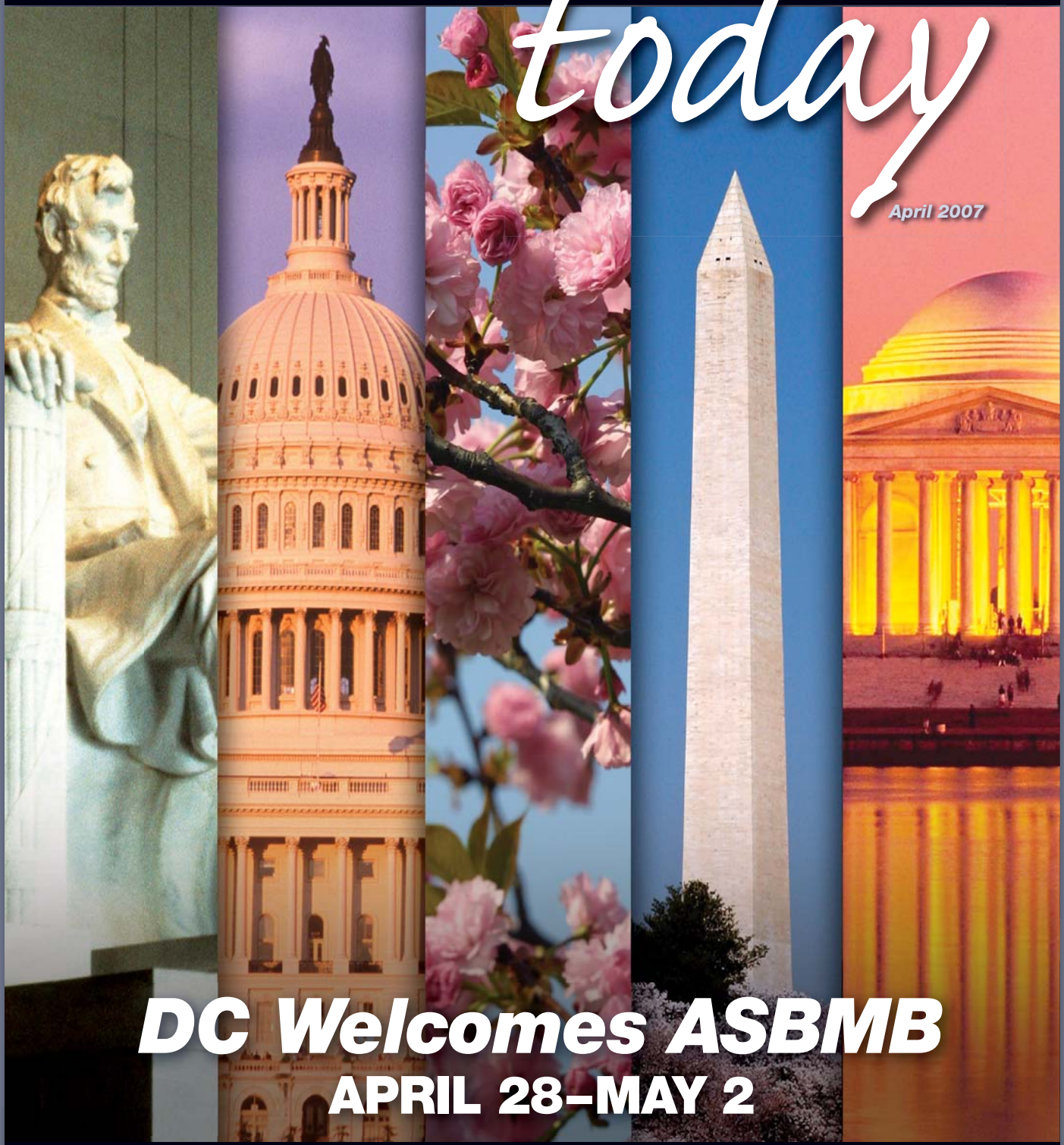
ASBMB ANNUAL MEETING PULLOUT GUIDE INSIDE

ASBMB today

April 2007



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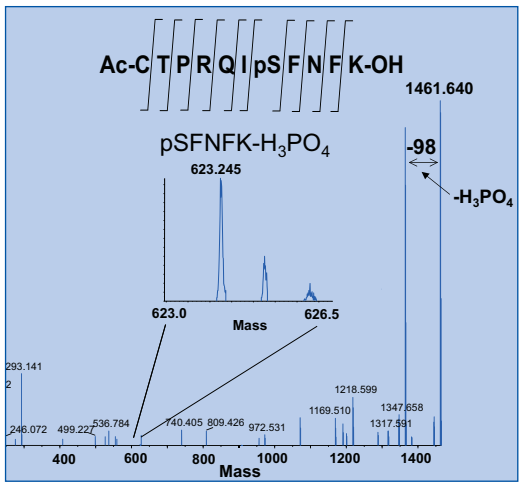

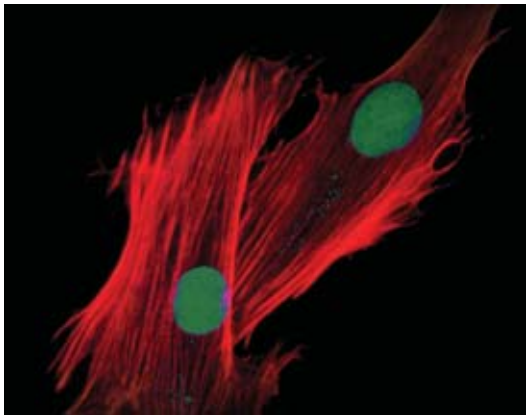

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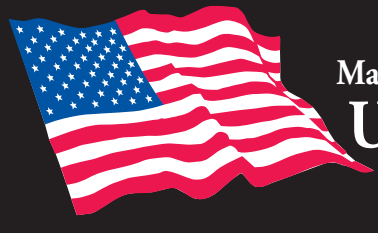

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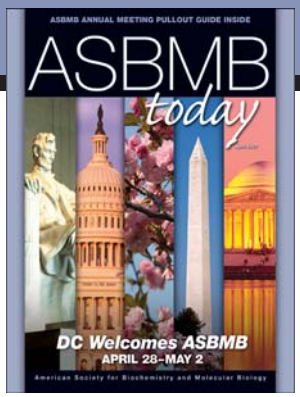

APRIL 2007

ON THE COVER: ASBMB's annual meeting will be held April 28 through May 2 in Washington, D. C. See inside for a pullout meeting guide.

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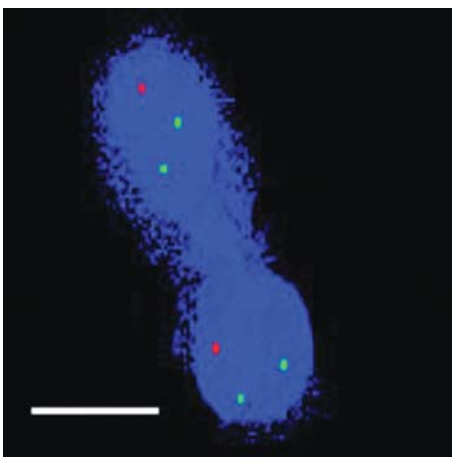

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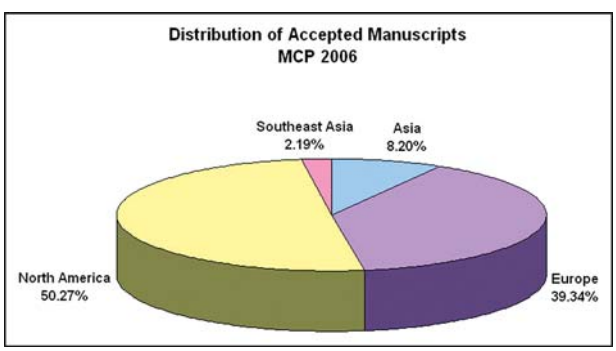

A look at ASBMB journal submission and acceptance rates. 10

letters to the editor

Teaching Interdisciplinary Science/Fostering Interdisciplinary Research

In the February 2007 issue of *ASBMB Today,* J. Ellis Bell calls attention to the importance and the dilemmas of developing interdisciplinary education within biochemistry and molecular biology (BMB). Finding solutions to the problems and obstacles that his paper refers to perhaps requires seeing them through a complementary perspective.

Levels of Integration

One often considers the issue of interdisciplinary education–also described as curriculum integration across disciplines–as an "all or none" phenomenon. This is the same as believing that there is no integration if it is not a perfect integration.

A more rich and manageable perspective perhaps considers that integration is a strenuous process of curriculum, faculty, and institutional development that must go through a series of steps until the ultimate goal–students analyzing problems with an interdisciplinary mind–is achieved. It is like defining that it is best to know where we are about the primary structure of a protein without moving hastily to understand how its tertiary structure evolved across time.

Under this stepwise perspective of integration, one should consider the definition of levels of integration with enough detail to understand what would be a "not so difficult" next step. In this regard, all of us who teach will find a very useful resource in a key paper (R. M. Harden (2000) The integration ladder: a tool for curriculum planning and evaluation *Medical Education* **34,** (7), 551–557) that defines a "ladder of integration" with 11 steps. The ladder goes through four broad categories: from absolutely no interaction among disciplines–when the faculty pay no concern to what other courses are teaching; through courses in which faculty have made adaptations to their own disciplinary courses based on any sort of input from other disciplines; to courses where faculty from different disciplines work together on each other's courses (much like the year lab project that Bell suggests for the science major course) that remain, however, separate courses; to the final step in which the disciplines have fused into integrated courses that are structured, developed, and assessed by a multidisciplinary team of faculty (the "integrated courses" in Bell's paper). This perspective will allow for more realistic planning and monitoring of the integration process.

Changing

Bell chooses the departmental structure as the first obstacle of integration. We could add institutional history, since institutional tradition weighs much and younger schools tend to be more prone to change. It is hard to imagine that there will be interdisciplinary teaching in BMB courses if faculty do not develop interdepartmental, interdisciplinary teams. Therefore, it is important to question institutional departmental structures and define policies for change.

Given the fact that research drives faculty's efforts–since it is given more weight in decisions related to promotion or others–and given the high contemporary emphasis on interdisciplinary scientific research, one can perhaps foresee that research might drive faculty to develop interdisciplinary educational practices. In order to be more optimistic about the near future, perhaps funding agencies and committees that define rules for promotion could define policies that would stimulate the evolution along integration steps.

Manuel João Costa
Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho, Braga, Portugal

Editor's note: In addition to this letter, J. Ellis Bell has received a number of comments on his article. The responses have been generally supportive of the concepts he expressed. He looks forward to more discussion on the topics discussed in his article over the coming months.

Tell Us What You Think

We appreciate receiving letters that are suitable for publication regarding issues of importance or comments on articles appearing in *ASBMB Today*. Letters should be sent to the editor at asbmbtoday@asbmb.org. Letters must be signed and must contain the writer's addresses and telephone number.

The editor reserves the right to edit all letters.

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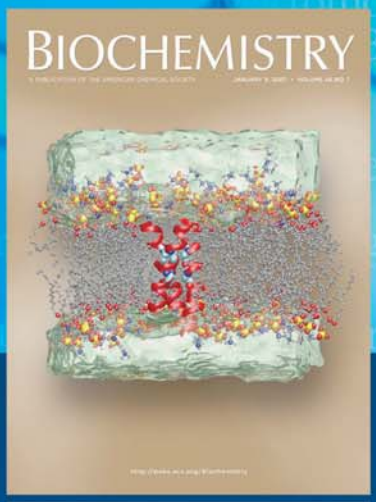

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president's message

A Feast of Public Affairs Events at EB 2007

HEIDI HAMM, PRESIDENT

One of the great advantages to holding our annual meeting in conjunction with Experimental Biology (EB) is the synergy among the participating societies that allows our members to partake of the wide variety of science in many different disciplines. This year, the advantages of meeting with EB are multiplied by our meeting in Washington, D.C. The societies participating in EB are thus taking advantage of this year's location to hold a number of public affairs-related symposia, workshops, and other sessions on both government processes and policy-related topics. A few are highlighted below.

Hill Visits

First and most important, we hope all of you will participate in a visit to Capitol Hill while you are here.

Biomedical scientists face one of the most alarming periods confronting the biomedical research enterprise in recent years. NIH funding is diminished. Success rates are declining. Politics trump science. Just four years after Congress completed the doubling of the NIH budget, the tide has turned dramatically. You can join over 10,000 of your colleagues to work to convince Congress to provide robust funding for the NIH and other scientific agencies. As a working scientist, no one is better informed or qualified than you to speak about the need to support biomedical research.

Many Members of Congress report that they never hear from our community. Research needs more champions in Capitol Hill, but that will only happen when we convince Congress that increased support for research funding makes political sense, improves public health, and helps maintain our competitiveness in the world.

The public affairs staffs of the participating societies are working to generate visits from as many EB attendees as possible. The meetings are being arranged for Tuesday and Wednesday, May 1 and 2. We hope that each of you will be able to spare an hour or two on one of those two days to meet with your member of Congress or your senators. The public affairs staff is eager to assist you in making appointments!

There is a Web site with further information on the Hill visits program. Please go to www.the-aps.org/pa/ebweb/index.htm for 1) information about making appointments, 2) a collection of advocacy materials, and 3) contact information.

If you have never met with a member of Congress and thus are worried about what to say, what to ask for, or how to behave, a training session will be held on Saturday, April 28, called "*Making the Case for Federally-Funded Research: Communicating with Congress.*" This session, organized by the American Physiological Society, will

be held from 1 to 3 p.m. If you are not able to attend this session, any of the public affairs staff can talk with you about what to do and say. ASBMB also has an advocacy Web site, which you can access from the ASBMB home page (www.asbmb.org). The link is under "What's New" and is called "*Local Advocacy – Resources ASBMB Members Can Use*."

