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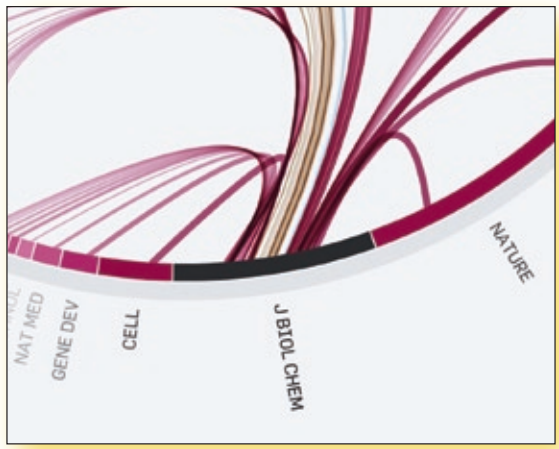

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Check out this month's JBC News Podcast in which Deputy Editor Robert Simoni interviews Jevin West about the Eigenfactor.

You can listen to the podcast at www.asbmb.org/Interactive.aspx.

ASBMB today

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ASBMB Today
Nicole Kresge *Editor*
nkresge@asbmb.org
Nick Zagorski *Science Writer*
nzagorski@asbmb.org
Nancy J. Rodnan *Director of Publications*
nrodnan@asbmb.org
Barbara Gordon *Executive Director*
bgordon@asbmb.org

Magazine design & production: Amy Phifer

For information on advertising contact
Capitol Media Solutions at 800-517-0610
or Danf@capitolmediasolutions.com

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2008 APEX AWARDS FOR PUBLICATION EXCELLENCE

from the editor

Column Changes

This issue of *ASBMB Today* marks a change in the BioBits column. In the past, we've featured articles that have already been published in the *Journal of Biological Chemistry*, the *Journal of Lipid Research*, and *Molecular and Cellular Proteomics*. Now, we're highlighting articles that have been published online as Papers in Press (PIPs) but have yet to appear in our print journals. This will allow you to preview some of our new journal material in a timely manner, which you'll appreciate if you don't have time to visit PIPs as often as you'd like!

We have also added a new column called "Lipid News" this month. This regular column will highlight information of current interest to the lipid community, including upcoming meetings, funding opportunities, and recent lipid advances and discoveries. The column also has a companion web site which can be found at www.asbmb.org/lipidcorner.

See You in New Orleans!

As you all know, the ASBMB annual meeting in New Orleans is rapidly approaching. We've spent the past 10 months highlighting the meeting's symposia and special events in *ASBMB Today*, but if you want a quick overview, you can always visit the ASBMB meeting web site at www.asbmb.org/meetings.

One thing we didn't mention in past issues is a unique "voluntourism" opportunity available at the meeting. If you're interested in assisting in the recovery of New Orleans, you can do some hands-on work with The Phoenix of New Orleans—a non-profit neighborhood recovery association dedicated to improving the living conditions in the Lower Mid-City area of the city. Some of their projects include hanging insulation and sheet rock, and painting. Contact Rachel Massey at rachel@pnola.org or (504) 342-4399 for more information, or visit their website at www.pnola.org.

And don't forget to visit us at booth #801/803 in the exhibit hall!

Nicole Kresge

letters to the editor

Mixed Messages

Dear Editor:

I am confused and upset about the last issue of *ASBMB Today*. In this issue, there is a feature giving the collective views of an ASBMB team on future spending at NIH. It is mentioned that there has been a tendency to overfund conglomerate programs in preference to single investigator-initiated grants (*i.e.* R01s). It is my feeling that the vast majority of biomedical scientists in the U.S. feel the same way—that we need to protect R01 type funding. Kudos to ASBMB for promoting this. It is thus ironic that the same issue of *ASBMB Today* features a cover story on the Lipidomics program funded by NIH. It is my feeling that most people in the lipid field are very upset by this type of spending and strongly feel that the value of this Lipidomics initiative is minimal compared to hypothesis-driven research. The latter has produced many more interesting lipids of known function over the past several years in which the Lipidomics program has existed.

It is time for people like me to speak out against promoting this kind of science that most people feel is close to a waste of time and money. I say this not out of my own desperation (my R01 funding is in good shape), I am speaking as a well established, securely employed biomedical scientist who sees the problems that come when young scientists cannot start up their research programs and established investigators go in circles of hiring and firing of their lab segments.

If you poll the biomedical community, I am confident they would applaud the ASBMB committee message on the need for more R01-type spending, and they would be upset with the Lipidomics feature. How can we expect to help the situation if ASBMB is sending mixed messages to Congress?

Michael H. Gelb
Harry and Catherine Jaynne Boand Professor
Departments of Chemistry and Biochemistry
University of Washington

Science Education

Dear Professor Petsko,

As a parent living in Louisiana, I am very concerned by ASBMB's decision to request the repeal of the state's recent Science Education Act. I was one of those who wrote to my state legislator and Gov. Jindal's office in support of it. The actual content of the bill, as you must be aware of, is this:

"It extends permission to Louisiana's teachers to help students understand, analyze, critique, and review in an objective manner the scientific strengths and scientific weaknesses of existing scientific theories pertinent to the course being taught."

How does such a measure, which inculcates critical evaluation and logical analysis in the classroom, threaten you and your scientific position? You state in your letter to Gov. Jindal that "the bill is nothing more than a thinly disguised attack on the theory of evolution." No, rather, evolution is listed as one of several controversial theories for which the merits and weakness should be considered. You go on to write:

"Science is based on observable and measurable phenomena, and the hallmark of good science is rigorous experimentation to discover and validate observations of the natural world."

Yes, and it is precisely because much of the theory of evolution does not fall within the realm of observables and is really a historical reconstruction, based on unsubstantiated speculation, that closer scrutiny of it is required in class. If the theory is as solid as the majority of the scientific community makes it out to be, then any criticism of it will not amount to much...except, of course, if this is not the case. Perhaps further research will "consign the theory of evolution to the dustbin of failed theories."

I urge you to reconsider your position and support academic openness. Freedom is the very basis of the American way of life. If you believe that you cannot bear to live in a society that espouses this ideal, then I am sure that there are some great biotech labs 90 miles off the coast of Florida that would welcome you.

Yours truly,
Joe Hannon
Thibodaux, Louisiana

RESPONSE

Thank you for your thoughtful letter. I appreciate the deep feelings you have about this issue. However, I don't agree with you that this is a matter of freedom of speech or of thought. As a biologist, I view it as a matter of competence. Any science teacher who teaches that evolution is controversial in a scientific sense is teaching something that is not correct and therefore is a bad teacher. The theory of evolution is as well-founded and as

central to biology as atomic theory is to chemistry.

Evolution is supported by both observation and experimentation. We can recapitulate it on short time scales in the laboratory with microorganisms, can watch it happen on longer time scales in the natural world (Darwin's finches being one of many examples), and can find its traces clearly laid out in the fossil record. Competing "theories" such as intelligent design have no such foundation and have been decisively rebuked as being creationism in disguise by numerous court decisions.

The fact that some people don't accept a theory doesn't make it controversial scientifically. There have to be solid scientific grounds for challenging it, and there are no such grounds for challenging evolution. If there were, believe me, we would be the first to call for teaching them.

I have no problem with teaching creationism or intelligent design in history, philosophy, or religion classes. But they, and other "challenges" to evolution, simply don't belong in a science class. If what I said doesn't convince you, we'll have to agree to disagree on this point. I suspect eventually the courts will decide on the constitutionality of the bill. But since you impress me as a concerned parent, and I have great respect for the sincerity of your view, I hope that you will consider the sincerity with which I, as a step-parent, say that a teacher who teaches your children that evolution is what drives biology is not teaching "a historical recreation, based on unsubstantiated speculation." They are teaching the best science we have, based on the best data available, and are trying to do the best for the children they teach.

Thanks for writing to me,
Gregory A. Petsko

CORRECTIONS:

The article titled "A MAP of the Lipid World" in the February 2009 issue of ASBMB Today mistakenly identified "four nucleic acids and 20 amino acids" as components of genes and proteins, respectively. The sentence should actually read "four nucleotides and 20 amino acids."

In the article titled "Biochemistry Department Diversity: A Lack of Sex Appeal" in the March 2009 issue of *ASBMB Today*, the labels were accidentally omitted from the y-axes of Figs. 1 and 2. The y-axis on Fig. 1 should read "Percent Women Among PhDs" and the y-axis on Fig. 2 should read "Percent Women."

Overstimulated

BY GREG PETSKO

I've spent so much time during the past couple of months with the science part of the stimulus bill—thinking about it, fighting for it, discussing its virtues and possible long-term consequences with members, trying to help NIH plan how to spend it—that it's almost painful to write anything about it. But we've never seen anything quite like this in our lifetimes, and we probably won't see it again, so I guess it's worth another presidential letter.

Let me say right off the bat that, like many of our members, I'm worried about the unintended consequences of such a huge, temporary boost in science funding. We could indeed be setting ourselves up for a hideous crash in fiscal year 2011, when the stimulus money runs out. We could also be setting ourselves up to look very bad to Congress if we don't spend this money wisely. Talk about "Be careful what you wish for!" So I, and the other scientific society presidents and our staffs, and the public affairs committees of ASBMB and the other FASEB organizations, and the Coalition for the Life Sciences, and a number of others I'm probably forgetting to name, have been having lengthy discussions with scientific administrators at NIH, NSF, and the Department of Energy, attempting to find the most effective ways of spending these enormous sums. I don't know if science is going to be overstimulated, but I know I already am. The good news is that the heads of the various agencies are at least as concerned as we are that we avoid the disaster that followed the doubling of the NIH budget almost a decade ago. The bad news is that, as I write this, it's still not clear exactly what's going to happen.

Some things are clear enough, though, that I think I can make some sensible suggestions to our members on what they should do to take advantage of a unique opportunity. Before I do, let me define some parameters:

"Be careful what you wish for!"

The National Science Foundation fared well in the stimulus bill, receiving $3 billion in funding, $2 billion of which goes directly to research, along with funds for instrumentation, education, and facilities. My guess—and at this point it's only a guess—is that a small amount, maybe 10 percent of their money, will go for facilities, and most of the rest will go to grants, particularly grants to new investigators or people with little or no current funding. They may give some supplements to existing grants, but I'd be surprised if that was a big portion of the total. If you have a grant from NSF, you could ask your program director about stimulus funding, and if you don't have a grant from NSF or anywhere else, this would be a good time to think about writing one.

The Department of Energy has the most complicated job of any agency in trying to spend its stimulus money because of the many things it's charged with doing. The $787 billion U.S. economic stimulus package includes $400 million to fund the Advanced Research Projects Agency-Energy (ARPA-E), which is modeled after the Pentagon research agency DARPA. ARPA-E was created last year as part of sweeping U.S. competitiveness legislation, but no funding was appropriated for the agency. Energy Department officials said there was still no timeline for organizing ARPA-E, but stressed, however, that Energy Secretary Steven Chu has emphasized in recent speeches the importance of moving quickly to get stimulus money in the pipeline for a variety of conservation and R&D programs. The stimulus package contains about $43 billion for energy efficiency and technology programs, including $4.3 billion for smart power grid R&D. Industry groups and companies large and small

are already lining up to win federal energy funding. Whoever is selected to head ARPA-E must be confirmed by the Senate, meaning the nominee will likely have to wait to get on a crowded Senate confirmation schedule. The director will report directly to Dr. Chu.

The DoE Office of Science, which typically funds academic research, will get $1.6 billion across a variety of programs. DoE will also provide $6.3 billion in block grants, $5 billion for weatherization, $4.4 billion for smart grid projects, $4 billion in loan guarantees for new renewable energy projects, $400 million to install infrastructure to charge electric cars, $3.4 billion to push carbon sequestration from coal-fired power plants, and $4.5 billion to make federal buildings more energy efficient. DoE will get $1.7 billion to improve energy efficiency. About $2 billion will expand or create transmission linkages between areas rich in solar and wind energy potential and population centers. If you are interested in biofuels, my guess is there's going to be a lot of money for biofuel research coming from DoE in the next year or so.

The final stimulus numbers contained $10 billion for the National Institutes of Health. Of that money, $1.8 billion will go to support infrastructure; about $1 billion of that will be for extramural infrastructure. At a February 18th briefing in Washington, Acting Director Kington offered some guidance on how the remainder of the money would be spent. Of the $8.2 billion in research funds, $800 million are assigned to the Office of the Director to fund trans-NIH initiatives. The remaining $7.4 billion will be divided among the institutes and centers of NIH according to the percentage of the total NIH budget that each currently receives.

Each Institute and Center will have considerable autonomy in how they spend their allocation, but in general, they are currently looking at three major mechanisms: 1) special 2-year R01 awards, made to applications that have been previously submitted and peer reviewed that will be able to make scientific progress in the shortened time frame required by the stimulus legislation; 2) supplements for grants that have already been awarded; 3) new "challenge grant" awards of up to $1 million over two years, to be solicited by an RFA that will be announced shortly. Mechanism #1 will be used at some institutes to more than double the payline for grants that are pending from the last few rounds.

In addition, the National Center for Research Resources is expected to have a huge amount of money—possibly as much as 30 times its normal amount—to spend on shared instrumentation. Instrumentation will also be a favored budget item for supplements, since it doesn't lead to long-term commitments.

By law, Congress will be collecting information from NIH on how the money has been used and how many jobs have been supported through the stimulus funds for release to the public via recovery.gov, the stimulus bill's new accountability website. The stimulus money needs to be spent by September 30, 2010.

So what does all this mean for you? Here's my take on the implications:

Remember that the key issue is jobs: job creation and job retention, and job creation is better than job retention. If you plan to hire someone with stimulus money, my guess is that technicians will be easier to justify than postdocs or graduate students, since the commitment to them can be shorter.

If you have an active NIH grant, you should make contact with your program officer and discuss a supplement. Probably it would be best if that supplement were used to hire somebody new or buy something new.

If you are thinking of writing a new grant for stimulus support, it should have objectives that can be realized in two years. I don't think any institute can, by law, prohibit you from requesting a no-cost extension at the end of the two years, but assume that there will be no renewal for stimulus grants at this time.

This will probably be a great time to get three NIH-funded investigators together and request a big piece of shared equipment (by "big" I mean costing more than $100,000). But do it soon; my guess is that the applications will be due within a couple of months after I write this, if not sooner.

Make no assumptions about what will happen in 2011 unless you assume that things will be very tight. Could Congress decide to fund NIH at a $40 billion base when the stimulus runs out, instead of the $30 billion that is the current non-stimulus budget? Yes, they could, and my guess is that some senators may try to do just that. But if the economy hasn't recovered from the recession, or if the deficit is soaring, or if the constellations don't align right—well, you get the idea. Treat the stimulus money as exactly what it is, a windfall, and don't build either expectations or programs that are based on the assumption that this sort of money will keep flowing in forever. That's what got us in trouble before, remember.

