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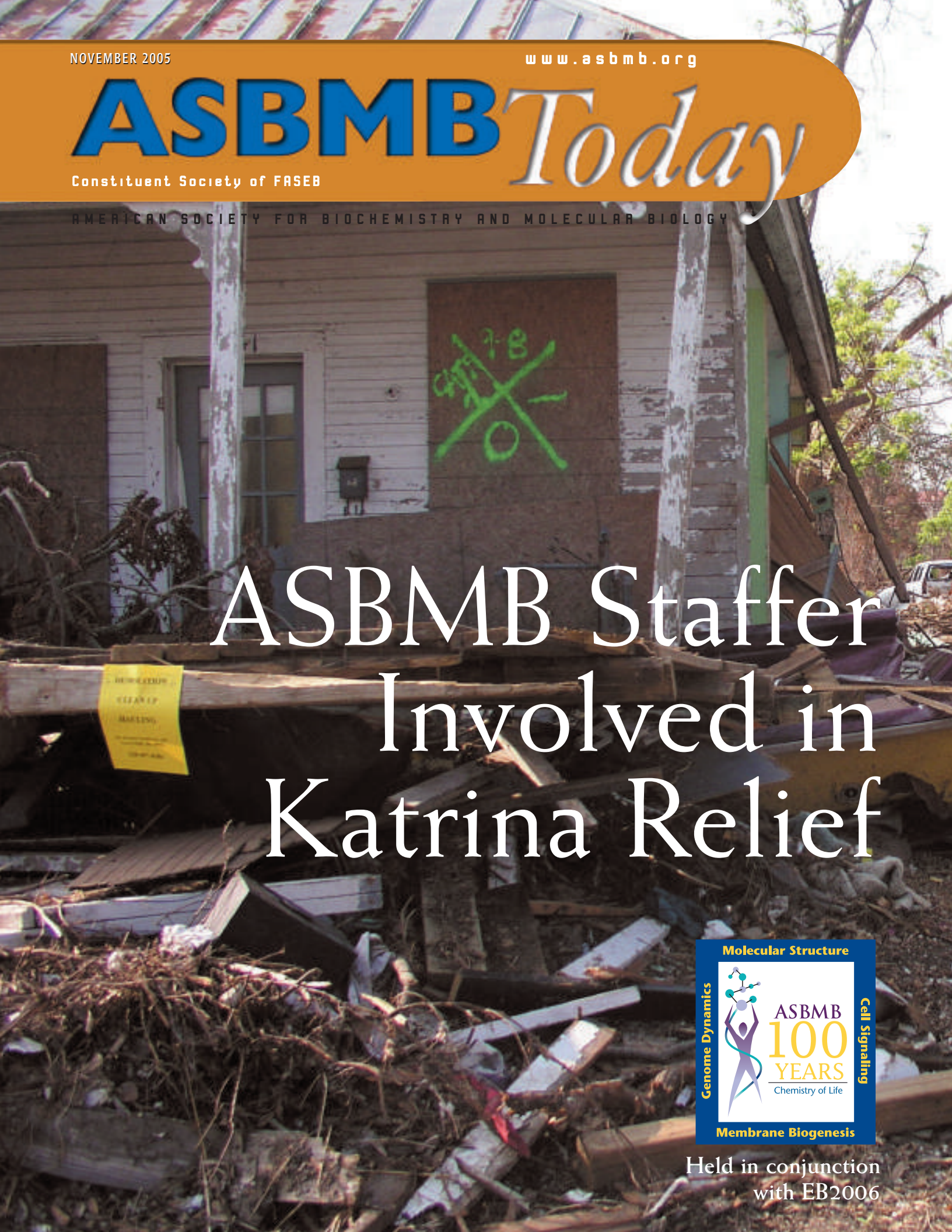

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ASBMB Today

AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY

NOVEMBER 2005,
Volume 4, Issue 8

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Comments

Please direct any comments or questions concerning *ASBMB Today* to:
John D. Thompson
Editor, *ASBMB Today*
9650 Rockville Pike
Bethesda, MD 20814-3996
Phone: 301-634-7145; Fax: 301-634-7126
E-mail: jthompson@asbmb.org

Writer Sees Need for Serious Dialogue About Intelligent Design

Dear Editor,

I found the article in your September issue, Intelligent Design Does Not Belong In the Science Classroom, very interesting. While agreeing with much of it, I feel compelled to present a somewhat different perspective. First, I think that Creationism and Intelligent Design should not be even remotely connected; they are drastically different and any confusion between them should be avoided.

Second, I do not agree that Intelligent Design seeks the "why" of natural phenomena. I see Intelligent Design as a perfectly normal scientific hypothesis aimed at explaining "how" (your definition) the astoundingly complex universe being revealed by current research has produced things that actually work (like us).

It seems to me that the time has arrived for the scientific community to drink a healthy draft of humility. Remember the recent "one gene, one protein" dogma? How many of us can encompass current transcription and translation theory, or the onslaught of proteomics? It does seem that it's time for the science community to develop some kind of forum for serious dialogue about Intelligent Design. I do not believe that philosophy courses, on the educational side, are appropriate for teaching ID, because they are not scientific enough.

Thanks for the opportunity for discussion.

Sincerely,
Thomas R. Blohm, Ph.D.
6468 Old Barn Ct.
Cincinnati, OH 45243

Tell Us What You Think

ASBMB welcomes letters regarding matters that are of concern to the scientific community and to the nation at large, as well as comments concerning articles that have appeared in *ASBMB Today*. Letters must be suitable for publication and the editor reserves the right to edit all letters. Letters should be sent to John D. Thompson, Editor, *ASBMB Today,* 9650 Rockville Pike, Bethesda, MD 20814-3996 or by email to jthompson@asbmb.today. Letters must be signed and must contain the writer's address and telephone number. The editor reserves the right to edit all letters.

Dr. Judith Bond

Strong Interdisciplinary Science Requires Strong Disciplinary Training

At a recent meeting of the Association of American Medical Colleges (AAMC) for Chairs of Basic Science Departments in Medical Schools, several issues were addressed relating to "The Changing Organization and Missions of Basic Science Departments" and "Dealing with the Hard Landing" (referring to the end of the period of the doubling of NIH funding for biomedical research).

There was an underlying theme suggesting (a) "the future is not what it used to be" (Yogi Berra quote), and (b) Basic Science Departments need to engage in 'interdisciplinary research', 'big science', 'translation research', or become obsolete. Some suggest Basic Science Departments are 'silos' and barriers to interdisciplinary research. Yet most will admit that in order to have strong interdisciplinary research we need strong disciplines and training in depth in disciplines.

Is there a conflict here? It seems to me that our organizations need to support strong disciplinary departments that are training our future scientists, and lower the barriers between departments to engage in interdisciplinary research. Science has increasingly applied its methodology and expertise to solve more complex and sophisticated problems, and has evolved from solitary scholarship to collaborations in which individuals with complementary expertise come together to address a particular problem.

There are many examples of successful team research, such as the global coordination of multidiscipline teams to determine the entire genomes of selected bacteria, plants and animals. These projects required the best efforts of computational scientists, biochemists and molecular biologists. Industry has long recognized the value of teams of specialists to discover, evaluate, develop and introduce chemotherapeutic agents into clinical use. In my own experience, I have called upon experts in electron microscopy to visualize the meprin metalloproteases, upon immunologists to probe the interactions between these enzymes in inflammation, upon human geneticists to map the meprin loci and to discover potential candidate genes for inherited disease.

The collaborators I have sought have been strong independent scientists, well versed in their disciplines. They also have a passion to solve problems, a willingness to exchange views with confidence, the mutual trust and respect of colleagues, and a desire to advance knowledge and understanding taking precedence over pride and ego. The key element of strong interdisciplinary science is to bring together teams committed to addressing important problems, the members of which have complementary skills based upon strong training and achievement in their respective disciplines. Although scientists from different disciplines may rely on similar methods and technology, the problems addressed are framed from different perspectives, and call upon different bodies of literature/knowledge. The proposition that discipline-based departments can be merged into umbrella administrative units fails to recognize the substantial differences and uniqueness of the disciplines. It takes a village of disciplines to solve complex scientific problems!

Judith Bond
ASBMB President

Renew Your 2006 Membership Online

ASBMB 2006 dues renewal notices have been mailed to all members. You can now make payment online at the ASBMB website: www.asbmb.org, by clicking on "membership" and then "renew your dues now."

Your membership includes a free subscription to our monthly magazine, *ASBMB Today,* plus free subscriptions to *JBC Online* and *MCP Online*. You also receive special member rates for *Biochemistry and Molecular Biology Education, The Journal of Lipid Research* and *Trends in Biochemical Sciences,* as well as the print versions of *JBC* and *MCP.*

ASBMB members may also register for the Annual Meeting at discounted rates. In addition, you can order your 2006 edition of the *Annual Review of Biochemistry* through ASBMB.

If you have any questions, please email membership@asbmb.org.

by Peter Farnham, CAE, ASBMB Public Affairs Officer

Katrina's Storm Surge Makes Cuts Likely In Research Spending

Lives and property were not the only valuable commodities destroyed or damaged as a result of Hurricane Katrina's catastrophic visit to the gulf coast on August 30. Federal funding for scientific research may also have been dealt a body blow as a result of the storm's ripple effects. In some ways, these are as damaging as the actual storm surge itself; the effects are simply more long-term.

Government by "CR"

In what has become an annual fall ritual, Congress (specifically, the Senate) once again failed to complete work on all appropriations bills by October 1, the beginning of the new fiscal year. In order to keep the government funded until all spending bills are signed into law, Congress approved a continuing resolution, known colloquially as a "CR," to fund the government until November 18. The CR freezes federal spending at 2005 levels, even though both the House and Senate Labor/HHS bills (which fund the National Institutes of Health) propose modest increases in spending for NIH this coming year. However, the level of spending needed to alleviate the effects of Hurricane Katrina now makes it likely that a spending freeze at the 2005 level may be the best we can expect for scientific research in 2006. And, as explained below, it increasingly looks like even the modest goal of remaining at 2005 spending levels may be a pipedream.

In the weeks following the hurricane, Congress approved two Katrina spending bills totaling $62 billion, but this was only a down payment on repairing the damage the storm wrought; as much as $200 billion might ultimately be spent. The House leadership at first intended simply to spend the additional money on hurricane relief and not revisit earlier spending decisions (the House had passed all of its appropriations bills before the August recess). But rank and file House members balked after receiving an earful of criticism about out-of-control spending during visits home. Thus, they began to agitate for offsetting spending cuts to help alleviate the negative effects on the deficit the Katrina spending entailed. The House leadership quickly backed off their initial intent not to offset Katrina spending, and now have adopted in principle the idea of spending cuts that they had derided mere weeks earlier.

Not that the House-passed spending bills are generous. The 2006 budget resolution—the annual spending blueprint that sets the maximum level of discretionary spending for the coming year—limited the appropriations committees to a total of $843 billion to fund all federal programs except for interest on the national debt, social security, and a few other programs, the spending levels for which are mandated by law. Thus, in the House version of the Labor/HHS bill, NIH (like all biomedical research, NIH spending is considered discretionary) received a 0.5% increase, for a total of $28.5 billion, slightly above the President's request level of $28.45 billion. The Senate was comparatively more generous; the Senate appropriations committee approved a 3.7% increase for NIH, which (if the Senate number ultimately prevails) would give NIH a total of $29.4 billion for 2006. However, no one now seriously expects even the House-approved figure to be signed into law. Instead, several options are on the table, none of them good for biomedical research.

First, the current CR is set to expire on November 18. However, some House members are touting the possibility of a year-long CR, which would keep discretionary spending at 2005 levels. This would result in the federal government spending $29 billion less than the budget resolution. While a bill proposing a year-long CR has not been introduced yet, the fact that House members are seriously considering it makes it a viable possibility.

A 'haircut'

The second option is to give the budget a "haircut," to use Rep. Jim Nussle's (R-IA) colorful term describing what he has in mind. Nussle is chairman of the House Budget Committee, which is responsible for setting the level of each year's budget resolution. The 2006 budget resolution of $843 billion is 2.1% larger than 2005, in line with the President's request (most of the House-passed 2006 appropriations bills reflect the President's spending requests).