ASBMB is also producing a training DVD on how to conduct a meeting with a member of Congress. The DVD covers common mistakes that are made during such a meeting as well as tips on avoiding such mistakes and how to make sure the meeting is successful. We expect to have copies of this DVD available at the meeting, and it will be posted on our Web site when ready.

Please give biomedical research an hour or two of your time while you are in Washington to participate in this important activity. Contact our public affairs director, Peter Farnham, for further information and assistance (pfarnham@asbmb.org).

Howard K. Schachman Public Service Award Lecture

We hope you will attend the ASBMB's Schachman Award Lecture. This award, initiated in 2000, recognizes substantial contributions to biomedical research in the public affairs arena and in the past has been awarded to the Honorable John Edward Porter, Ruth Kirschstein, and others. This year's award recognizes the organization Research!America, the first time an organization has received the recognition. Research!America's president, Mary Woolley, will accept the award on behalf of the organization. Her lecture will be held on Tuesday, May 1, from 12:30 to 1:30 p.m.

NIH at the Crossroads

Another lecture you won't want to miss is the EB-wide session "*NIH at the Crossroads: How Diminished Funds Will Impact Biomedical Research and What Scientists Can Do About It*." We are pleased to announce that NIH Director Elias Zerhouni will be sharing the stage with the Honorable John Edward Porter, for 20 years biomedical research's chief advocate in the House of Representatives before his retirement in 2000. Porter will give a legislative overview of the FY 2008 outlook for the NIH and will discuss how scientists have an obligation as citizens to become politically active and aware. He will also make suggestions for what needs to be done to make an impact on the NIH budget. Zerhouni will provide details on the current state of the NIH enterprise and offer projections based on the FY 2008 budget. This session will be held on Monday, April 30, from 12:45 to 1:45 p.m.

A variety of other public affairs sessions are being sponsored at EB by other participating FASEB societies, such as the one listed in the box below.

You can learn more about these and other public affairs sessions, including ones on the federal budget process, nutritional issues, and animal experimentation, on EB's Web site at www.eb2007.org/pages/page14a.htm.

We hope to see you in Washington, starting April 29. Please attend some of these public affairs sessions—especially ASBMB's—and don't forget to make your Capitol Hill visits!

Communicating Complicated Science

The American Society for Nutrition is sponsoring a symposium called "*Communicating Complicated Science: The Women's Health Initiative as a Case Study*." This important symposium will be held on Sunday, April 29, at 3 p.m. The session features speakers from the media and science and will address how scientists can communicate more effectively with the media.

Other sessions focus on biomedical ethics, including APS's "*Walter C. Randall Lecture on Biomedical Ethics: The Dark Side*." This session will be held on Tuesday, May 1, at 2 p.m. and features Sandra L. Titus, from the Office of Research Integrity at the Department of Health & Human Services, and David Prentice, of the Family Research Council.

NIH Director Testifies on 2008 Goals, Funding Issues

BY PETER FARNHAM

The Bush White House opened its campaign for its 2008 budget proposal for the National Institutes of Health (NIH) on March 6 when NIH Director Elias Zerhouni pleaded the administration's case before a clearly skeptical House Appropriations Subcommittee on Labor, Health and Human Services, Education, and Related Agencies. Although accompanied by a group of senior NIH institute directors, Zerhouni was the only witness. (The institute directors answered an occasional question during Zerhouni's several-hour grilling.)

Subcommittee Chairman Dave Obey (D-WI) opened the festivities with a number of shots at the budget proposal. The proposal calls for an increase at NIH of $232 million, which is almost $300 million below what Congress has already approved for 2007. It would also transfer $200 million from NIH to the Global AIDS/HIV fund, meaning that the President's proposal would in effect reduce the NIH budget by $500 million from 2007.

Obey characterized the proposal for what it was—a proposed cut. He also said that the White House Office of Management and Budget was treating NIH like the "Bank of Bethesda" by taking money from it to spend on combating AIDS and HIV worldwide. He said that this was a worthy cause, but the money should not come from NIH.

Ranking Minority Member James Walsh (R-NY) restrained himself from criticizing the financial aspects of the proposed budget but gently chided Zerhouni about making sure that research advances move more quickly into practical use as cures and therapies. He also noted that because of NIH's greatly increased budget in recent years, strong financial management was necessary.

With the preliminary congressional statements out of the way, Zerhouni began his statement by noting progress that had been made in a variety of areas in recent years, including advances in identifying and treating coronary heart disease, declining mortality rates from cancer, and improvements in treatment of diabetes, cognitive decline, and mental disorders. He also cited promising new drugs for treatment of tuberculosis, inflammatory disease, and muscular dystrophy and new knowledge and understanding of the avian flu and HIV viruses.

Regarding current problems, he cited the growing importance of chronic disease, which now consumes over 75% of health care costs. He also mentioned lifestyle changes that have caused growth in obesity rates and attendant diseases. He noted that despite medical progress, health care costs have risen more than $2 trillion and that we also will be facing the emergence of new and unpredictable threats, such as reemerging infectious diseases, bioterrorism, a worldwide HIV/AIDS epidemic, and pandemic influenza.

To deal with these threats, Zerhouni again called for medicine to move beyond the reactive mode it has followed in the past to become one of being "predictive,

personalized, and pre-emptive." He characterized this as "21st century medicine."

He then described some of the management changes made at NIH under his watch to bring about this more modern approach. First, to encourage innovation and sustain the next generation of scientists to the greatest extent possible, NIH has developed programs to support new investigators and pioneering high risk/high impact investigator-initiated research. In addition, NIH recently changed its policy of having only a single principal investigator on any NIH grant to a policy that allows multiple principal researchers to apply for a grant together. This was done to encourage collaboration across disciplines.

He also promoted the NIH Roadmap as one of a number of trans-NIH activities. He cited the Clinical and Translational Science Awards (CTSA) program, the Strategic Plan for Obesity research, the Neuroscience Blueprint, and certain managerial changes to modernize NIH governance and improve efficiency. This includes the Office of Portfolio Analysis and Strategic Initiatives (OPASI), which he characterized as "invaluable for supporting key trans-NIH initiatives being incubated through the NIH Common Fund."

NIH's budget priorities in 2008 will include preserving opportunities for young investigators; the agency intends to maintain an average of 1,500 new investigators getting their first R01-equivalent grants in both 2007 and 2008. NIH also intends to promote the "Pathway to Independence" program for 175 recently trained scientists.

Zerhouni then noted that NIH will strive to "maintain the historical balance between the critically important investigator-initiated research portfolio and agency-driven priorities. Our successful model of research is based on creative and unconstrained scientists who propose their best ideas, so we can. . . support the most promising and high quality projects. Our budget targets resources to provide as large a number of competing Research Project Grants for individual scientists as possible." He noted that the percentage of NIH's budget in FY 2008 supporting basic science is 54.1%.

NIH's budget priorities in 2008 will include preserving opportunities for young investigators

Questions Were a Mixed Bag

Most of the Subcommittee members had a variety of questions. In response to them, Zerhouni noted that:

- From a scientific standpoint, science demands that researchers pursue all avenues of stem cell research, including human embryonic stem cell research. He also clarified that some of the claims that adult stem cells had been reprogrammed into pluripotent cells were exaggerated; although some of this research was promising, there was a great deal that was still not understood.
- Narrowing health disparities between minority and majority populations is a top priority of the agency.
- Only 50% of NIH grants get renewed, and fewer than 5% of scientists hold onto an NIH grant for 20 years or more.
- NIH is working very hard to promote translational research, even though funding clinical trials is becoming increasingly difficult because of their expense and increasing regulatory burden.
- In response to a question about open access, Zerhouni agreed with the principle of not damaging peer review and promised to submit more information about this in writing for the hearing record.
- Regarding taking money out of the NIH to support the Global AIDS/HIV fund, Tony Fauci, director of the National Institute of Allergy and Infectious Diseases, noted that how to fund this program was up to congressional appropriators.
- There is a decrease in disability among the elderly, but the rate of obesity in children is very worrisome.
- Exercise is important for children for a variety of reasons related to obesity and possibly to mental health.
- While funding for the National Children's Study was cut from the 2007 budget, Obey noted that it would be restored but not taken from other NIH funds. He also commented extensively on the impact of cuts over the long term.

A complete copy of Zerhouni's presentation, including the slides he used, is available at www.nih.gov/about/director/budgetrequest/fy2008directorsbudgetrequest.htm.

Peter Farnham, CAE, is ASBMB's public affairs officer.

FASEB

A New Model for USDA-funded Research?

BY CARRIE D. WOLINETZ

The reauthorization of the Farm Bill, which will occupy much of the summer, has provided Congress with a potential platform to restructure research funding through the United States Department of Agriculture (USDA). Currently, three proposals have been put forward, with more undoubtedly to come as the Congressional agriculture committees debate how best to invest in fundamental and applied agricultural research. For research advocates, it provides a possible opportunity to generate a reinvigorated funding stream for basic life science research at an agency where competitive research has long been neglected.

The first proposal aimed at restructuring USDA's research portfolio arose in 2004 as the result of a report published by a USDA task force that recommended establishment of a National Institute of Food and Agriculture (NIFA) to fund competitive, fundamental research in agriculture. FASEB supported this proposal, which was championed by William Danforth, chair of the originating task force. The NIFA concept has gone through a number of legislative reiterations, having been the subject of a series of bills that would have placed the new research entity at either USDA or under the purview of the National Science Foundation. While the independent NIFA bills never moved out of the congressional committees to which they had been referred, the research title of the Farm Bill presents an opportunity in a must-pass piece of legislation to fulfill the task force's vision.

In anticipation of this year's Farm Bill activities, two other proposals have arisen to reinvent USDA's research portfolio. The first is from the White House, as part of the Administration's Farm Bill proposal, and would consolidate the intramural research arm of the USDA, the Agricultural Research Service (ARS), and the division that oversees the extramural grants program, the National Research Initiative (NRI). This plan, which was unveiled in early February by Secretary of Agriculture Mike Johanns, would place the consolidated agencies under the oversight of a newly created chief scientist, who would report to a newly established undersecretary of science. Unlike the NIFA proposal, the Administration's plan does not emphasize competitive research (on the contrary, it reserves the Administration's right to target research) and does not provide for significant additional funding, although there is a modest increase.

The third and final proposal is called "Create Research, Extension, and Teaching Excellence for the 21st Century" or CREATE-21 and is the brainchild of the National Association of State Universities and Land-Grant Colleges (NASULGC). CREATE-21 would result in a major restructuring of the USDA, consolidating not only the extramural and intramural research programs but also the Economic Research Service and Forestry Research programs. The consolidated programs would be reformed as the National Institutes of Food and Agriculture, a model seemingly similar to the National Institutes of Health (NIH) in that there would be multiple institutes representing different research areas, such as the Institute of Food and Health or the Institute of Natural Resources and Environment. The proposal calls for a significant increase in authorized funding, up to $5.35 billion, approximately 70% of which would go towards competitive grant awards. Like the NIH director, the head of the CREATE-21 version of NIFA would be appointed by the President.

It is unclear which of these three proposals will most likely appeal to Congress as they move forward with development of the Farm Bill. Sen. Tom Harkin, chair of the Senate Agriculture Committee, is the author of the legislation that would establish NIFA, as suggested by the Danforth Task Force, within the USDA. However, NASULGC is dedicating considerable resources to market CREATE-21, and the Farm Bill presents a unique opportunity to make this sort of dramatic change. Regardless, the profile of fundamental research in agriculture has certainly been raised, and any of these proposals could potentially increase the pool of federal dollars available for research.

Carrie D. Wolinetz is with the FASEB Office of Public Affairs.

Review of 1918 Pandemic Flu Studies Offers More Questions than Answers

Scientists and public health officials, wary that the H5N1 avian influenza virus could trigger an influenza pandemic, have looked to past pandemics, including the 1918 "Spanish Flu," for insight into pandemic planning. However, in an article in the April 1 issue of the *Journal of Infectious Diseases*, David M. Morens and Anthony S. Fauci of the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, conclude that studies of the 1918 influenza pandemic, which killed some 50–100 million people around the globe, have so far raised more questions than they answer.

In their article, Morens and Fauci review several topics, including the origins of the 1918 pandemic influenza virus, the excess mortality of the pandemic, the predilection to kill the young and healthy, the lower than expected mortality among the elderly, and the regular occurrence of influenza pandemics over the past 100 years. Such topics are relevant today as highly pathogenic H5N1 avian influenza viruses have spread from Asia to the Middle East, Europe, and Africa.

Morens and Fauci predict that, if a pandemic with similar characteristics were to occur in the near future, the relative number of deaths would be substantially lower than in 1918.

"Almost all 'then *versus* now' comparisons in theory are encouraging," they write. "In 2007, public health is much more advanced, with better prevention knowledge, good influenza surveillance, more trained personnel at all levels, well established prevention programs featuring annual vaccination with up to date influenza and pneumococcal vaccines, and a national and international prevention infrastructure." In addition, two classes of antiviral drugs are currently available, as are antibiotics effective against bacteria that cause influenza-associated pneumonia.

The most difficult challenge in mitigating the effects of a severe pandemic today would be to ensure access to medical care and resources, they note. Hospitals, medical personnel, and drug suppliers could be overwhelmed with huge demands for services, medicines, and vaccines, a situation that would be exacerbated in less developed countries and impoverished regions.

Fauci and Morens conclude that the best hope for the future lies in developing and stockpiling more broadly protective influenza vaccines. In the meantime, prevention efforts should be directed toward logistical planning, increased surveillance, the development of medical countermeasures, an improved understanding of pandemic risks, and an aggressive and broad research agenda.