FASEB Weighs in on Peer Review, Core Facilities, and CTSA Evaluation

BY CARRIE D. WOLINETZ

FASEB is not only playing a leadership role in advocating for greater National Institutes of Health (NIH) funding through the stimulus bill and regular appropriations process, but it is also providing input on how the agency distributes its money. Recently, FASEB has submitted comments to NIH on several subjects summarized below.

Peer Review

Last spring, FASEB responded to NIH's Peer Review Self-Study (opa.faseb.org/pdf/2008/NIHPeerReviewSelfStudy.pdf) and was pleased to see many of the comments incorporated into recent policy revisions announced by the agency, including increasing flexibility for reviewers, reporting of scores, and clustering applications for new investigators. However, FASEB thought some additional suggestions, related to the new resubmission policy, application length, scoring procedures, and the training of reviewers and staff, merited consideration and sent a letter to the Center for Scientific Review with further input. FASEB was concerned that the new policy limiting applications to one amendment might disproportionately impact early stage investigators and those very close to the payline and suggested NIH reconsider or develop more flexible policies for these populations. In addition, FASEB proposed that NIH work with applicants whose A0 was 25 pages, but whose resubmission would be limited to the new, reduced page limit policy. The Federation suggested that reviewers be made aware of the sharp page reduction and allow applicants three additional pages to respond to the previous review. Finally, FASEB encouraged NIH to make the changes to the peer review system an integral part of the training of reviewers and staff, and to provide training to all participants in the study section process.

Core Facilities

In response to a request for information from the National Center for Research Resources (NCRR), FASEB submitted comments (opa.faseb.org/pdf/2009/RFI_Cores_030309_Final.pdf) on improving core facilities. FASEB reiterated the critical importance of maintaining core facilities and urged NIH to actively promote (*e.g.* on the NCRR website) information on the location, capabilities, and research priorities of cores as well as fee structure, who can gain access, and how to negotiate access. The comments also contained suggestions for removing barriers to access to core facilities, including providing fee subsidies for investigators from outside institutions.

CTSA Clinical Research Training Evaluation

FASEB's Clinical Research Subcommittee of the Science Policy Committee has spent time considering assessment of NIH-supported clinical research training programs, particularly the clinical career development (K) awards. In that vein, FASEB recently sent a letter to the NIH Coordinators of the CTSA (Clinical and Translational Science Awards) Evaluation Steering Committee and Education and Career Development Committees requesting that, in addition to collecting data on the demographic and professional characteristics of CTSA trainees and scholars, they consider some other ideas. FASEB encouraged the CTSA consortium to standardize the evaluation of CTSA training programs, through creation of a common set of data elements and centralized database, and to examine institutional factors that contribute to success. Lastly, FASEB suggested institutions prioritize training program evaluation and develop a means to collect data on an expanded repertoire of career outcomes. FASEB also pointed out that outcomes that are not directly related to research but that are essential for sustaining the clinical and translational research enterprise—such as teaching, mentoring, administration, and leadership in clinical and translational research settings—might also be examined.

Carrie D. Wolinetz is Director of Scientific Affairs and Public Relations for the Office of Public Affairs at the Federation of American Societies for Experimental Biology (FASEB). She can be reached at cwolinetz@faseb.org.

Obama Scientific Integrity Memo Overshadowed by Stem Cell Announcement

BY PETER FARNHAM

March 9th was in many ways an important day for science under the still-young Obama administration. Making good on a long-standing campaign promise, the President signed an executive order rescinding former President Bush's executive order of August 2001 limiting federal funding for embryonic stem cell research to those lines already in existence at the time of the signing (see the story on the stem cell order on p. 10 for more details).

However, at the same time, the President issued a memorandum to the heads of all executive departments and agencies on the subject of scientific integrity. In it, he assigned the Director of the Office of Science and Technology Policy "the responsibility for ensuring the highest level of integrity in all aspects of the executive branch's involvement with scientific and technological processes." The OSTP director was given 120 days to come up with a plan to accomplish this.

The six principles that the OSTP director is expected to consider in developing this plan cover the hiring and retention of personnel in science-related positions; rules ensuring integrity within each federal agency; making sure that scientific information is accurately and appropriately used when making policy decisions; making publicly available scientific findings upon which policy decisions are based; having in place procedures to identify and address instances where scientific information is ignored or misused; and developing and maintaining adequate whistleblower protections.

President Obama made it very clear that the memo was aimed at correcting a tendency under the previous administration to ignore, downplay, or actually suppress scientific information that did not support policy decisions in a whole host of areas, including the environment, health, and medical research. While all administrations shade data to support political conclusions—and there is always a large component of politics in any major policy decision of any administration—the Bush administration developed a somewhat deserved reputation for pushing this tendency to extremes.

The memo states: "The public must be able to trust the science and scientific process informing public policy decisions. Political officials should not suppress or alter scientific or technological findings and conclusions. If scientific and technological information is developed and used by the Federal government, it should ordinarily be made available to the public. To the extent permitted by law, there should be transparency in the preparation, identification, and use of scientific and technological information in policy-making. The selection of scientists and technology professionals for positions in the executive branch should be based on their

scientific and technological knowledge, credentials, experience, and integrity."

The memo thus addresses a variety of supposed weaknesses in how the Federal government manages the use of science and technology in its decision-making. Of course, many of the protections called for in the memo have been in place in Federal agencies for decades—whistle blower protections, for example. Likewise, scientific integrity regulations have been in place since the late 1980s and early 1990s—ASBMB was intimately involved in their development at the Department of Health and Human Services. Furthermore, a variety of "sunshine" laws require that meetings be open to the public and that scientific and other data used to inform policy decisions be made available to the public whenever possible.

The significance of the Obama memo, however, is twofold. For the first time, the White House has taken these issues on as a unified whole; up until now, action has been more or less ***ad hoc***, with piecemeal legislation being passed applying to some but not all agencies, or with some agencies developing regulations but not others.

A second highly significant component is that the OSTP director is now—for the first time in decades—squarely in charge of an administration-wide science policy initiative. While the power of OSTP directors has varied greatly from administration to administration, it is fair to say that their power since at least the 1970s has never approached that enjoyed by Vannevar Bush under President Truman or Guy Stever during the Kennedy administration, for example.

Unfortunately, at the moment, there is no OSTP director. John Holdren, from Harvard University, had been appointed to fill the position last December, but he has since been caught up in a power struggle in the Senate, with Senator Robert Menendez (D-NJ) having placed a "hold" on his nomination for reasons unrelated to Holdren himself. Even if the "hold" were removed immediately, a confirmation hearing has not yet been scheduled, and so Holdren may find himself being responsible for the completion of a very complex and time-consuming charge but without the full authority and cache associated with being confirmed in his position.

It is thus highly likely that unless Holdren is allowed to assume his responsibilities soon, the 120-day deadline for completion of his first major task will have to be extended.

Obama Outlines 2010 Budget

On February 26th, the President released his administration's budget proposal for fiscal year 2010, which begins on October 1st. The overall proposed budget is a whopping $3.5 trillion, with a deficit expected to approach $1.7 trillion. The proposal includes large spending increases on the President's three top priorities: education, health care, and energy. There are also large increases in science spending.

A somewhat puzzling item is the increase proposed for NIH for "cancer research," totaling $6 billion. It is unclear exactly how this money is counted, or where it will go. Is this money going to be spread among the various institutes (on the theory that much spending not specifically labeled as being for cancer research does in fact impact on cancer research), or is NCI slated for a huge increase while the rest of the institutes languish? There are no details.

Instead, the HHS summary states: "…this funding is central to the President's sustained, multi-year plan to double cancer research. These resources will be committed strategically to have the greatest impact on developing innovative diagnostics, treatments, and cures for cancer…"

In any case, it appears that NIH is slated for an increase of about $6 billion, a 20 percent increase if one does not include the stimulus money as part of the base.

Likewise, the National Science Foundation is slated for a generous increase, continuing the trend established in the last two years of the Bush administration, which strongly supported the America Competes Act and thus advocated spending increases at NSF—$7 billion is proposed for 2010. This is $500 million over what was approved for NSF for fiscal year 2009—just shy of an 8 percent increase.

The budget increases support for graduate research fellowships and for early-career researchers; increases support for the education of technicians in high-technology fields; encourages novel high-risk, high-reward research; and increases support for administration research priorities like global climate change.

Obama Rescinds Bush Stem Cell Decision—and Leaves Hard Choices up to NIH

President Obama rescinded the Bush stem cell decision of August 2001 on Monday, March 9th, to widespread approval from the science community.

The order does the following:

- Gives NIH the authority to "conduct responsible, scientifically worthy human stem cell research, including human embryonic stem cell research…"
- The NIH director was given 120 days to develop new guidelines on stem cell research.
- President Bush's statement and executive order of August 9, 2001 are specifically revoked.

President Bush's 2001 order declared that federal funding would only be allowed for research on stem cell lines developed from human embryos that existed as of August 9th of that year. This amounted to about 21 lines, and some of these proved to be less than useful due to contamination issues. However, the order did not forbid private funding for such research, and since 2001 hundreds of new stem cell lines have been developed.

There were repeated efforts in Congress to overturn the Bush executive order, but the only bill to make it to his desk (after the Republicans lost control of Congress) provoked the first veto of his presidency. The Obama order has thus been long awaited by the life sciences community. However, it includes a number of surprises and presents challenges in the months ahead.

The Obama order has been long awaited by the life sciences community; but it includes a number of surprises and presents challenges in the months ahead.

First, the order leaves implementation plans almost entirely up to the NIH director, who has 120 days to come up with plans to start funding such research. It is likely that the pro-life community is already weighing legal options to delay implementation of such plans when they are announced.

One likely avenue is the Dickey-Wicker amendment, which makes it illegal to use federal funds to support research "in which human embryos are created, destroyed, discarded, or knowingly…subjected to risk of injury or death greater than allowed for research on fetuses in utero." This may limit NIH's ability to create human embryos for purposes of this research (as the embryo is typically destroyed during the process of obtaining the stem cells). Whether NIH could conduct research on stem cell lines created in the private sector without federal funding is an obvious legal question.

Second, the order does not limit research to so-called "surplus" embryos left over from fertility treatments at IVF clinics (some 400,000 embryos are currently languishing in cold storage in such clinics nationwide). Legislation introduced in two previous Congresses would have overridden the Bush executive order but would have limited what embryos could be used.

A challenge NIH faces in implementing the Obama order is that there currently is no permanent NIH director. Thus, NIH is in much the same situation as the Office of Science and Technology Policy with respect to implementation of the President's directives regarding scientific integrity. NIH of course does have an acting director, Raynard Kington, a longtime NIH staffer who served as Elias Zerhouni's deputy. It is possible that Kington may end up developing the implementation proposals for the new stem cell policy before a new permanent director is on board. This might not be entirely unwelcome by the administration—as Kington may thus take the political heat already being generated over the decision, sparing the new permanent director from political trouble early on.

Finally, it will be interesting to see what happens to embryonic stem cell research funding in various states. During the Bush years, a number of states, including California, Maryland, and New Jersey, established embryonic stem cell research programs funded with state money. California and Maryland are both in deep financial trouble. Maryland is reportedly already considering defunding its stem cell research program to save money now that the research can be conducted with federal money. It is likely that this option is already being considered in Sacramento—and other financially pressed state capitols as well.

With Stimulus Done, Attention Turns to 2009 and 2010 Appropriations

The Obama administration spent most of its first month in office working on getting the massive $787 billion stimulus package completed. Now that that bill has been signed into law and money has started to flow, attention is turning to spending for 2009 and 2010.

A $410 billion omnibus spending bill covering all 2009 discretionary spending except for defense and veterans funding finally cleared the Senate the evening of March 10 after a highly contentious week of debate. Passage was much harder than the Senate leadership had expected, and opposition was more bipartisan than usual. In the end, however, 54 Democrats and eight Republicans voted in favor of cloture, thus cutting off debate and clearing the bill for final passage. The President signed the bill on March 11.

The bill includes a $937 million increase for the National Institutes of Health. This money is separate and distinct from the $10 billion included in the stimulus bill. It is counted as part of NIH's base, as opposed to the stimulus money, which must be spent in fiscal year 2009 and 2010 and won't be in NIH's budget after 2010 absent congressional action to make it a permanent increase.

Likewise, the National Science Foundation received a $425 million boost, rising to $6.5 billion (approximately a 7 percent increase). This is in addition to the $3 billion NSF received under the stimulus bill—a whopping 50 percent increase in that case. But again, this is only temporary money that must be spent in two years.

The contentious Senate debate over the 2009 omnibus bill was related to two issues—earmarks and what can be described as "sticker shock." The bill contains almost 9,000 earmarks totaling about $8 billion. Disdain was widespread and more bipartisan than one might expect over the earmarks (even though support for them was also broadly bipartisan, with 40 percent of the earmarks having been requested by Republicans), but in the end, the leadership managed to find the votes to beat back efforts to trim the bill.

Aside from the earmark issue, the overall cost was a problem for some senators. The bill increases discretionary spending by 8 percent over 2008, and many senators were reluctant to increase regular spending that much, given that the Congress had just approved the stimulus bill as well as a $700 billion bailout of the financial industry last fall. Also in the spending mix is talk that a *second* stimulus package might be needed (so far no details).

Table 1 includes overall 2009 funding levels for several science funding agencies.

Peter Farnham is Director of Public Affairs at ASBMB. He can be reached at pfarnham@asbmb.org.

TABLE 1

Federal Funding for NIH, DoE, NSF, USDA, and VA Programs

Agency/Program	FY 2009 Omnibus	FY 2008	Change FY 2008—FY 2009	FASEB FY 2009 Recommendation
National Institutes of Health	$30.3 billion	$29.4 billion	+$937.5 million (+3.19%)	$31.1 billion
Dept. of Energy **Office of Science**	$4.7 billion	$4.0 billion	+$755 million (+18.8%)	$4.8 billion
National Science Foundation	$6.5 billion	$6.0 billion	+$425 million (+7%)	$7.3 billion
USDA Agriculture and Food Research Initiative (AFRI) **USDA Agricultural Research Service (ARS)**	$201 million $1.14 billion	$192 million $1.12 billion	+$9 million (+4.82%) +30 million (+6.25%)	$300 million $1.4 billion
Veterans Affairs Medical & Prosthetics Research Program *(Not included in FY 2009 Ominibus. Included in Public Law 110-239)*	$510 million	$480 million	+30 million (+6.25%)	$555 million

Table Courtesy of FASEB Office of Public Affairs

asbmb member spotlight

Benkovic Honored by the Franklin Institute

Stephen J. Benkovic, Evan Pugh Professor and Eberly Family Chair in Chemistry at Pennsylvania State University, will be honored with the Benjamin Franklin Medal in Life Science during a gala black-tie ceremony and dinner at the Franklin Institute in Philadelphia this month.

