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ASBMB Today

AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY

DECEMBER 2005,
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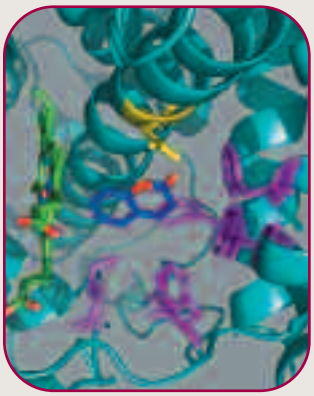

ON THE COVER:

12 Analysis of Coumarin 7-Hydroxylation Activity of Cytochrome P450 2A6 using Random Mutagenesis

Donghak Kim, Zhong-Liu Wu, and F. Peter Guengerich
J. Biol. Chem. 2005; 280 40319-40327

features

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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

Is there an Asian American Glass-ceiling?

Dear Editor,

In an October 28th news article published in *Science*, I was interviewed by a writer about the question of an "Asian American glass-ceiling?" in scientific career development. Because ASBMB was mentioned in the news article, not by me, but by another individual, I wish to write to express my view on this matter.

I have been an ASBMB member for over a decade. I am in my second term on the *JBC* editorial board; and those of you who were at the recent Board meeting in San Diego might have seen my name briefly flashed on the screen as one of the 25 most highly tasked board members at *JBC*. I have great respect for the leadership of our society and much admiration for what ASBMB means to American and international science. I do not for a moment think that ASBMB or NIH or American science as an institution is promoting "discrimination" against Asian Americans. For one to reach that conclusion, he/she would have to believe there are deliberate commissions of acts of exclusion against Asians in science. This, I do not believe.

I am, however, troubled that extant statistics can be viewed to suggest that there may have been unintended "omissions of inclusion" of Asians when certain categories of opportunities are considered. In light of ASBMB's leadership position in global science, a reasoned and civil discourse of what the statistics say and mean would appear to be a worthwhile and healthy endeavor for our society.

Going forward, the issue is not to query whether anyone did anything badly; rather, it is to ask whether we as a society should and can do better on this question. Diversity at all levels in a scientific society, and for that matter in society at large, is a plus. I applaud Dr. Judith Bond's commitment to explore and to address this issue.

Kuan-Teh Jeang
NIAID, NIH

Tell Us What You Think

We appreciate receiving letters that are suitable for publication regarding issues of importance or commenting on articles appearing in *ASBMB Today*. Letters should be sent to the editor, John Thompson, at the address found at left. 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

How Secure is the Scientific Record?

With the continuing trend of our scientific journals to publish online, and the decreasing reliance on 'paper journals,' a new set of questions and concerns has arisen about the preservation of the scientific record. Attention has been directed toward capturing the scientific record in searchable databases, and digitizing back-issues of print journals, but the challenge of revitalizing electronic archives as technology changes has not received enough attention—or at least solutions have not been discussed generally. We all know how difficult it is to access our own electronic files from five, no less ten years ago; how will we ensure the records are available and searchable for hundreds of years? These are technological problems that must and will be solved.

Recently, however, we have encountered a new threat to the stability of the scientific record – purging the record of 'falsified data,' 'irreproducible studies' or 'errors.' It began, with good intentions, in discussions about purging the electronic repository of publications retracted because of scientific misconduct. It was argued that retracted publications continued to be cited because new authors were unaware of the acknowledged defects in the reports. The counter argument is that some publications are withdrawn because of defects in only one segment of the report, and that the remaining segments constitute a valuable contribution to the literature. It is argued that scientific understanding is refined and synthesized by pre- and post-review of the reports. Moreover, the electronic format has the potential to annotate files to advise that a publication has been called into question.

But dangers loom in 'purging the record.' Who should make these decisions? Will this be a benefit or detriment to documentation of scientific progress? A specific example emerged recently. Emilie Marcus, editor of *Cell*, published a one-paragraph retraction of an article released in July 2004 by a research team at the University of Brasilia claiming that *Trypanosoma cruzi* DNA can be integrated into the genomes of chickens and rabbits (Nitz N et al. (2004) *Cell* 118:175-186). The September 23, 2005 Retraction in Cell states:

"It has been brought to our attention that there are concerns with the integration site sequence analyses provided in support of integration of T. cruzi kDNA into the host genome in the above paper. Following careful and extensive review of the data by independent experts in the field, we are forced to conclude that the sequence analysis associated with publication do not provide strong evidence for the central hypothesis and are open to alternative interpretations. The Southern blot analyses while consistent with integration do not in and of themselves provide sufficiently strong support for the main conclusion. We are therefore retracting the paper.