NIH Director Launches Program for Innovative New Investigators

NIH Director Elias A. Zerhouni has announced a special program to fund new investigators who propose highly innovative research projects that could have an exceptionally great impact on biomedical or behavioral science. The NIH Director's New Innovator Award offers grants of up to $1.5 million in direct costs over five years.

The application period opens on April 25 and closes on May 22, 2007. NIH expects to make at least 14 awards in September 2007.

New investigators who have not yet obtained an NIH R01 or similar grant are eligible to apply. Applicants must hold an independent research position at an institution in the United States and must have received a doctoral degree or completed a medical internship and residency in 1997 or later.

"We want proposals in a broad range of scientific areas relevant to the NIH mission and from a diverse pool of applicants," Zerhouni said. "We're shortening the application and emphasizing the significance of the research, what makes the approach exceptionally innovative, how the applicant will address challenges and risks, and the applicant's qualifications for the grant. We aren't requiring applicants to present preliminary data, although we'll allow it if they choose to do so," he added.

More information and application instructions can be found at grants.nih.gov/grants/new_investigators/innovator_award/.

ASBMB Journal Snapshot: Submitted

BY NICOLE KRESGE

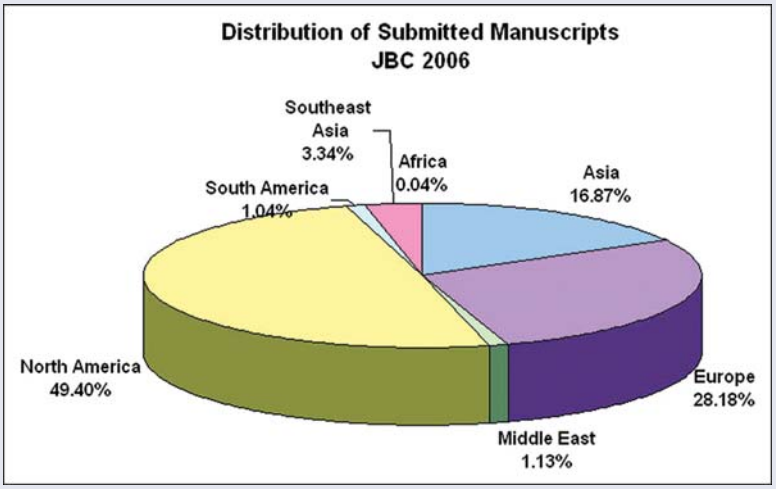
This is the first in a series of reports on data from the *Journal of Biological Chemistry* (*JBC*), the *Journal of Lipid Research* (*JLR*), and *Molecular and Cellular Proteomics* (*MCP*). In this report we look at manuscript submission and acceptance rates for the three journals by geographic region.

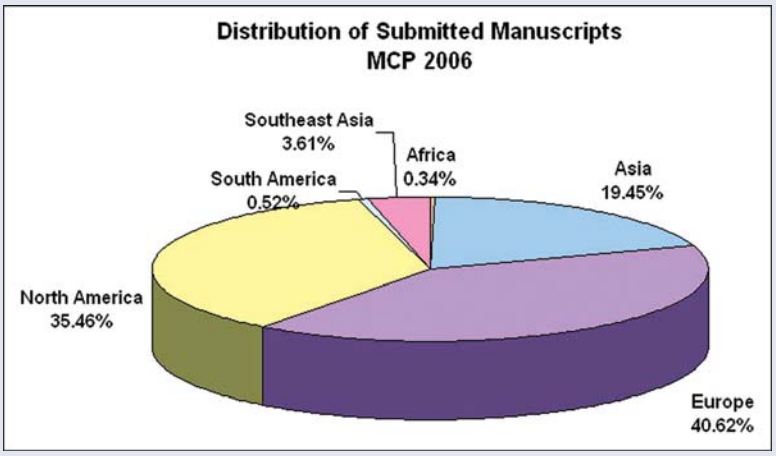
In 2006, *JBC* received 12,442 manuscripts and accepted 4,295, resulting in an acceptance rate of 34%. Over the same time period, *JLR* received 677 manuscripts for review and accepted 296, or 44% of the submitted articles. *MCP* received 581 manuscripts and accepted 183, resulting in an acceptance rate of 32% in 2006.

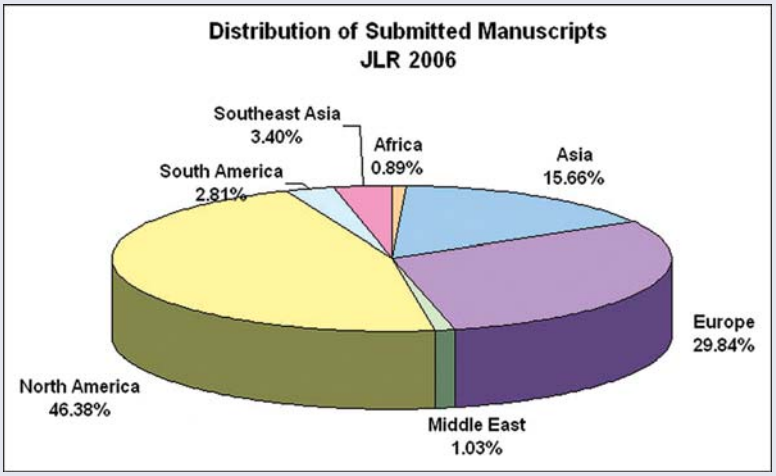
The countries submitting manuscripts in 2006 were divided into the following seven geographic areas: Africa, Asia, Europe, the Middle East, North America, South America, and Southeast Asia. For all three journals, the top three geographic regions for manuscript submissions were North America, Europe, and Asia. Both *JBC* and *JLR* received the majority of their manuscripts from North America, but *MCP* received the largest percentage of its manuscripts from Europe.

"Proteomics has always been strong in Europe; it is one of the areas of biomedical research that enjoys real parity around the world," says Ralph Bradshaw, co-editor of *MCP*. "We find this healthy for science in general and the field of proteomics in particular."

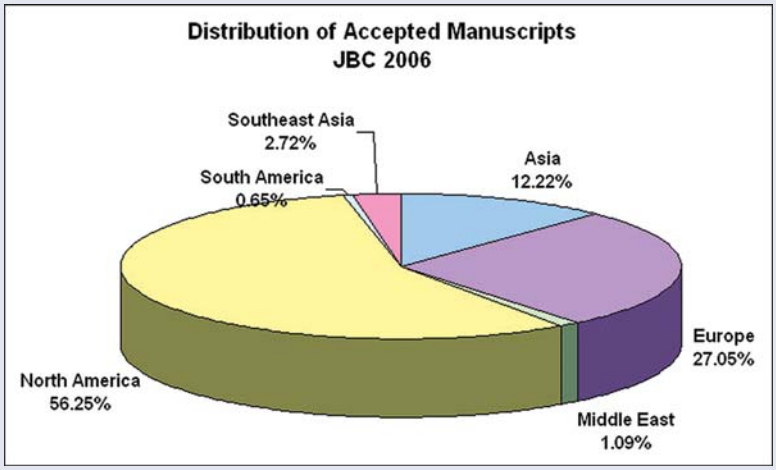
The distribution of accepted manuscripts was similar for all three jour-

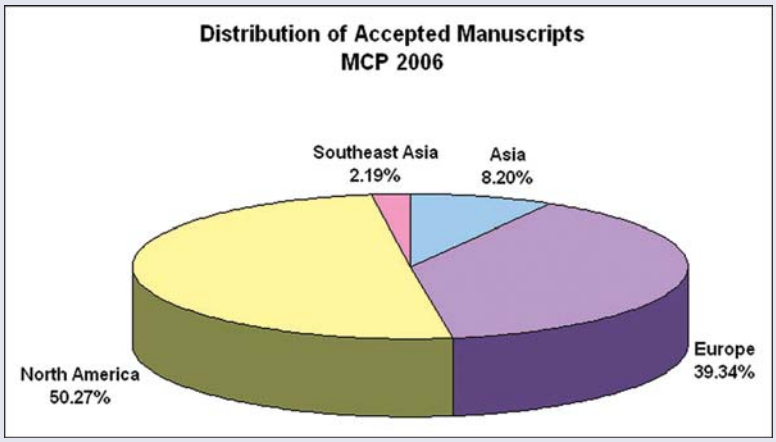


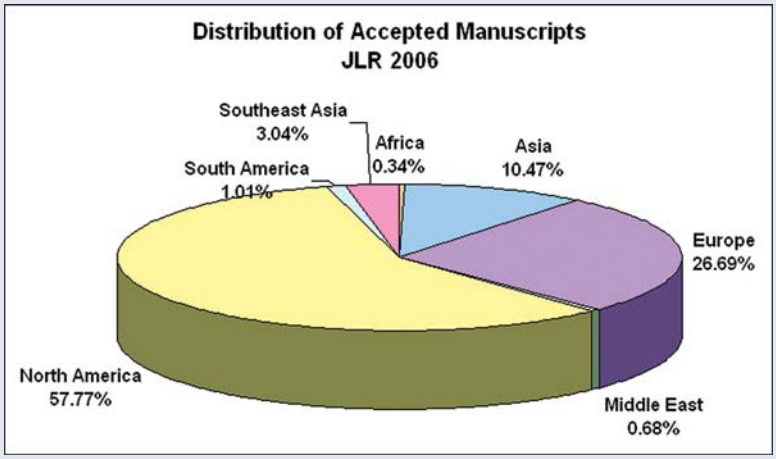




and Accepted Manuscripts by Region







nals, with the highest number of accepted manuscripts coming from North America, followed by Europe and then Asia. Among the top three geographic regions, North America had the highest manuscript acceptance rate and Asia had the lowest rate for all three journals. So, papers from North America were more likely to be accepted than papers from Asia. The acceptance rate for *JBC* manuscripts from North America was 39%, Europe was 33%, and Asia was 25%. For *JLR*, the numbers were 54% (North America), 39% (Europe), and 29% (Asia). And for *MCP*, the numbers were 45% (North America), 30% (Europe), and 13% (Asia).

"The low acceptance rate for manuscripts from Asia may reflect a know-how gap between Asian scientists and their western counterparts in terms of scientific presentation and language skills such as the clarity of their writing," says Duanqing Pei of ASBMB's Guangzhou, China, office.

In an effort to minimize these barriers, ASBMB has begun to offer language assistance for authors who are not native English speakers. The ASBMB journal Web sites provide links to companies that supply revising, editing, and proofreading services for scientific and medical research documents. These services can help maximize the accuracy and impact of the manuscripts and aid in communicating ideas to fellow scientists and the journals' editors and reviewers.

Highlights from the ASBMB

As reported in the March issue of ASBMB Today, the Society is publishing a selection of ASBMB journal articles of particular interest to scientists in Asia. Each article that appears in this compendium will include a commentary summarizing the article and the article's significance. Following are summaries for two of these reports.

Sorting Nexin 10 Induces Giant Vacuoles in Mammalian Cells

J. Biol. Chem., Vol. 281, Issue 48, 36891–36896, December 1, 2006

Baoming Qin, Miao He, Xiao Chen, and Duanqing Pei

The Guangzhou Institute of Biomedicine and Health, Chinese Academy of Sciences, Guangzhou, China

Sorting nexins or SNXs are a family of approximately 30 genes containing a conserved PX domain capable of binding phosphoinositides such as PtdIns 3-phosphate (PI3P). Several SNXs have been well studied and shown to be involved in the trafficking of internalized receptors such as epidermal growth factor receptor (EGFR). However, many SNXs encoded in the human genome have not been isolated or characterized.

Many SNXs encoded in the human genome have not been isolated or characterized

This recent paper from a new group in the SNX field reports the surprising finding that the expression of SNX10 in several mammalian cell lines causes the formation of striking vacuoles visible under light microscope. These vacuoles appear to be from endosomes and early lysosomes. The drug brefeldin A can inhibit the formation of these vacuoles, suggesting that the vacuolation process is also dependent on the Golgi complex. The vacuolation activity of SNX10 should be dependent on its ability to bind phosphoinositides, as a mutation in the putative PX domain rendered SNX10 impotent in generating the giant vacuoles.

These experiments suggest that the observed activity of SNX10 may be physiologically relevant despite the fact that giant vacuoles form only when cells are transfected with exogenous SNX10. In addition, no other SNXs tested by the authors appear to induce these giant vacuoles. This report clearly suggests that the intracellular organelle system in mammalian cells is regulated by protein activities, as is true in many other cellular systems. However, the protein/gene systems for organelle morphogenesis or biogenesis remain poorly understood in basic cell biology at present. Further studies into SNX10-induced vacuole formation or related observations may lead to fundamental discoveries concerning endosome dynamics in particular and intracellular organelle formation in general.

Confocal image of an MCF7 cell expressing SNX10, a novel sorting nexin with a conserved phosphoinositide 3-phosphate (PI3P) binding motif.

Asian Compendium

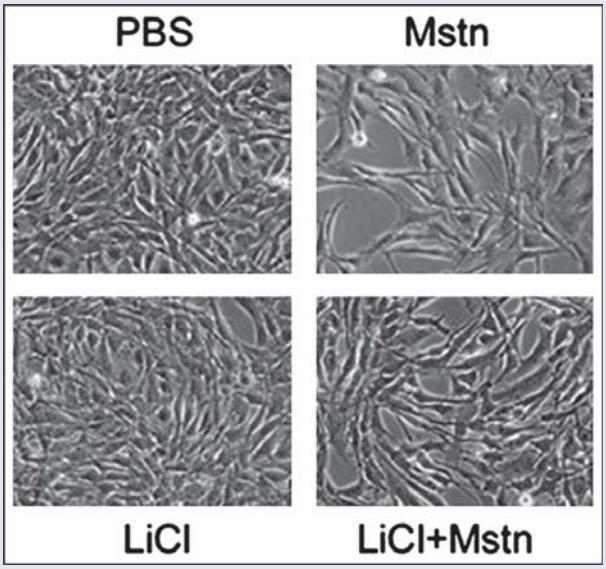
Myostatin Induces Cyclin D1 Degradation to Cause Cell Cycle Arrest through a PI3K/Akt/GSK-3β Pathway and is Antagonized by IGF-1

J. Biol. Chem., Vol. 282, Issue 6, 3799–3808, February 9, 2007

Wei Yang[‡], Yong Zhang[‡], Yanfen Li[‡], Zhenguo Wu[§], and Dahai Zhu[‡¶]

[‡]Chinese Academy of Medical Sciences and Peking Union Medical College, [¶]Harbin Institute of Technology, Harbin, China and [§]Hong Kong University of Science & Technology, Clearwater Bay, Kowloon, Hong Kong, China

Myostatin (also known as Growth and Differentiation Factor 8), a transforming growth factor β superfamily member, is highly expressed in the developing and adult skeletal muscle. Myostatin-deficient mice are characterized by marked hypertrophy and hyperplasia of skeletal muscle. Similar increases in skeletal muscle mass are evident in naturally occurring mutations of myostatin in cattle and humans.