Robert Bazell, of NBC News, will host the event, which will celebrate the extraordinary contributions of Benkovic and seven other pre-eminent trailblazers in science, business, and technology who will receive Franklin Institute awards. Benkovic's citation as a medal recipient lauds him for his "groundbreaking contributions to our mechanistic understanding of enzymes and for helping to unravel the complexities of the enzymes involved in DNA replication."

Benkovic's work is considered to be at the forefront of research being done at the interface of chemistry and biology, and he is considered one of the most prominent mechanistic enzymologists in the world. His studies include the development and application of innovative kinetic methods and the invention of novel biological protocols for investigating the chemical sequence and structural basis of enzyme activity. With these techniques, he has studied many different enzyme systems and has aided in the design of cancer drugs and antibiotics.

Fanning to Receive Humboldt Research Award

Ellen H. Fanning, Stevenson Professor of Biological Sciences at Vanderbilt University, has received a 2009 Humboldt Research Award.

The award is granted by the Alexander von Humboldt Foundation in Bonn, Germany for the purpose of encouraging research collaborations between German scientists and colleagues in other countries. The foundation grants up to 100 such awards annually.

According to the Foundation, the award is given to "outstanding scientists and scholars from all disciplines from abroad whose fundamental discoveries, new theories, or insights have had significant impact on their own discipline and who are expected to continue producing cutting-edge achievements in the future."

Fanning's research has focused on understanding DNA replication in mammalian cells. She has played a leading role in turning simian virus 40 (SV40) into a powerful model system for studying how mammalian cells divide and reproduce, by making use of the fact that the virus relies heavily on the replication machinery of its host cell and uses a single viral protein, T antigen, to co-opt the cellular proteins that it needs to copy itself. This has allowed Fanning and her colleagues to identify a number of the host proteins that are essential for cell replication, figure out how they function, and determine how they fit into the complex network of molecular pathways that orchestrate the normal process of cell division in mammals.

Bertozzi Selected for Howe Award

Carolyn R. Bertozzi, T. Z. and Irmgard Chu Distinguished Professor of Chemistry and professor of Molecular and Cell Biology at the University of California, Berkeley, has been selected to receive the 2009 Harrison Howe Award from the Rochester Section of the American Chemical Society. The award was established to recognize a scientist who has made outstanding contributions to chemistry or closely related fields and who shows great potential for further achievement.

Bertozzi's research interests lie at the intersection of chemistry and biology, with a particular focus on understanding the relationship of cell surface glycosylation to normal cell function and to human disease. Bertozzi has designed experiments that have contributed to the way in which researchers can profile changes in cell surface glycosylation associated with cancer, inflammation, and bacterial infection. She is most noted for her pioneering work in the field of bioorthogonal chemistry on living systems.

In addition to her Berkeley appointment, Bertozzi is an Investigator of the Howard Hughes Medical Institute and Director of the Molecular Foundry, a nanoscience institute at the Lawrence Berkeley National Laboratory.

Brown Receives Lifetime Achievement Award

Donald D. Brown of the Carnegie Institution's Department of Embryology will receive the 2009 Lifetime Achievement Award from the Society for Developmental Biology. The award is given to "a senior developmental biologist in recognition of her/his outstanding and sustained contributions in the field…[and] for the individual's excellence in research and for being a superb mentor who has helped train the next generation of exceptional scientists."

From 1960 to 1990, Brown studied how genes are expressed during embryonic development. Many of these studies took place before the recombinant DNA era and established facts about genes such as their structure, their evolution, and how their expression is controlled.

In 1990, Brown changed his research to a more complex problem—the control of gene expression by thyroid hormone in regulating the transformation of tadpoles into frogs. By studying the hormone's role in amphibian metamorphosis, Brown and his colleagues developed a strategy to analyze the complexities of the hormone-gene interactions. He used thyroid hormone-induced metamorphosis in *Xenopus laevis* to identify genes and gene pathways regulated by the hormone. This work provided the foundation for understanding how hormones control the development of organs, as well as tissue development, growth, and death.

Serda Wins Professional Development and Enrichment Award

Rita Serda, a postdoctoral fellow in the Department of Biomedical Engineering at the University of Texas Health Science Center in Houston, has been selected to receive a 2008 FASEB Postdoctoral Professional Development and Enrichment Award.

The award is funded by a grant from the National Institute of General Medical Sciences, National Institutes of Health and was established to recognize outstanding achievement by an early career life scientist from an underrepresented minority group. The awards are primarily intended for advanced postdoctoral fellows or new assistant professors who will be able to utilize these resources to gain knowledge, skills, and training to enrich their competitiveness for research funding, publication in top-tier journals, and employment in prestigious research-intensive settings.

Recipients of the award receive a $3,000 unrestricted career development award and a certificate of recognition. In addition, a travel award of up to $2,450 is provided to each award winner to support his/her participation in a national scientific meeting.

Serda's research centers on engineering vehicles for the systemic delivery of therapeutic molecules and imaging agents for the treatment of cancer and other diseases. Her nanoscale drug delivery system uses a multi-stage approach that combines the ability to perform sequential functions, offers opportunities to negotiate multiple, serially presented biological barriers, and reduces systemic toxicity.

IN MEMORIAM:

Marco Cabrera (1954-2009)

Marco Cabrera, associate professor of pediatrics and researcher in pediatric cardiology at the School of Medicine at Case Western Reserve University, died this past February.

Cabrera was born in Guatemala City. Fascinated with science early on, he got in trouble for experiments with oil in the shower and matches at a gas station. He graduated from the Universidad del Valle de Guatemala with a degree in physics/mathematics. He then studied at the Swiss Federal Institute of Technology and at Case Western Reserve University, earning a doctorate in biomedical engineering. He remained at Case Western for his postdoctoral studies.

Cabrera returned to Guatemala and became an assistant professor in the Departments of Mathematics and Chemistry at the Universidad de San Carlos de Guatemala and the Departments of Mathematics and Physics at the Universidad del Valle de Guatemala. He became an instructor in the Department of Mathematics at the Universidad Rafael Landivar as well as an instructor in the Department of Computer Sciences at the Universidad Francisco Marroquín, both in Guatemala.

Finally, Cabrera returned to the United States to become scientific director of the exercise physiology laboratory at Rainbow Babies and Children's Hospital in Cleveland, OH. He also ran the cardiology department's computer network operations. Cabrera later became an assistant professor at Case Western and a department head for its Modeling Integrated Metabolic Systems.

Cabrera had the knowledge and tact to unite theoretical and experimental researchers from different fields in fruitful work. "He spent his life to integrate these worlds," said Nicola Lai, senior research associate. He was also an outstanding member of the *Journal of Biological Chemistry* editorial board.

IN MEMORIAM:

Takashi Tsuruo (1943-2008)

Takashi Tsuruo passed away last December after a brief battle with non-small cell lung cancer.

Tsuruo was director of the Cancer Chemotherapy Center at the Japanese Foundation for Cancer Research, as well as editor-in-chief of *Cancer Science*, and professor emeritus at the University of Tokyo. He was a founding member of both the Metastasis Research Society and the Japanese Association for Metastasis Research.

Tsuruo earned his Ph.D. from the University of Tokyo in 1972. He then did postdoctoral studies at St. Louis University and the University of California, Los Angeles. In 1977, Tsuruo joined the Cancer Chemotherapy Center as a research staff scientist. He was promoted to chief of the Division of Experimental Chemotherapy in 1986 and eventually became director of the Cancer Chemotherapy Center in 2006.

Tsuruo was well known for his studies of cancer multi-drug resistance (MDR), cancer metastasis, and cancer apoptosis. He discovered that Aggrus (or gp44) is a platelet-aggregating factor expressed in a number of human cancers and also that the drug verapamil is an MDR-reversing agent. In addition, he conducted pharmacological and molecular biological studies on MDR mechanisms, and as a result of these studies, P-glycoprotein was first recognized as an ABC (ATP-binding cassette) transporter family protein. More recently, Tsuruo had turned his attention to apoptosis, as many antitumor drugs induce apoptosis in tumor cells.

News from the Public Affairs Office

Listed below are several upcoming opportunities for ASBMB members to participate in the Society's public affairs work.

The Public Affairs Advisory Committee will be sponsoring two symposia at the upcoming annual meeting in New Orleans.

Balancing NIH Program Priorities between Biomedical Research Technology Centers and Emerging Clinical and Translational Programs

Today's tough financial times have hit research institutions especially hard, with budget cuts and hiring freezes across academia. Fortunately, the economic stimulus legislation includes large amounts of funding to support our biomedical research infrastructure. NIH's National Center for Research Resources (NCRR) received $1 billion to fund "competitive awards for the construction and renovation of extramural research facilities," another $300 million for shared instrumentation and other capital equipment, and an additional share of the $7.4 billion stimulus funds being distributed among the various Institutes and Centers of NIH. These events have made ASBMB's upcoming symposium on biomedical research infrastructure especially timely.

NCRR plays an essential role at NIH in harnessing the basic science advances produced through NIH-funded research into treatments to improve public health. The new Clinical Translational Science Awards program at NCRR is intended to fulfill this mission. NCRR also funds the longstanding Biomedical Technology Research Center program (also referred to as funding mechanism P41) which performs a related function, bringing the cutting edge of technology to bear on all areas of research: basic, translational, and clinical. These intertwined projects provide NCRR with unique opportunities for synergy in support of both clinical research and the basic biomedical discoveries that will provide the breakthroughs of the future. How can NCRR best support both of these aspects of its mission? ASBMB has assembled a prominent panel of speakers and panelists to discuss these questions in New Orleans:

Moderator:

- **Ralph A. Bradshaw**, Professor, Pharmaceutical Chemistry, UCSF and Chair, Public Affairs Advisory Committee, ASBMB

Speakers:

- **Barbara Alving**, Director, National Center for Research Resources
- **Henry Ginsberg**, Director of the Irving Institute for Clinical and Translational Research, Columbia University
- **Philip Needleman**, Former Professor and Chairman of Pharmacology at Washington University School of Medicine and Former Chief Scientist and Head of R&D Monsanto/Searle/Pharmacia

Panelists:

- **Al Burlingame**, Director of the NCRR National Resource in Mass Spectrometry and Proteomics, University of California, San Francisco
- **Wah Chiu**, Director of the National Center for Macromolecular Imaging, Baylor College of Medicine
- **Cathy Costello**, Director of the BU Mass Spectrometry Resource, Boston University School of Medicine
- **Keith Hodgson**, Deputy Director of the SLAC National Accelerator Laboratory and NCRR Synchrotron Research Resource, Stanford University
- **Michael Marron**, Director of the Division for Biomedical Technology, National Center for Research Resources

We hope that you will join us for this discussion on Sunday, April 19th, from 12:25 to 1:55 pm in room 346 of the Convention Center. For more information on this symposium or to tell us what you think about these issues, please visit our webpage at: http://friendfeed.com/rooms/nihinfrastructure09.

The Evolution of Creationism

With the passage last year of the Louisiana Science Education Act and this being the year of Darwin, it is especially fitting that ASBMB is holding a public affairs symposium in New Orleans on evolution. The symposium, called "The Evolution of Creationism," will take place on Monday, April 20th, at 5 pm in the La Louisiane Ballroom. The Public Affairs Advisory Committee has arranged a knowledgable panel of speakers, and the event will be chaired by ASBMB President Gregory Petsko, Brandeis University. The speakers are listed below in alphabetical order.

- **Dr. Barbara Forrest**—Southeastern Louisiana University. Dr. Forrest teaches philosophy and has written a book called *Creationism's Trojan Horse,* about the intelligent design movement. She will discuss the likely impact of the new Louisiana law on teaching science in the state.
- **The Honorable John E. Jones**—Judge Jones presided over the 2005 Kitzmiller v. Dover trial in Dover, Delaware, which resulted in a major court victory for opponents of teaching intelligent design in public school science classrooms. Judge Jones will discuss the case law leading to the Dover trial and also describe how judges decide what is good science.
- **Dr. Kenneth Miller**—Brown University. Dr. Miller is a very well known advocate for evolution education, has won numerous science education awards, and has written extensively on the subject of evolution education, including most recently *Only a Theory—Evolution and the Battle for America's Soul.*
- **Dr. Eugenie Scott**—National Center for Science Education. Dr. Scott is the executive director of the NCSE, based in Oakland, California, and has been a leading educator in the field of evolution for decades. The second edition of *Evolution vs. Creationism—an Introduction* was released in December 2008.

We hope all of you will plan to attend what is likely to be one of the premier events at EB this spring.

The ASBMB Science Policy Fellowship

BY ALLEN DODSON

As this year's science policy fellow, I have learned a tremendous amount about policy issues that affect researchers. We spend much of our time in Washington focusing on the latest budget numbers, but regulatory and funding agencies are constantly discussing many other issues. In February's edition of "News from the Hill," I provided updates on financial conflicts of interest, dual-use research, and early-stage investigators, just some of the many topics we follow. ASBMB's Director of Public Affairs, Peter Farnham, the Society's Public Affairs Advisory Committee, our colleagues at FASEB, and other advocacy organizations provide ASBMB's policy fellow with access to a tremendous wealth of experience and expertise.

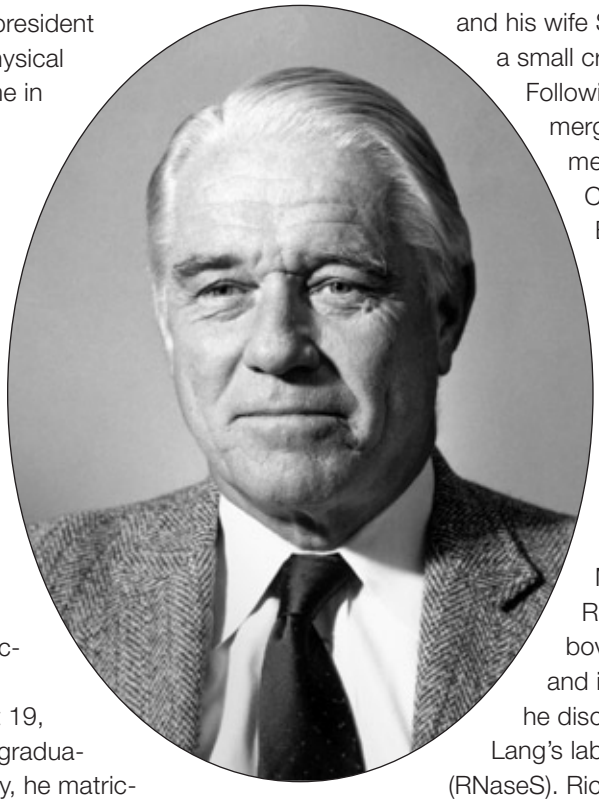
If you, or someone in your lab, still love science but are considering stepping away from the bench to advocate for science policy, ASBMB's science policy fellowship is a great opportunity. More information can be found in our ad in this issue of *ASBMB Today* or on our website at: www.asbmb.org/policyfellowship.