The authors of the paper stand by the original data and do not endorse the Retraction."

Editor Emilie Marcus advised the authors that "subsequent re-analyses do not support the claim" of DNA integration. The Brazilian research team submitted supporting arguments defending their data and the interpretation, but this did not satisfy Editor Marcus, who asserted "Editor-instigated retractions occur when the Editor receives correspondence from a third party who cannot reproduce the original data." Team leader Antonio Teixeira retorted that he has not been provided with any experimental data contradicting the July 2004 paper. This retraction sets a dangerous precedent, and seems to undermine the scientific peer-review process inappropriately.

The scientific community accepts that honest errors will occur in the self-correcting process of research, and acknowledges that interpretations of data will change as a result of re-analysis, and in light of additional information. How then, in the electronic era, shall the completeness, integrity, and usefulness of the world literature be maintained? Should publications felt to be inaccurate or inappropriate be purged from the archives, the 21st century implementation of 'book burning'? If outdated interpretations and data generated by outdated methodology are purged, how can the historic, social and cultural dimensions of scientific progress, and the impact of science on society be evaluated and understood? Rather than purging the archives, it is better to evaluate critically all of the relevant literature, and to challenge scientists to conduct research that will refine interpretations, applications and understanding. The scientific community is appropriately wary of those who would deny permanently access to the already published literature.

Judith Bond
ASBMB President

Photo by Gene Dailey, American Red Cross

ASBMB Donates Nearly $250,000 To Help Katrina's Victims

ASBMB has donated approximately a quarter of a million dollars to research laboratories and individuals which were dealt a blow by Hurricane Katrina as it tore through Louisiana and Mississippi, leaving in its wake shattered buildings, broken levees, and widespread flooded areas. Tulane University and the Louisiana State University Health Sciences Center, both of which sustained substantial damage to lab equipment and the loss of perishable reagents, antibodies, and lab specimens. Each received $25,000 to assist in the replacement of necessary supplies, while 88 individuals—students, postdocs, and faculty—received up to $2,000 each to assist in the cost of relocation and the replacement of clothing and other items damaged or lost in the flooding that persisted for weeks in parts of the New Orleans region. Following are excerpts from some of the pleas for help received by ASBMB.

I am a tenure-track assistant professor in the Department of Cell Biology and Anatomy at the LSU Health Sciences Center in New Orleans. My research focuses on the role of endogenous electrical activity, especially NMDA receptor function, in regulating neuronal survival and neural circuit formation in the intact brain. Due to the power outages following Hurricane Katrina we lost all perishable reagents and most of my mouse colony. All members of my laboratory are still displaced as of October 11 (one technician and three Ph.D. students). Dr. Tony Pham is hosting my lab at the Baylor College of Medicine. It would be very helpful to have $2,000 to purchase a few supplies (antibodies to active caspase-3, antibodies to neuron-specific Hu, DAPI, restriction enzymes, etc.) that would allow us to continue our work without becoming too much of a burden to Dr. Pham. We will bring these back to New Orleans with us when we return. The LSU Medical school is planning on being able to re-open my building (the Medical Education Building) in January.

My laboratory is housed at the Dental School campus, which remains without power. I was able to gain access and retrieved some antisera and affinity columns. I have established Visiting Professor status in the Department of Pharmacology, University of Colorado HSC here in Denver/Aurora, and a colleague (Professor Michael D. Browning) has provided space for me to work in his laboratory. The first step in re-establishing my research is to re-establish the reagents. In this case, I will need supply money to affinity-purify the antisera..

My New Orleans home is uninhabitable, sustaining damage due to 5 feet of flood water. Basic services such as electricity will not be restored until wiring and the main fuse box (submerged) is replaced and inspected. This could take many months.

We temporarily relocated to Atlanta. My husband who is a tenured Chemistry faculty member at the University of New Orleans set up base at Georgia Tech University and is teaching an online UNO graduate course. I have set up base in the Department of Microbiology & Immunology, School of Medicine, Emory University, where I continue my HTLV-I research, mostly writing my research papers and some grants. I have experiments ongoing with NIH and University of Manchester (England) collaborators on a MAP kinase project. I will be traveling to NIH to give a seminar sometime this semester and stopping by NCI-Frederick to do some lab work with my ex-post-doc advisor. So, we are staying research and work busy and trying to commute between New Orleans and Atlanta to deal with home and work issues. We have many bills since we left New Orleans with only 3 days of clothes. But we are lucky that we have such great support in Atlanta, including schools for our children and a place to stay. Any aid for which we can apply to off-set our living expenses (food, gas, etc.) in the Atlanta area and to save as much money for our home repairs in New Orleans. I will also use some ASBMB funds to pay for work expenses—supplies for some experiments being done by collaborators.