GSK-3β kinase activation is required for myostatin-induced cyclin D1 degradation and proliferation suppression.

Therefore, there is considerable interest in manipulating myostatin's biological activity and understanding the cell processes it regulates. It has been reported that myostatin is able to arrest the cell cycle of myoblasts in the G_1 phase and that it negatively regulates myogenic differentiation. However, the detailed mechanisms whereby myostatin inhibits cell proliferation and differentiation are still largely unclear. This paper provides experimental evidence to show that in C2C12 cells, myostatin and insulin growth factor (IGF)-1 act in concert to regulate cell growth and cell death through a common PI3K-Akt-GSK-3β signaling pathway.

Myostatin promotes cyclin D1 degradation and thus the down-regulation of CDK4 activity, a process dependent on GSK-3β, the activin receptor IIB, and the PI3K/Akt pathway. IGF-1 treatment or Akt activation, resulting in GSK-3β phosphorylation and thus its inactivation, attenuated the myostatin-stimulated cyclin D1 degradation and repression of cell proliferation. Data also suggest that attenuation of IGF-1 signaling causes cell death in response to myostatin.

These findings are clearly important to our understanding of how myostatin influences cell proliferation and how cyclin D1, a key component of the cell cycle machinery, is regulated at the protein level. This manuscript also highlights cross-talk between two important regulatory pathways (TGFβ and PI3K/Akt) in the cell. This is an extremely logical and well executed study. On the whole, the authors have performed elegant experiments to provide data that well support their claims. Overall, this is a very strong paper addressing an important question in a quite physiological setting.

These findings are clearly important to our understanding of how myostatin influences cell proliferation

asbmb member spotlight

Please submit news about yourself and other ASBMB members to asbmbtoday@asbmb.org

Blau Re-elected to IOM Council

Helen M. Blau, Donald E. and Delia B. Baxter Professor of Molecular Pharmacology and director of the Baxter Laboratory in Genetic Pharmacology at Stanford University, was recently re-elected to the Institute of Medicine's (IOM's) Governing Council and appointed to the Ellison Medical Foundation's Scientific Advisory Board.

The Institute of Medicine, based in Washington, D.C., is a not-for-profit organization that advises the federal government on issues related to biomedical science, medicine, and health. Blau, who has served on the IOM Council since 2004, has been elected for a second three-year term as a member of the council's Executive Committee, which provides oversight for all of IOM's activities.

The Ellison Medical Foundation, based in Bethesda, Maryland, supports basic biomedical research on aging and infectious diseases and stimulates new, creative research that might not be funded by traditional sources or that is often underfunded. Blau has been appointed to serve for two years to the foundation's Scientific Advisory Board, which monitors progress of research funded by the foundation.

Blau's research activities include understanding how stem cells work and the molecular mechanisms involved in RNA interference–a mechanism by which short RNA fragments inhibit the expression of genes.

Aebi Receives Honorary Doctorate

Ueli Aebi, professor of structural biology and director of the M. E. Muller Institute for Structural Biology at the University of Basel, Switzerland, received an honorary doctorate from Charles University in Prague, Czech Republic.

The honorary degree was awarded for Aebi's contributions in understanding supramolecular protein assemblies by using various techniques–including light, electron, and scanning probe microscopes; x-ray crystallography; and rational protein design–and for his continuous support of Czech science and education as well as his many charitable activities.

Since 1986, Aebi has built a world-class structural biology department at the University of Basel that integrates x-ray crystallography, NMR spectroscopy, and light, electron, and scanning-probe microscopes. He has worked on cytoskeleton structures, the nuclear pore, and the formation of amyloids–protein deposits found in the brains of individuals with Alzheimer and Parkinson diseases. Aebi's team is now working on nanosensors and nanoactuators that could be used in minimally invasive medical interventions.

In 1981, Aebi co-founded Protek, Inc. to develop, manufacture, and sell hip and knee prostheses in North America, and in 2003, he co-founded Therapeomic, Inc., a company that develops drug delivery techniques and therapies for tissue repair using growth hormones. In 2004, Aebi became president of the Basel Tumor Bank Foundation, which administers one of the largest breast tumor databases and conducts work on expression profiling of breast tumors aimed at individualized diagnosis of cancer patients.

Marletta Wins Esselen and Kaiser Awards

Michael A. Marletta, Aldo DeBenedictis Distinguished Professor of Chemistry and professor of Biochemistry and Molecular Biology at the University of California, Berkeley, received the American Chemical Society's (ACS's) 2007 Gustavus John Esselen Award for Chemistry in the Public Interest and the Protein Society's 2007 Emil Thomas Kaiser Award.

The first award, established to honor the memory of Gustavus John Esselen, a distinguished member of ACS's Northeastern Section, recognized Marletta's work in the biology of nitric oxide biology and malaria and his communication of chemical research to nonscientific audiences.

The second award, presented in the memory of Emil Thomas Kaiser, a pioneering bioorganic chemist, acknowledged Marletta's contribution in applying chemistry to the study of proteins.

Marletta's research focuses on the biochemistry of nitric oxide, a gas that regulates blood pressure, the immune system, and the transmission of nerve impulses in the brain. Because nitric oxide exists for mere seconds in the body before being chemically transformed into other substances, its role was unknown until 1985 when Marletta published one of the first scientific papers documenting how nitric oxide is produced in mammalian cells.

Marletta's discovery has led to new treatments for infants with pulmonary hypertension and drugs–such as Viagra–that treat male erectile dysfunction.

Genentech Patent Revoked by Government

The Patent and Trademark Office has decided to revoke a controversial patent held by San Francisco-based Genentech.

The patent covers techniques for making the monoclonal antibody Synagis, used to stimulate the immune system of infants with Respiratory Syncytial Virus (RSV) infections.

The suit to invalidate the patent was brought in a Los Angeles court in 2003 by MedImmune, although it had agreed to pay royalties to Genentech in 1997 to manufacture, use, or sell Synagys.

MedImmune said Genentech had violated antitrust laws by seeking to extend patent protection by 12 years with Celltech, a British biotechnology company.

The Los Angeles court dismissed these charges, saying that the settlement between Genentech and Celltech had been legally approved and that MedImmune could not sue Genentech because it already had licensed the rights to use the patent.

In January, that latter claim was rejected by the Supreme Court, which ruled that a patent license doesn't have to be breached to be challenged in court.

The recent decision by the patent office agreed with MedImmune that the patent could not be extended and should have expired in 2006.

Canada Announces AIDS Initiative

On February 20 Canadian Prime Minister Stephen Harper and billionaire philanthropist Bill Gates announced a major joint initiative to support a new effort to accelerate the development of an HIV/AIDS vaccine.

Called the Canadian HIV Vaccine Initiative (CHVI), this new endeavor will receive up to $111 million from the Canadian government and up to $28 million from the Bill and Melinda Gates Foundation.

CHVI will support Canadian researchers and institutions in working with international partners to discover new HIV vaccine candidates, manufacturing promising vaccine candidates for trials, and addressing policy, regulatory, and social issues related to HIV vaccine development. The initiative will also support research priorities identified in the Global HIV Vaccine Enterprise scientific strategic plan. CHVI also complements the Canadian government's existing funding of the International AIDS Vaccine Initiative and the African AIDS Vaccine Programme.

AstraZeneca Digitally Signs FDA Applications

U.S. drug giant AstraZeneca has become the first company to submit digitally signed drug reporting documents to the U.S. Food and Drug Administration. The London-based firm uses a technology called Signatures and Authentication for Everyone (SAFE), which provides a secure way to verify the identity of the parties involved in the transaction.

The SAFE digital signature standard allows companies to perform completely paperless transactions, which could help pharmaceutical companies bring critical therapies to market more quickly than previously possible.

The SAFE standard was designed by a non-profit consortium of pharmaceutical and health care companies, including Bristol-Myers Squibb, GlaxoSmithKline, Johnson & Johnson, Merck, Pfizer, Proctor & Gamble, and Sanofi-Aventis.

Although companies have been capturing data electronically for the past two decades, one of the main roadblocks to going paperless has been the lack of a tamperproof way to sign documents. The new standard not only helps verify that a document has not been tampered with but also confirms that a transaction has actually occurred and authenticates the signature of the person who signed the document.

British Agency Calls for Drug Pricing Overhaul

The Office of Fair Trading (OFT), the British consumer regulating agency, called for an overhaul of drug pricing to potentially save the National Health Service (NHS)–the British equivalent of the U.S. Department of Health and Human Services–money spent on branded prescription drugs and encourage private companies to invest in drugs that have the greatest benefits for patients.

The OFT argued that the prices of a number of drugs are "significantly out of line with the benefit they provide to patients." These drugs include treatments for cholesterol, blood pressure, and stomach acid.

The OFT recommends replacing the current price regulation scheme, in which companies are free to set their own prices within broad profit constraints, with a pricing scheme in which NHS spends money on medicines that have the most therapeutic benefits to patients. The OFT estimates that the new plan would save NHS about £500 million, or $967 million, out of the £8 billion it spends annually on branded prescription medicines.

Over time, value-based pricing would give companies stronger incentives to invest in drugs for medical conditions with the greatest patient need, the OFT says. If NHS adopts the new plan, it will join Sweden, Australia, and Canada, which have already implemented value-based pricing and reimbursement systems.

China Takes Aim at Fake Drugs and Food Safety

The Chinese government will review production licenses for 170,000 drugs distributed in China between 1999 and 2002 in an effort to reorganize its drug market and will introduce a new food safety law to prevent distribution of food containing toxic and carcinogenic substances.

The decision to review drug production licenses follows an investigation by Chinese Premier Wen Jiabao into allegations that the former head of China's State Food and Drug Administration, Zheng Xiaoyu Zheng, took bribes related to public distribution of fake drugs.

Fake drugs have killed dozens of Chinese citizens in the past years. In 2004, at least 13 babies died from malnutrition in Anhui province after drinking "fake" milk made of powder with no nutritional value, and a 33-year-old man was recently accused of making fake versions of the bird flu drug Tamiflu.

Also, toxic and potentially carcinogenic substances have been found in the past few years in various food items, including honey, eggs, and fish. A new food safety law will be introduced by the Chinese government on May 1 mandating fines of up to 30,000 yuan, or $3,876, for those held responsible of distributing potentially unsafe food, the Chinese Ministry of Commerce said.

Cheap Test for Parkinson Disease

Scientists at the University of Melbourne's Howard Florey Institute, Australia, have developed a cost-effective diagnostic test for some forms of Parkinson disease (PD), which will also help researchers identify the genes that cause this debilitating condition.

Currently, no diagnostic test for the disease is available, and doctors rely on their observations to make a diagnosis, which means some patients may not be prescribed the most suitable medication.

Justin Rubio, senior research officer, has created a "gene sequencing chip" that screens, at once, 17 genes–including the six known Parkinson disease genes–for $500. The current test costs $4,000. Rubio said the chip would allow for routine testing of people suspected of having PD.

"As the test is relatively cheap and only involves collecting a sample of blood or saliva, it could also be made available to the patient's relatives and those at risk of developing PD," Rubio added.

Rubio and colleagues from hospitals and research institutes in the states of Victoria and Tasmania plan to test the chip on DNA samples from 400 people with the disease who were recruited from both states.

"In addition to being a diagnostic tool, this low cost chip will allow researchers to undertake an Australia-wide gene mapping study to identify further genes that are involved in PD," Rubio said.

LAURA MALISHESKI:

In Pursuit of Happiness: My Transition from Neuroscientist to Career Counselor

My thesis advisor once described me as a "pit bull" because once I attack a problem, I don't let go until it's solved. This is often a laudable trait for a scientist. However, for me, an electrophysiologist with day-long experiments and a success rate of 10–15%, this unflagging persistence led to a great deal of frustration, anxiety, and even misery. Ironically, it was the misery–generated by my life experience as a graduate student and postdoc–that prepared me the most for my eventual transition to career counseling for graduate students and Ph.D.s.

In my current work as a career counselor, I often ask graduate students about their initial motivations for entering a Ph.D. program. Common responses include being strongly influenced by a professor, taking the path of least resistance (*i.e.* the logical next step after a B.S. in Biology), and fear of searching for a job in the "real world." In retrospect, these were all reasons underlying my decision to pursue a Ph.D., although I was also overflowing with the energy and ideas of an academic, and I was truly passionate about neuroscience.

During my third year in the neuroscience program at a major research university, I began to question my decision to pursue a Ph.D. My self-esteem had begun to erode, and I felt that I couldn't compete with my peers who were all brilliant and self-assured. A fellow graduate student told me about the "imposter syndrome"–a pernicious feeling that I am not as smart as everyone seems to think I am and that someday I am going to be revealed as a fraud. My friend assured me that most graduate students can't help but feel insecure and inferior while being surrounded by the intellectual elite, even though they may still appear confident. Bolstered, I persevered and managed to make it through grad school with a few publications, a prestigious grant, and a dissertation and a successful defense.