Retrospective: Frederic M. Richards (1925-2009)

BY JAMES V. STAROS

Frederic M. Richards, former president of the ASBMB and the Biophysical Society, passed away at his home in Guilford, CT on January 11th. He was 83.

Fred Richards was a towering figure in protein chemistry, having played a key role in moving the concept of proteins from amorphous colloids to discrete molecular structures. His contributions to protein science ranged from his central role in founding what is now known as structural biology—both experimental and computational—to the design and application of new chemical reagents for probing protein structure and function.



Richards was born on August 19, 1925 in New York City. After his graduation from Phillips Exeter Academy, he matriculated at the Massachusetts Institute of Technology (MIT). Military service intervened toward the end of WWII, but he returned to MIT after his discharge and received a B.S. degree in 1948. For his graduate study, he moved to E. J. Cohn's department at Harvard Medical School, where he worked with Barbara Low and received a Ph.D. in 1952. He stayed at Harvard for a year as a research fellow with Cohn and then moved to the Carlsberg Laboratory in Denmark, where, with Kaj Linderstrøm-Lang and others, he began working with ribonuclease. After a short stint at Cambridge University as a National Science Foundation postdoctoral fellow, Richards joined the faculty of the Department of Biochemistry at Yale University in 1955 as an assistant professor. He rose rapidly through the ranks, becoming professor in 1963.

In 1963, Richards was appointed chairman of the Department of Molecular Biology and Biophysics at Yale, which entailed a move from the Medical School to the Yale College campus. Richards spent a sabbatical at Oxford University from 1967 to 1968, for which Richards and his wife Sally sailed their own boat with a small crew across the Atlantic Ocean. Following this break, when Yale merged the Medical School Department of Biochemistry and the Yale College Department of Molecular Biology and Biophysics to form a new university-wide Department of Molecular Biophysics & Biochemistry, Richards became its founding chair (1969–1973).

Summarizing Richards' contributions to protein science is difficult because of the breadth that he covered. Much of the early work in Richards' laboratory focused on bovine pancreatic ribonuclease, and in particular a preparation that he discovered while in Linderstrøm-Lang's laboratory, dubbed ribonuclease-S (RNaseS). Richards and co-workers purified and characterized RNaseS, separated it into S-peptide (residues 1–20) and S-protein (residues 21–124), both enzymatically inactive, and showed that S-peptide did not retain an ordered structure in solution but could be reconstituted with S-protein into enzymatically active RNaseS. They crystallized RNaseS and showed that RNaseS was enzymatically active in the crystal, putting to rest the widely held view (at that time) that protein crystal structures were irrelevant to the conformation and behavior of enzymes in solution. In collaboration with the late H. W. Wyckoff, they solved the structure to atomic resolution (a tie for the third protein structure ever solved to atomic resolution) with and without bound nucleoside monophosphate. While on sabbatical at Oxford, Richards designed and built the Richards Optical Comparator, better known in the field as "Fred's Folly," or simply "the Folly," which remained the method of choice for converting electron density maps to models, until it was supplanted by computer graphics.

The Richards Lab always included a "wet" component

focused on the properties of proteins in solution and on the design and application of new chemical reagents for modifying proteins in ways that reported on the proteins' structure and/or function. Types of reagents pioneered in the Richards laboratory included hydrophilic and hydrophobic photoactive reagents for studying membrane protein topology, cleavable cross-linking reagents for studying protein quaternary structure, and reagents that exploited the remarkably strong binding between ferritin and avidin for use in localizing target proteins within cellular structures.

Richards received many honors for his scientific achievements, including the Pfizer-Paul Lewis Award in Enzyme Chemistry (1965), a Guggenheim Fellowship (1967-1968), election as Fellow of the American Academy of Arts and Sciences (1968), election to the National Academy of Sciences (1971), the Kai Linderstrøm-Lang Prize in Protein Chemistry (1978), the ASBMB Merck Award (1988), the Stein and Moore Award of the Protein Society (1988), and the State of Connecticut Medal of Science (1995).

What should not be overlooked in reviewing Richards' science is that the Richards Lab was a wonderful place to develop as a scientist, whether one's experience there was as an undergraduate student, graduate student, postdoctoral fellow, or sabbatical visitor.

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

When I came back to the U.S. after doing my D. Phil. and postdoc in Europe, Fred Richards went out of his way to help me get integrated into the American structural biology community. It was typical of the man; over the years, he was enormously kind and supportive, not just to me, but to numerous young scientists. Since we worshipped him for his direct manner and extraordinary creativity, his support and friendship over the years meant more than I can easily express. Fred was a role model for how to behave, not just as a scientist but also as a person. I'm really going to miss him.

Gregory A. Petsko,
Gyula and Katica Tauber Professor of Biochemistry and Chemistry and Chair, Department of Biochemistry, Brandeis University

In 1979, Fred was the incoming President of ASBMB (ASBC at that time) and chaired the search committee for recruitment of a new Executive Officer. While not excluding a scientist for the position, Fred did not exclude a non-scientist from consideration for the job. From a purely selfish view, I will be forever grateful for this decision and the trust he and the rest of the committee put in me. Fred was always someone who was enthusiastic about life, especially when he discussed sailing, and I will always remember him fondly. A personal loss and a loss to science.

Charles C. Hancock,
former ASBMB executive director

Fred was very inclusive. He came from a family of strong women and married another strong woman. Sally and I recall his joking at his retirement party about the effect that this environment had on his development. He had a gift for mentoring women; setting an example himself through his creativity, work ethic, and high standards; and opening doors that might otherwise have remained closed. His choice of John Mouning as his right-hand man and his inclusion of John's wife, Thelma, and their children in lab activities, placed an African-American family in a prominent position in the scientific world and undoubtedly encouraged others to pursue careers in science.

Norma M. Allewell,
Dean of Chemical and Life Sciences and Professor of Chemistry and Biochemistry at the University of Maryland

Fred Richards was an inspiration to me and other structural biologists of my generation. He had deep understanding of protein chemistry and structure. His presentations were crisp, delivered with a square-jawed assurance often punctuated by good jokes, frequently at his own expense. Among his historic findings was, with Flo Quiocho, that enzymes are active in the crystalline state as well as in solution. This all but silenced the frequently voiced biochemical concerns of the 1960s that crystalline proteins are somehow different from those in solution. Another was his finding that the cleaved S peptide of ribonuclease A binds to the rest of the protein, restoring native activity. This was a paradigm-defining result on protein-protein interactions.

David Eisenberg,
Director UCLA-DOE Institute for Genomics and Proteomics

Fred Richards was such a remarkable person that it is difficult to describe his achievements in only a few words. He was an amazing experimentalist. As an undergraduate at Yale, I had a wonderful time building instruments for Fred, most of them related to the study of protein structure and dynamics in crystal lattices. One instrument we built allowed the measurement of the size of solvent channels in protein crystals, work that I believe influenced Fred's pioneering theoretical work with B. K. Lee on protein accessible surface areas. Fred also did pioneering work on enzyme mechanisms with Ribonuclease-S and nurtured an environment within the Yale WERMS group that led to a host of additional important discoveries in molecular structure and biophysics by colleagues and students. Fred motivated several generations of scientists, many of whom are still basically working on questions that he asked first. He will be missed by everyone who knew him.

F. Raymond Salemme

Fred Richards was a new assistant professor when I was a graduate student at Yale in the 1950s. Just back from his postdoc in Denmark, he brought to the Biochemistry Department new ways of looking at proteins, an infectious attitude that research was indeed fun, and a collection of elegant glass micropipettes, the first we had ever seen. We could not know it then, but he also brought with him the profound changes in scientific outlook that fueled the last half century of biology.

Maxine Singer,
Carnegie Institution, president emerita

Whether it is ribonuclease, crystallography, folding, energetics, packing, solvent accessibility, or inside versus outside, Fred Richards was there. Much of present day research on protein bears the imprint and the impact of his creative studies. For more than 50 years, he produced a steady stream of bold and imaginative investigations that combined novel tools and approaches leading to invaluable knowledge of protein structure and function. He raised questions that had not been considered previously and devised experiments to answer them. In addition, Fred Richards was a remarkable teacher and citizen whose contributions as editor, head of the Jane Coffin Childs Memorial Fund for Medical Research, and President of the American Society of Biological Chemists were incalculable. Moreover, he was an accomplished sailor and a great guy.

Howard K. Schachman,
professor of Molecular and Cell Biology,
University of California at Berkeley

One of Fred's outstanding characteristics was his penetrating, almost prescient vision and his ability to see far beyond the experiment at hand. One example: In a paper published in the JBC *half a century ago* (Richards & Vithayathil [1959] *JBC* **234**: 1459-1465), *in which were described the separation of ribonuclease S into enzymatically inactive S-protein and S-peptide and the reconstitution of enzyme activity by the re-association of S-protein and S-peptide, he observed, "The strength of the interaction in this enzyme system appears to be of the order of magnitude that might be required to explain the initial effects of peptide hormones in the target organs." As someone who has spent much of his scientific career working on receptors for one class of polypeptide hormones, I find this remarkably visionary—and typical of Fred.*

James V. Staros,
professor of Biochemistry and
dean of the College of Arts & Sciences,
SUNY-Stony Brook

I recall Fred with great affection. He was a marvelous mentor (although I was always a little in awe of him), a great scientist with whom one could discuss a whole range of phenomena (for example, the diffusion of ligands into proteins and protein crystals), and most of all, a person who made science and the life of science great fun.

Louise Johnson,
Sir David Phillips professor of Molecular Biophysics at Oxford University

Fred was an original. He was one of the great protein chemists at a time when protein chemistry was center stage. His contributions were enormous.

Ralph Bradshaw,
professor of Chemistry and Pharmaceutical Chemistry and deputy director, Mass Spectrometry Facility,
University of California, San Francisco

Systems Biology for Biochemists

BY ARCADY MUSHEGIAN

The words "systems biology" occur more than 5,000 times in PubMed and return more than 32 million matches in a Google search. This is not bad for an area of science that is still trying to define itself.

Maureen O'Malley and John Dupre, social scientists who have studied the emergence of the new discipline, note:

> *Under the systems biology rubric are two different (but not mutually exclusive) understandings of "system." The first account is given by scientists who find it useful for various reasons (including access to funding) to refer to the interconnected phenomena that they study as "systems." The second definition comes from scientists who insist that systems principles are imperative to the successful development of systems biology… The majority of today's systems biologists fall into the former category, united simply by an agreement that systems biology involves the study of interacting molecular phenomena through the integration of multilevel data and models. For them, "system" is a convenient but vague term that covers a range of detailed interaction with specifiable function… For hard-line systems-theoretic biologists, however, an ad hoc approach to systems is inadequate. It is crucial, they argue, "to analyze systems as systems, and not as mere collections of parts" in order to understand the emergent properties of component interactions.*[1]

Biochemists and molecular biologists whose training and practice are rooted in the mechanistic and evolutionary understanding of macromolecules have been observing many of these recent developments in systems biology with a detached amusement. However, what they wanted to know, and were not hearing from even hard-line systems biologists, were the important facts, or at least claims, about the molecular level of living systems that would emerge from the systems-level analysis.

The representation of biological systems as complex networks is also taking hold, but the questions here are the same. Indeed, some networks exist in a real sense: a signal can be sent from an Internet address to other addresses, and perhaps from some cells in a metazoan neural system to some other cells. But is there any physical sense in, say, a protein-protein interaction network? For example, can anything be sent or propagated across it? Another question has to do with the quality of the evidence: after the first round of claims that certain biological networks are "scale-free" or "small-world" or "highly robust," we are now at the stage of much more careful analysis when many of these earlier conclusions are being refined and sometimes even refuted. Finally, there is the "so what?" factor. Much attention has been given to the global properties of biological networks, such as their node-degree distribution. However, even when we finally describe such properties with some accuracy, will they end up being important for understanding of life?

The time is right to provide some of the answers to these questions in ways that would fit the sensibilities of the ASBMB members. The new ASBMB small meeting, *Systems Biology for Biochemists*, which will take place October 22-25, 2009 at Granlibakken Conference Center and Lodge in Lake Tahoe, attempts to do just that. The meeting will focus on three themes: ancestral biochemistry, protein structure, and metabolism. The speakers will explore these themes using systems biology approaches. Three morning sessions of invited presentations will be followed by two evening sessions for shorter talks selected from submitted abstracts to allow young researchers to present their work. Women and minority scientists are strongly encouraged to submit abstracts for consideration.

For more information and details on registration, go to www.asbmb.org/systemsbiology.

Systems Biology for Biochemists Small Meeting *An ASBMB Sponsored Special Symposium*

OCTOBER 22-25, 2009

Granlibakken

TAHOE CITY, LAKE TAHOE, CALIFORNIA

Organizer: Arcady Mushegian *(Stowers Institute for Medical Research)*

Confirmed Plenary Speakers

Eugene Koonin *(National Institutes of Health)*
Gregory Petsko *(Brandeis University)*

Confirmed Invited Speakers

Vadim Gladyshev *(University of Nebraska)*
Eric Gaucher *(Georgia Institute of Technology)*
Carol Lartigue *(J. Craig Venter Institute)*
Valerie DeCrecy-Lagard *(University of Florida)*
Nick Grishin *(UT Southwestern—HHMI)*
Joun-Mark Chandonia *(Lawrence Berkeley National Laboratory)*
Aled Edwards *(University of Toronto)*
Frederick Roth *(Harvard University)*
Andrey Rzhetsky *(University of Chicago)*
Arcady Mushegian *(Stowers Institute for Medical Research)*
Alexey Murzin *(MRC Laboratory of Molecular Biology)*
David Sprinzak *(California Institute of Technology)*

Arcady Mushegian is the director of the Bioinformatics Center at the Stowers Institute for Medical Research. He can be reached at arm@stowers-institute.org.

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The Eigenfactor™ Metrics: How Does the *Journal of Biological Chemistry* Stack Up?

BY JEVIN D. WEST, MORITZ STEFANER, AND CARL T. BERGSTROM

The scientific literature comprises a vast network of research papers, linked to one another by scholarly citations; this network traces the spread of ideas through the scientific community.[1] At the Eigenfactor™ Project, we use the structure of this network to assess the influence of scholarly journals and to map out relations among scientific fields.[2]

The main idea behind the Eigenfactor Metrics is that a journal's influence is determined by a weighted sum of the citations that it receives. Citations from influential journals such as *Nature*, *PLoS Biology*, or *Cell* carry more weight than citations from second- and third-tier journals. Which journals are influential is determined by an iterative procedure analogous to Google's PageRank algorithm.[3] Although iterative rankings require more complicated computations than measures like impact factor, the reward of accounting for the variable influence of citation sources is a much richer measure of journal quality.