For the lab, I have lost everything in freezers and refrigerators because of the lack of power for several weeks. We were unable to perform experi-

ASBMB President Judith Bond: "Our members and the Society responded quickly and generously to the needs of our colleagues and their trainees along the Gulf coast. It was most gratifying to witness and take part in the response. The devastation will require long-term strategies, and the Society will work with our members to face the challenges."

ments for several weeks. However, we have been utilizing this period of time to write manuscripts, analyze data obtained before, and discuss future experimental plans. Therefore, the impact of Hurricane Katrina on my research projects has been minimized. Currently I have set up a lab in the Pennington Biomedical Medical Center at Baton Rouge. I, as well as my six lab members, have to drive there almost every day about 140 miles for 3 hours. Personally, I have lost almost everything in the first floor in my house due to flooding. Also, my house has a lot of damage in the second floor by roof leaking. After several weeks in Houston in a rental apartment, my family has just moved back to Metairie to repair our house. The ASBMB grant will be mainly used to cover the cost for transportation and lab relocation.

Our facilities had some flooding on the lowest floors. The electricity is still out because of electrical damage to these lower floors. The facilities of my mentor and myself were not flooded. Our main problem is the lack of electricity for refrigeration. Most of our proteins and many substrates along with assay reagents and other compounds will have denatured/decomposed in the heat. We face a large financial burden to replace all of these materials. Any assistance in replacing these materials will be greatly appreciated.

I have been displaced from my labs in the downtown area of New Orleans due to flooding from Hurricane Katrina. Our administration is displaced as well and is minimally functional at this time. Funding from ASBMB will enable me to continue my work on characterizing a new transgenic mouse that I have developed. It will also help me recover and validate plasmids and cells that may have been damaged due to thawing of freezers when the school lost power. Dr. Ken Marion, chair of the Biology department at UAB, is my host for the next 3 months. I anticipate returning to Tulane University in New Orleans after the new year to resume my teaching and research next semester.

Photo courtesy of the National Oceanic and Atmospheric Administration

Hurricane winds drove a 10-foot 2X4 through this palm tree.

I have recently been displaced from Tulane University School of Medicine to Baylor College of Medicine due to the aftermath of Hurricane Katrina. I am setting up my temporary research laboratory at Baylor College of Medicine in the Department of Molecular Physiology and Biophysics to rescue and save very critical and valuable research materials, including cDNA genomic clones, constructs, a number of our antibodies, and gene-targeted mice colonies which have been built over a number of years. Some of these materials and animals may be lost completely. The grant from ASBMB will be extremely helpful and supportive in our continuing efforts to recover from this disaster. Thank you very much for your kind consideration.

I am currently a graduate student in the laboratory of Arthur J. Lustig at Tulane University Medical School Department of Biochemistry. I am supported by the standard graduate student stipend of $21,000 per year. I am currently at Northwestern University where my PI has temporarily moved after Katrina with the aim of facilitating my research. My apartment in New Orleans is in the heart of the city and so we are currently unable

to return, especially with a three-week old baby. I will return to New Orleans in January, but this situation results in a payment of double rent for this period of time in order to keep the apartment (they are rather scarce). Due to the increased financial burden, I am requesting compensation for 3.5 months of the expected difference in housing costs. Biweekly pay: $809; Approximately $1620 per month Monthly rent in New Orleans: $475 Monthly rent in Evanston: $1075 Total Housing cost loss: $2,000 This has been a financially and otherwise stressful time for us. The ASBMB support will be very helpful in offsetting the housing costs here at Evanston.

Hurricane Katrina destroyed all of our current research projects due to the loss of power we experienced. The University was out of power for four days

A Report from LSUHSC

In late November, Arthur L. Haas, Professor and Head of Biochemistry and Molecular Biology, at the Louisiana State University Health Sciences Center, submitted this report on conditions in New Orleans.

Here at the LSU Health Sciences Center we are still dealing with returning to our buildings. The floods destroyed all utilities and power to our buildings and contractors are continuing repair work that will allow us to reoccupy our labs. The current target date is 1 January. A big milestone was getting approval to occupy the upper floors of our buildings while repair work continues on the lower two floors. At present our buildings have limited power and some have air conditioning, which is allowing the atmosphere to be stabilized. In the interim, many of my faculty and their personnel continue to work in labs at other institutions across the country. We are running a virtual department in which we communicate by email and phone. My department business managers work out of their homes and meet several times a week to coordinate their efforts. This has all proven to be a workable but laborious solution to not having a physical location to call your department. Of course, some of our faculty are dividing their time between maintaining their labs and research momentum while also having to deal with their flooded homes. A major concern at present is how to move families back with limited housing and limited schools and daycare.