However, Nussle said on October 4, "In consultation with House Speaker Hastert, I will propose an amendment to the budget for fiscal year 2006 call-

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ASBMB

Science Committee Chairman Sherwood Boehlert

By Peter Farnham, CAE, ASBMB Public Affairs Officer

Sherwood Boehlert (R-NY), Chairman of the House Committee on Science, is the 2006 recipient of the Howard K. Schachman Public Service Award. In announcing the award, ASBMB President Judith Bond noted that Boehlert has been "an outstanding advocate and supporter of scientific research" for his entire career in Congress.

Boehlert has been in the House of Representatives since January 1983 and according to his official biography, "has earned a reputation for independence, moderation and thoughtful leadership." This is evident in many ways, including through what he has chosen to display on the walls of his personal office. Instead of the usual display of plaques, awards, and "grip 'n' grin" photos showing the member standing next to a famous—or not-so-famous—public personality, Boehlert's office walls are covered with framed copies of the title pages of legislation he has authored or championed, along with the pens used to sign them into law. There are at least two dozen such displays on Boehlert's office wall, certainly the most this writer has seen in any congressional office.

Boehlert is well known as a champion of the federal investment in science and technology. As he told *ASBMB Today*, "We need to convince the American people that we need a greater investment in science and technology. We once were so far ahead in the science and technology race that we'd look behind us and couldn't even see who was second. Now we look behind us and they're breathing down our necks. We've got to invest more in science and technology." When asked to comment on the view that biomedical research is over-funded at the expense of adequate funding for research in the physical, scientific and geological sciences, Boehlert said that "It's not that the NIH is over-funded; it's that the physical sciences are under-funded. These disciplines are all needed; science is of a piece. Even [former NIH Director] Harold Varmus once said that more money ought to be spent on the physical sciences. We have to make sure that Congress provides the resources necessary to bring this about."

> ***"We once were so far ahead in the science and technology race that we'd look behind us and couldn't even see who was second. Now we look behind us and they're breathing down our necks. We've got to invest more in science and technology."***

Sherwood Boehlert (R-NY), Chairman of the House Committee on Science.

Boehlert has served on the Science Committee since taking office in 1983, and was elected chairman in January 2001. The committee has jurisdiction over all federal non-military scientific and technology research and development (R&D) programs, including the National Science Foundation, and federal spending on these programs totals more than $30 billion a year. In his first speech as chairman, Boehlert pledged to "build the Science Committee into a significant force within the Congress," and "to ensure that we have a healthy, sustainable, and productive R&D establishment, one that educates students, increases human knowledge, strengthens U.S. competitiveness and contributes to the well-being of the nation and the world."

One of Boehlert's top priorities is science and math education, and several of the Science Committee's major initiatives in both K-12 and undergraduate education were signed into law as part of the Investing in America's Future Act, which put the National Science Foundation on track toward doubling its budget over five years.

Following the tragic events of September 11, 2001, the Science Committee played a key role in the development of legislation establishing the Department of Homeland Security,

Selected as 2006 Schachman Award Recipient

ensuring the creation of an undersecretary for science and technology at the new department.

Recognizing that innovation is the key to U.S. economic success, Boehlert has also focused his efforts on strengthening the U.S. research enterprise and American industry. In December 2003, President Bush signed into law Boehlert's 21st Century Nanotechnology Research and Development Act, which authorized a better funded and coordinated interagency program in nanotechnology, an emerging field of science that the National Science Foundation estimates will be a $1 trillion industry within the next decade. Science Committee legislation was also signed into law last year to strengthen U.S. supercomputing capabilities. On September 21, 2005, the House passed committee legislation to help domestic manufacturers remain globally competitive.

Concerned that unnecessary visa delays would discourage the world's top students and researchers from becoming part of the U.S. research enterprise, Boehlert also led a successful effort to reduce the waiting time for visas through a series of hearings and a Government Accountability Office study. Boehlert is also known as a staunch environmentalist, and one of his legislative initiatives of which he is most proud is the Clean Air Act Amendments of 1990, which attacked the problem of acid rain, at the time especially affecting the Adirondacks.

The Howard K. Schachman Public Service Award, established by the ASBMB in 2001, recognizes individuals who best demonstrate dedication to public service in support of biomedical science, as exemplified by the award's namesake. Howard Schachman served as chairman of ASBMB's Public Affairs Advisory Committee from 1989 to 2000, and made numerous contributions to biomedical research policy in both governmental and non-governmental capacities as well as firmly establishing the ASBMB Public Affairs Advisory Committee as effective and influential.

The Schachman Award is given annually, and consists of a permanent keepsake, an honorarium of $5,000, an opportunity to deliver a talk or lecture at the Society's annual meeting, and travel expenses to the meeting.

ASBMB offers its heartiest congratulations to Mr. Boehlert, its 2006 Schachman Award recipient.

Research Spending continued ...

Continued from page 4

ing for additional savings—in both mandatory and discretionary spending—to make a down payment on disaster relief." While he does not mention a specific figure here, Nussle has been talking up the possibility of eliminating almost all of the increase in discretionary spending in the 2006 budget resolution; he is proposing a 2% cut in all discretionary spending—hence the term, "haircut."

A haircut—or a clip job?

Unfortunately, such a proposal plays out very adversely at NIH. Biomedical inflation is usually in the range of 3-4 % each year (it is always higher than general inflation), so any increase less than this amounts to a cut in NIH funding, since NIH needs at least an inflationary increase to support the current level of effort. Thus, the House-approved figure of less than a 1% increase would already put NIH behind inflation. A 2% cut on top of that would be even more damaging. Pay lines in the institutes are plummeting, according to recent participants in study section deliberations at NIH; in some study sections, pay lines are approaching the levels prevalent in the late 1990s, before the doubling took place.

But more broadly, across-the-board cuts are almost always bad public policy. The essence of politics is making choices, and across-the-board cuts by definition do not make choices; rather, they treat all programs alike without any effort to discriminate based on the value of spending programs. Biomedical research has long been considered one of the best ways to spend public money. To cut spending at what has been called one of the "crown jewels" of the Federal government strikes many observers as short-sighted at best.

Unfortunately, the ripple effects of Hurricane Katrina have rendered unlikely even a modest increase in biomedical research spending this year. One can only hope that as 2007 spending plans begin to develop, someone in Congress will see the danger to the public health that Katrina's ripples are causing.

ASBMB-Amgen Award Goes to Ali Shilatifard

Ali Shilatifard, Professor, Department of Chemistry, St. Louis University has been selected to receive the ASBMB-Amgen Award. The Award is made to a new investigator (defined as an individual with no more than 15 years experience since receipt of a doctorate) for significant achievements in the application of biochemistry and molecular biology to the understanding of disease. However, the implications for human disease should be evident. Nominations must be originated by Society members, but the nominees need not be ASBMB members. The Award consists of a silver and crystal commemorative sculpture, a stipend, an unrestricted research grant, and transportation, and expenses to present a lecture at the 2006 ASBMB Annual Meeting and Centennial Celebration, April 1-5 in San Francisco. Recent recipients of this award were Barry Forman in 2005, Steven C. Almo in 2004, Wesley Sundquist in 2003, Joseph Heitman in 2002, and Thomas Ried in 2001.

"We first became acquainted with Ali," recalled Joan and Ronald Conaway, Investigators at the Stowers Institute for Medical Research, in their letter nominating Shilatifard for the award, "when he came to our laboratory approximately 10 years ago to do postdoctoral research. As a postdoctoral fellow, Ali initiated an ambitious biochemical search for novel RNA polymerase II elongation factors. Although he realized the potential rewards of such research, he also realized the risks, because of the enormous amount of work required to identify and purify such transcription factors. Ali succeeded rapidly in this endeavor, however, making it clear that he was among the very best of the crop of young scientists.

"By systematically fractionating and assaying rat liver nuclear extracts, Shilatifard single-handedly identified and quickly purified a novel RNA polymerase II elongation factor. This protein unexpectedly turned out to be a rat homolog of the product of the human ELL gene, which undergoes frequent translocations with the trithorax-like MLL gene in acute myeloid leukemia. This work, which provided the first hints of possible biological functions of the ELL gene product, was published in 1996 in Science."

Since starting his own laboratory in 1997, Shilatifard has been extremely productive. Much of his early independent work involved in depth biochemical studies of ELL. He first purified and characterized a multi subunit ELL complex (Shilatifard, 1998). One interesting property of this complex was that it failed to repress transcription initiation by RNA polymerase II, unlike the isolated ELL protein. The purification of the complex paved the way for the cloning of ELL associated proteins. The cloning and characterization of the first associated protein was reported the following year (Schmidt et al., 1999). The protein that was cloned, EAP30, provides significant insight into the functions of the endogenous ELL complex because of its homology to a well-characterized yeast protein called SNF8. In addition, EAP30 appears to be responsible for derepression of the RNA polymerase-inhibitory activity of purified ELL. As part of his comprehensive analysis of ELL proteins, Shilatifard isolated a novel member of the ELL family, called ELL 3.other aspects of chromatin.

"Dr. Shilatifard is a clear and prolific writer, whose views on pol II elongation and histone modifications have appeared in numerous reviews and book chapters, in addition to the other 40 or so high-quality publications he has generated. He has also leveraged his scientific skills in support of the broader gene regulation community," noted Michael Carey, Director of the Jonsson Cancer Center Gene Regulation Program at UCLA. "It is a great honor to teach the Cold Spring Harbor Gene Expression Course and Dr. Shilatifard is an instructor and soon to be chair of the course."

Dr. Ali Shilatifard

Shilatifard is on the editorial board of the Journal of Biological Chemistry and is a member of the MGC2 study section, where many transcriptional regulation grants are reviewed. Most importantly, in addition to his numerous invited talks and seminars, Shilatifard recently organized the ASBMB-sponsored 2005 Transcriptional Regulation by Chromatin and RNA Polymerase II meeting at Granlibakken. This meeting was of note because it was the subject of two journal reviews due to the timely nature of the material.

On the personal side, Shilatifard presents entertaining yet scientifically rigorous seminars, and additionally is an individual who goes to great lengths to provide advice and inspiration to younger colleagues. In summary, Ali Shilatifard is an outstanding scientist, scholar and teacher, who has made seminal contributions to understanding the molecular mechanism of disease at a very early stage in his career.

ASBMB Reminiscences

As part of our Centennial Celebration, we recently asked members to contribute reminiscences of their early thoughts about becoming a scientist, their experience as postdocs, their first paper published, their first lecture at an ASBMB Meeting, the friendships and connections they formed with other ASBMB members, their impressions of the first ASBMB meeting they attended, and anything else they thought pertinent. Here is the first such contribution received. We believe you will find it interesting, and we look forward to receiving and publishing more reminiscences. Please send to them to editor@asbmb.org.

Dr. Birgit Vennesland, at left, and Dr. Eric E. Conn

When I was working for my Ph. D. in biochemistry at the University of Chicago, my supervisor Birgit Vennesland suggested I present a paper on some of my research at a FASEB meeting in Detroit. (The year was either 1947 or 1948, as I recall.) When the abstracts came out, we learned that I would be speaking on the afternoon of the last day of the meetings, and was indeed the last paper in that session.

One or more of the experienced graduate students in the department—-Eugene Kennedy, Morris Friedkin, Irving Zabin as I recall—-warned me that being the last speaker on the last afternoon would probably mean that few if anyone would be there to hear my paper. I was pretty disheartened by their warnings and spoke to Dr. Vennesland about the matter. She replied to the effect that she was confident that I would have a reasonable audience and tried to make me feel more optimistic about giving my first paper at a FASEB meeting.

When the fatal day came and I went up to the podium to present my work, I saw that Dr. Vennesland was as good as her word. In the audience were Carl and Gerty Cori, Sarah Ratner, Albert Lehninger and Frank Putnam (both of whom were assistant profs at Chicago (and outranked by Vennesland at that time). I think Konrad Bloch and Herbert Anker were also there.

As my years of association with Birgit Vennesland went on, I realized what a supportive supervisor she was. I've tried to "pay her back" by providing such support to my students over the years.