We use two primary measures to rank scholarly journals. The Eigenfactor™ Score measures a journal's total influence; with all else being equal, larger journals have higher Eigenfactor scores. The Article Influence™ Score measures the influence *per article* of a journal. As a per article measure of prestige, the Article Influence is comparable to Impact Factor. At the Eigenfactor website (www.eigenfactor.org) we provide the Eigenfactor scores and Article Influence scores for more than 8,000 scholarly journals over the past decade, based on citation data from the Thomson-Reuters *Journal Citation Reports* (*JCR*).[a]

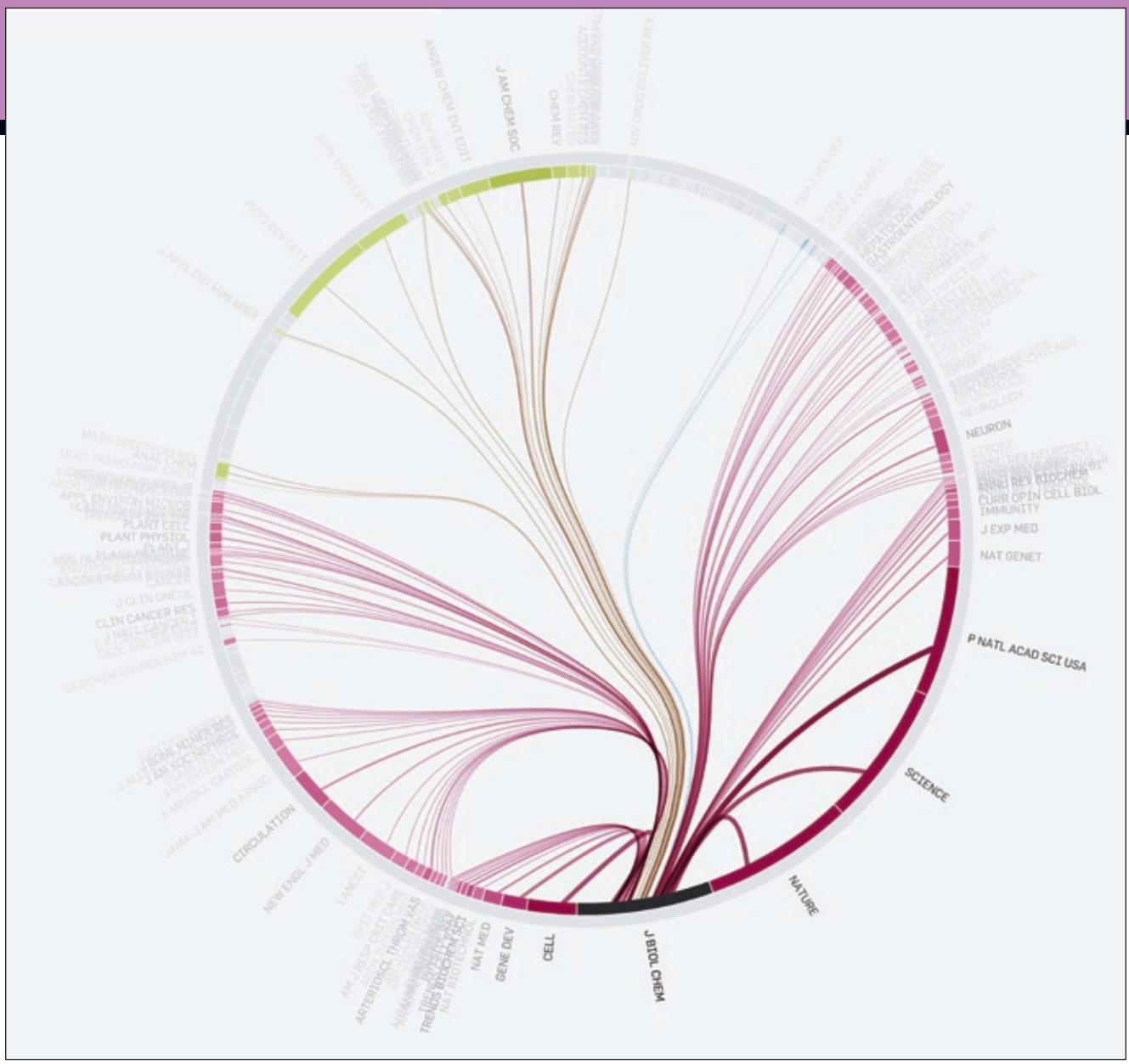
So what do the Eigenfactor metrics tell us about the *Journal of Biological Chemistry (JBC)*? In 2006,[b] *JBC* had an Eigenfactor Score of 1.82. Basically, this score tells us that the journal is both large and influential. The Eigenfactor algorithm estimates that the *JBC* constitutes 1.82 percent of the *total* citation traffic in all of the scientific literature. In fact, *JBC* has the fourth-highest Eigenfactor score out of the 7,611 journals indexed, after only *Science*, *Nature*, and *Proceedings of the National Academy of Science, U. S. A.*

The 2006 Article Influence Score for *JBC* is 2.4. This means that an article in this journal is on average 2.4 times more influential than the average article in the *JCR*, placing it in the top 5 percent of all journals in all fields.

Another important consideration is the price of a journal. In studying the economics of scientific publishing, we have been struck by the enormous discrepancies in journal prices.[4] In most disciplines, the library subscription prices for journals produced by for-profit publishers are three to five times as much per page as those charged for journals produced by societies and university presses. The high prices of many for-profit journals do not reflect higher quality as measured by citation rates, but they have contributed to the current serials crisis that leaves even large research libraries unable to afford all of the journals that their users demand.

Quantitative measures of cost effectiveness are therefore useful as libraries struggle to make difficult subscription decisions, and as authors endeavor to steer their best work toward journals that provide good value to the scholarly community. Our Cost Effectiveness[c] tool provides a way of quantifying the value per dollar that a journal provides; the basic assessment metric is the "subscription cost per Eigenfactor score." By this measure, the *JBC* is an exceptionally good deal—the third best deal in all of science, placing it in the 99.9th percentile in terms of the value per dollar that it offers.

The Eigenfactor Project is not, however, only about ranking and assessing cost effectiveness. It is also about understanding the structure of the sciences and mapping the way that citations flow among the disciplines. The radial diagram in Fig. 1 illustrates one of the interactive tools we have developed for exploring these patterns. In this figure, we see the flow of citations between the *JBC* and 399 other leading journals in the natural and social sciences. The most striking aspect of this diagram is the breadth of reach that the *JBC* has across the sciences. We see strong connections not only to chemistry, biochemistry, and molecular biology but also to neuroscience, medicine, evolutionary



Citation flow for the *Journal of Biological Chemistry*, from well-formed.eigenfactor.org/radial.html. The figure highlights the citation relationships between the *JBC* and the rest of science. The colors depict major groups within science. For example, the *greenish* color represents physics and chemistry. The *thickness* and *opacity* of the lines connecting the different journals indicate connection strength.

biology, ecology, geosciences, and physics. We also see the major gaps in citation influence: there is little connection between *JBC* and the area of astronomy and astrophysics, for obvious reasons. The interactive on-line version of this diagram allows one to select any field or journal and see its citation flow patterns; this application can be found at well-formed.eigenfactor.org/radial.html.

The Eigenfactor Project began as an attempt to better evaluate the scholarly literature, using citation data and powerful tools from network and information theory. In the process, we have found that citation networks tell us not just about relative ranks among journals but also about the connections between them. We hope to use this information to better understand the nature and structure of the scientific enterprise.

Jevin D. West and Carl T. Bergstrom are in the Department of Biology at the University of Washington, Seattle. Moritz Stefaner is at the Interaction Design Lab of the University of Applied Sciences in Potsdam, Germany.

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FOOTNOTES

[a] As of February 2009, Eigenfactor scores and Article Influence scores are also provided as part of Thomson-Reuters' Journal Citation Reports database.
[b] At the time of publication, the 2006 scores were the latest available on the Eigenfactor.org website. These scores will be updated periodically.
[c] Cost Effectiveness rankings can be found at www.eigenfactor.org/pricesearch.php.

75 for 50: Special Anniversary Issue of *JLR* Celebrates All Things Lipid

BY NICK ZAGORSKI

"Everything you always wanted to know about lipids but were afraid to ask." That would certainly be a fitting subtitle to the special 50th anniversary "golden issue" of the *Journal of Lipid Research* to be published this month. Featuring a set of 75 review articles covering virtually every corner of lipid research, from Lipid A to Apo-AV, this special issue provides a comprehensive time capsule of the tremendous growth of lipid-related studies over the past half-century that should be of considerable interest and a valuable resource to lipid and non-lipid scientists alike.

As *JLR* Co-Editor-In-Chief Edward Dennis notes in his review piece, "Founding, Early History, and Transformation of the *Journal of Lipid Research* to an ASBMB Journal," the growth of the *JLR* these past 50 years has in many ways reflected the growth of lipid research as a whole. Initially conceived primarily as a methodology notebook to compile findings from new analytical techniques such as gas-liquid chromatography and lipoprotein fractionation, *JLR* has grown into a significant resource for all lipid research, including basic biochemical analyses, animal models of disease, and even patient-oriented epidemiological studies.

Along the way, many of the groundbreaking discoveries in lipids and many of the prominent players in the lipid arena graced the pages of this journal, so it is only fitting that this golden issue celebrate the rich, distinguished, and international history of lipid research with 75 stellar contributions (encompassing nine separate lipid themes: Enzymology, Metabolism, Lipoprotein Metabolism, Oxidized Lipids, Signaling, Receptors, Membranes and Lipid Domains, Atherogenesis, and Lipids in Health and Disease) from past, present, and future experts in this field.

Among the contributors are seven of the *JLR*'s current and former editors-in-chief (Edward Dennis, Alan Fogelman, Trudy Forte, Donald Small, Arthur Spector, Daniel Steinberg, and Joseph Witztum), as well as several scientists with whom readers of *ASBMB Today* might be familiar. These include George Carman, director of the Rutgers Center for Lipid Research, who (with Gil-Soo Han) reviews the "Regulation of Phospholipid Synthesis in Yeast;" recent Science Focus profilee Rosalind Coleman, who contributes an article (with Cynthia Nagle and Eric Klett) on "Hepatic Triacylglycerol Accumulation and Insulin Resistance;" and both the 2008 and 2009 winners of ASBMB's Avanti Award in Lipids, Alexandra Newton and Sarah Spiegel.

One of the issue's highlights is undoubtedly a special review by Michael Brown and Joseph Goldstein chronicling the rich 75-year history of cholesterol research, from Rudolf Schoenheimer's measurements of cholesterol balance in mice in a bottle to the discovery of the Sterol Regulatory Element-binding Protein (SREBP) pathway. And, they are not the only Nobel laureates to participate in this issue, as Bengt Samuelsson (along with Olof Rådmark) discusses the mechanisms regulating 5-lipoxygenase, an enzyme important in the synthesis of leukotrienes.

Of course, while the reviews contained within the 50th anniversary issue highlight how far we've come in understanding the structure, synthesis, and metabolism of lipids, they also showcase that there are still countless exciting questions left to ask; in fact, we may only be beginning to understand the true complexity of the lipid world. That undoubtedly means that the 100th anniversary of *JLR* will be as exciting as this one!

The special 50th anniversary collection will be shipped as a supplement to the regular April issue of *JLR* to all subscribers. ASBMB members and *JLR* subscribers can also view the collection of reviews for free at: www.jlr.org/collections/anniversary.

Nick Zagorski, Ph.D., is a science writer for ASBMB. He can be reached at nzagorski@asbmb.org.

Announcing the ASBMB Lipid Research Division

Interest in lipids in a wide variety of disciplines and from a diverse array of technical and scientific perspectives has increased dramatically in recent years. Many lipid researchers contacted ASBMB to express concern that the area of lipid research was not receiving significant recognition given its clinical importance. ASBMB has always enjoyed strong representation from lipid researchers among its members, and in an effort to better serve their needs, the ASBMB has created a Lipid Division that will provide a forum within ASBMB for lipid chemists, biochemists, physiologists, and biophysicists.

The Lipid Research Division will provide an organized platform to foster communication within the global lipid research community. Communicating new ideas, emerging concepts, questions, and novel techniques will be facilitated by a new section on the ASBMB website called "The Lipid Corner" at www.asbmb.org/lipidcorner. This lipid-centric web space contains a forum for discussions, information about upcoming meetings and funding opportunities and will highlight recent lipid advances and discoveries. In addition to the webpage, a regular "Lipid News" column will appear in this space and will highlight information of current interest to the lipid community.

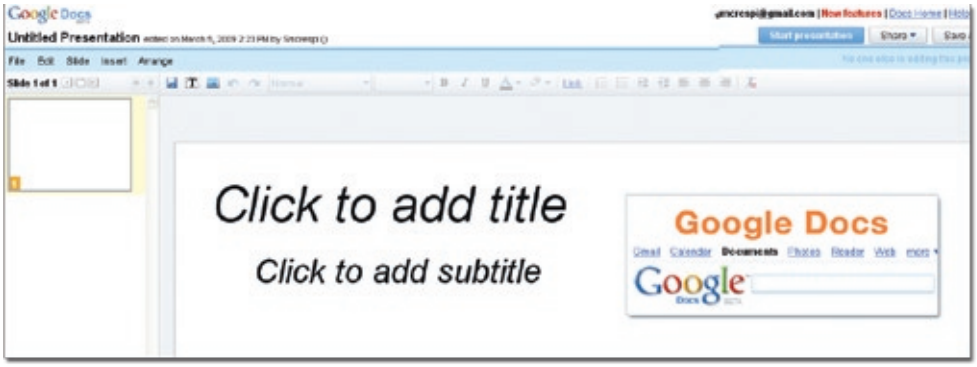
Additionally, the Lipid Research Division will provide a mechanism for communicating the needs and concerns of lipid scientists to NIH (and other funding agencies) to ensure that lipid science/scientists are represented on study sections. The Division will contact these agencies and provide a list of senior/mid career investigators that could serve as potential NIH reviewers.

Finally, the Division will act as a resource for organizing the Lipid Theme for future ASBMB annual meetings. In addition to representing a pool of potential organizers and speakers, the Division plans to establish two new components within the Lipid Theme: a "Featured Speaker" and a "New Investigator Award" (NIA). The featured speaker will be selected to give a special plenary session talk that focuses on an emerging question or concept and will be pitched to the lipid naïve. The New Investigator Award is particularly exciting. This award will be presented to a new investigator doing exciting/innovative work in a lipid field. The recipient of this award would be invited to give a talk at the ASBMB annual meeting and receive a cash award. The exact mechanism for selecting the winner has not been established, but a committee within the Lipid Research Division is being formed to outline a procedure.