What people elsewhere in the country cannot really understand, because it is so far from one's normal experience, is the scope of the devastation here in New Orleans. Imagine that 60% of the residential area in your city—homes, businesses, shops—across all economic layers (since we have a very homogeneous city in which there is little economic stratification) is completely wiped away in one day and replaced with a gray film and greasy flood line. That is what has happened here; over half of the city cannot be inhabited without substantial renovation or rebuilding.

Now consider the secondary effects: where are people to live who want to come back; where will the people live who you need back to provide essential services like opening grocery stores, manning police and fire forces, etc.; what is the municipal and state budget to do with a 60% loss of tax base? This is what we are faced with here. Our cities, our businesses, and our universities are literally bankrupt. Xavier, one of two major predominantly African American universities in the country, has announced that it is closing for good, and with little prospect for help from the government, we expect others in the city to follow suit soon.)and.

In front on TV cameras we have been promised to put everything back better than before. Once the cameras are off there has been a much different reality in which help is slow to arrive and Congress balks at the cost. This cuts across the entire Gulf Coast, not just New Orleans. It should worry the rest of the country.

How much better will California fare after a major earthquake, from the domestic violence immediately afterward to the lack of Federal help? How will any other city fare after other natural or man-made disasters?

Finally, keep in mind that this is not a natural disaster in New Orleans but a man-made one, in which it is now being shown by NSF engineering studies that the Corp of Engineers incorrectly designed the levee and pump system so that they would not even meet the Cat 3 standard mandated by Congress, then oversaw shortcuts in construction that even further eroded the safety margin. All the while Congress was continuing to further cut budgets to prevent repair and upgrade work to the levee system in order to fund pork barrel projects.

More than a few lines and not the upbeat "helping Katrina victims" sound bites you see on television, but a reasonable summary of life here at present from someone who stayed through the storm and afterwards and has been here through most of the recovery to date. These comments obviously are my own and do not reflect the policies or views of LSU.

ASBMB Treasurer Kenneth Neet: "What else is a professional society good for if it doesn't come to the aid of its members in the wake of a natural disaster like Katrina? I'm proud of the way the ASBMB stepped up to offer help to affected society members. I'm glad we had the resources to do something for them."

without any available generator backup. My project revolves around *Drosophila* S2 cell work. During the power outage, cell lines that were growing, as well as frozen stocks, were destroyed. All bacterial cultures containing vectors were also lost. Therefore, cell lines must be reestablished as well as all protein expression. We will be required to replenish all cell culture materials, including cells, media and media supplements, transfection supplies, and supplies for protein analysis. An inventory of all lost items totaled over $30,000. A grant would be a great help in reestablishing this doctoral research project.

The USDA-ARS facility in New Orleans was flooded with approximately six feet of water due to Hurricane Katrina. The access to the building has been cut off with the exception of a few individuals that are bringing out our computers and very limited small items. All large equipment is being left since there is no electric and heavy equipment cannot be carried down the stairs. The building is also contaminated with mold and the conditions are hazardous to humans. The employees of the center are spread around the country at 16 different locations and we are told that it will six months to a year before we can return. I am currently working out of the Food Science Building on the LSU campus in Baton Rouge. We are basically having to start over from lab coats and gloves to chemicals and equipment. Any help that you can provide will be greatly appreciated.

The facilities of LSUHSC in New Orleans were badly damaged by Hurricane Katrina, and my lab and office there have been closed—along with everyone else's. My home was also flooded and wind damaged and is not livable. I was associated with the School of Biological Sciences at the University of Missouri here in Kansas City for a long time before moving to New Orleans just this past August. SBS and UMKC have kindly let me use lab and other facilities (like the library and shared instrumentation) to try to accomplish something while LSUHSC and my home are being repaired. This is likely to take until sometime in the Spring. At this time, I do not have any research funds that can be transferred to support my research here. A grant from the ASBMB would enable me to purchase supplies and hire a part time student assistant to continue some experiments I was involved in. I look on this stay at UMKC as a forced mini-sabbatical, and I would like to make some research progress even under tough conditions. This grant would go a long way toward allowing this to happen.