Eric E. Conn
Professor Emeritus of Biochemistry, University of California at Davis

Special Events Will Highlight ASBMB/JBC Centennial Celebration

The American Society for Biochemistry and Molecular Biology will include, as part of the 2006 Annual Meeting, a series of special events to add to your experience and honor of the centennial anniversary of ASBMB and the *Journal of Biological Chemistry* (JBC). All ASBMB and EB participants are invited to attend. As tickets are limited, we urge you to register and at the same time purchase your tickets for these special events.

Opening Centennial Celebration

Saturday, April 1

The meeting will kick off with the Opening Centennial Celebration honoring the accomplishments, endeavors, and contributions of our members. This reception will immediately follow the Herbert Tabor/*Journal of Biological Chemistry* Lecture which will open the 2006 Annual Meeting. This event is free for ASBMB registrants. The cost to all others is $15. Tickets ordered and paid for in advance will be mailed with your registration materials.

ASBMB/JBC Birthday Bash, A Taste of San Francisco

Sunday, April 2

Come celebrate with us! ASBMB and JBC will celebrate their hundredth anniversary with a huge "Birthday Bash" on Sunday, April 2. Revelers will be entertained by jugglers, mimes, fortune tellers, and other entertainment while listening and dancing to one of San Francisco's favorite entertainment bands and enjoying the many authentic tastes of San Francisco. The Birthday Bash is a ticketed event open to all EB registrants. The cost to ASBMB members is $15. The cost to all other EB registrants (including Biochemistry nonmembers) is $25. Costs will increase after February 3, so make sure to register early for this event! Tickets will be mailed with your registration materials.

ASBMB 5K Fun Run

Monday, April 3

Rise and run with your fellow running enthusiasts, while taking in the scenic streets of San Francisco! The ASBMB 5K Fun Run will be held Monday, April 2 at 7:00 a.m. Runners will meet at the ASBMB Lounge in the Moscone Convention Center (West). The Fun Run entry fee is $20 for all runners. Costs will increase after February 3, and there will be no same-day registration. T-shirts and refreshments will be available for registered participants. The Fun Run will be held rain or shine. Detailed information can be found at www.faseb.org/meetings/eb2006.

Thematic Receptions

Monday, April 3 and Tuesday, April 4

Each of our 13 scientific theme meetings will host a reception immediately following their afternoon symposia. All session attendees are welcome to continue the scientific discussion, meet the speakers, and network with other attendees in their field. Check the meeting program for schedule information.

An Evening with the San Francisco Symphony

Monday, April 3

A unique opportunity to experience one of the nation's premier orchestras awaits you in San Francisco. As a special highlight of the ASBMB/JBC Centennial Celebration, we have arranged a private performance for our members, EB meeting attendees, exhibitors, and guests. Hear the classics or discover new favorites and thrill to the excitement of listening to the music of the San Francisco Symphony. Casual attire is permitted. A limited number of tickets are available for an evening with the San Francisco Symphony, so we urge you to purchase your tickets before the Early Registration deadline, February 3, when ticket prices will increase. The cost to ASBMB members is $15. The cost for all other EB registrants, including Biochemistry nonmembers, is $25.

How to Publish in the Journal of Biological Chemistry (JBC)

Monday, April 3

JBC is setting up a lunchtime workshop for authors interested in submitting their work to the JBC. This workshop will be led by JBC Associate Editors. Space is limited, however the workshop may repeat on subsequent days based on the level of interest. Workshop registrants will receive additional information after the early registration deadline, February 3.


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Protein Synthesis, Post-translational

Organizer: William Merrick, Case Western Reserve University

The ideal goal of this theme is to go from free amino acids to proteins to protein processing to protein turnover at the molecular level. Given the restriction of time, this will not be accomplished in all areas. Each symposium will have three additional talks selected from submitted abstracts.

Molecular Mechanisms of Protein Biosynthesis

This symposium will provide what most of us have looked for since the determination of the genetic code, the how's and whys of the predominate step in protein biosynthesis, the elongation cycle. In this cycle, the ribosome bound mRNA is decoded by a process that encompasses the steps of protein synthesis involving binding of an aminoacyl-tRNA to its correct codon, the subsequent formation of a peptide bond and translocation to get back to the starting point.

Using a variety of rapid kinetic in vitro methodologies, Dr. Marina Rodnina (University of Witten/Herdecke) and colleagues have been able to isolate intermediates of the steps of elongation and with structural data on various ribosome•aminoacyl-tRNA complexes, have constructed a mechanistic interpretation of the entire process of elongation. From this, it is now possible to logically interpret what happens when the decoding process is perturbed by an antibiotic or mutation.

In a companion series of experiments, Dr. Olke Uhlenbeck (Northwestern University) has taken the focal point of the tRNA molecule to determine its contribution to the specificity of aminoacylation, binding to EF1A and interactions at the surface of the ribosome. A part of his presentation is the observation that while tRNAs vary with respect to their individual kinetic or thermodynamic properties in the steps of protein synthesis, the overall balance is such that essentially all tRNAs are equivalent (this in spite of ten-fold differences in some steps). To achieve this, the aminoacyl-tRNAs play an active role in decoding where each tRNA sequence has evolved to meet the idiosyncratic needs of their cognate amino acid and anticodon. Finally, Dr. Jamie Cate (University of California, Berkeley) will report on progress in obtaining a high resolution X-ray structure of the E. coli ribosome.

This will be our first opportunity to view the whole ribosome at atomic resolution. In addition, the structure is extremely important since although some structural information on thermophilic bacterial ribosomes has been available for almost 5 years, virtually all biochemical and molecular genetic experiments are performed using the Escherichia coli system. This unique coupling of the structure and function of both tRNA and the ribosome with a detailed kinetic analysis of protein synthesis is not be missed.

New Views on How to Study Protein Biosynthesis

The second symposium will focus on the "struggles" to understand the complex mechanisms in play in the initiation of eukaryotic protein synthesis. The focus on initiation reflects the many biological intricacies that manipulate the expression of specific proteins as a function of development, stress, or viral infection.

The first talk by Dr. Jon Lorsch (Johns Hopkins University School of Medicine)

Dr. William Merrick

will cover basic pathway aspects of initiation as viewed by an enzymologist. His previous efforts allowed for the determination of 2 GTP-dependent steps in this pathway and his current studies examine the AUG codon-dependent hydrolysis of the GTP in the ternary complex (eIF2•GTP•Met-tRNAi) on the 40S subunit. Much to his amazement, it appears that the key regulatory step is not the hydrolysis of GTP, but the "irreversible step" of Pi release.

The second talk by Dr. Christopher Hellen (SUNY Downstate Medical Center) examines the results obtained using several standard biochemical techniques combined with "toe printing", the mapping of the location of an mRNA on the 40S subunit using reverse transcriptase. Like Dr. Lorsch's efforts, a key feature in this study is the use of individually purified reagents (translation initiation factors, mRNAs, ribosomal subunits). This has allowed he and his wife, Tatyana Pestova, to define the elements necessary for the correct formation of the 40S pre-initiation complex whereby the ternary complex, start codon and 40S subunit are correctly positioned in what is to become the P site of the ribosome.

Key in their findings is that specific translation factors are required for dif-

Modification and Degradation

ferent mRNAs (they differ depending on the mRNA) and the ability to determine when in the assembly pathway specific factors appear to function. The final talk by Dr. William Merrick will serve as a reminder of how little is known about the initiation process. By using rabbit reticulocyte lysates (which function at or near the in vitro rate) and by either the addition of translation initiation factors or inhibitors of translation (Pdcd4, human P56, mouse P56), it is becoming clear that some of the basic tenets of the "80S Initiation Pathway" may not be valid, especially as applies to IRES-mediated translation initiation.

Co- and Post-Translational Events

The third symposium is designed to provide a view of how proteins emerge from the ribosome and become functional proteins. Dr. Arthur Johnson (Texas A & M University System Health Science Center) will introduce this topic from the early steps in peptide elongation to the secretion of the growing polypeptide chain into the endoplasmic reticulum (ER). His unique use of fluorescence methodologies has provided insights into how early the growing polypeptide chain begins folding, aspects of the structure and function of the protein trafficking machinery and how the permeability barrier of the ER membrane is maintained.

The subsequent presentation by Dr. Carol Deutsch (University of Pennsylvania) will advance this type of study one level higher with her report on how voltage-gated potassium (Kv) channels are made and put together and how they work. Kv channel proteins are oligomeric and their precise subunit composition dictates their biophysical and pharmacological properties. Using several novel biochemical approaches that she has developed, Dr. Deutsch will define the stages of and compartments in which secondary, tertiary and quaternary structures of the channels are acquired.

The final presentation in this symposium will focus on how polypeptides are correctly folded to yield biologically active molecules. Dr. Judith Frydman (Stanford University) will present her work on eukaryotic, cytosolic chaperones. Given that unfolded polypeptide chains have a strong tendency to either aggregate or misfold, the role of chaperones is critical to provide a protected folding environment that sequesters folding intermediates from the bulk cytosol. The mechanism of action of the Hsp70 family members as well as the ring-shaped chaperonin TRiC/CCT and the prefoldin/GIMc complex will be discussed as well as their relative contribution to cellular folding.

Protein Modification and Turnover

The fourth symposium will begin to address the fate of proteins following their initial synthesis. Bacterial systems pose a problem when ribosomes become entangled with damaged or truncated mRNAs.

Dr. Robert Sauer (MIT) will present his work on how the tmRNA/SmpB system functions in bacteria. This uniquely prokaryotic system represents a quality control system whereby ribosomally bound, incomplete proteins are tagged and degraded. Specialized adaptor proteins that couple ATP binding and hydrolysis to conformational changes allow these proteases to unfold stable native proteins despite the radically different sequences and physical properties of the polypeptides to be degraded. A part of the quality control system in eukaryotes is the determination of how protein substrates are recognized and then targeted to the proteasome for degradation.

Dr. Jeffrey Brodsky (University of Pittsburgh) will present his use of proteomics and genomics to address the mechanism of action of the ER associated degradation pathway (ERAD pathway). Using yeast as a model system, Dr. Brodsky has been able to show that small heat shock proteins (originally identified in yeast) also impact the cystic fibrosis transmembrane conductance regulator biogenesis in mammalian cells. Current efforts are aimed at delineating how factors in the different stages of the ERAD pathway impact protein biogenesis in the secretory pathway.

The final presentation by Dr. Marla Berry (University of Hawaii at Manoa) will examine how the unusual amino acid, selenocysteine (the twenty first amino acid) is incorporated into proteins. Uniquely, this amino acid is incorporated into the growing polypeptide chain in response to the normal termination codon UGA. Unlike several enzymes that contain and use a single selenocysteine, the selenoprotein P gene encodes as many as 18 UGA codons. Efforts to identify the factors involved in selenocysteine incorporation into selenoprotein P have identified a number of proteins, several of which contain putative NLS and NES sequences. The coordinated effort of these proteins is required to not only accomplish selenoprotein P synthesis, but also to circumvent possible nonsense-mediated decay due to the many potential stop codons in the mRNA.

ASBMB Staffer Involved in Katrina Relief

By Peter Farnham, CAE, ASBMB Public Affairs Officer

"I've never heard a noise like that in all my life, when Katrina came ashore," Biloxi, Mississippi, resident James Turner told ASBMB's Peter Farnham during Farnham's recent trip to the storm-battered Gulf Coast city to assist with recovery efforts. The Category 4 hurricane came ashore just west of Biloxi on August 30, and the resulting storm surge put almost 8 feet of water in Turner's house.

All photos by Peter Farnham, ASBMB

ASBMB's Peter Farnham, at left, with volunteers Bruce Purdy, Denise Elfes, Otto Stahley, and Corinne Berkseth, all members of Good Shepherd Lutheran Church in Alexandria, Virginia.

Turner and 18 friends and family members took shelter in his attic during Katrina's landfall. "The water rose to about six inches from the entrance to the attic," he said. "I was starting to think about cutting a hole in the roof, but I don't think we'd have been able to hold on out there the way the wind was blowing." Fortunately, the water stopped rising before this became necessary, and it receded a short time later as Katrina moved further inland.