A year prior to my finishing, I was faced with a question I couldn't escape: Should I continue my career as a scientist or embark on a new career? I questioned whether I was unhappy because my thesis project was particularly difficult and frustrating or whether it was experimental science in general that wasn't my forte. Reasoning that I was still intrigued by the overarching theme of my research (developmental emergence of synaptic plasticity and learning), I decided to give myself another chance in science. I arranged what seemed to be the best postdoctoral position possible. I left sea slugs behind and studied neural mechanisms of song learning in zebra finches. I learned a variety of new techniques, published, presented at scientific meetings, and landed another grant.

Anyone looking at my CV would have thought I had a chance at a successful career as an academic scientist. For a while, I thought so, too. Not long after I had signed the pay back agreement on my fellowship, I finally had the courage to face the truth: I was on the wrong path. What a bind! I now had two more years as a postdoc, trapped by my own accomplishments, forcing myself to perform experiments that turned out to be equally as frustrating as my thesis research had been.

Those two years turned out to be, at alternating moments, the most depressing and the most exciting times of my life. I was plagued by lack of motivation–a pit bull who had to force herself to bite! But at the same time, I began to try to imagine myself in a different career, and I had an incredibly supportive family who never believed me when I moaned

Laura Malisheski received her Ph.D. in Neuroscience from a prestigious Research I university in the Northeast. She is currently a career counselor for graduate students and Ph.D.s at another Research I institution.

that I had no skills and was trained only to be a scientist.

Taking advantage of my relatively flexible work schedule, I began to research "alternative careers" for scientists. I read about dozens of different paths Ph.D.s had taken, attended panels and seminars on nonacademic careers, and talked endlessly with my friends and colleagues, many of whom, I discovered, were equally questioning their situations and exploring nonacademic options too. After several months of casual exploration, I still hadn't discovered my dream career. I was fascinated by all of the careers that I had read about, but I just didn't want to do ANY of them!

I stumbled upon some "self-assessment" exercises in a book for scientists preparing for a career transition ("Career Renewal" by Stephen Rosen and Cynthia Paul). This was really the beginning of my career overhaul. I began to assess my skills, interests, and values, and I discovered two important things about myself: 1) I really did have a lot more skills to offer the world than pipetting and electrophysiological recording, and 2) I had been spending so much of my energy developing skills that I didn't enjoy that I was forced to suppress my natural abilities such as my interpersonal communication skills. Finally, I had learned to appreciate the skills that truly motivated and energized me: talking with people about their problems, organizing events, and teaching and presenting information.

Within 10 minutes of our conversation, I had a revelation: I wanted to do what she did!

At last, I ventured to the career office to talk with a professional career counselor who became a wonderful mentor and friend. Within 10 minutes of our conversation, I had a revelation: I wanted to do what she did! The counseling session morphed into an informational interview, and I realized that career counseling, especially with grad students and Ph.D.s, was the perfect career for me. That day, I proposed a volunteer internship (6–10 hours/week) in which I would sit in on some counseling sessions and help plan a career fair. Through my relationships in this career office, I learned of the position that I now hold.

I still find it amazing that this Office of Career Services hired me (is that the old imposter syndrome speaking?). While I had strong application materials, life experience, and strong recommendations, I could not offer a degree in counseling or any real counseling experience. I think what really cinched the offer was my interviews. I was able to sincerely portray someone who really understood the pressures and concerns of young academics–I had embarked on an academic career, survived grad school, and engaged in my own career transition process that mirrored the approach that they espoused.

Having worked in my first "real job" for nearly five years, I am constantly amazed by the people that I work with: their stories and concerns, their strengths and insecurities, and their potential and their hesitancies. I am a true believer in the process and power of self-assessment, and I guide hundreds of students through it each year as they embark on their own career exploration. Many of them will leave academia for a career better suited to them, and many of them will pursue academic careers, confident in that decision. But I love my non-academic job so much that, at least for now, the pit bull in me is not letting go.

Inside the Education and Professional Development Committee: Are You Being Served?

BY J. ELLIS BELL

The Education and Professional Development (EPD) Committee and its Web page have been revamped in recent years with the goals of increasing connections to the communities served by the society.

The committee consists of members from a wide variety of academic institutions and industry and has a graduate student and a postdoctoral representative. The committee works closely with the Undergraduate Affiliates Network (UAN) Steering Subcommittee and interfaces with the Minority Affairs Committee in its efforts to serve as wide a selection of the society's membership as possible. The committee meets formally in Bethesda, Maryland, each fall to discuss the agenda for upcoming national meetings and other issues that the committee will be acting on.

While much of the work at last fall's meeting focused on the revamped Web pages that have just been released, we did discuss some issues that are on the horizon for the next year or two. A number of these issues would benefit from a broader input from the society's membership, and I invite feedback on any of the following topics as the committee generates its agenda for action items for the next several years.

Small Meetings

The society now encourages "small meetings" on specialized topics that are held separately from the national meetings. In the past, members of the EPD have worked hand in hand with Project Kaleidoscope to run a series of meetings focusing on biochemistry and molecular biology education. We would like to know whether ASBMB members are interested in having additional small meetings with workshops focusing on hands-on teaching activities, program development, and roundtable discussions on topics in education. Also, if such a meeting were held, what types of topics would interest society members? What time of year would be right for such a meeting? Along these lines, we could expand the regional meeting concept that has now been introduced by the UAN to include sessions on topics such as course development, teaching styles, pedagogy, and assessment issues as well as focusing on undergraduate science. One- or two-day meetings could easily be arranged on a regional basis with undergraduate presentations being one focus and teaching aspects and networking being another focus.

Biotechnology Curriculum

Several years ago, the committee developed a recommended curriculum for undergraduate biochemistry and molecular biology degree programs. We would like to develop a similar initiative for biotechnology training. What do ASBMB members see as the most important technical skills, knowledge areas, etc. that should be encompassed by a biotech-oriented education?

Program Accreditation

As we discussed the recommended curriculum, another topic repeatedly came up: should the society accredit programs in biochemistry and molecular biology in much the same way the American Chemical Society accredits chemistry degree programs? An endorsement by the largest professional society in the discipline would be a plus for both graduate school admission and employment. Also, programs and departments could leverage their accreditation with administrators to further departmental or program goals.

Accreditation could be done in a relatively straightforward manner by collecting data on the Web and reviewing factors such as curriculum, number of graduates, where graduates go, the number of students engaged in research, and research outcomes. The institutions would be reviewed by a committee and perhaps visited every five or 10 years by a regional UAN committee. Such data collection could be extremely useful to the society and the academic community and would be cost effective.

Of course, if the society collected all these data it could also easily rank programs in a meaningful manner. For example undergraduate programs could be ranked in terms of preparation for graduate school, medical school, and employment in biotech industry. Such rankings could be very beneficial and useful to prospective employers and

potential undergraduates. The rankings could be published every few years so that a rolling average could be used in determining the rankings of schools and programs.

Biochemistry and Molecular Biology Assessment

Whenever accreditation is discussed by the EPD, it generally leads to assessment issues. For several years, a subgroup of the committee has been working on a "standardized" biochemistry and molecular biology exam that would represent a set of expectations for a solid program in terms of what students should be able to do and answer. Part of the problem of such an exam is that the ASBMB's recommended curriculum focuses on skills as much as knowledge areas, and it is difficult to construct an exam that would be easy to grade and widely adopted. A solution is to have an exam that could be administered and graded locally or submitted to the regional UAN director for more formal grading. This summer, we will be in a position where it would be most helpful to have faculty that are involved in undergraduate teaching at a variety of institutions review this exam and develop grading expectations in terms of the levels of understanding that students should be held accountable for. If you are interested in participating in this project, please contact me (jbell2@richmond.edu). If we get enough ASBMB members to participate in this endeavor we could have a finished product available for the next academic year.

Member Chat Room

Another suggestion that has been discussed is the idea of having an online members "chat room" for educational and professional development issues. It could be accessed by membership ID and password and serve as a forum for a wider discussion of educational and professional development issues than is possible otherwise. There could be separate rooms for undergraduates, graduate students, and postdoctoral fellows as well as different interest groups based on areas of science, research, and teaching interests. How better to connect with someone who has gone to the effort of developing a new course on "protein folding" and learning from their successes!

The EPD and the National Meeting

Always under discussion is the format of the "Education and Professional Development" theme at the national meeting. How can that theme best serve the society's membership? At this year's meeting in D.C., all attendees at the Education and Professional Development Theme sessions will be asked to fill out a survey asking questions about the types of sessions they would like to see in future national meetings. If you are unable to attend this year's meeting but would like to fill out a survey, we will try to have the survey available online shortly after the meeting.

Finally, I thank the members of both the Education and Professional Development Committee and the Undergraduate Affiliates Committee for all their hard work and service to the society this past year and ask that anyone who has suggestions for potential action items for either committee contact me or other members of the committees so that we can best serve you in the future. I look forward to hearing from you and seeing you in Washington.

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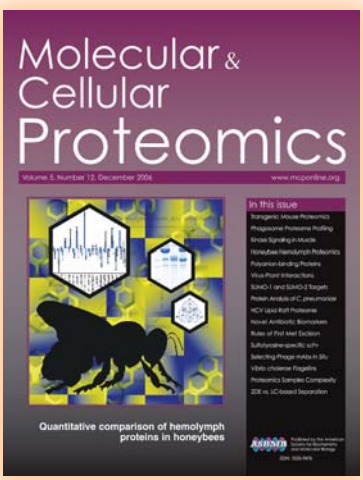

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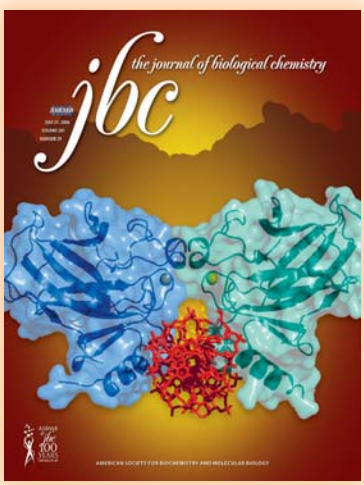

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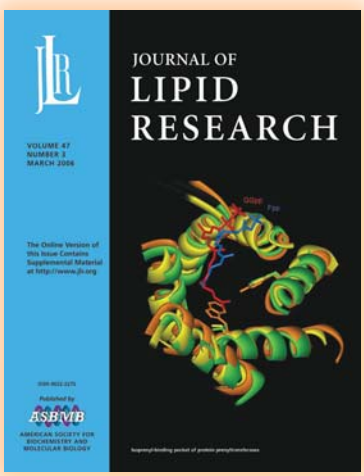

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Cytochrome P450's New Partner

BY PAT PAGES

Scientists have discovered a new protein that partners with and regulates cytochrome P450 enzymes, which are known for their role in synthesizing cholesterol and steroids and in eliminating chemical drugs from our body. The findings could significantly affect the way biologists think of the various roles of cytochrome P450 in cellular metabolism.

The investigators, led by Peter Espenshade, assistant professor of Cell Biology at Johns Hopkins University, showed that in both yeast and humans, cytochrome P450 enzymes form stable complexes with another protein, which has never been seen before.

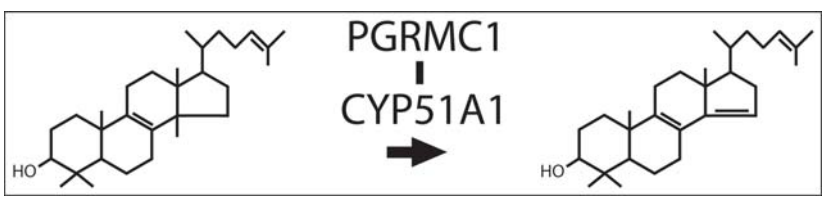
In yeast, Espenshade's team found that Dap1, a protein involved in the synthesis of ergosterol–the yeast analog of cholesterol– binds to and regulates the only two P450 enzymes present in yeast. Although Dap1 and the P450 enzymes are key players in ergosterol synthesis, nobody suspected that they would bind to each other.

In humans, the scientists showed that the human homolog of Dap1, a protein called progesterone membrane receptor component 1 (PGRMC1) binds to CYP51A1, the cytochrome P450 enzyme involved in cholesterol synthesis in the endoplasmic reticulum. Until now, the only proteins known to bind to CYP51A1 were P450 oxidoreductase and cytochrome b5, which deliver electrons to CYP51A1. And, unlike PGRMC1, these two proteins interact only fleetingly with CYP51A1.

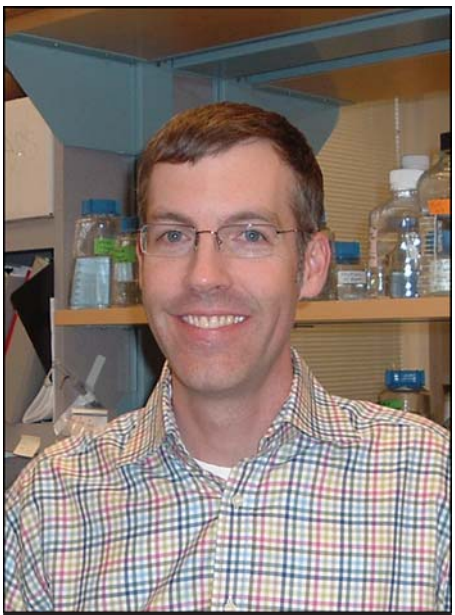
Espenshade's team also showed that PGRMC1 binds to three other P450s, one of which metabolizes pharmaceutical compounds, raising the possibility that PGRMC1 may work with many P450 enzymes.