Daniel M. Raben will act as the interim Director of the Lipid Division and is working with a steering committee. Raben will work with the ASBMB office to ensure that the website is dynamic and that the needs of the community are met. Lipid Division committees and committee chairs will be established in the near future. We invite all lipid researchers to visit the "Lipid Corner" web page, register for the Lipid Division, and let us know what features you would like to see in the future. We welcome input of all kinds, including volunteers! Please feel free to write us with your suggestions, either via our website, or at lipidcorner@asbmb.org.

Presentations in the Digital Age

BY SARAH CRESPI



Google offers more than email. Gmail comes equipped with document storage and sharing.

The topic this month is in honor of the ASBMB annual meeting and is dedicated to one of the perils of communicating science in person: the slide presentation. In this column we will focus on some possible solutions to those familiar issues that have come about since slide presentations first went digital.

On the PC side, the latest version of PowerPoint (2007) outputs files denoted ".pptx," which are not always compatible with older versions of the software. One way around this is to save the presentation in compatibility mode (as a .ppt) to reduce the risk of error messages or worse when loading the presentation onto a different machine. To save a presentation in the older, more ubiquitous format, choose "Save As" and select "PowerPoint 1997-2003." However, you cannot show PowerPoint presentations on Apple computers in general.

If you created your presentation on a Mac and are presenting on a PC or don't know if your MacBook will be compatible with an on-site projector, you might want to have an online, platform-agnostic version at the ready. Google Documents now offers a nice back-up that might help take your mind off these incompatibility worries. This is also a good move for PC users in cases where your thumb drive becomes uncooperative.

If you already have a Gmail account, simply go to the "Documents" tab located at the top of your browser window when you log in. If not, sign up and you'll find a great place to store and edit documents, presentations, and spreadsheets. Google allows users to upload many types of files (Word docs, Excel spreadsheets, OpenOffice docs, and PowerPoint slides). Users can then log in and download the files onto any computer or open them right in the browser. For example, a PowerPoint slide presentation (.ppt not .pptx) can be imported into Google Documents at home and then opened from any computer, Mac or PC, in the browser window. Alternatively, the project can be downloaded as a PDF document or text-only for printing.

But alas, nothing is perfect. One major drawback to the Google Docs presentation is that video in uploaded slideshows does not work. If you want to display video in an online Google Docs presentation, you must load the video into YouTube (also conveniently owned by Google) and then embed it into the presentation using the edit feature. The editing function works well if you are importing a presentation from your desktop or creating the presentation from scratch using the Google editor. Be sure to check over your slides once they are imported because some shifting during travel may occur.

Want to learn more about PowerPoint 2007? *ASBMB Today* published an introduction in May 2008. Go there now: www.asbmbtoday-digital.com/asbmb-today/200805/

Sarah Crespi is a Multimedia Communications Specialist at ASBMB. She can be reached at screspi@asbmb.org.

Thoughts about Education and Professional Development: Part I

BY ELLIS BELL

It's the time of the year when many programs are either having, or thinking about having, an external review or preparing for a departmental retreat to assess how well their teaching mission is performing. It's also the time of the year when faculty are starting to reflect on how well they did during the previous academic year and what they might do to improve during the "off-season" (the summer before classes begin again for a new academic year) to be more successful next year.

A critical part of this is deciding how to define "success," and the most important part of success is focusing on what the teaching mission of the department or program is. Clearly, different types of institutions will define their teaching mission according to whether their main focus is research, medical education, graduate education, or undergraduate education. For example, in a research-intensive environment, the main "teaching" mission is likely focused on young faculty, postdoctoral fellows, and graduate students and their development; whereas at a primarily undergraduate institution, the focus is on undergraduates and helping them to transition to the next phase of their development, whether it be graduate school, professional school, or directly into the job pool.

For the remainder of this article I am going to focus on a more traditional undergraduate teaching environment, but I believe that these concepts would also translate to all aspects of academia, whether it be faculty development or any of the more formal teaching environments. Everyone is familiar with SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, but here, I'm going to use a "What, When, and How" analysis.

Establishing the goals of a department or program is largely the job of the department with input from the administration of the institution—the mission of a given department or program should not be contrary to the mission of the institution and should incorporate the major features of the institutional mission. You often see statements such as "excellence in teaching" in mission statements and often comments about "preparing students for…" as well as content areas and skills that students will acquire, but what is really needed is a deeper consideration of how these "goals" are to be achieved and how success is to be measured.

Why are faculty members so reluctant to sit down with each other and discuss what students should understand and what skills they should have? After all, it is well known that a truly integrated curriculum and department works much better than most departments that do not make such efforts (see the writings of Sheila Tobias, especially "Revitalizing Undergraduate Science: Why Some Things Work and Most Don't" and "They're Not Dumb, They're Different: Stalking the Second Tier").

This constitutes the "what." Once this is agreed upon, the next question is "when?" The potential gains for students are immense if a department prioritizes its goals for student learning and establishes what students should be able to do at various time points in their education. The results of such a discussion can yield a student curriculum that everyone buys into and in which they understand their roles. The students benefit because the key features of their education are thoughtfully introduced, reiterated, and built upon across the curriculum. The key concepts and skills are no longer the "property" of any one course but of the curriculum. The faculty will benefit by having a better understanding of what students should be able to do when they enter a particular course, rather than being frustrated at how little "essential" background the students actually understand and, hence, how badly they must have been taught in earlier courses! The reality is, of course, that without a proper context, it is impossible for anyone to teach "well." A departmental audit of its goals for student outcomes goes a long way toward making it easier for everyone in the department to perform at their best when it comes to teaching.

In next month's article we will consider how success should be measured and how ASBMB can help in this process.

Ellis Bell is currently professor of chemistry and chair of the Biochemistry & Molecular Biology Program at the University of Richmond. He is also chair of the ASBMB Education and Professional Development Committee. He can be reached at jbell2@richmond.edu.

When Doing the Right Thing Becomes Profitable

BY NESTOR CONCHA

Diversity makes sense. Moreover, a careful examination of the consequences of applying this principle indicates that it enables the achievement of goals, especially for those focused on the bottom line.

Scientists in general accept talent regardless of race, gender, or ethnicity. It is fair to acknowledge that, in the generally progressive and open-minded scientific community, social acceptance is the norm. The scientific community comprises many races and ethnicities and its members comfortably reach out to any and all with enough talent and dedication. So, it is not surprising that the scrutiny aimed at uncovering deficiencies in integrating minorities and women is rejected as groundless and frivolous. There is no time to waste on it, and it is immaterial since seeking talent in an individual is a far more important consideration.[1] But the reality is that there is a considerable dearth of black scientists and of women in prominent or leading scientific positions. For these reasons, it is prudent to keep watchful guard. On this point, postdocs at NIH queried about their careers and family choices showed marked differences between male and female attitudes toward reaching principal investigator status or use of time-off for family reasons. Lowered expectations and frequent time-off may be responsible for a disproportionately low number of females in tenure positions.[2] The personal choices may be genuine and sufficient to justify these differences.

> "It is especially important for those involved in mentoring to eliminate bias while developing interpersonal skills."

On the subject of the gender pay gap, the author of a report from the Institute of Economic Affairs[3] concludes, "The widespread belief that the gender pay gap is a reflection of deep rooted discrimination by employers is ill-informed and an unhelpful contribution to the debate. The pay gap is falling but is also a reflection of individuals' lifestyle preferences. Government can't regulate or legislate these away and shouldn't try to." Within the 22-29 age group, men and women are being paid similarly. The gap increases, peaking in the 40–49 age group when the choice to raise a family takes precedence. From many other reports, it is apparent that today's young women are much better educated and perform better than young men at grade schools and universities. This suggests that the pay gap is likely to continue to decline. The study also indicates that, in general, the gap between single women and single men is insignificant, but that single women in the middle age groups earn more than middle-aged single males. Other pay gaps due to ethnicity, disability, religion, and sexual orientation do exist but are difficult to assess.

In a previous issue of this magazine,[4] a report by I. Mills-Henry and R. Chapman described the perils of those trying to detect the presence of hidden biases and its influence on how people make choices. This gives rise to questions such as: What sort of data do we need to gather? Can we trust social sciences' methods?[5]

A press report on the "The Price of Prejudice" spells out the notion that we are uncomfortable when confronted with issues like race, body weight, sex, or age.[6] Most people lie to themselves some of the time, and the lying is subtle. It can take the form of postponing corrective actions, as in cessation of smoking, exercising, or weight reduction. It can go as far as denial. Here lies the difficulty in identifying the truth between what people say compared to what they actually do. Eugene Caruso has attempted to identify the peoples' unknown biases by evaluating the cost associated with the choices they make acting on those biases.[4] The experiments quantify the "stereotype tax," that is, the price the person is willing to pay when he/she makes decisions based on some preconceived notions. In one study, the

subjects were asked to pretend they will be participating in a game for which they have to choose teammates from a pool of candidates. To make their choices, the subjects were given photos of the candidates, along with their IQs, educational level, and previous experience with the game. Not surprisingly, when asked, they identified body weight (taken from the photos) as being the least important factor in picking their choices of teammates. In reality, however, they were willing to sacrifice quite a bit to have a thin teammate: they would trade 11 IQ points (about 50 percent of the range of IQs available) for a colleague who was thin. In a second study, the participants were asked to consider hypothetical jobs that varied in salary, location, amount of vacation time, and the gender of the boss. The preferences on salary, location, and vacation time matched their decisions on what jobs they would take; but when it came to the boss' sex, they were willing to sacrifice 22 percent of the starting salary to have a male boss. The results were indistinguishable between male and female subjects in the study. One might conclude from these reports that we have more prejudices than we are ready to admit. Similarly, Kawakami *et al.*[7] showed that his subjects appeared to be more prejudiced about race than they said they were.

It would be misguided to think that these studies revealed little or nothing of substance because they involved college students in fictional situations. The question is, "Why we are, as we are?"[8] It appears that the mechanism that the brain uses to discern who is part of "us" and who belongs to "them" is a basic human characteristic. This may be the source of prejudice. But as far as anybody can demonstrate, race (hair color, skin color, and facial features) plays no part in any biological, psychological, or genetic differences between people. So what is operating when individuals act on perceived differences deduced from physical appearances? Social psychology teaches us that on meeting someone for the first time, one forms first impressions which provide us a means for classifying that individual based on sex, age, and race.

Research by Cosmides *et al.*[9] suggests that race is a "give away" to identify members of one's clan. It is used for "tribal" branding that allows the human brain to identify friend and foe. The hypothesis is that this very early recognition mechanism has evolved in humans. In times when traveling was restricted, encounters with individuals of sufficiently different complexion and/or language would elicit a hostile response or a preparation of defense mechanisms. The ancient response to race is thus very basic, and ever present, despite a world where people are able to relocate quite easily. What stands out in considering these issues is that the brain has the ability to change a person's perception of race. The work of Penner and Saperstein[10] shows that race appears to be a fluid concept in the brain, where there is nothing particular about skin color if other group-membership features or "markers-of-status" are available. In other words, the perception of race can change based on education level, employment, or income level. For some, the first AfricanAmerican U.S. President was not "black enough," while for others, not black at all.

In many instances, it is certainly possible for an individual to identify many of their own biases and to consciously dismiss them. But as a matter of prudence, vigilance in the form of constant evaluation of one's behavior is required to keep us aware of those biases. It is especially important for those involved in mentoring to eliminate bias while developing interpersonal skills.[11,12] These "people" skills can be learned and used to support whatever goals have been set, be it those in business or in research, to satisfy customers, to innovate, to achieve higher productivity, to find and retain talent, to run more productive groups, to produce "better science," or to have a higher level of job satisfaction.

Diversity goes beyond race and gender. It involves dealing with a collection of individuals different in some way from us. To have diversity is not equal to having representation. Diversity involves being inclusive, creating the right climate so that everyone has the opportunity to excel or to join in and creating an environment that works for all, in the workplace, at home, or in the community.[13]

Nestor O. Concha is at GlaxoSmithKline. He can be reached at nestor.o.concha@gsk.com.

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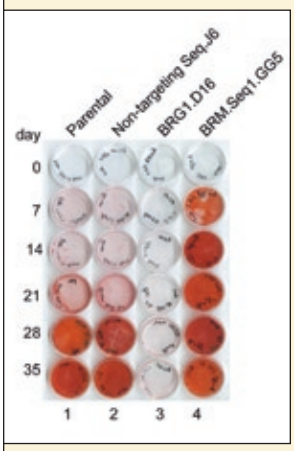
The Opposing Roles of BRM and BRG1

The mammalian SWI/SNF complex, which coordinates the disruption of nucleosomes to allow for a proper flow of transcription during differentiation and development, can consist of several distinct assemblies containing alternative subunits. For example, SWI/SNF can contain one of two closely related ATPases: BRM or BRG1. Most studies suggest these ATPases are redundant, though BRG1 is considered more important during development; this study demonstrates that this notion is inaccurate. Using osteoblast differentiation as a model (since it proceeds through discrete, predictable stages allowing for observations of subtle changes), the researchers found, surprisingly, that BRM deficiency did not delay osteoblast progression but rather sped up the rate of mineralization. Chromatin immunoprecipitation of the differentiation gene osteocalcin revealed that both BRM- and BRG1-containing complexes can bind to the osteocalcin promoter; BRG1 activates these genes to promote osteoblast differentiation, whereas BRM represses them. This work may foreshadow additional findings with alternative SWI/SNF complexes, revealing how different factors oppose one another to fine tune the regulation of development.



Osteoblast cells stained at specific time intervals with Alizarin Red S (a marker for calcium-containing compounds in the cell matrix) reveals that BRG1 deficiency inhibits mineralization while BRM deficiency speeds it up.

Antagonistic Roles for BRM and BRG1 SWI/SNF Complexes in Differentiation

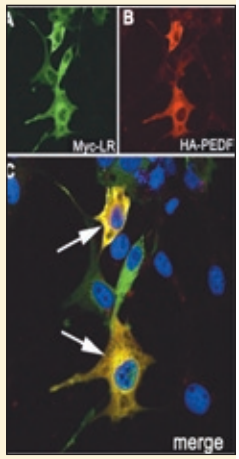
Stephen Flowers, Norman G. Nagl Jr., George R. Beck Jr., and Elizabeth Moran

J. Biol. Chem. 2009, published online January 14

jbc

Fishing for a PEDF Receptor

Pigment epithelium-derived factor (PEDF) is a multifunctional protein that is one of the most potent endogenous inhibitors of angiogenesis, making it a valuable target of therapeutic studies aimed at inhibiting tumor growth and metastasis. Currently, only two receptors for PEDF have been identified, the 80-kDa PLA2/nutrin/patatin-like phospholipase domain-containing (PNPLA2) protein in neuronal cells and an unknown 60-kDa protein in endothelial cells. In this study, the researchers performed yeast two-hybrid (Y2H) screening to fish out this mystery receptor and perhaps some others. They reeled up the non-integrin 67/37-kDa Laminin Receptor (LR) as a potential candidate and confirmed its interaction with PEDF with co-immunoprecipitation experiments and surface plasmon resonance assays. The researchers also identified the interacting domains for each partner (amino acids 44-77 on PEDF and 120-210 on LR). Using a synthetic peptide derived from the 34-mer binding region of PEDF, they managed to induce apoptosis and inhibit tube-like network formation in endothelial cells, highlighting LR as both the likely 60-kDa PEDF target and the receptor that primarily mediates the anti-angiogenic effects of PEDF.