This was only one of the many stories told to Farnham during his week in Biloxi in late September. He went there with a group of volunteer relief workers from Good Shepherd Lutheran Church, in Alexandria, Virginia. Farnham took down a van load of sorely needed bleach, laundry detergent, and other cleaning supplies, all donated by ASBMB and FASEB staffers.

Continued on page 16

CERAMIDES AND SPHINGOLIPIDS

^{14}C ^{3}H

Catalog ARC	Product Description		Quantity	
ART-453	N-Acetyl-D-erythro-dihydrosphingosine [4,5-^{3}H]		250 µCi	$999
ARC-1651	N-Acety-D-erythro-phytosphingosine, [acetyl-1-^{14}C]		50 µCi	$1099
ARC-1652	N-Acetyl-D-erythro-phytosphingosine-1-phosphate, [acetyl-1-^{14}C]		10 µCi	$1199
ARC-1024	N-Acetyl-D-erythro-spingosine [acetyl-1-^{14}C]		50 µCi	$999
ARC-1655	N-Acetyl-D-erythro-sphingosine-1-phosphate, [acetyl-1-^{14}C]		10 µCi	$1199
ART-829	Ceramide trihexosides [galactose-6-^{3}H]		10 µCi	$549
ART-460	Dihydrosphingosine D-erythro [4,5-^{3}H]		250 µCi	$1049
ART-618	Dihydrosphingosine-1-phosphate, D-erythro [4,5-^{3}H]		10 µCi	$549
ART-634	Dihydrosphingosine-D-erythro-phosphocholine [4,5-^{3}H]		50 µCi	$999
ART-1191	Dimethyl-D-erythro-sphingosine, [methyl-^{3}H]		50 µCi	$1199
ART-830	Galactosyl ceramide [galactose-6-^{3}H]		10 µCi	$699
ARC-1331	Glucocerebroside [glucosyl ceramide (stearoyl-1-^{14}C)]		10 µCi	$1349
ART-669	Sn-Glycero-3-phosphocholine, 2-palmitoyl-1-0-hexa/octadecyl [1,2-^{3}H]	50 µCi		
ART-668	Sn-Glycero-3-phosphoserine, 2-palmitoyl-1-0-hexa/octadecyl [1,2-^{3}H]		250 µCi	$1549
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ART-598	N-Hexanoyl-D-erythro-sphingosine [hexanoyl 6-^{3}H]		50 µCi	$849
ARC-1076	N-Hexanoyl-D-erythro-sphingosine [hexanoyl 1-^{14}C]		50 µCi	$999
ARC-555	Lyso-3-phosphatidylcholine, L-1- [methyl-^{14}C]		10 µCi	$849
ART-677	Lyso-3-phosphatidylcholine, L-1- [methyl-^{3}H]		50 µCi	$999
ART-1176	Lysosphingomyelin, [methyl-^{3}H]		10 µCi	$1149
ART-601	N-Octanoyl-D-erythro-dihydrosphingosine [4,5-^{3}H]		50 µCi	$1049
ART-792	N-Octanoyl-D-erythro-dihydrosphingosine [4,5-^{3}H] 1-phosphate		10 µCi	$949
ARC-1073	N-Octanoyl-D-erythro-sphingosine [octanoyl 1-^{14}C]		50 µCi	$1049
ART-599	N-Octanoyl-D-erythro-sphingosine [octanoyl 8-^{3}H]		50 µCi	$1049
ARC-1649	N-Octanoyl-D-erythro-phytosphingosine, [octanoyl-1-^{14}C]		50 µCi	$1099
ARC-1653	N-Octanoyl-D-erythro-phytosphingosine-1-phosphate, [octanoyl-1-^{14}C]	10 µCi		
ARC-1656	N-Octanoyl-D-erythro-sphingosine-1-phosphate, [octanoyl-1-^{14}C]		10 µCi	$1199
ARC-1650	N-Oleoyl phytosphingosine, [oleoyl-1-^{14}C]		50 µCi	$1299
ARC-1654	N-Oleoyl phytosphingosine-1-phosphate, [oleoyl-1-^{14}C]		10 µCi	$1399
ARC-818	N-Oleoyl-D-erythro-sphingosine [oleoyl 1-^{14}C]		50 µCi	$1649
ARC-831	N-Palmitoyl-D-erytho-sphingosine [palmitoyl 1-^{14}C]		50 µCi	$1599
ART-899	N-Palmitoyl, [9,10-^{3}H] D-erythrosphingosine		50 µCi	$1199
ARC-772	Sphingomyelin (bovine) [choline methyl-^{14}C]		10 µCi	$519
ART-481	Sphingomyelin (bovine) [choline methyl-^{3}H]		50 µCi	$719
ART-490	Sphingosine D-erythro [3-^{3}H]		50 µCi	$679
ART-859	Sphingosine D-threo [3-^{3}H]		50 µCi	$849
ART-778	Sphingosine, D-erythro-[3-^{3}H]-1-phosphate		10 µCi	$1349
ART-1283	Sphingosine D-threo-[3-^{3}H]-1-phosphate		10 µCi	$1349
ARC-1612	Sphingosine D-erythro-1-phosphate, [^{14}C]			Inquire
ARP-144	Sphingosine D-erythro-1-phosphate, [^{33}P]		10 µCi	$1049
ARC-1815	N-Stearoyl-D-erythro-sphingosine [stearoyl-1-^{14}C]		50 µCi	$1599
ART-1408	N-Stearoyl-D-erythro-sphingosine [stearoyl-9,10-^{3}H]		50 µCi	$999
ARC-1048	Sulphatide [stearoyl 1-^{14}C]		50 µCi	$1499
ARC-1492	N,N,N-Trimethyl-D-erythro-sphingosine, [N-methyl-^{14}C]		10 µCi	$699
ART-1138	N,N,N-Trimethyl-D-erythro-sphingosine, [N-methyl-^{3}H]		10 µCi	$699

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"These were much needed and appreciated," Farnham said.

The volunteers spent most of their time trying to salvage houses that were damaged during the storm. "We had a pretty ruthless triage system going on," Farnham said. "We'd only work on houses that were still on their foundations, structurally sound, and that were owned by the people living in them. We'd also select houses where the owners were low-income, elderly or disabled, and thus needed the help."

The help consisted of completely emptying a house of its contents, and then stripping out the ruined drywall and insulation and removing all the flooring. "We'd then power-wash the studs and interior siding," Farnham said, "and spray fungicide all around." This was necessary because of the various kinds of mold that had already begun to grow. The weather was hot and humid, and unless the house dried out, the mold would spread and within a few weeks the house would be rendered uninhabitable.

Bethel Lutheran Church was the center for Lutheran disaster relief efforts in Biloxi. In addition to coordinating efforts to clean out houses, the church also maintained a food and clothing bank and a medical clinic. However, most religious denominations had major relief efforts going on, as did both the Red Cross and Salvation Army.

The Federal Emergency Management Agency (FEMA) was also present, but according to Farnham, did little to alleviate its poor reputation. "Fifty volunteers were living at Bethel," Farnham noted, "with one shower." FEMA

Farnham said the trip was a very demanding experience, both physically and emotionally, but one he hopes to do again. "Helping these people was something I had to do," he told *ASBMB Today*. "And everyone was so grateful. One family even cooked us barbecue. Here's someone who had just lost everything except the framework of his house, and he and his wife are cooking barbecue for us. This was pretty typical; the people of Biloxi we met were just terrific. I hope we helped them in some way, if only a little."

had set up headquarters across the street in a local community center, with six showers in the locker rooms by the indoor pool there. FEMA had been allowing the volunteers to use the showers after working in the neighborhoods all day, but stopped doing so after one of the cleaning staff complained that the volunteers had made the showers dirty. Eventually, after lengthy negotiations between Bethel's pastor and FEMA, the agency relented and as of this writing the volunteers are once again being allowed to shower at FEMA. "I'm glad someone over there at FEMA came to their senses," Farnham said, "but it never should have been an issue in the first place. You get dirty, cleaning out these houses all day."

Symposium on Signaling

Organizer: Natalie Ahn, Professor, Department of Chemistry and Biochemistry and Howard Hughes Medical Institute, University of Colorado at Boulder

This symposium will cover themes related to signal transduction mechanisms and intracellular communication. Special emphasis will be directed towards cellular pathways and molecular events that are relevant to diseases caused by cell stress and dysregulation of cell proliferation or apoptosis, and how these mechanisms may be linked to cellular processes controlling senescence, aging, and immortalization. Each session will feature three invited speakers and three short talks chosen from submitted abstracts.

Apoptosis and Cell Stress

Chair: Sue Goo Rhee, NHLBI, NIH

The speakers will present signal transduction mechanisms underlying the cellular responses to environmental stress and programmed cell death. Key to these are signaling pathways that control intracellular redox balance, through pathways involving protein covalent modification and proteolysis, protein-protein interactions, and enzyme regulation. These are linked to mitochondrial function and caspase pathway activation of proteasome activity. Dr. Sue Goo Rhee (NIH) will discuss pathways responsive to oxidative stress, the intracellular messenger functions of hydrogen peroxide, and regulatory mechanisms that control signaling effectors via proteinaceous cysteine oxidation. Dr. Valeria Culotta (Johns Hopkins) will discuss mechanisms of metal homeostasis and enzymes that confer protection against oxidative stress. Dr. Ding Xue (University of Colorado, Boulder) will present functional genomic approaches to identify new mechanisms involved in apoptosis and cell stress in C. elegans that lead to cell killing, phagocytosis, and DNA degradation.

Cell Proliferation

Chair: Natalie Ahn, University of Colorado at Boulder

The speakers will discuss signal transduction pathways that promote cell transformation, which involves a complex interplay between diverse mechanisms that control proliferation, invasive behavior, and cell size. Emerging evidence reveals new effectors and downstream targets that extend in new directions classic mechanisms linked to growth factor receptor pathways. Dr. Adrienne Cox (U. North Carolina) will discuss the importance of the R-Ras family of small GTPases, which exhibits transforming properties as potent as oncogenic Ras proteins, and also plays unique roles in mediating integrin-dependent migration and invasiveness in cancer cells. Dr. John Blenis (Harvard Medical School) will discuss cellular signal transduction through the mammalian target of rapamycin (mTOR), a key pathway that coordinates cell growth with cell proliferation by regulating ribosomal biogenesis and protein translation, through mechanisms that are tightly regulated by tuberous sclerosis complex (TSC)-1/2, PTEN, and LKB1 tumor suppressor proteins. Dr. Natalie Ahn will discuss functional proteomics strategies for identifying downstream targets of signaling pathways, and how these yield novel insight into the function of Rho GTPase signaling in cancer.

Dr. Natalie Ahn

Telomeres and Senescence

Chair: Judith Campisi, Lawrence Berkeley Laboratories

The speakers will focus on the problem of replication at chromosome ends, and how the control of telomere length by telomerase reverse transcriptase (TERT) modulates processes of cell senescence, immortalization and tumorigenesis. Shortened telomere length has been shown to be causally linked to cell cycle arrest and senescence, whereas mechanisms that prevent shortening are associated with cell immortalization and transformation. Thus, TERT and regulators of telomere biology are exciting new targets for cancer therapeutics through the development of small molecule

in Aging and Disease

inhibitors, vaccines, or genetic therapies. Signal transduction mechanisms that enable cells to respond to telomere length are still poorly understood, but emerging evidence reveals diverse connections with DNA damage and repair mechanisms, causing shortened telomeres to trigger DNA damage responses that mediate cell cycle arrest, and enabling telomere binding proteins to hide chromosome ends from DNA repair enzymes. In this session, Dr. Elizabeth Blackburn (UCSF) will present work on mechanisms of action of telomeres and telomerase and the effects of altering their functions, Dr Jerry Shay (U. Texas Southwestern Medical School) will discuss the roles of telomeres and telomerase on cell senescence and immortalization, and Dr. Judith Campisi will discuss how signaling pathways involving tumor suppressor genes control senescence phenotypes and influence organismal aging.