"Although the biochemical details of how Dap1 and PGRMC1 contribute to sterol synthesis still need to be resolved, these findings have important implications for understanding diseases caused by defects in cytochrome P450 and how our body metabolizes drugs," Espenshade says.

Mutations in cytochrome P450 can lead to congenital adrenal hyperplasia, which is caused by excessive or deficient production of sex steroids and can lead to delayed puberty, excessive facial hair, infertility, and hypercholesterolemia, which is the presence of high levels of cholesterol in the blood and a precursor to cardiovascular diseases. The new results suggest that mutations in PGRMC1 may lead to more subtle forms of these diseases, Espenshade notes.



Biosynthesis of cholesterol requires the demethylation of lanosterol (*left*) to 4,4-dimethylcholesta-8,14,24-trienol (*right*) by CYP51A1. Experiments now show that this reaction requires both CYP51A1 and another protein called PGRMC1.



Peter J. Espenshade

Peter J. Espenshade is an assistant professor of Cell Biology at Johns Hopkins School of Medicine, where his lab uses both yeast and mammalian systems to study how cells control cholesterol homeostasis and adapt to a low oxygen environment. Espenshade received his A.B. from Princeton University in 1990 and his Ph.D. from Massachusetts Institute of Technology in 1998. He trained as a postdoctoral fellow with Michael Brown and Joseph Goldstein at the University of Texas Southwestern Medical Center in Dallas before joining the faculty at Hopkins in 2002.

Espenshade has received several fellowships and awards including the Burroughs Wellcome Fund (BWF) Career Award in Biomedical Sciences and a BWF Investigator in Pathogenesis of Infectious Disease Award.

Also, understanding how Dap1 and PGRMC1 interact with cytochrome P450 could explain why people respond differently to the same drug or why it takes longer for some people to process drugs than others. Studies dating back to the 1950s–now part of an expanding field called pharmacogenomics–have shown that genetic variation among individuals can explain different responses to drugs. By looking at variations in the gene producing PGRMC1 among individuals, scientists may show that it contributes to different drug responses as well.

Any new discovery involving these enzymes could significantly affect our understanding of cellular metabolism

This new study may prompt research into other proteins that contribute to the regulation of P450 enzymatic activity. A few potential candidates are discussed in Espenshade's article, which is published in the February issue of *Cell Metabolism*. Among those, a close homolog of PGRMC1, called PGRMC2, has been identified in mammals, frogs, and fish and could possibly modulate P450 enzymes as well. Another candidate is Insig1, a protein present in the endoplasmic reticulum's membrane and a key player in sterol regulation. PGRMC1 has been identified as a binding partner for Insig1, so this protein could also modulate CYP51A1.

"The prospects offered by these findings are exciting," Espenshade says. "There are more than 5,000 P450 enzymes dispersed among animals, plants, fungi, and bacteria, so any new discovery involving these enzymes could significantly affect our understanding of cellular metabolism."

New Lipid Player in Embryonic Development

BY PAT PAGES

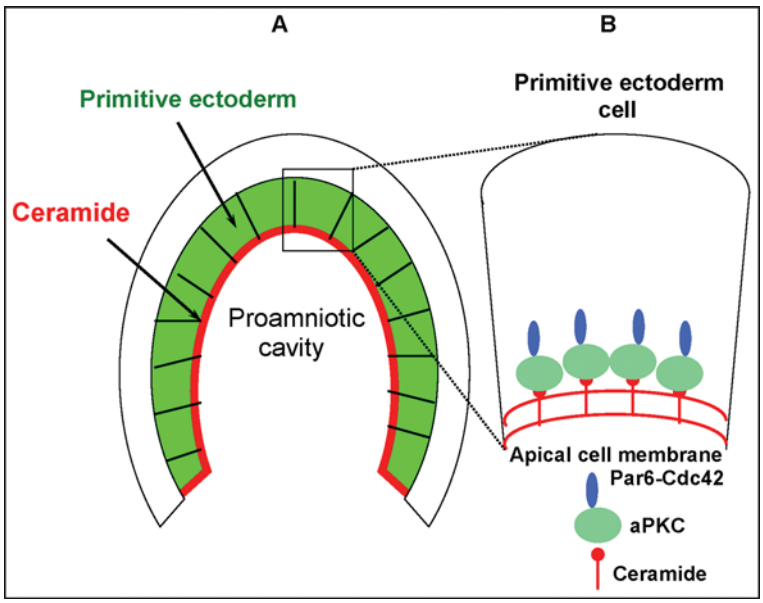
For the first time, researchers have discovered that a lipid present in cell membranes plays a key role in embryonic development, providing new insight into how individuals grow from a small collection of cells and possibly leading to treatments for birth defects in which this lipid may be involved.

Erhard Bieberich, a biochemist at the Medical College of Georgia, Augusta, and his colleagues found that ceramide, a lipid known for its role in insulating the skin and a precursor to the protective coating of nerves, helps cells to get organized. The discovery was a surprise because ceramide is known for its role in cell death, not cellular organization.

"When we started looking at ceramide's role in embryonic development, we expected it to destroy cells," Bieberich says. "We were pretty excited to see that, instead, ceramide was helping cells grow and differentiate."

After fertilization of an egg by a sperm, cells first divide in a disorganized way then start to arrange to create a spherical cluster of cells that expands and, after successive changes in shapes and sizes, creates what ultimately becomes an embryo. As the cellular cluster grows, the cells move in various directions, defining the head and "tail" of the embryo, its backbone and belly, and its left and right sides.

Each of the multiplying cells is helped in its movement by changes in the distribution of its proteins and lipids. By clustering in some areas of



Simplified representation of primitive ectoderm (*A*) and the role of ceramide and the polarity complex (made of Par6, Cdc42, and aPKC) in the polarization of one of the ectoderm cells (*B*).

Erhard Bieberich

Erhard Bieberich is an associate professor at the Medical College of Georgia, Augusta, Georgia. He received his M.S. in Biochemistry and his Ph.D. in Biochemistry from the University of Cologne, Germany.

During his tenure as a postdoctoral fellow at the University of Bonn, Germany, he cloned and characterized for the first time several enzymes involved in N-glycoprotein processing. He continued his work on N-glycoproteins and glycolipids when he joined Virginia Commonwealth University, Richmond, in 1996. He determined the functional role of N-glycosylation for the processing of sialyltransferases in glycolipid biosynthesis.

In 2000, Bieberich joined the Medical College of Georgia and developed his own projects on ceramide-dependent cell signaling in cancer and stem cells.

the cell, the proteins and lipids "tell" the cell where to go and to which other cells it should connect. This process, called cell polarization, helps cells move together and later form specific tissues and organs.

Although cell polarization is known to occur during embryonic development and the various steps leading to organs are well documented, the biochemical details at the cellular level are still not well understood. The new results, published in the February 2 issue of the *Journal of Biological Chemistry*, shed new light on the mechanisms involved.

Bieberich and his colleagues studied cell polarization in the primitive ectoderm, produced when about 100 stem cells are formed after fertilization. They showed that ceramide molecules, present in the cell's membrane, attach to proteins inside the cell, prompting the proteins to cluster on one side of the cell (see figure). The proteins form a "polarity complex" made of three components called atypical PKC, Cdc42, and Par6, which are known to be involved in cellular development. Ultimately, 90% of the ceramide molecules gather at one end of the cell.

"This is the first evidence of a direct role of ceramide in cell polarization," Bieberich says. "Another membrane lipid, phosphoinositol, well known for its involvement in cell polarization, seemed to be a major player in this process so far. But our results show that more players are actually involved, helping to unravel the biochemical details of cell polarization."

Bieberich and his colleagues plan to study whether ceramide is involved in other aspects of embryonic development. The scientists will also investigate potential birth defects resulting from lack of ceramide in stem cells involved in embryonic development.

Another area of interest is how ceramide could be involved in cancer. Ceramide may help regulate the fate of adult stem cells similarly to how it helps embryonic stem cells differentiate. When ceramide levels in adult stem cells are changed–say, by ultraviolet light or other environmental factors–the stem cells may proliferate abnormally and form tumors. The possible role of ceramide in tumor growth may thus offer alternative ways of treating cancer.

"Ceramide seems to play a bigger role in cell biology than expected," Bieberich says. "It is not only a structural lipid and a cell death messenger, but also a key player in embryonic development and maybe in stem cell biology as well. . . which is good news for scientists working on this molecule!"

New Insight into Mitochondrial Diseases

BY PAT PAGES

Research performed at St. Jude Children's Research Hospital, Memphis, Tennessee, may provide renewed hope for the treatment of a rare disease in which patients have intellectual impairment and difficulty in walking and speaking.

The disease, called pantothenate kinase-associated neurodegeneration (PKAN), is caused by the mutation of a gene that produces pantothenate kinase (PanK), a protein that catalyzes the first step in the biosynthesis of coenzyme A (CoA), which is needed to break down fatty acids. Some mutations cause PanK not to work properly, leading to an accumulation of iron in the neurons and ultimately to their damage.

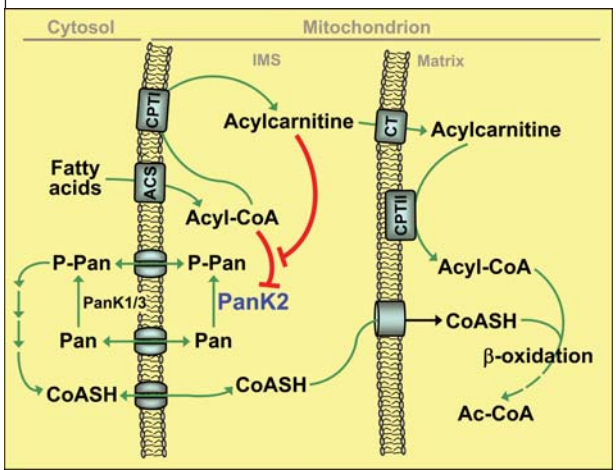
Although PanK is known to control CoA biosynthesis, it has been unclear why three isoforms–PanK1, PanK2, and PanK3–exist and what they do. The new research reveals a new regulatory property of PanK2, which could provide ideas for treatment of the disease.

The scientists, led by Suzanne Jackowski, principal investigator in St. Jude's Infectious Diseases Department, showed for the first time how PanK2 operates in mitochondria to control the degradation of fatty acids, also called β-oxidation. The results of the study appeared in the January 30 issue of the *Proceedings of the National Academy of Sciences of the U. S. A.*

Fatty acid oxidation in mitochondria is monitored as follows. When CoA supply and fatty acid degradation are in balance, PanK2 is bound to acyl-CoA (CoA carrying an acyl group) and is inactive. But when fatty acids exceed the capacity of the mitochondria to eliminate them, a molecule called carnitine, which shuttles the fatty acids into the mitochondria, accumulates. Acylcarnitine, a combination of a fatty acid and carnitine, liberates PanK2 from acyl-CoA inhibition, activating PanK2 and initiating the production of more CoA molecules, which are used to break down the fatty acids (see figure).

As the system returns to balance, PanK2 binds to CoA and again becomes inactive while fatty acids are being degraded.

"PanK2 acts like a smoke detector for fatty acids," Jackowski says. "When the fatty acid oxidation reactions stop working, acylcarnitine accumulates, which activates PanK2 to produce more CoA molecules that act like



A model illustrating how PanK2 controls the degradation of fatty acids in mitochondria.

Suzanne Jackowski

Suzanne Jackowski is a full member in the Infectious Diseases Department at St. Jude Children's Research Hospital in Memphis, Tennessee. She is also an adjunct professor in the Department of Molecular Sciences at the University of Tennessee Health Science Center in Memphis. Jackowski received a B.A. in Biochemistry from Canisius College, Buffalo, New York, and a Ph.D. in Biomedical Sciences from the University of Tennessee's Oak Ridge Graduate School. She did postdoctoral training at the University of Connecticut Health Center in Hartford and at the University of Illinois at Urbana-Champaign.

Jackowski investigates the molecular mechanisms that regulate coenzyme A homeostasis. Her accomplishments include cloning the first bacterial and eukaryotic pantothenate kinase (PanK) genes and characterizing PanK inhibitors. She has also helped determine the x-ray structures of several PanKs.

firefighters to help destroy the extra fatty acids."

The scientists suggest that PanK2 is localized in the intermembrane space (IMS) of mitochondria, where acylcarnitine is formed, placing the sensor in exactly the right place to monitor the status of mitochondrial β-oxidation. The CoA molecules arising from PanK2 activation are produced in the cytosol and then transported into the mitochondrial matrix. There, they break down the fatty acids.

This model is consistent with symptoms of human disorders in which mitochondrial fatty acid breakdown is not working properly, Jackowski notes. In those disorders, acylcarnitines accumulate and are secreted in the circulation, which would result, according to the model, from acylcarnitines not being broken down properly in the mitochondrial matrix.

Jackowski and her colleagues note that the roles of the two other types of PanK molecules will need to be further investigated to better understand mitochondrial dysfunction. Inactivation of PanK2 in knock-out mice, for example, does not cause neurodegeneration, perhaps because PanK1 and PanK3, which are found outside the mitochondria (see figure), contribute to maintaining the CoA pool. Jackowski adds that the severity of symptoms in mitochondrial β-oxidation disorders depends in part on diet, suggesting that dietary strategies similar to those used to treat these disorders–such as avoiding fasting and eating a diet rich in carbohydrates–may be useful in improving the symptoms in PKAN patients.