Immunostaining COS7 cells transfected with HA-PEDF and Myc-LR with anti-Myc (*green, A*) and anti-HA (*red, B*) antibodies reveals the co-localization of PEDF and LR (*merged, C*).

Laminin Receptor Involvement in the Anti-angiogenic Activity of Pigment Epithelium-derived Factor

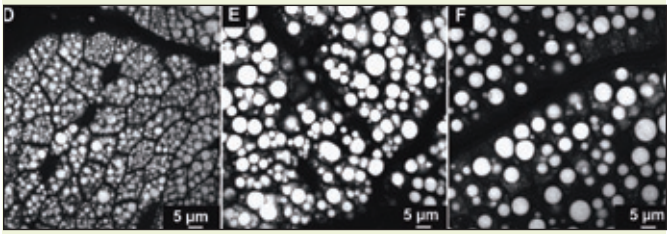
Adrien Bernard, Jacqueline Gao-Li, Claudio Areias Franco, Tahar Bouceba, Alexis Huet, and Zhenlin Li

J. Biol. Chem. 2009, published online February 17

jbc

Intestinal Lipid Droplets

Enterocytes, the absorptive cells on the surface of the small intestine, take up dietary fat and package it as triacylglycerols (TGs) into chylomicrons for secretion to the circulatory system. In this regard, enterocytes are generally not believed to store TGs in cytoplasmic lipid droplets (LDs) as other cell types do. In this study, the authors revisited this idea with the aid of coherent anti-Stokes Raman scattering (CARS) microscopy, an emerging technique that permits the three dimensional imaging of molecules with submicron spatial resolution. Using both CARS and fluorescence imaging, the authors directly visualized the presence of cytoplasmic LDs in mouse enterocytes. Furthermore, *in vivo* CARS imaging during dietary fat absorption revealed a dramatic variation in the amount of TGs stored in the LDs during the absorption process, indicating that enterocyte LDs are dynamic organelles. The discovery of this lipid reservoir in enterocytes suggests that these cells may play previously unanticipated roles in regulating plasma TG concentrations following the intake of food.



Coherent anti-Stokes Raman scattering imaging reveals the growth and ebb of lipid droplets in mouse enterocytes following feeding with olive oil (*D*, 1.5 h, *E*, 3.0 h, and *F*, 6.0 h post-feeding).

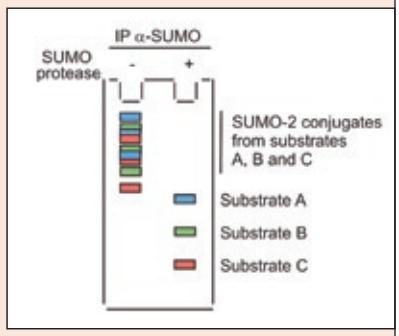
A Dynamic, Cytoplasmic Triacylglycerol Pool in Enterocytes Revealed by *ex Vivo* and *in Vivo* Coherent Anti-Stokes Raman Scattering Imaging

Jiabin Zhu, Bonggi Lee, Kimberly K. Buhman, and Ji-Xin Cheng

J. Lipid Res. 2009, published online February 18

Separating the SUMOs

The attachment of SUMO (Small Ubiquitin-like MOdifier) to target proteins is one of the numerous dynamic and reversible modifications that help regulate protein stability, activity, and function. The vast majority of known SUMO substrates are recognized by the SUMO E2-conjugating enzyme Ubc9, which binds to the consensus tetrapeptide ΨK*X*E, usually with the requirement of extended motifs that contain phosphorylated or negatively charged amino acids. This study, however, reveals that the tetrapeptide may not be as crucial as currently thought. Using a novel strategy of SUMO protease treatment prior to SDS-PAGE separation and mass spectrometry analysis to improve sensitivity, the authors identified 382 SUMO-2 targets in a human cell line, more than half of which (52 percent) lacked any known consensus site. Gene ontology analysis also revealed that the prevalence of negatively charged Ubc9 motifs (NDSM sites) was strikingly different among the different functional classes of substrate protein. These unexpected findings suggest that many SUMO substrates are recognized by a yet unknown site-independent mechanism and that mechanism of recognition depends on the biological function of the substrate.



Representative example of how desumoylation prior to SDS-PAGE can produce well-separated substrates and improve the sensitivity of MS analysis.

Novel Proteomics Strategy Brings Insight into the Prevalence of SUMO-2 Target Sites

Henri A Blomster, Ville Hietakangas, Jianmin Wu, Petri Kouvonen, Sampsa Hautaniemi, and Lea Sistonen

Mol. Cell. Proteomics 2009, published online February 24

The Stowers Institute: Great Science on the Great Plains

BY NICK ZAGORSKI

Maybe it's just a case of coastal bias, but the thought of Kansas City as an epicenter for biomedical research seems a bit…off. A mecca for barbeque? Definitely. A cultural hub of jazz and blues? Certainly (and this writer can personally attest to both). But science in Kansas City? After all, the most recent instance when this region made headlines regarding science involved the Kansas Board of Education's infamous decision to change high school science standards to allow for "alternative" explanations for evolution.

Yet, amid thoughts that the Kansas-Missouri area may be a bit too conservative to embrace a cutting-edge research center or that there is not enough of a local academic presence to support it, one of the country's preeminent scientific institutes has gradually been emerging in this most unlikely of locations: The Stowers Institute for Medical Research.

Brought to life in 2000 through the philanthropy of James and Virginia Stowers, this private institute probes the fundamental processes underlying the growth and development of organisms, in the belief that an individual's own creativity and drive should be the only limits to what they can accomplish. This notion is plainly evident in the two brick-colored towers that define the skyline west of the Stowers campus: the headquarters of American Century Investments. Founded by James Stowers 50 years ago from a modest seed of 24 shareholders and $100,000, American Century has now risen to become one of the top mutual fund companies in America.

The Stowers Institute.

And though the Stowers Institute has been around for less than a decade, it is already moving in a similar upward trajectory in defining itself as one of the top biomedical institutes in America. "We haven't quite reached the moon yet," says William Neaves, president and CEO of Stowers, "but importantly, we did not crash on take-off, which some skeptics thought might occur." If nothing else, the Stowers provides a shining example that, as a scientist, your office doesn't need a view of the ocean to be surrounded by exceptional colleagues or to be able to carry out exceptional research.

No, a view of a 31-foot sculpture of DNA that highlights the entrance to the Stowers Institute is a good enough view for Joan and Ron Conaway, who were one of the first research teams to arrive here back in 2000, when the handsome 600,000-square foot Stowers building on the outskirts of downtown Kansas City was mostly empty lab space, and not the vibrant community of over 500 researchers, students, and support staff that it is today. And their move entailed quite a gamble; the pair had a secure position at the Oklahoma Medical Research Center, and relocating would require Joan to relinquish her Howard Hughes Medical Institute (HHMI) fellowship, as Stowers was not yet an HHMI affiliate institution (in 2005, HHMI Investigator Olivier Pourquié, who studies the segmentation of developing vertebrae, received Stowers' first HHMI award).

And while this intriguing new center in Kansas City seemed full of promise, it was essentially a risky start-up company that did not offer the

safety of academic tenure. Still, Joan recalls that when the Stowers leadership hinted that they would be interested in bringing the Conaways into the fold during a visit to give an invited lecture, the choice was easy. "At first, we politely thanked them and told them we'd get back to them in a few weeks after weighing all of our options," she says. "But the next morning after we woke up, Ron and I looked at each other and said, 'What are we thinking? We'd be foolish not to go there!'"

So what is the Stowers allure? As Ron and Joan sit in their office relating some of their research history, they give each other a glance, the kind that suggests a level of unspoken communication. Now, after years of marriage, not to mention running a research lab together, this husband-and-wife team has probably developed some amount of ESP. "It's certainly an unusual management situation," Joan notes (though spouses working in the same school or lab is not uncommon, having them as joint PIs is uncommon), "but when it works, it works awfully well." The reason behind the success, she says, is that she and Ron have similar ideas and goals in their studies unraveling the mechanisms of transcription initiation and elongation by RNA polymerase, but they each bring their own skill set to the table. Joan, for example, states that her husband is the one who specializes in preparing the first drafts of grants and papers, while Ron counters that "when it comes to understanding technical equipment, knowing which buttons to push to make it work, Joan is the expert."

As they continue to discuss their work on the basis of transcription, it begins to dawn on me that the structure of the Conaway Lab is in many ways a microcosm of Stowers as a whole. This institute is, in essence, a marriage, a design to produce a union of individuals with shared goals but differing strengths that, when brought together, can achieve more than the sum of the individual parts.

A Case of Supply and Demand

I think back to how Robb Krumlauf, the scientific director of the Stowers Institute, described this place earlier: "From the very beginning, the people behind the institute (the Stowers family and the scientific advisory board they put together) embraced a desire to ensure the institute included the highest quality infrastructure, staffed not just with knowledgeable technicians, but with experts. Then, by surrounding that infrastructure with a cadre of talented investigators willing to use the available technology and collaborate with each other, the Stowers Institute could achieve a synergy and put forth truly innovative, cutting-edge science."

The fireplace at the Stowers Institute showing the Stowers mission in 22 different languages.

Of course, such an ambitious platform is not a completely novel idea; Krumlauf himself has been around many such places. Before accepting his position at Stowers, he spent 16 years at the National Institute for Medical Research in London, where he was in close proximity to several institutes in both the United Kingdom and mainland Europe that promoted this vision of an open, shared, and interdisciplinary environment.

"Unfortunately, in many cases, these institutes are underfunded, thus preventing them from really being at the leading edge of science." He cites the Max Planck Institutes as a well-funded exception, though he adds that, in their case, individual groups are typically self-sufficient entities that contain 50 or more members, thus limiting the need to be collaborative.

But while vision without capital is certainly a barrier, capital without vision is equally so. As Joan Conaway explains, many centers bring in expensive equipment or facilities without really considering long-term institutional commitment. "So in some cases, the equipment may be directly linked to one or a handful of labs, thus making them not a truly equal resource. At other places, such technologies are maintained as core

facilities for which researchers need to pay a fee to use, effectively limiting their optimal potential."

The Stowers Institute, however, understands the importance of both sides of the coin. "What I like about Stowers is that they don't just offer you a start-up package," says Mike Washburn, who has been heading the Proteomics core since 2002. "When I moved in, they told me, 'Whenever you need something, just let us know, and we'll give it to you.' And that's great for an area like proteomics because the technology is always changing, and this allows me to stay on top of the field."

But it's more than just inundating the core facilities with all of the latest toys. "An important distinction at Stowers is that we don't think of these technology centers as a service for the principal investigators," Krumlauf says. "Rather, they're a branch of the institute that works *alongside* the investigators to significantly contribute to the ultimate success of the institute."

Though the two components officially operate as distinct entities, the heads of the technology centers have backgrounds and experience similar to an academic PI level and are held to the same high standard as investigators.

And as investigative peers, these core centers engage in both give and take in the Stowers community. So in addition to supporting investigator-driven projects, they also take the lead in developing their technology to expand its capabilities. As Microscopy head Winfried Wiegraebe, a physics Ph.D. who worked at Zeiss before coming here, explains it, "A PI is judged by the level of science they produce, whereas I am judged on the level of science that I enable."

It's all part of the institute's goal to try to bring their entire robust infrastructure to bear on biological problems of interest—even before researchers may have a specific need for them. As Krumlauf says, "It's a sustainable engine of research." The investigators stimulate the core technologies by asking them to develop tools to help answer their scientific questions, whereas the technology centers stimulate the investigators to continually ask new questions by making new and better tools.

Joan (*left*) and Ron (far *right*) Conaway discuss some research with Ali Shilatifard *(center).*

For example, Washburn, who works extensively with the Conaways, Jerry Workman, and Ali Shilatifard on transcriptional biochemistry, has his group looking into improving the quantitative analysis of protein complexes using mass spectrometry, as well as developing methods to change proteomics from a static to a dynamic tool. "Say you have a protein complex, and you delete one specific protein from it. How does that affect the activity of the complex? How does that affect the activity of the cell? These are definitely questions that people studying mammalian transcription want answered."

"We really want these core centers to push the envelope of what their technology can do," Ron Conaway says. "And the growth of these facilities since we've come here has been amazing; I never even daydreamed they could accomplish this much this fast."

Indeed, the Stowers Institute does not simply specialize in two or three core areas, which would limit the type of work that could be done locally. Today, Stowers features a staggering 11 core technology centers led by some of the brightest scientists around: centers for bioinformatics, cytometry, histology/immunohistochemistry, media, microarrays, microscopy, molecular biology, and proteomics, as well as fully equipped facilities for *Drosophila*, laboratory animals, reptiles, and aquatic species.

What's amazing is that Stowers only has 22 research groups that work hand-in-hand with these 11 cores (though three of the core leaders have dual appointments as investigators and conduct their own research as well), strongly indicative of the equality of these two groups. What's even more amazing, and a very good sign, is that Washburn, Wiegraebe, and others will tell you they all share the same problem: constantly saying "no" to potential ideas and collaborations because they're always so busy.

Building a Winning Tradition

William Neaves knows a thing or two about developing science in a so-called "non-traditional market." In 1972, Neaves, then a self-described young

and naïve cell biologist who had spent the preceding decade being trained and educated at "tradition-rich" Harvard, moved to Dallas to take up a faculty position at the University of Texas Southwestern Medical Center, which back then was a lightly regarded institution. Twenty-six years and four Nobel laureates later (more active laureates than any other medical school), UT-Southwestern had become one of the best academic medical centers in the world and a true destination for professors, post-docs, and students alike.

Over that time, Neaves had been instrumental in Southwestern's rise, first serving as dean of the Graduate School of Biomedical Sciences, then dean of the Medical School, and finally, executive vice president for Academic Affairs. By 1998, as he was settling in to enjoy the ride, he received a phone call that presented him an opportunity to reproduce that success.