Aging

Chair: John Denu, University of Wisconsin

The speakers will highlight new molecular mechanisms that control the process of organismal aging. Although the aging phenotype is familiar to everyone, an understanding of how this process is controlled mechanistically is only in its nascent stages. Genetic experiments in several species have now demonstrated control of organismal lifespan by several molecular regulators and events. These include insulin, NAD+-dependent deacetylases, and oxidative damage, which are known to mediate other cellular processes, but only recently have been linked to aging. How these effectors control organismal longevity and how they may be linked mechanistically are emerging areas of research. In this session, Dr. Anne Brunet (Stanford University) will discuss how mammalian Sir2 deacetylase controls the cellular response to stress by regulating the FOXO family of Forkhead transcription factors, which function as sensors of the insulin signaling pathway and regulators of longevity. Dr. John Denu will explore the enzymology of NAD+-dependent histone/protein deacetylases, explaining the molecular basis for Sir2 activation by resveratrol, a polyphenol in wine shown to enhance lifespan. Dr. Douglas Wallace (University of California, Irvine) will discuss a free radical theory of aging, which involves increased oxidative stress and the generation of reactive oxygen species (ROS) caused by mutations that lead to mitochondrial dysfunction in age-related degenerative diseases.

William L. Smith to Receive William C. Rose Award

William L. Smith, Professor and Chair of the Department of Biological Chemistry, University of Michigan Medical School, has been selected to receive the William C. Rose Award in Biochemistry. The Award recognizes outstanding contributions to biochemical and molecular biological research and a demonstrated commitment to the training of younger scientists, as epitomized by the late Dr. Rose. Nominators and nominees need not be members of the Society. The Award consists of a plaque, stipend, and transportation to the 2006 Meeting to present a lecture. Past recipients of the award include Frederick P. Guengerich in 2005, Sunney I. Chan in 2004, Jack E. Dixon in 2003, Gordon Hammes in 2002, and Marc W. Kirschner in 2001.

As a graduate student Dr. Smith provided some of the earliest biochemical characterizations of the oxygenation of fatty acids, and identified one of the first examples of suicide inactivation of an enzyme. As his career progressed, antibodies to prostaglandin synthase were developed and used to localize the enzyme in specific organs and tissues. This work was followed by more detailed enzyme localization to the endoplasmic reticulum and nuclear envelope at the subcellular level. In addition to his work with prostaglandin synthase, he successfully identified the association of prostanoid receptors with G-protein coupled receptors. Continued work with the prostaglandin synthase ultimately led to the identification of the cDNA for the enzyme and the deduction of its primary structure.

This crucial accomplishment launched structural studies of the enzyme that continue to be essential for mechanistic understanding of the biochemistry and pharmacology of the catalytic process. Mutagenesis of the cDNA and structure-function analysis of the protein revealed critical residues essential for catalysis, and provided important new insights into the mechanisms of action of non-steroidal anti-inflammatory drugs and aspirin. His work with the biochemistry and pharmacology of prostaglandin synthase 1 was extended to prostaglandin synthase 2 and provided critical insights into mechanisms of differential inactivation of catalytic activities. Dr. Smith's most recent work has been strongly and clearly focused upon fundamental structural questions concerning the binding of fatty acid substrates to the enzyme and the mechanisms of multiple product generation. Each of the advances described above have been major steps in the understanding of the biochemistry of prostaglandins that have extremely important implications for human medicine.

Support of cutting edge research facilities is crucial to the growth and success of the biomedical research enterprise.

Dr. William L. Smith

During the last eight years of his career at Michigan State University, Dr. Smith served as Chair of the Department of Biochemistry and Molecular Biology. In this role he was exceptionally effective in guiding the direction of the department and maximizing the resources available. He took the lead on persuading the biological science departments to do joint recruiting of students, in a unique but effective umbrella program which preserved the independence of departments and their curriculum. He was also a leader in convincing the administration that support of cutting edge research facilities is crucial to the growth and success of the biomedical research enterprise. On a day-to-day basis, he dedicated time and energy to the challenging job of Chair of a large department that served four Deans, each with a different agenda. This was a hard job, but Dr. Smith did it with good organization, good humor, and good sense.

Zach Hall Appointed Permanent President Of California Institute For Regenerative Medicine

The Independent Citizens Oversight Committee (ICOC) for the California Institute for Regenerative Medicine (CIRM) announced today that it has appointed Zach Hall as permanent President of CIRM, following an extensive search.

When Dr. Hall joined the CIRM in March 2005, he brought a distinguished background in academic and scientific leadership—including past positions as Director of the National Institute of Neurological Disorders and Stroke, Executive Vice Chancellor of University of California, San Francisco, and, most recently, Director of the Zilkha Neurogenetic Institute and Senior Associate Dean at the Keck School of Medicine of the University of Southern California. During the six months that he has served as Interim President of CIRM, Dr. Hall has led scientific and administrative planning, has worked with the ICOC to establish CIRM policies, and has begun to build a scientific and administrative team through hires of key personnel.

"Stem cell research is one of the frontiers of modern biomedical science and the CIRM will help American science take the lead in this area. The opportunity for me to continue as President in this exciting program is simply too important to forego." said Dr. Hall. "We must build our scientific enterprise so that we may contribute to the ongoing discoveries leading to therapies that are occurring world-wide."

About CIRM

Governed by the ICOC, CIRM was established in 2004 with the passage of a statewide ballot measure, which provided $3 billion in funding for stem cell research at California universities and research institutions, and called for the establishment of an entity to make grants and provide loans for stem cell research, research facilities, and other vital research opportunities. For more information, please visit: www.cirm.ca.gov.

New Understanding of DNA Repair May Pave Way to Cancer Treatments

A Burnham Institute study has found that a protein known for its role in gene regulation has another important function, that of initiating DNA repair. The study, published in the May 27, 2005 edition of *Molecular Cell,* points to new targets for the treatment of cancer.

Ze'ev Ronai,* Director of the Institute's Signal Transduction Program, and his colleagues found that the protein ATF2 (Activating Transcription Factor-2) is activated by a protein kinase called ATM (Ataxia-Telangiectasia Mutated), which stimulates DNA repair. ATF2's role in regulating expression of proteins that control cell cycle and programmed cell death is well established. The current study is the first to demonstrate ATF2's role in DNA repair, an intracellular process that prevents formation of genetic mutations, including those that lead to cancer.

"This is the first time we've seen a protein which has been implicated in gene regulation possess an independent function—in DNA repair—while both functions are independent from one another," said Ronai. Dr. Ronai's laboratory has been studying ATF2 with the goal of understanding its role in regulation of cell cycle and programmed cell death. These studies evolved from the finding that ATF2 has an important role in the development and progression of melanoma tumors. Inhibition of ATF2 was found to sensitize melanoma to various treatments, both in tissue culture and in animal models.

"Melanoma is usually resistant to chemotherapy, but we found that by inhibiting ATF2, it became more sensitive to treatment," Ronai said. Consequently, his laboratory developed a small peptide that interferes with ATF2 function, efficiently blocking melanoma growth in mouse models. Ongoing studies are devoted to screening for compounds that mimic the peptide's actions and to allow for further development of the peptide toward clinical assessment.

"Until our recent studies, we were certain that the mechanism by which ATF2 affects melanoma growth was primarily through its established function in the regulation of proteins important in cell cycle and cell death control. We were therefore most surprised to find an uncoupled function for the same protein," said Ronai.

The finding of ATF2's novel function in DNA repair was serendipitous. As Shoichi Takahashi, a postgraduate researcher, was testing for the changes in ATF2 in human cancers, he "lost the signal" for ATF2. "Later," Dr. Ronai said, "we did experiments that showed the signal was lost because a protein kinase, ATM, modified ATF2 enough to interfere with detection of the ATF2 signal. Soon, work performed by Anindita Bhoumik confirmed that ATF2 is regulated by ATM and that this regulation is central to the cell's ability to initiate DNA repair processes following ionizing irradiation or other exposures that cause breaks in DNA. A likely way in which ATF2 works is to halt the cell's cycle to allow repair of damaged DNA before such damage results in mutation."

Ronai and his colleagues are now determining how molecules like ATF2 can balance their dual roles. "High doses of radiation, as well as changes that take place in cancer and pathologic situations, can activate both functions of ATF2, which is expected to disturb the otherwise conserved balance between its role in gene regulation and the DNA damage response. We need to find out which of the two functions is more dominant under these circumstances in order to devise ways to regain the proper balance," he said.

The Ronai lab's work on ATF2 was started at Mount Sinai School of Medicine in New York City, from which Dr Ronai and his colleagues recently relocated to the Burnham Institute. This study was carried out in collaboration with Wolfgang Breitweiser and Nic Jones of the Paterson Institute for Cancer Research, Manchester, England, and Yosef Shiloh, of Tel Aviv University, Israel. The study was supported by a grant from the National Institutes of Health.

**ASBMB Member*

ASBMB Members Named

CAMBRIDGE, MA - At an induction ceremony here on Saturday, October 8, the American Academy of Arts and Sciences officially welcomed its 225th class of Fellows.

Among the new fellows are ASBMB members Jack D. Griffith, Kenan Distinguished Professor of Microbiology and Immunology at the University of North Carolina at Chapel Hill; and Rowena Green Matthews, Research Professor and G. Robert Greenberg Distinguished University Professor of Biological Chemistry at the University of Michigan Medical School and Life Sciences Institute; Norris Professor of Biochemistry and Biophysics at the University of Pennsylvania School of

'Dimmer Switch' For Genes

A protein that was thought to simply turn genes on and off now looks to be more like a cellular "dimmer switch," researchers from Huntsman Cancer Institute at the University of Utah, reported in the July 1, 2005, issue of the journal *Science*.

The scientists showed for the first time that when certain parts of a protein molecule?flexible, randomly structured regions believed to be only minor players in the protein world?are modified they become important in turning genes on and off.

Huntsman Cancer Institute scientists, led by Barbara Graves,* Professor and Chair of the Department of Oncological Sciences at the University of Utah School of Medicine, and doctoral student Miles Pufall, studied Ets-1, a protein known as a transcription factor that helps read genetic information. This factor serves as a cell's librarian, helping find the right genetic instructions.

How much information the librarian provides, and how accurate that information is, must be tightly controlled. Without the right information, cells can't behave properly, and may, as in the case of cancer, grow out of control. One way proteins are controlled occurs after a cell creates a protein. After the protein is made, it can acquire post-translational modifications, which are like decorations on a beaded necklace. These modifications give the protein different properties."

The "decorations" that were studied were phosphate molecules, which previously had been shown to build up on proteins until a certain number accumulated. The result, according to the study, has been described in the past as a sharp on-off switch of protein activity.

"What we found was that each time we added a phosphate to a particular unstructured region of Ets-1, there was an effect on the protein's ability to bind to a gene. Binding was weakened, but it was a gradual weakening. That isn't typical," Graves says. "Instead of acting like an on-off switch, it behaved the way a dimmer switch does to regulate lighting in a gradual manner."

In studying this fine-tuning, the team discovered that conventional wisdom failed to fully describe how proteins function. It was known that proteins have regions with parts that are fixed in space with a definite structure, and other parts that are randomly positioned. It was thought that the structured regions did most of the work, while the unstructured regions served only minor roles, such as tethering parts together.

"Scientists understand how a molecule works in part because we understand the shape or structure," Graves explains. "But what we discovered takes us beyond knowing the structure. Our data were about features that are not fixed in space, but that are flexible and changing."

The team used a nuclear magnetic resonance, NMR, to observe how the atoms of a molecule behave inside a magnetic field. They found that unstructured regions of the Ets-1 protein were affecting the structured regions in the work of controlling genes. "In fact," Graves reports, "the region's unstructured nature appears to be an essential requirement." NMR showed that phosphate addition to this unstructured region caused a gradual decline in DNA binding, gradually turning a gene off.

According to Pufall, "Ets-1 provides a remarkable illustration of how elegantly proteins are put together - forming a distinct shape, but with the versatility to respond to the changing needs of the cell, however subtle."

The findings have long-term implications for the study of all proteins, because, according to Graves, any protein has the potential to be organized this way, with structured and unstructured regions that work together ℵ.