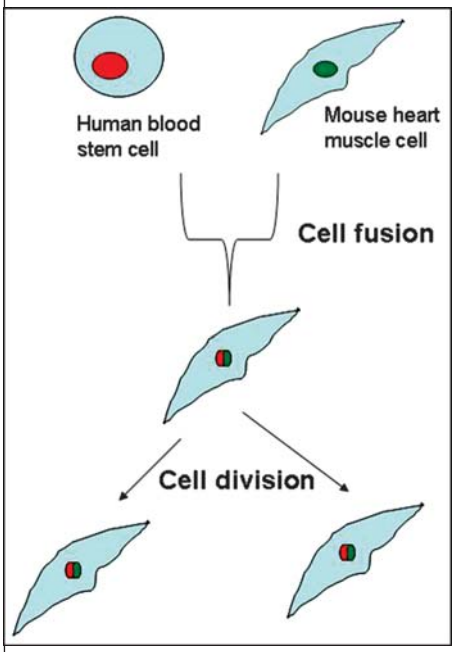
Jackowski's team is now working on developing an animal model of mitochondrial PKAN disease to determine whether reduced dietary fat and carnitine supplements offer hope in the treatment of the disease.

"Sticky" Proteins Fuse Adult Stem Cells to Cardiac Muscle, Repairing Hearts

BY PAT PAGES

Researchers at the University of Texas M. D. Anderson Cancer Center have shown that adult stem cells transplanted to an ailing heart fuse with its cells and repair it. The discovery is the first to show cellular-level details of how adult stem cells can heal heart tissue and raises hopes for using adult stem cells to treat patients with heart failure.

Edward Yeh, professor of medicine and chair of M. D. Anderson's Department of Cardiology, and his colleagues transplanted human blood stem cells to injured mouse hearts. The scientists noticed that the stem cells attached to the heart cells with "sticky" proteins called cell adhesion molecules. Once fused, the two types of cells shared their genetic material, forming one nucleus, and later divided.



Schematic depiction of how human blood stem cells fuse with mouse heart muscle cells and then divide to repair heart tissue under conditions similar to those of a heart attack.

The researchers investigated whether this fusion process could also heal damaged heart tissue in mice. They created conditions similar to a heart attack by exposing the stem cells and heart muscle cells from mice to low oxygen and chemokines–proteins released following a heart attack. To their surprise, not only did the stem cells fuse with the heart muscle cells, but the number of stem cells produced was 10 times as high as when the cells were not exposed to low oxygen and chemokines, showing that the stem cells were highly active in conditions that mimicked a heart attack. The scientists also identified the sticky proteins that had been previously observed.

Encouraged by these results, Yeh's team transplanted the human stem cells directly to mice with induced heart attacks. As expected, new cells were produced and started patching the damaged heart muscle.

Then, the scientists investigated whether the new cells might have been the result of blood cells transforming into heart muscle cells, a phenomenon called transdifferentiation observed with various types of stem cells. They used antibodies known to block cell fusion but not transdifferentiation and showed that no new cells were produced, confirming that they were made by cell fusion.

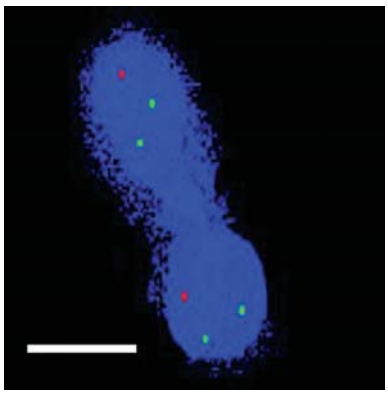
The researchers also examined what the fused cells did after they

Edward T. H. Yeh

Edward T. H. Yeh is professor and chairman of the Department of Cardiology at the University of Texas M. D. Anderson Cancer Center. He received a B.A. in biochemistry with honors from the University of California, Berkeley, and a medical degree from the University of California, Davis.

Yeh's laboratory discovered three novel biochemical pathways–SUMOylation and neddylation, post-translational protein modifications using, respectively, small ubiquitin-like modifier (SUMO) and a ubiquitin-like protein called NEDD8, and the biosynthesis of a glycolipid called glycosylphosphatidylinositol (GPI) anchor–that have revolutionized our understanding of cell cycle progression, cell signaling, and cancer pathogenesis. He is also an authority in the study of adult stem cells in cardiac repair.

Yeh is a member of the Republic of China's science academy, Academia Sinica; the Association of American Physicians; and FASEB's American Society for Clinical Investigation.



A cell produced by the fusion of a human blood stem cell with a mouse heart muscle cell undergoes cell division. Both human (*red*) and mouse (*green*) X chromosomes are visible in the nuclei of the dividing cells. *Scale bar* = 5 micrometers.

formed, because it wasn't clear whether the fused cells were an endpoint in themselves–designed to replace only dying cardiac muscle–or whether they could give rise to new cells. They discovered that fused cells continued to divide for up to two months.

"The accepted dogma among cardiologists is that heart cells cannot divide," Yeh says. "These results challenge this dogma by showing that, when fused with adult stem cells, the fused cells can actually divide and, more importantly, have the potential to repair an ailing heart."

Yeh's team also showed that the transplanted human stem cells formed endothelial cells–cells that line the interior surface of blood vessels. Unlike the heart muscle cells, the new endothelial cells resulted from stem cells transdifferentiating into endothelial cells, not fusing with already existing endothelial cells. This was verified by showing that the same antibodies that blocked the sticky proteins did not prevent the new cells from being produced. (But the new endothelial cells were blocked by antibodies known to block transdifferentiated cells.)

"The stem cells repaired the heart in two independent ways by growing either more muscle tissue or new blood vessels," Yeh says. "So it may be possible in the future to choose to enhance either or both processes when treating a patient with a heart failure or a heart attack."

The results of the study were published online February 15 in the journal *Circulation Research*.

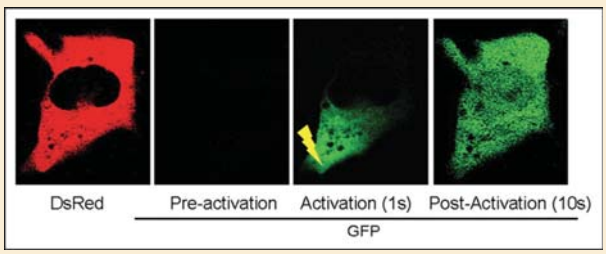
biobits asbmb journal science

J. Biol. Chem. 2007 282: 4210–4217

Hormonal Regulation of Nuclear Permeability

Elizabeth M. O'Brien, Dawidson A. Gomes, Sona Sehgal, and Michael H. Nathanson

The nuclear envelope acts as a barrier to passage between the nucleus and the cytosol. By regulating the envelope's permeability, cells can control the nuclear access of proteins that affect nuclear function. Nucleocytosolic passage generally occurs through the nuclear pore complex, which restricts movement on the basis of size and the presence of appropriate localization sequences. In this paper, the authors used localized, two-photon activation of a photoactivable green fluorescent protein (GFP) to investigate whether hormones, via their second messengers, could alter nuclear permeability. They found that vasopressin and other hormones that increase cytosolic Ca^{2+} and activate protein kinase C increased permeability across the nuclear membrane. Furthermore, localized photorelease of caged Ca^{2+} near the nuclear envelope resulted in a local increase in nuclear permeability. However, neither activation nor inhibition of protein kinase C affected nuclear permeability. These findings provide evidence that hormones linking to certain G protein-coupled receptors increase nuclear permeability via cytosolic Ca^{2+}.



GFP moves from cytosol to nucleus in cells stimulated with vasopressin.

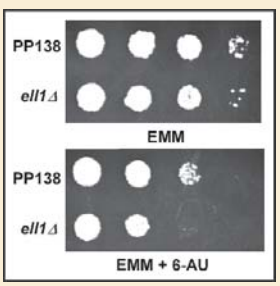
jbc

J. Biol. Chem. 2007 282: 5761–5769

Identification and Characterization of a *Schizosaccharomyces pombe* RNA Polymerase II Elongation Factor with Similarity to the Metazoan Transcription Factor ELL

Charles A. S. Banks, Stephanie E. Kong, Henrik Spahr, Laurence Florens, Skylar Martin-Brown, Michael P. Washburn, Joan W. Conaway, Arcady Mushegian, and Ronald C. Conaway

ELL family transcription factors increase the rate of transcription elongation by suppressing transient pauses by RNA polymerase II. ELL-associated factors (EAFs) bind to ELL family members and positively regulate their transcription activities. Orthologs of ELL and EAFs have been found in metazoa but not in fungi. Using bioinformatic and biochemical approaches, the authors of this paper have now identified a new *Schizosaccharomyces pombe* RNA polymerase II elongation factor that is composed of two subunits, SpELL and SpEAF. Like their counterparts from larger eukaryotes, SpELL and SpEAF form a stable heterodimer that potently activates transcription elongation by RNA polymerase II *in vitro*. In addition, like many yeast RNA polymerase II elongation factors, deletion of the SpELL gene renders *S. pombe* sensitive to the drug 6-azauracil. This discovery provides strong evidence that transcription elongation factors of this class are not limited to multicellular organisms.



Deleting SpELL renders *S. pombe* sensitive to 6-azauracil.

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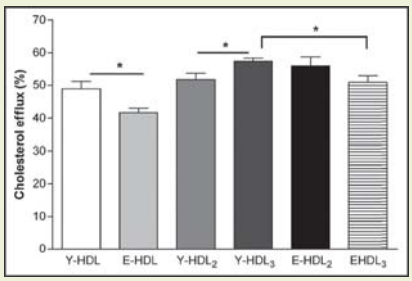
J. Lipid Res. 2007 48: 328–336

Age-related impairment of HDL-mediated cholesterol efflux

Hicham Berrougui, Maxim Isabelle, Martin Cloutier, Guillaume Grenier, and Abdelouahed Khalil

An inverse relationship exists between plasma levels of high density lipoproteins (HDLs) and cardiovascular disease. High levels of HDL seem to protect against cardiovascular disease, whereas low HDL cholesterol levels increase the risk for heart disease. One of the ways HDLs protect against cardiovascular disease is by promoting reverse cholesterol transport, which involves the movement of cholesterol from the peripheral tissues to the liver. In this study, the authors investigated the effect of aging on the capacity of HDLs to promote reverse cholesterol transport. Using HDLs isolated from the plasma of young (Y-HDL) and elderly (E-HDL) subjects, they found that E-HDLs were less able to promote cholesterol efflux than Y-HDLs. Moreover, they discovered that ATP binding cassette transporter 1 (ABCA1)-mediated cholesterol efflux is more highly affected in terms of cholesterol removing capacity. These results show that E-HDLs present a reduced capacity to promote cholesterol efflux, principally through the ABCA1 pathway, which may explain the increase of the incidence of cardiovascular diseases observed during aging.



Effects of aging on HDL-mediated cholesterol efflux.

Mol. Cell. Proteomics 2007 6: 207–230

Proteomics Identification of Differentially Expressed Proteins Associated with Pollen Germination and Tube Growth Reveals Characteristics of Germinated *Oryza sativa* Pollen

Shaojun Dai, Taotao Chen, Kang Chong, Yongbiao Xue, Siqi Liu, and Tai Wang

Mature pollen from most plant species is metabolically quiescent; however, after pollination, it germinates quickly and gives rise to a pollen tube to transport sperm into the embryo sac. Because methods for collecting a large amount of *in vitro* germinated pollen grains for transcriptomics and proteomics studies from model plants such as *Arabidopsis* and rice are not available, molecular information about the germination developmental process is lacking. In this study, the authors established an *in vitro* germination system for rice pollen and then used two-dimensional electrophoresis followed by MALDI-TOF MS and ESI-Q-TOF MS/MS to identify 160 differentially expressed proteins associated with germination and tube growth. These proteins are involved in different cellular and metabolic processes with a functional skew toward wall metabolism, protein synthesis and degradation, cytoskeleton dynamics, and carbohydrate/energy metabolism. Of the differentially expressed unique proteins, 25% had isoforms, many of which showed distinct changes in expression.

Differential interference contrast microscopy of germinated rice pollen grains.

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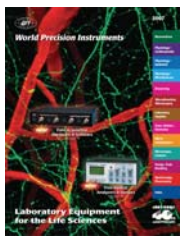

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The Institute for Environmental Medicine at the University of Pennsylvania is seeking an enthusiastic and innovative postdoctoral fellow with extensive theoretical background and practical experience in organic chemistry (with focus on protein and lipid chemistry), biochemistry, and biophysics to participate in studies of protein-protein and lipid-protein interactions. The successful candidate must have extensive computer skills and hands on experience using common molecular modeling, docking, and other specific software. Extensive experience in UV/VIS spectroscopy and DLS and SLS measurements is a plus. The successful candidate must have excellent organization and communication skills and the willingness and ability to be a good team player. Excellent writing and presentation skills are a plus.

Advanced degree required. Send CV to:

Susan Turbitt, University of Pennsylvania. Fax: 215-898-0868; E-mail: turbitt@mail.med.upenn.edu.

University of Pennsylvania is an Equal Opportunity Employer. Minorities are encouraged to apply.

ASBMB 2007/2008 SCIENCE POLICY FELLOWSHIP

ASBMB is pleased to announce that it is accepting applications from newly graduated Ph.D.s for the ASBMB Science Policy Fellowship. The fellowship affords the opportunity to gain experience and insight into the workings of the policy process and the role that science plays in government decision-making in a wide range of issues. The Fellow will work closely with policy professionals both inside and outside the government. The experience will provide exposure to the federal research budget process, regulatory issues, and the interplay between science and decision-making.

The application deadline for the 2007/2008 fellowship is May 15, 2007.

TERMS

The Society will sponsor one Fellow who will spend one year as a staff member in the ASBMB Office of Public Affairs. The fellowship will begin September 1. The Fellow will receive an annual stipend of $40,000 and health care coverage.

QUALIFICATIONS

Fellows will be selected on a competitive basis from ASBMB members who have:

- a recently awarded doctorate (i.e. the applicant is not beyond the post-doctoral stage);
- interest in the relationship between science, technology, and public policy;
- flexibility in tackling a variety of tasks; and,
- excellent interpersonal and communication skills.