It turns out that at that same time, Jim and Virginia Stowers were traveling across the country, visiting several highly regarded research centers to see what made them tick as part of the planning for their institute. A dean at Stanford University who happened to be quite entrepreneurial caught wind of the Stowers' plan and tried to convince them that, if they wanted to build a truly outstanding basic science center, they needed to do it in Palo Alto. When he realized, with disappointment, that Jim and Virginia were steadfast that their institute be built in their hometown, he offered some parting advice: "If you're determined to make this mistake, at least speak with Bill Neaves at UT-Southwestern."

Soon, Neaves was brought on board as the president and CEO, and together with Krumlauf, tasked with bringing in the right investigators to carry out the Stowers' mission of world-class science.

"First, we knew it was absolutely important to avoid any perception that Stowers was using Howard Hughes-level resources to put out less than Hughes level science," Neaves says. "That would have doomed the institute early on." To handle that, they set up a rigorous selection and review process that would be on par with the standards used by HHMI. Potential hires are screened by the five-member scientific advisory board, and Neaves notes that "every member had to independently agree that the individual merited a quality similar to a Hughes appointment; even one hesitation was enough to prevent the hire." Then, once appointed, every Stowers investigator, regardless of past accomplishments, received a five-to-seven year contract, reviewed at completion by an unbiased panel of recognized experts in that particular field.

Even with this peer-review system in place, however, Neaves knew that Stowers could still fail if they only focused on bringing in established, big name researchers to increase visibility—"there's always the risk that you can end up with an institute populated with selfish prima donnas," he says; so they set a goal that at least half the initial appointments would be at a junior level. "For true long-term growth, we needed people who had not yet made a name for themselves but were therefore willing to really take chances and go in new directions to fulfill the Stowers' mandate for scientific excellence combined with collegiality."

Now would come the tricky part of seeing whether the saying "If you build it, they will come," would hold true for this ambitious start-up in Kansas City. But arrive they did, from across the globe. Though some of the very first hires, like the Conaways, helped tremendously in this regard by creating a positive culture at Stowers that undoubtedly influenced future recruits, success arrived because many of the Stowers' unique properties, which could be viewed as weaknesses—a new, private enterprise in a non-traditional market without any major academic affiliation—were ultimately viewed as strengths.

"When I was applying for jobs, I sat down and asked myself, as a young investigator, what do I want to be doing for the next five to ten years?" says associate investigator Peter Baumann. "I decided I wanted a place where I could focus on my research and not be drawn out of the lab for too many reasons, and during my visit I got the feeling that Stowers was that kind of place." Indeed, this detachment from an academic body has removed many of the barriers that can hinder scientific progress. The researchers are not required to take part in administrative or teaching duties (though they can teach if they desire; many of the members, including Joan Conaway, lecture at nearby Kansas University Medical Center). And the private, endowment-based funding frees researchers from another major obstacle: constantly writing and worrying about grants (though again, members can still supplement their Stowers money with external funds to promote their work). In essence, Stowers takes the politics out of science and lets its investigators do what they do best.

Ali Shilatifard agrees, and it's the reason—along with the exceptional core facilities and colleagues—Stowers managed to coax him out of his tenured position at Saint Louis University Medical Center and travel to the other side of Missouri. "Many academic and medical centers require that you cover a good portion of your salary with your grant money," he says, "and philosophically, I've always had an issue with that. Here at Stowers, I'm their employee—they pay my salary. So the bulk of my external funding goes to the actual research, which means the taxpayers get a lot more out of our grants."

As to the 25 investigators who lead the research, it's definitely a diverse mix of disciplines, though there are certainly major focal points, chief among those are transcription, chromosome dynamics, and cell division (after all, an embryo cannot eventually grow into a viable organism unless the right genes are turned on and off, and mitosis occurs properly). Although Jim and Virginia Stowers created the institute with the specific aim of impacting human health down the road, the leadership believed that the Stowers Institute should not define itself by any particular disease, like cancer, or therapeutic avenue, like gene therapy. "In some ways we've been accused of being too broad," Krumlauf says, "but our view is that discovery often comes from unexpected places, so you would be missing out if you tried to limit the direction a scientist could take. If you hire creative scientists who ask fundamentally important questions, then you will get medically relevant findings."

And while the growth of investigators has been steady and on the expected pace, Neaves points out that the arrival of first-rate post-docs and graduate students has been burgeoning beyond even his lofty expectations; Stowers currently boasts 111 postdocs and 43 Ph.D.-pursuing students (initially, the students came through the affiliation of Stowers investigators with KUMC, though more recently, the institute parlayed the connections of Krumlauf and Pourquié to set up affiliations with the Open University of London and University of Paris, respectively). "I expected it would take a decade or more before we began recruiting the brightest students and postdocs because that's how long it took for them to start coming to UT-Southwestern. It's one of the reasons we built up our core facilities at Stowers so quickly, to liberate our investigators from a dependence on finding postdocs with specialized skills." Yet, in the end, those facilities would help speed up the recruiting process.

"When postdocs come here, they see all these great applications literally right down the hallway," Baumann says, "and that lowers the activation energy to initiate some projects they wouldn't normally think of." Baumann cites one of his own postdocs who arrived having never done any experiments that didn't involve pipetting or running gels, but since coming to Stowers has begun working with both the cytometry and microscopy centers. "And it's not like another place where someone might show you a FACS machine, give you a manual, and make you figure it out yourself; the core centers here really get involved with them. So it works out great for these young researchers because they leave here with a much more multi-faceted skill set that helps them in the next stage of their career."

It works out well for Stowers too; "Students and postdocs are essential to the intellectual vibrancy of any research group," Neaves says, "because they're early enough in their research field, they don't know *not* to ask questions."

Small Details for the Big Picture

While any good union needs to have a shared vision for the big picture, it's often the little things that define the ultimate success of any marriage. And in wandering the halls and offices of the Stowers building, it becomes clear that, while Stowers does pride itself on its cutting-edge technologies, they did not skimp on the smaller details in building this Institute. As Marie Jennings, who oversees the institute's public affairs, points out as she guides my tour, "The Stowers mission is not just about quality of science but quality of life."

New investigators get a sense of that commitment to quality of life even before they arrive. Both visiting speakers and potential recruits are put up in luxurious on-site suites, a true sign that Stowers is looking out for them. And upon being hired, new members can visit their appointed lab space and customize it as they like before they officially move in, to both optimize their available area and give it a little personal touch.

The customization doesn't end there. Wiegraebe recalls he was pleasantly surprised shortly after his arrival when he was visited by Beth Lurey, a contractor who works with Stowers to supply the building with local art (the importance of art is one of several contributions Virginia Stowers made to the design of the building, working with the architects to help create an inviting atmosphere). "She came to my office and asked me what kind of art I like and then came back later with a mini-exhibition to help me decorate my office," he says. "And she also encouraged me to keep looking around local galleries and to let her know if I saw something I liked; she would then see if she could acquire some pieces from that artist."

For associate investigator Jennifer Gerton, who spent most of her life in the San Francisco Bay area before venturing into the Midwest, the cafeteria is the perk of choice. Partially subsidized through the Institute, the Stowers cafeteria offers high quality food at extremely reasonable prices; this is not just a place to dine and dash. And, recognizing that the staff of a scientific center has an international flair, the cafeteria mixes in a variety of ethnic cuisine on a regular basis to give some of the members a small taste of home. It also provides a great social and brainstorming fixture away from lab. "I often like to sit down at a table by myself and see which colleagues end up sitting next to me," Gerton

Jim & Virginia Stowers: The Birth of the Dream

"We're still living with yesterday's discoveries, who's making tomorrow's discoveries?" That was the question circling the mind of Jim Stowers in the early 1990s. It had been a rough stretch for the Stowers family; over the past few years, Jim, Virginia, and their daughter Kathy had all been diagnosed with cancer, creating a period of fear and unease when all the financial success the Stowers had obtained was rendered meaningless. However, with their determination and quality medical care, they had all fought through the disease, and afterwards Jim and Virginia had a vision that they should use part of their money to improve the lives of others. They considered numerous options, such as setting up a Hughes-like fellowship program or donating money to a local hospital, but, with the above quote in mind, settled on developing a truly special basic research institute because fundamental discoveries pave the way for all future progress in human health. Perhaps we should not be surprised by this choice; after all, as a thoughtful and savvy investor, Jim Stowers always had a keen sense of the "long-term plan."

What's remarkable about the Stowers generosity, though, is that they did so much more than simply write a check, in part because of their close connection with science and medicine. Jim trained in medicine and even came close to becoming a researcher after taking a physiology course with Daniel Mazia (though he unfortunately did not complete medical school due to a political battle over a misdiagnosis of Jim's appendicitis—perhaps a reason why the Stowers Institute keeps politics out of science). Still, he won't regret his time in medicine, as it introduced him to the love of his life, Virginia, a nurse. Together, the pair spent two years visiting research centers to prepare for their institute, speaking not only with leadership but also with scientists, to learn what aspects of the center worked and which ones were a hindrance to research. Jim and Virginia also took an active role in setting up the Stowers Institute and even today still regularly stop by to examine the progress of their gift. And with the typical modesty they've displayed their whole lives, Jim often brings his own bagged lunch.

Virginia and Jim Stowers.

says. "Then once we get a group, we can see where the conversation goes from there."

Though the cafeteria isn't open late, night owls will find a plentiful assortment of vending options that offer more than just sugary fare; soups, sandwiches, and other healthy, filling food options are available. Oh, and in case you just ran out of an important reagent at 2:00 am, Stowers also features scientific vending machines. From the attractive 24-hour fitness center to the cable TV-equipped lounges, these amenities are part of the understanding that science is not always (in fact, it's probably pretty rarely) a predictable nine to five job.

And in regard to jobs, the Stowers also realizes that, no matter how talented the scientists are, a research center cannot operate on researchers alone, and all their efforts at enhancing the quality of life, as well as their commitment to excellence, apply to each employee; after all, everyone contributes to Stowers' success. And to reinforce that, the Institute features, in one of their unique and thoughtful touches, a monthly seminar series in which one of the investigators presents an open talk about their work specifically geared to the Stowers' non-scientific staff.

One of Stowers' major aims is to change conceived perceptions about the intellectual culture of the Great Midwest, yet as I leave, I find that one stereotype about Kansas City has a small basis in fact. It's not quite the land of cowboys and tumbleweeds that many "coasters" like me imagine, but the people here at the Stowers Institute have taken on a sort of "pioneer spirit" to build this distinct place and that might be the main reason the Stowers marriage works so well. Everyone involved, from top to bottom, scientist and non-scientist alike, believes in and works toward the Stowers mission, proclaimed boldly in 22 different languages above the fireplace in the building's library: "Hope for Life."

Nick Zagorski, Ph.D., is a science writer for ASBMB. He can be reached at nzagorski@asbmb.org.

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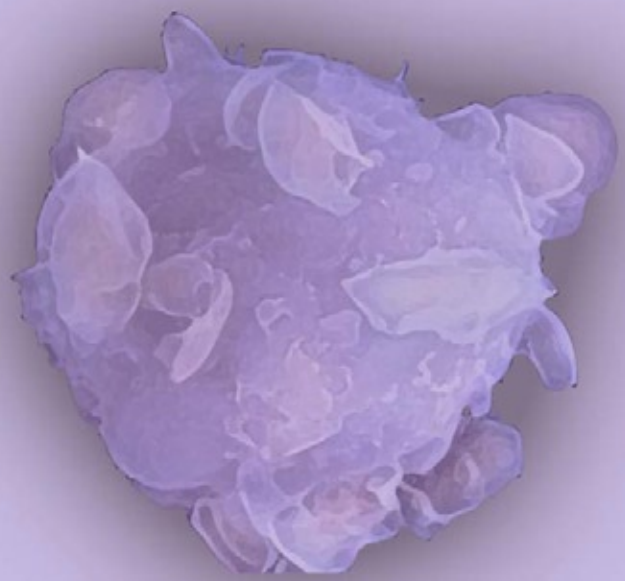

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www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=961

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www.americanheart.org/presenter.jhtml?identifier=3057022

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BETHESDA, MD
dir.nhlbi.nih.gov/stadtmansymposium/Default.aspx

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BLOOMINGTON, IN
www.21staps.org

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DUBLIN, IRELAND
www.selectbiosciencies.com/conferences/files/Agendas2009/CP2009_Agenda.pdf

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JUNE 11–14, 2009
AMES, IA
www.bb.iastate.edu/~gfst/phomepg.html

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

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

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

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

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

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

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

JULY 2009

Short Course on Statistical Genetics & Statistical Genomics
JULY 13–17, 2009
HONOLULU, HI
www.soph.uab.edu/ssg/nsfstatgen/nsfsecondannual

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

SWLA 4th Annual Scientific Forum
JULY 24–26, 2009
OKLAHOMA CITY, OK
www.lipid.org

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

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

AUGUST 2009

Student-Centered Education in the Molecular Life Sciences: Essentials for Educating Biochemistry and Molecular Biology Undergraduates
AUGUST 5-8, 2009
COLORADO SPRINGS, CO
www.asbmb.org/meetings

Gordon Research Conference: Molecular, Biophysical, & Biomechanical Understanding of Skin Barrier Formation, Function, & Disease
AUGUST 9–14, 2009
WATERVILLE VALLEY, NH
www.grc.org/programs.aspx?year=2009&program=barrier

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

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

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

SEPTEMBER 2009

50th International Conference on the Bioscience of Lipids
SEPTEMBER 1–5, 2009
REGENSBURG, GERMANY
www.icbl2009.de

Systems Biology for Biochemists
OCTOBER 22-25, 2009
TAHOE CITY, CA
Organizer: Arcady Mushegian, Stowers Institute for Medical Research
www.asbmb.org/meetings

MWLA Annual Scientific Forum
SEPTEMBER 25–27, 2009
CINCINNATI, OH
www.lipid.org

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

6th International Congress on Heme Oxygenases in Biology and Medicine
SEPTEMBER 30-OCTOBER 4, 2009
MIAMI BEACH, FL
www.hemeoxygenases.org

OCTOBER 2009

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

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

NOVEMBER 2009

Annual Meeting of the Society for Glycobiology
NOVEMBER 12–15, 2009
SAN DIEGO, CA
www.glycobiology.org

4th Barossa Meeting: Cell Signaling in Cancer and Development
NOVEMBER 18-21, 2009
BAROSSA VALLEY, SOUTH AUSTRALIA
sapmea.asn.au/conventions/signalling09/index.html

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

FEBRUARY 2010

Biophysical Society 53rd Annual Meeting
FEBRUARY 28-MARCH 4, 2009
BOSTON, MA
www.biophysics.org/Default.aspx?alias=www.biophysics.org/2009meeting

APRIL 2010

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

JUNE 2010

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

11th International Symposium on the Genetics of Industrial Microorganisms
JUNE 28–JULY 1, 2010
MELBOURNE, AUSTRALIA
www.gim2010.org

AUGUST 2010

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