** ASBMB member*

to American Academy's 225th Class of Scholars

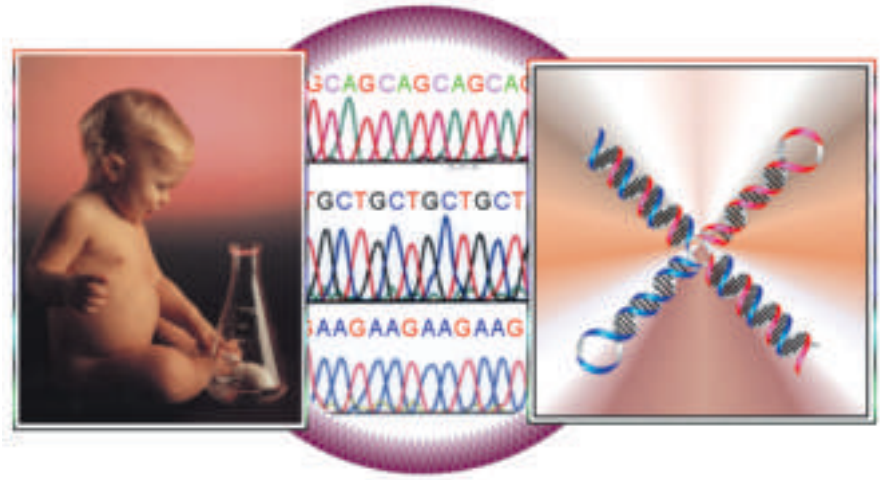
Medicine; Stephen C. Kowalczykowski, professor of microbiology and molecular and cell biology at the University of California, Davis; and Nancy Goldman Nossal, chief of the Laboratory of Molecular and Cellular Biology at the National Institutes of Health.

The 196 Fellows and 17 Foreign Honorary Members who make up the American Academy's 225th class are leaders in scholarship, business, the arts and public affairs. They come from 26 states and 10 countries and include Nobel and Pulitzer Prize laureates, MacArthur and Guggenheim fellows. A complete list of new members is available on the Academy's website at: www.amacad.org

Founded in 1780, the American Academy of Arts and Sciences is an independent research center that conducts multidisciplinary studies of complex and emerging problems. Current Academy research focuses on: science and global security; social policy; the humanities and culture; and education. With headquarters in Cambridge, Massachusetts, the Academy's work is advanced by its 4,600 elected members, who are leaders in the academic disciplines, the arts, business and public affairs from around the world. (www.amacad.org)

Experts on DNA Structure and Genomic Rearrangements to Meet in Houston

Approximately 125 to 150 researchers will gather at the Institute of Biosciences and Technology in Houston, Texas for a three-day symposium on DNA structure and how atypical DNA conformations result in human genetic disease. The symposium, titled "DNA Structure, Genomic Rearrangements, and Human Disease," runs from March 12 to 14, 2006.



In recent years, major advances have been made in our understanding of the types of conformations adopted by segments of DNA, their biological functions, and their medical consequences. These advances stem from the dramatic progress in the areas of human genomics, genetics as related to hereditary diseases, medicine, biochemistry, and DNA structural biology. As a result, it is now possible to identify a role for non-B DNA conformations in the etiology of at least 50 human genetic diseases including neurofibromatosis, chronic myeloid leukemia and Williams-Beuren syndrome. Furthermore, recent work has demonstrated that non-B DNA conformations demarcate the breakpoints involved in gross deletions in DNA and that these gross deletions are responsible for the above diseases.


Dr. Robert D. Wells

These discoveries are of extreme importance for at least two reasons. First, they provide unequivocal evidence for the biological roles of non-B DNA structures such as triplexes, cruciforms, tetraplexes, sticky DNA, bent DNA, slipped structures, and left-handed Z-DNA. Second, these discoveries herald a new era of potential therapeutics which modulate the conformation of DNA. Prior to these discoveries, this concept could not have even been considered.

Organized by James R. Lupski, Baylor College of Medicine, and Robert D. Wells, Institute of Biosciences and Technology, the meeting in March will cover genome structure and how it relates to susceptibility to DNA rearrangements causing genetic disorders and will discuss a variety of non-B DNA structures and how they are involved in human genetic disease. Dr. Evan Eichler of the University of Washington, Seattle, will present a keynote lecture on the interrelationships between human genetics, genomics, and non-B DNA structures in disease etiologies. In addition there will be talks by invited speakers as well as poster sessions featuring the work of most of the participants. The meeting will be held in the auditorium of the Institute of Biosciences and Technology, which is a part of the Texas A&M University System Health Science Center.


Dr. James B. Lupski

The symposium is sponsored by the American Society for Biochemistry and Molecular Biology (ASBMB), Baylor College of Medicine (Department of Molecular and Human Genetics), Texas A&M System Health Science Center, Institute of Biosciences and Technology, Houston (TAMUHSC), March of Dimes, New England BioLabs, Inc., Athena Diagnostics, Inc., and Center for Genome Research-Institute of Biosciences and Technology.

Registration forms and appropriate fees are available on-line and abstracts may be submitted for the poster sessions before Friday, January 13, 2006. More detailed information, including programs and registration materials, can be found at www.asbmb.org/meetings.

SACNAS Honors Phillip Ortiz

Phillip Ortiz, of the Center for Distance Learning at Empire State College, Saratoga Springs, New York was presented with the Distinguished Undergraduate Institution Mentor Award for 2005 at the recent annual convention of SACNAS, the Society for Advancement of Chicanos and Native Americans in Science.

This award recognizes those who have dedicated themselves to science, education and mentoring. Awardees are those who have reached the top of their field and continue to serve as role models for the next generation of minority scientists. All must have a demonstrated record of encouraging minority students to pursue advanced science degrees.

Dr. Phillip Ortiz

The majority of Dr. Ortiz's work has been related to the study of diabetes mellitus, applicable to insulin secretion and insulin responsiveness in adipose tissues. During his previous faculty appointment at Skidmore College from 1993 to 2001, Ortiz served as chairperson of Skidmore's Diversity and Affirmative Action Committee. As chair of the Minority Affairs Committee of ASBMB he participated in the setting of the society's agenda and sessions for its annual meetings, organized educational opportunities, and contributed to task forces organized by NIH.

In accepting the award, Ortiz said, "Words cannot express the great honor I feel in receiving this award. I have always regarded SACNAS as an organization that highly values strong mentoring, and I feel humbled to be included among those people who have been honored with this recognition."

Addressing the many students at the meeting, Ortiz noted that in the near future they will be invited to graduate and offered the following advice:

"In our lives we all face situations that frustrate us, but good may arise from them if we use these frustrations as motivators. In New York when students are graduating, the college president bestows their degrees and tells them that they are now allowed 'all the rights and privileges associated with their degrees.' From the very first time I heard this phrase at a college commencement, I felt it was incomplete. A diploma is not an entry ticket, but rather it is an empowerment and an obligation. Shouldn't we be telling the students that they now have 'all the rights, privileges, and responsibilities associated with their degrees.'"

ASBMB Welcomes New Ph.D.s

ASBMB extends its congratulations to these individuals who recently received their Ph.D. degrees. In recognition of their achievement, ASBMB is presenting them with a free one-year membership in the Society. The new Ph.D.s are listed below with the institution from which they received their degree.

Jennifer Aurandt
University of Michigan Medical Center

Eddy Brace
University of Michigan Medical Center

Barry G. Garchow
Michigan Technological University

Steven P. Wilkinson
University of California, San Diego

Xiaonan Zhu
University of North Carolina, Chapel HIll

* Candidates with an asterisk were previous Associate members who met the requirements for a free one-year membership.

New Technique Developed for Creating

Researchers have developed a new technique for creating human embryonic stem cells by fusing adult somatic cells with embryonic stem cells. The fusion causes the adult cells to undergo genetic reprogramming, which results in cells that have the developmental characteristics of human embryonic stem cells, and may permit scientists to derive new human embryonic stem cell lines without the need to use human embryos.

The researchers said that while the technique might one day be used along with SCNT, technical hurdles must be cleared before it sees widespread use. It is considered more likely that it technique will see immediate use in helping to accelerate understanding of how embryonic cells "reprogram" somatic cells to an embryonic state.

Senior author Kevin Eggan and Howard Hughes Medical Institute Investigator Douglas A. Melton,* both at Harvard University, led the research team. Their findings were published in the August 26 issue of the journal *Science*.

Eggan, Melton and their colleagues decided to pursue their alternative route after other researchers had shown that genetic reprogramming can occur when mouse somatic cells are fused to mouse embryonic stem cells. The scientists knew that if their studies were successful, it would provide the research community with a new option for producing reprogrammed cells using embryonic stem cells, which are more plentiful and easier to obtain than unfertilized human eggs.

In the studies, the researchers combined human fibroblast cells with human embryonic stem cells in the presence of a detergent-like substance that caused the two cell types to fuse. The researchers demonstrated that they had achieved fusion of the two cell types by searching the fused cells for two distinctive genetic markers present in the somatic fibroblast and stem cells. The researchers were also able to further confirmed that fusion occurred by studying the chromosomal makeup of the fused cells. Their analyses showed that the hybrid cells were "tetraploid" - meaning they contained the combined chromosomes of both the somatic cells and the embryonic stem cells.

One of their key findings was that fusion cells have the characteristics of human embryonic stem cells. "Our assays showed that the hybrid cells, unlike adult cells, showed the development potential of embryonic stem cells," said Eggan. "We found they could be induced to mature into nerve cells, hair follicles, muscle cells and gut endoderm cells. And, since these cell types are derived from three different parts of the embryo, this really demonstrated the ability of these cells to give rise to a variety of different cell types."

> ***"The long term goal for this experiment was to do cell fusion in a way that would allow the elimination of the embryonic stem cell nucleus to create an embryonic stem cell from the somatic cell."***
>
> **—Douglas A. Melton**

Furthermore, he noted that genetic analyses of the fused cells revealed that the somatic cell genes characteristic of adult cells had all been switched off,

Dr. Douglas A. Melton

while those characteristic of embryonic cells had been switched on. "With the exception of a few genes one way or the other — which is perhaps because these cells are now tetraploid — the hybrid cells are indistinguishable from human embryonic stem cells," he said.

"The long term goal for this experiment was to do cell fusion in a way that would allow the elimination of the embryonic stem cell nucleus to create an embryonic stem cell from the somatic cell," said Melton. "This paper reports only the first step toward that goal, because we end up with a tetraploid cell. So, while this does not obviate the need for human oocytes, it demonstrates that this general approach of cell fusion is an interesting one that should be further explored."

The researchers also performed fusion experiments using pelvic bone cells as the somatic cells and a different human embryonic cell line, to demonstrate that their technique was not restricted to one adult cell type or embryonic cell line.

In both cases, the researchers observed extensive reprogramming of the somatic cells. "We were surprised at how complete the repro-

Human Stem Cells

gramming was," said Eggan. "I think we were expecting that there would be more 'memory' of the adult state than the embryonic in the hybrid cells. It was quite clear, when we looked at these hybrid cells, that they had completely reverted to an embryonic state."

Melton said that the remaining technical hurdle is figuring out a way to eliminate the embryonic stem cell nucleus in the hybrid cell, causing it to have a normal number of chromosomes. One problem, said Melton, is that the nucleus in stem cells is large, occupying nearly the entire cell. Thus, it is not practical to physically extract the nucleus, as is currently done with oocytes, which have a relatively small nucleus. An alternative approach of destroying the embryonic stem cell nucleus with chemicals or radiation would induce apoptosis, he said.

Melton emphasized that "at this stage in our understanding, the hard fact is that the only way to create an embryonic stem cell from a somatic cell is by nuclear transfer into oocytes. Taking advantage of this current capability — such as colleagues in South Korea and other countries are doing — is critical if we are to maintain the progress necessary to realize the extraordinary clinical potential of this technology."

Eggan added that the most realistic current promise of the fusion technique is in studying the machinery of genetic reprogramming of somatic cells by embryonic cells. "It is extremely difficult to study the reprogramming process using eggs, because in the case of humans it is very difficult to obtain eggs in any quantity and difficult or impossible to genetically manipulate them," he said. "But embryonic stem cells can be grown in large quantities. We can isolate the components of the reprogramming machinery, and we can genetically manipulate the cells to analyze the reprogramming process."