HOW TO APPLY

Individuals interested in applying for the ASBMB Science Policy Fellowship should submit the following:

1. A resume/CV;
2. A letter of intent (2-3 pages) that outlines:
   - why you have applied
   - what policy issues and situations interest you
   - what you hope to accomplish as a Fellow
   - how you feel this experience will enhance your career
   - your participation in civic activities and/or public affairs
3. Two letters of reference sent directly to ASBMB. Please include the addresses and telephone numbers for your references in your application.

Send all application materials to:
Peter Farnham, CAE, Public Affairs Officer, ASBMB, 9650 Rockville Pike, Bethesda, MD 20814.
Tel.: 301-634-7384; Fax: 301-634-7126; E-mail: pfarnham@asbmb.org

meeting calendar

APRIL 2007

3rd European Symposium on Plant Lipids
APRIL 1–4, 2007
YORK, UK
www.eurofedlipid.org/meetings/index.htm

Second Workshop on Biophysics of Membrane Active Peptides
APRIL 1–4, 2007
LISBON, PORTUGAL
www.biophysicsmap.com

Arteriosclerosis, Thrombosis and Vascular Biology Annual Conference 2007
APRIL 19–21, 2007
CHICAGO, IL
www.americanheart.org/presenter.jhtml?identifier=3039918

2nd International Congress on Prediabetes and the Metabolic Syndrome
APRIL 25–28, 2007
BARCELONA, SPAIN
www.kenes.com/prediabetes2007
E-mail: prediabetes2007@kenes.com

ASBMB Annual Meeting in Conjunction with EB2007
APRIL 28–MAY 2, 2007
WASHINGTON, DC
www.asbmb.org/meetings
Contact: ASBMB 2007, 9650 Rockville Pike, Bethesda, MD 20814-3008
E-mail: meetings@asbmb.org
Tel.: 301-634-7145

MAY 2007

7th International Symposium of the Protein Society
MAY 12–16, 2007
STOCKHOLM-UPPSALA, SWEDEN
www.proteinsociety.org/pages/page02b.htm
E-mail: cyablonski@proteinsociety.org
Tel.: 301-634-7277

94th Annual Meeting of the American Association of Immunologists
MAY 18–22, 2007
MIAMI BEACH, FL
www.immunology2007.org/

National Lipid Association Annual Scientific Sessions
MAY 31–JUNE 3, 2007
SCOTTSDALE, AZ
www.lipid.org/chapters/swla

Epistasis: Predicting Phenotypes and Evolutionary Trajectories
MAY 31–JUNE 3, 2007
IOWA STATE UNIVERSITY, AMES, IA
www.bb.iastate.edu/%7Egfst/PSIframeset.html
Tel.: 515-294-7978

JUNE 2007

55th ASMS Conference on Mass Spectrometry
JUNE 3–7, 2007
INDIANAPOLIS, IN
www.asms.org
Tel.: 505-989-4517

Mitosis Spindle Assembly and Function: A FASEB Summer Research Conference in Honor of Dr. B. R. Brinkley
Applications from students and post-docs are especially welcome!
JUNE 9–14, 2007
HYATT GRAND CHAMPIONS RESORT AND SPA, INDIAN WELLS, CA
Organizers: Conly L. Rieder
E-mail: rieder@wadsworth.org
Robert E. Palazzo
E-mail: palazr@rpi.edu

76th Annual European Atherosclerosis Society Congress
JUNE 10–13, 2007
HELSINKI, FINLAND
www.kenes.com/eas2007
Tel.: 41-22-908-0488
Fax: 41-22-732-2850

American Diabetes Association's 67th Annual Scientific Sessions
JUNE 22–26, 2007
CHICAGO, IL
www.wynjade.com/ada07/

20th American Peptide Symposium
JUNE 23–27, 2007
MONTREAL, QUEBEC, CANADA
E-mail: 20thAPS@UMontreal.ca

JULY 2007

32nd FEBS Congress: Molecular Machines and Their Dynamics in Fundamental Cellular Functions
JULY 7–12, 2007
VIENNA, AUSTRIA
Registration is open until March 31
www.FEBS2007.org

Life Sciences 2007: A Joint Meeting of the Biochemical Society, the British Pharmacological Society, and The Physiological Society
JULY 8–12, 2007
THE SECC, GLASGOW, UK
www.lifesciences2007.org/

21st Annual Symposium of the Protein Society
Proteins: From Birth to Death
JULY 21–25, 2007
BOSTON, MA
www.proteinsociety.org

Gordon Research Conference–Molecular and Cellular Biology of Lipids
JULY 22–27, 2007
WATERVILLE VALLEY, NH
www.grc.org

4th British Society for Proteome Research/European Bioinformatics Institute Proteomics Meeting
Integrative Proteomics: Maximizing the Value of Proteomics
JULY 25–27, 2007
CAMBRIDGE, UK
www.bspr.org/
E-mail: meetings@bspr.org

Senescence, Aging and Cancer Symposium
JULY 26–29, 2007
IOWA STATE UNIVERSITY, AMES, IA
www.bb.iastate.edu/%7Egfst/homepg.html
Tel.: 515-294-7978

FASEB Summer Research Conference: Lipid Droplets: Metabolic Consequences of Stored Neutral Lipids
JULY 28–AUGUST 2, 2007
VERMONT ACADEMY, SAXTONS RIVER, VT
Organizers: Dawn L. Brasaemle, Rutgers, The State University of New Jersey and Rosalind A. Coleman, University of North Carolina
src.faseb.org

AUGUST 2007

13th International Conference on Second Messengers and Phosphoproteins
AUGUST 1–4, 2007
SAN DIEGO, CA
Abstracts must be submitted by July 1
www.smp-2007.com/

FASEB Summer Research Conference–Lipid Signaling Pathways in Cancer
AUGUST 11–16, 2007
INDIAN WELLS, CA
src.faseb.org

Kern Aspen Lipid Conference–Diabetes, Obesity and Atherosclerosis
AUGUST 19–22, 2007
ASPEN, CO
www.uchsc.edu/kernconference/
E-mail: julie.morris@uchsc.edu

8th International Symposium on Mass Spectrometry in the Health & Life Sciences
AUGUST 19–23, 2007
FAIRMONT HOTEL, SAN FRANCISCO, CA
www.donatello.ucsf.edu/symposium/
E-mail: sfms@itsa.ucsf.edu
Tel.: 415-476-4893

234th American Chemical Society National Meeting
AUGUST 19–23, 2007
BOSTON, MA
chemistry.org/meetings/boston2007

21st Biennial Meeting of the International Society for Neurochemistry and the American Society for Neurochemistry
AUGUST 19–25, 2007
CANCUN, MEXICO
www.isn-asn2007cancun.org.mx/

13th Nordic Mass Spectrometry Conference
AUGUST 28–31, 2007
SAVONLINNA, FINLAND
www.nsms.no/moter.html

SEPTEMBER 2007

Proteomics Forum: International Meeting on Proteome Analysis
SEPTEMBER 2–5, 2007
MUNICH, GERMANY
www.proteomicforum.com/
Tel.: 49-(0)89-8578-2557

48th International Conference on the Bioscience of Lipids
SEPTEMBER 4–8, 2007
TURKU, FINLAND
www.icbl2007.abo.fi

British Mass Spectrometry Society Meeting
SEPTEMBER 9–12, 2007
EDINBURGH, SCOTLAND
www.bmss.org.uk/meetings.htm
E-mail: bmssadmin@btinternet.com
Tel.: 44-(0)-1480-880-669

5th Euro Fed Lipid Congress
SEPTEMBER 16–19, 2007
GOTEBORG, SWEDEN
www.eurofedlipid.org/meetings/goeteborg/index.htm

10th International Conference of the Eicosanoid Research Foundation: Bioactive Lipids in Cancer, Inflammation and Related Diseases
SEPTEMBER 16–19, 2007
MONTREAL, CANADA
bioactivelipidsconf.wayne.edu/

OCTOBER 2007

XVI International Symposium on Drugs Affecting Lipid Metabolism
OCTOBER 4–7, 2007
NEW YORK, NY
www.lorenzinifoundation.org/download/dalm2007.pdf

HUPO 6th Annual World Congress
OCTOBER 6–10, 2007
SEOUL, KOREA
www.hupo2007.com
E-mail: Wehbeh.Barghachie@mcgill.ca
Tel.: 514-398-5063

5th Annual World Congress on the Insulin Resistance Syndrome
OCTOBER 11–13, 2007
BOSTON MARRIOT, NEWTON, MA
This scientific meeting will bring together national and international leaders as well as researchers in the clinical practice of the syndrome
E-mail: insulinresistance@pacbell.net or metabolicinst@pacbell.net
Tel.: 818-342-1889
Fax: 818-342-1538

Protein Misfolding and Neurological Disorders Meeting
OCTOBER 17–19, 2007
DUNK ISLAND, NORTH QUEENSLAND, AUSTRALIA
www.proteinmisfolding.org

4th International & 2nd Asia-Pacific Peptide Symposium
OCTOBER 21–26, 2007
CAIRNS, QUEENSLAND, AUSTRALIA
www.peptideoz.org
E-mail: mibel.aguilar@med.monash.edu.au
Tel.: 613-9905-3723

AUGUST 2008

HUPO 7th Annual World Congress
AUGUST 16–21, 2008
AMSTERDAM, THE NETHERLANDS
www.hupo2008.com
E-mail: Wehbeh.Barghachie@mcgill.ca
Tel.: 514-398-5063

30th European Peptide Society Symposium
AUGUST 31–SEPTEMBER 5, 2008
HELSINKI, FINLAND
www.30eps.fi/
E-mail: 30eps@congrex.fi
Tel.: 358-(0)9-5607500

AUGUST 2010

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

You are invited to attend a

LIPIDOMICS WORKSHOP

at Experimental Biology 2007, Washington, DC
on Saturday, April 28, 2007 from 8 AM – Noon

Sponsored by: the American Society for Nutrition,
the LIPID MAPS Consortium, and Avanti Polar Lipids, Inc.

The Workshop will provide an overview of protocols that have been developed by the LIPID MAPS Consortium for Lipidomic analysis using mass spectrometry as well as related issues such as sample handling and extraction, internal standards for quantitative analysis, data management and display, lipid nomenclature, and an overview of global lipidomic initiatives.

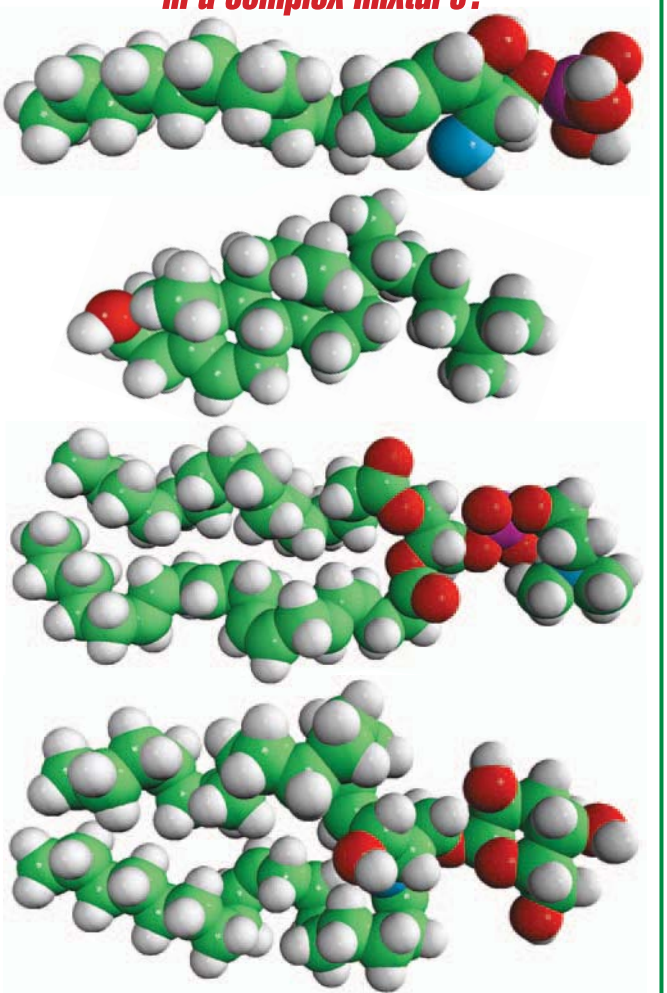
The Panel

- Edward Dennis
  University of California, San Diego
- Eoin Fahy
  University of California, San Diego
- Teresa Garrett
  Duke University Medical Center
- Rick Harkewicz
  University of California, San Diego
- Jeffrey McDonald
  University of Texas Southwestern Medical Center
- Al Merrill
  Georgia Institute of Technology
- Robert Murphy
  University of Colorado Health Sciences Center
- Walt Shaw
  Avanti Polar Lipids
- Cameron Sullards
  Georgia Institute of Technology

To Attend

This Workshop will be conducted as a satellite session at Experimental Biology 2007 under the sponsorship of the American Society for Nutrition (ASN).
If you plan to attend please Email:
al.merrill@biology.gatech.edu
For information about EB 2007 - registration, lodging, etc. visit: www.eb2007.org

Can you identify (and quantify) these lipids*
in a complex mixture?



If not, this workshop will teach you how -
for these and thousands of other lipids

*S-1-P
Cholesterol
PC
GlcCer

LIPID MAPS™
www.lipidmaps.org

A culture of opportunity.

Louisiana is cultivating opportunity for the Life Sciences Industry. We've injected over $30 million in state assistance for the development of three innovation centers in New Orleans, Shreveport and Baton Rouge. These centers offer low-cost wet lab incubator space and integrated business development to companies and individuals alike. And when you consider Louisiana's Gulf Opportunity Zone incentives, including 50% bonus depreciation or tax-exempt bonds, the timing couldn't be better for you to make your move.

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