ASBMB Journals Get RSS Feeds

In August, the *Journal of Biological Chemistry*, the *Journal of Lipid Research*, and *Molecular and Cellular Proteomics* all started offering RSS feeds. The feeds are a quick and easy way to get citation and abstract information for articles from all three journals in one place. This makes it easier for our journal readers to stay on top of the latest developments in scientific research.

RSS, which stands for "Rich Site Summary," "RDF Site Summary," or "Really Simple Syndication" is a way to keep track of news and other updates from several different websites. Instead of having to go to the website, the website sends the user a message every time there is something new. Messages from selected websites are gathered by a piece of downloadable software known as an RSS Reader which then displays feed from all of the websites in one place.

To learn more about RSS and how to subscribe to our journal feeds, go to the journal websites at www.jbc.org, www.jlr.org, and www.mcponline.org and click on the orange RSS link.

European Consortium to Focus on Tissue Research

A research consortium in Europe plans to make tissue engineering that uses stem cells both clinically and commercially viable in the next four years.

The $32 million project, funded by the European Union, gathers 23 of Europe's leading companies and research centers from 13 countries. It's a who's who of European biotech, with partners like the UK Centre for Tissue Engineering and the National Centre for Biomedical Engineering Science in Galway, Ireland.

The project hopes to give biomedical companies the jump start they need to turn a profit through tissue-engineering technologies— that is, producing skin, bone and cartilage for the treatment of diabetic wounds, shattered or diseased bones and many other conditions.

"Despite plenty of progress, tissue engineering has not achieved tremendous clinical success or commercial success," said Dr. David Williams, director of the UKCTE and scientific lead in the program, called Systems Approach to Tissue Engineering Products and Processes and thankfully nicknamed Steps.

"At the moment we can successfully produce a very small amount of tissue, but nothing good enough to replace large areas of skin or cartilage," he said. "We want scale up the process."

A lot of the science is there, he said, but gaps remain and some current methods are inefficient. For example, scientists can take stem cells from bone marrow or blood and get them to produce tissue, but it takes weeks or months. That makes it not only slow but expensive. "We want to produce tissue faster," Williams said.

The partners will work on a wide range of problems in parallel, tackling the logjams that face commercial tissue engineering. One partner, the National Center for Biomedical Engineering Science in Galway, Ireland, will look at the rapid manufacture of biocompatible scaffolds for large bones.

"Cells grow on the scaffold to produce a femur, or whatever," said Dr. Peter McHugh, research director for biomechanics at the NCBES. "We want to find the optimal scaffold and speed up the production process."

It's a good example of what the project involves. Researchers need to differentiate stem cells to grow bone, find the right growth factors, develop a 3-D scaffold and then grow the cells on it. Each step needs to advance to create a viable product. A lot of the work will tweak existing techniques to make them commercially viable. "They are major tweaks," Williams said.

The research draws on a wide range of expertise, from gene therapy and molecular biology to engineering like rapid prototyping and materials science, making it one of the largest projects in tissue engineering in the world, McHugh said.

While the effort is extremely ambitious, Williams believes they will be testing new treatments in the clinic in four years.

The researchers also want to understand how stems cells grow into other types of cells. No one is sure how it works, Williams said. "We have empirically worked out how to do it in many cases. But this project wants to turn that empirical knowledge into a model."

The EU research will primarily use adult stems cells for their work, which avoids ethical problems, and Williams believes they'll be more effective. Although embryonic stem-cell research is allowed in Europe, many European countries like Germany and Italy have a Catholic base. Embryonic stem-cell research requires destroying a very young embryo to obtain the cells, so the work is controversial to Catholics and other groups that believe life begins at conception.

Williams believes the United Kingdom is a leader in embryonic stem-cell research. One U.K. team recently developed populations of neural stem cells from a fetus. Meanwhile in the U.S., President Bush forbids federal funding for any research that destroys embryos.

So, is the United States falling behind the rest of the world? "No, I don't think so," said Williams, who believes states like California are very effective at funding this research.

"Actually it's quite interesting. I'd say that America is probably scientifically ahead, while we find that Singapore and Shanghai and Seoul are practically ahead, because they have far less constraints. I think Europe represents a very, very good, solid middle ground—following normal ethical paradigms but developing practical applications."

Dr. William Wagner, deputy director of the McGowan Institute for Regenerative Medicine at the University of Pittsburgh, partly agrees, at least when it comes to the uncontroversial adult stem-cell research.

"But in embryonic, I think there's some truth that we're falling behind because there's a lot that we can't do," Wagner said. "I think, particularly in Asia, you see a lot of advances that are not happening in the U.S. If you polled U.S. scientists, I think there would be a sense that the U.S. is falling behind."

Life Scientist Salaries Reported

The median annual income reported in a recent survey of the compensation of life scientists was $69,000, according to Dr. Steven Langer, President of Abbott, Langer & Associates, Inc., a Crete, Illinois-based management consultancy. The composite highest-income practitioner in this field (salary plus cash bonus and/or cash profit sharing), taking into account the size of the organization, is a college or university department head (11-12 month appointment—tenured) with a median income of $153,450. Far toward the other end of the income spectrum, laboratory technicians have a median annual income of $35,000.

E-mail invitations to participate in the survey were sent to subscribers of *The Scientist* magazine, to registrants on *The Scientist* web site who identified themselves as U.S.-based professional life scientists, and to members of the American Society for Microbiology and the American Society for Biochemistry & Molecular Biology. An invitation to participate was also printed in *The Scientist*. Usable responses were received from over 12,000 individuals. The results are contained in a 983-page survey report.

Income data are reported by region, state, and metropolitan area; type of employer; size of organization; level of education; length of experience; primary area of specialization; primary job activity; level of professional responsibility; industry or service of employer; gender; age; years since highest degree; level of supervisory/managerial responsibility; and numerous cross-tabs of the variables.

The highest median incomes (all between $101,325 and $94,500) are found in the Mobile, Alabama; Johnson City/Kingsport, Tennessee; Wilmington Delaware; New Jersey suburbs of Philadelphia; and Kalamazoo, Michigan areas. The lowest are found in the Tallahassee, Florida; Greenville/Spartanburg, and Columbia, South Carolina; and Tampa/St. Petersburg, Bradenton/Sarasota Florida areas (all between $50,000 and $52,000).

Compensation varies considerably from one type of employer to another. Median incomes are highest in law firms, health practitioners' offices, and pharmaceutical manufacturing firms ($175,000, $130,000, and $95,000 respectively); and lowest in primary schools ($48,600), secondary schools ($49,500), and state governments ($53,000).

Life scientists with under one year of professional experience have a median income of $35,000, as opposed to the 30-plus-year veteran with a median income of $106,764.

By primary area of specialization, the highest median incomes are found in nosocomial infections, pathology/ infectious diseases, and radiation (all between $135,000 and $98,375). The lowest are found in bacterial virology, mycology, and wildlife biology (all between $45,000 and $49,602).

Those life scientists with no supervisory responsibility have a median income of $52,000. For those supervising 10 or more professional & sub-professional employees, it is $126,000.

Compensation of Life Scientists in the United States of America – 2005 is available for $495 from Abbott, Langer & Associates, Inc., Dept. NR, 548 First Street, Crete, IL 60417 (www.abbott-langer.com). Also available is a Findpay Program, which permits the user to determine pay levels of each survey job on the basis of two or more variables simultaneously. The software alone may be purchased for $990; both the software and the printed report are available for $1,245.

The middle-50% median total cash compensation of some of the jobs included in the survey report are:

Research Vice Presidents/Directors	$108,300 - $203,950
"Distinguished" Researchers	$108,337 - $160,510
Professors (11-12 month appointment, tenured)	$103,000 - $155,260
Chief Operating Officers	$ 95,000 - $230,000
Research Section Heads	$ 90,000 - $146,750
Research Managers	$ 89,750 - $147,375
Presidents/Managing Directors	$ 80,000 - $185,000
Laboratory Directors	$ 75,000 - $130,000
Research Unit Supervisors	$ 71,000 - $111,984
Government Section Heads	$ 70,000 - $133,500
Professors (9-10 month appointment - tenured)	$ 68,237 - $105,000
Senior Consultants	$ 53,126 - $ 95,000
Laboratory Managers	$ 51,000 - $ 75,500
Assistant Professors (9-10 month appointment - on tenure track)	$ 48,000 - $ 64,640
Intermediate Researchers	$ 40,000 - $ 65,950
Secondary School Teachers	$ 40,000 - $ 60,000
Post-Doctoral Researchers in Academia (11-12 month appointment)	$ 35,000 - $ 43,500
Intermediate Research Technicians	$ 29,017 - $ 42,875

by John D. Thompson, Editor

Animal Rights Extremists Get Stock Exchange to Block Research Firm

In its September 26 issue, *The Scientist* reported that pressure from an animal rights group led the New York Stock Exchange to postpone the listing of Life Sciences Research.

According to the article by Stephen Pincock, "on the morning of September 7, Brian Cass, CEO of contract research firm Huntingdon Life Sciences, was standing in an anteroom of the New York Stock Exchange (NYSE) chatting to officials, waiting to go onto the floor of the exchange where Huntingdon's U.S. parent company, Life Sciences Research (LSR) was due to be listed … But minutes before the bell was rung to begin that morning's trading, a Huntingdon spokesman says that Cass was approached by Exchange President Catherine Kinney, who told him the listing was going to be postponed. She gave no explanation for the delay."

Huntingdon has been the target of animal activists for well over a decade and was delisted from the London Stock Exchange after a sustained campaign against its shareholders and brokers. The company then moved its headquarters to New Jersey and became the sole subsidiary of LSR, which is currently traded on NASDAQ's over-the-counter market.

James C. Greenwood, President and CEO of the Biotechnology Industry Organization, said in a statement that he was "dismayed that biomedical research has taken a backseat to the pressure tactics of animal rights extremists." Senator James Inhofe (R-Okla.), Chairman of the Environment and Public Works Committee, wrote in a letter to the exchange that "it seems to me unimaginable that this country's worldwide symbol of the integrity of the capital markets, the NYSE, would capitulate to threats, or even the mere threat of threats, from a single issue extremist group."

Animal rights groups, meanwhile, have trumpeted the delay as a victory. According to *The Scientist*, Camille Hankins, of Animal Liberation and Win Animal Rights (WAR), said "Brian Cass may be on Wall Street for the day, but WAR will be there every day after that."

Low Chinese Imports Hit India's Drug Makers

India's bulk drug manufacturers are facing shrinking volume in their trade with China, as imports of Chinese pharmaceuticals has shrunk drastically as that country has decided to give more priority to its own domestic industry.

As a result paracetamol prices in India, have shot up to 150 rupees per kg from Rs140 in just two months. Ciprofloxacin prices, too, have surged abruptly, up to Rs1,300 per kg as against the normal market range of Rs900-1,000 per kg. Also fueling the increase has been a rise in the price of crude oil and chemicals

"The whole industry depends on the supply from China. When prices go up there, it has a cascading affect on the Indian industry. With prices rising there, it hardly takes a day to see a similar rise in the Indian industry. But when prices go down there, it takes months for prices to see a fall in the domestic markets," explained Kiran Waghela, owner of Chamunda Pharma, a leading Mumbai-based broker, which has figured in numerous bulk drug and pharmaceutical trades and other related dealings between Indian and Chinese traders.

"Chinese traders are currently not interested in supplying to India, as they now want to supply to the country's domestic industry first. The government, too, has put emphasis on the domestic industry. Further, the traders there want to cash in on the emerging opportunity without any risks," Waghela added.

India's pharmaceutical industry usually faces a slack period in the winter season, from December to February, in which demand is generally less from the urban as well as the rural India. However, this year, the downturn is expected to worsen, as diarrhea and other diseases have spread in many regions due to massive floods, thus creating a huge demand for medicines.

NCI Selects InforSense Technology

Integrative analytics specialist InforSense recently announced the selection of its InforSense KDE platform by the National Cancer Institute (NCI) for use in high-throughput genetic data analysis. NCI researchers at the Gaithersburg, Maryland-based Core Genotyping Facility (CGF) will use KDE for rapid application development.

According to Dr. Meredith Yeager, CGF Scientific Director, the InforSense platform will provide the functionality, flexibility, and scalability the CGF needs to support its research and develop compatible applications for its Cancer Biomedical Informatics Grid (CABIG) initiative.

UBI to Market Real Biotech's HIT Competent Cells in Canada

United Bioinformatica Inc. (UBI) has reached an agreement with Real Biotech Corporation (RBC) to market their molecular biology kits in Canada. UBI's kits are priced 25% or more below competitors prices, reportedly due to its use of post graduates and post docs in Canadian academic labs to provide marketing and support to the labs that use its products.

Fionn Quinlan, International Sales Manager at RBC, explained, "A combination of proprietary technologies involved in HIT cells have been developed in our labs over the last two years. These cells save over two hours compared to traditional transformation methods, while exceeding efficiency claims of established competitors. It's truly a revolution in a basic molecular biology technique. The customer simply thaws the cells, adds DNA, mixes and plates immediately. The cells have proved so efficient, fast and economical many researchers don't bother with the tedious and low efficiency preparation and use of DIY competent cells anymore and can focus on more important details."

With RBC, UBI has a broad range of molecular biology kits available including competent cells, DNA and RNA extraction, plasmid isolation, nucleic acid cleanup, cloning systems, polymerases, ladders, and proteomics.

Established in 2001, UBI distributes Bioinformatic Software, Laboratory Information Management Systems (LIMS), Molecular Biology Kits, and Proteomics (products and services). Real Biotech Corporation is an international life science company with headquarters in Taipei, Taiwan and research partners located in Taiwan, Korea and Japan.

Novartis, Alnylam Alliance to Focus on RNAi Therapeutics

Novartis and Alnylam Pharmaceuticals, Inc. have announced a major multi-year alliance focused on the discovery of innovative therapeutics based on RNA interference (RNAi). The alliance will combine the research expertise and understanding of disease mechanism and pathway biology of Novartis with Alnylam's leading position in the field of RNAi.

"This collaboration underscores Novartis' commitment to forging strategic alliances with partners at the forefront of scientific discovery. RNAi holds great promise as a new therapeutic modality for treating many diseases. In particular, this exciting new area of biology has potential to target diseases that cannot be addressed by traditional approaches. This collaboration complements our robust small molecule and antibody-based research programs and will advance our efforts to develop innovative medicines for patients," said Mark Fishman, President of the Novartis Institutes for BioMedical Research.

Novartis and Alnylam will form a Scientific Strategy and Advisory Group to review the overall strategy for the relevant science and clinical applications of the collaboration. Chairing the group will be Dr. Fishman and Alnylam founder and director Phillip A. Sharp, Institute Professor of MIT and 1993 Nobel Laureate in Physiology or Medicine.

The agreement has an initial three-year term that may be extended for two additional one-year periods. If the collaboration is successful and multiple products are developed and commercialized, collective payments to Alnylam could exceed $700 million, not including royalties. Alnylam retains the rights to develop its own proprietary pipeline of RNAi therapeutics, including its respiratory syncytial virus (RSV) program and other unpartnered and partnered programs, while Novartis will have a right of first offer, subject to prior agreements, should Alnylam seek additional partnerships.

New Site Will Help GSK Boost Vaccine Production

GlaxoSmithKline says it will increase its ability to supply vaccine to the American market through its acquisition of new R&D and manufacturing operations in Marietta, Pennsylvania. Previously owned by Wyeth, the 90-acre site will be used to help develop next-generation seasonal and pandemic flu vaccines by focusing on novel tissue culture technologies. According to GSK CEO J. P. Garnier, the new technology will complement the company's current efforts in egg-based vaccine manufacture.

The move is the latest in the vaccine market for GSK, which doubled capacity at its Dresden, Germany, vaccine manufacturing facility in June and purchased vaccine-specialist Corixa in July. Terms of the Marietta acquisition were unavailable, but GSK employs 270 people at the site.

Calendar of Scientific Meetings

NOVEMBER 2005

International Workshop on Biosensors for Food Safety and Environmental Monitoring

November 10-12 • Agadir, Morocco
Contact: Université Hassan II-Mohammedia, Faculté des Sciences et Techniques, B.P. 146, Mohammedia, Morocco
Email a.amine@univh2m.ac.ma
Website: www.univh2m.ac.ma/biosensors

BioConferences International 6th European Biotechnology Symposium

November 13–15 • Radisson SAS Scandinavia Hotel, Copenhagen
Contacts: Aimee Burt; 800-524-6266; aburt@liebertpub.com
Nilda Rivera; 800-524-6266; nrivera@liebertpub.com
Website: www.bioconference.com/ebs/

Cambridge Healthtech Institute Second Annual Fluorescent Proteins in Drug Development

November 14–15 • Hyatt Regency La Jolla, California
Contact: Pete DeOlympio
Ph: 617-630-1359, Email: peterd@healthtech.com
Website: www.healthtech.com/2005/gfp/index.asp

Third Annual World Congress on the Insulin Resistance Syndrome Clinical manifestations of the Insulin Resistance Syndrome - Metabolic Syndrome X

November 17-19 • Palace Hotel, San Francisco
For information on registration, abstracts submission, accommodations and exhibits: Ph: 818-342-1889; Fax: 818-342-1538
Email: insulinresistance@pacbell.net
Website : www.insulinresistance.us

DECEMBER 2005

Xth PABMB Congress: Panamerican Association for Biochemistry and Molecular Biology

December 3-6 • Hotel del Bosque, Pinamar, Province of Buenos Aires, Argentina
For more information contact:
SAIB President. Ernesto Podestá: ernestopodesta@yahoo.com.ar
SAIB Secretary Carlos Argaraña: carga@dqb.fcq.unc.edu.ar, or
PABMB Chairman Juan José Cazzulo: jcazzulo@iib.unsam.edu.ar
website: http://www.saib.org.ar

2005 Congress Expanding Proteomics: New Directions in Biology, Chemistry, Pharmaceutical Sciences and Medicine

December 5-7 • Zurich, Switzerland
For information contact:
Email: sps.congress@nlight.ch; Ph: +41 21 802 1163
Website: http://sps05.swissproteomicsociety.org/qsPortal/Home.asp

Cambridge Healthtech Institute Sixth Annual Metabolic Profiling

December 7–8 • Wyndham Palace Resort and Spa
Contact: Pete DeOlympio
Ph: 617-630-1359, Email: peterd@healthtech.com
Website: www.healthtech.com/2005/gfp/index.asp

3rd Cachexia Conference

December 8-10 • Rome
For information contact:
Website: www.nataonline.com/LMS-Group/events/2/index.ph

American Society for Cell Biology Annual Meeting

December 12–14 • San Francisco
Contact: John Fleischman; Ph: 301-347-9300
Email: jfleischman@ascb.org; Website: www.ascb.org

Non-VesicularIntracellular Traffic

December 15-16 • Goodenough College, London, UK
Contact: Meetings Office, Biochemical Society, 3rd Floor, Eagle House, 16 Procter Street, London, WC1V 6NX
Email: meetings@biochemistry.org
Website:www.biochemistry.org/meetings/focused.htm

Pacifichem 2005

December 15-20 • Honolulu, HI
For information contact: Website:www.pacifichem.org/
Email: pacifichem2005@acs.org

JANUARY 2006

Pacific Symposium on Biocomputing

January 3-7 • Wailea, Maui
For information contact: http://psb.stanford.edu/
Email: psb@helix.stanford.edu; Phone: (650)725-0659

Building Bridges, Forging Bonds for 21st Century Organic Chemistry and Chemical Biology

January 7-9 • Pune, India
Tel.: 202-872-4523; Email: t_nameroff@acs.org
Website: http://www.ncl-india.org/occb2006/index.htm

Gordon Research Conference on Biology Of Aging

January 29 - February 3 • Ventura, CA
Chairs: Monica Driscoll, driscoll@mbcl.rutgers.edu
Roger J McCarter, rjm28@psu.edu
For more information: www.grc.uri.edu/06sched.htm

FEBRUARY 2006

The 11th Annual Proteomics Symposium

February 3-5 • Erskine on the Beach, Lorne, Australia
Email: mp@asnevents.net.au
www.australasianproteomics.org.au/lorne.htm

The 31st Lorne Conference on Protein Structure and Function

February 5-9 • Erskine on the Beach, Lorne, Australia
email: mp@asnevents.net.au; www.lorneproteins.org/

Third International Conference on Ubiquitin, Ubiquitin-like Proteins, and Cancer

February 9-11 • The University of Texas M. D. Anderson Cancer Center, Houston, Texas
This meeting will celebrate the Nobel Prize awarded to Avram Hershko, Aaron Ciechanover, and Irwin Rose for their discovery of the ubiquitin pathway and the 10th anniversary of the discovery of SUMO/Sentrin and NEDD8
Application and Abstract Submission Deadline: Friday, November 11, 2005; For information contact: Amy Heaton
Program Manager, Department Of Cardiology
University of Texas M. D. Anderson Cancer Center
Tel: 713-745-6826; Fax: 713-745-1942
Website: www.sentrin.org

ABRF 2006—Integrating Science, Tools and Technologies with Systems Biology

February 11-14 • Long Beach, California
For Information: www.faseb.org/meetings/abrf2006

G Protein- Coupled Receptors: Evolving Concepts and New Techniques

February 12-16 • Keystone, Colorado
For information contact:
Ph.: 800-253-0685 / 970-262-1230
Email: info@keystonesymposia.org
http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=807

MARCH 2006

Gordon Research Conference (GRC) on New Antibacterial Discovery & Development

March 5-10 • Ventura Beach Marriott, Ventura, California
For Information: Email:trevor.trust@astrazeneca.com
Website: www.grc.org/programs/2006/antibact.htm

RNAi2006: Advances in RNA Interference Research

March 22-23 • St. Anne's College, Oxford, UK
Conference Organizer: Muhammad Sohail
Biochemistry Department, University of Oxford
Tel: +44 1865 275225; Fax: +44 1865 275259
Email: muhammad.sohail@bioch.ox.ac.uk
Website: http://libpubmedia.co.uk/Conferences/RNAi2006HomeMay2005.htm

American Chemical Society 231st National Meeting

March 26 – 30 • Atlanta
Contact: Charmayne Marsh; Ph: 202-872-4445
Email: y_marsh@acs.org; Website: www.acs.org/meetings

Biochemical Society Annual Symposium The Cell Biology of Inositol Lipids and Phosphates

March 29-31 • University of Birmingham, UK
Organizer: Michael Wakelam, University of Birmingham
Early registration deadline: February 28, 2006
For more information: www.biochemistry.org/meetings

APRIL 2006

American Society for Biochemistry and Molecular Biology Centennial Meeting in Conjunction with Experimental Biology 2006

April 1–5 • San Francisco
For information contact: www.asbmb.org/meetings
Email: meetings@asbmb.org
Ph: 301-634-7145; Website: www.asbmb.org/meetings

RECOMB 2006 - The Tenth Annual International Conference on Research in Computational Molecular Biology

April 2-5 • Venice, Italy
For information contact:Email: info@veneziacongressi.com
Ph: +39 0415238995; Website: http://recomb06.dei.unipd.it/

47th ENC Experimental Nuclear Magnetic Resonance

April 23-28 • Asilomar Conference Ctr., Pacific Grove, CA
Contact: ENC, 2019 Galisteo Street, Building I-1
Santa Fe, New Mexico 87505; Ph: 505-89-4573
Fx: 505-989-1073; Email: enc@enc-conference.org
Web page: http://www.enc-conference.org

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Join us for the ASBMB/*JBC* Centennial Celebration to honor a century of achievements and contributions of The American Society for Biochemistry and Molecular Biology (ASBMB) and *The Journal of Biological Chemistry* (*JBC*). This grand event will be held next year at the ASBMB 2006 Annual Meeting (April 1-5, 2006, San Francisco, CA, in conjunction with Experimental Biology 2006).

- Special publications which tell the history of ASBMB and *The JBC*. A collection of Classics, Reflections, scientific landmarks, and the many contributions to science that have been made by ASBMB members.
- Lectures and commentary by scientific luminaries.
- Displays and demonstrations of both historic instruments and current state-of-the-art instrumentation.

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