A Report from Jim Karam, Chair of Biochemistry at Tulane University

My wife and I were topping off the summer with a visit to our daughter in Portland, Oregon before Katrina became a threat to New Orleans. We ended up watching the hurricane hit our hometown and the ensuing events on CNN from 2,000 miles away. The buildings at the downtown location of Tulane's Medical School fared well against the storm, but the floods that followed caused devastating damage to electrical equipment and emergency generators, ultimately leading to major losses in perishable research materials. Some of these buildings remain closed and unsafe to enter 2.5 months later and others are just beginning to repopulate with the scientists who once occupied them and refugee colleagues who await the reopening of their labs. Many have lost their homes and all that was in them.

Throughout this ordeal, the ASBMB and individual members of the Society have been extremely generous and compassionate in their moral support and help to relocate our faculty and graduate students to temporary academic homes all over the U.S. We received many more offers of help than the logistics of our situation could allow us to accept. The Society offered travel awards to society members in the department and their coworkers, and made a generous award to the Department of Biochemistry to help with recovery efforts. Some of Tulane Biochemistry's graduate students have been enrolled, with tuition waivers, at the University of Michigan-Ann Arbor, University of Texas-Houston, Northwestern University-Evanston and University of Oregon-Eugene. Faculty members have been given lab space at Louisiana State University-Baton Rouge, Northwestern University, The Fred Hutchinson Cancer Center (Seattle) and University of Rochester.

Former ASBMB President Bettie Sue Masters Recalls the Atlantic City Meetings

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 another contribution. 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.

I don't know the exact year when this picture was taken, but it was probably 1962 or 1963. I believe all of the Federation meetings were held in Atlantic City at that time. They were always, as now, in the month of April, so it was still cool in New Jersey. I was Henry Kamin's graduate student until June 1963, at which time I received my Ph.D. and began an American Cancer Society postdoctoral fellowship in his laboratory that summer. The Atlantic City meetings were well-attended each year (20-30,000 scientists) and featured ALL of the most significant biomedical scientists.

There were shouting matches among the most high-profile scientists in a particular field. Since I was in the electron transport field, I recall the warring factions in the field of mitochondrial oxidative phosphorylation disagreeing about the biochemical basis of the formation of ATP and each claiming to have found the "Holy Grail." In truth, none of these factions was to be credited with the ultimate mechanism but, instead, an English gentleman, Peter Mitchell, who built his own modest, private institute and who performed research as a sort of hobby, was to receive the Nobel Prize in Chemistry in 1978 for his theory of a proton-motive force mechanism for the production of a high-energy compounds.

Henry Kamin was the first student of Dr. Philip Handler, Professor and Chairman of the Department of Biochemistry at Duke University during my graduate student and postdoctoral fellowship training, and spent his entire academic life as Professor of Biochemistry at Duke. Dr. Handler later became the President of the National Academy of Sciences.

Dr. Kamin was well-known for his research on flavoprotein mechanisms and electron transport in the endoplasmic reticulum of mammalian cells. He contributed to our knowledge of steroid-metabolizing systems in steroidogenic organs and to the mechanisms of xenobiotic metabolism in liver. He was a consummate teacher and a student of history, art, music and literature, as well as science. At a time when election to the American Society of Biological Chemists was honorific, was reviewed by a Membership Committee, and was based on original and independent contributions to the biochemical literature, he served as Chair of this committee. I don't recall if he ever ran for office in the ASBC/ASBMB. He was known as a man of high principle and defended academic freedom with great energy.

The photo was made on the beach in Atlantic City on a windy, cool day in April. More often than not, it rained there during the meetings. With the boardwalk running the length of the hotel strip, it was ideal for a meeting of this type. You ran into everyone you knew on the Atlantic City boardwalk. There were jitneys (small buses) that transported you on the city streets and the hotels were vintage early 20th century; many were elegant in their heyday, which had long passed.

Bettie Sue Masters and Henry Kamin in Atlantic City for an ASBMB Annual Meeting in the 1960s.

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Glycobiology and Extracellular Matrix
Carlos B. Hirschberg, Boston University Goldman School of Dental Medicine

Genome Dynamics

Genome Dynamics: Replication, Repair, and Recombination
Laurie S. Kaguni, Michigan State Univ.

Chromatin: Structure, Expression, and Regulation
Sharon R. Dent, University of Texas M. D. Anderson Cancer Center

RNA: Structure, Metabolism, and Regulation
Alan D. Frankel, UCSF

Protein Synthesis, Folding and Turnover
William Merrick,
Case Western Reserve University

Cell Signaling

Metabolic Regulation
Richard W. Hanson,
Case Western Reserve University
Daryl K. Granner, Vanderbilt Univ.

Signaling in Growth and Development
Michael B. Yaffe, MIT

Signaling in Aging and Disease
Natalie G. Ahn,
University of Colorado at Boulder

Membrane Biogenesis

Biochemistry and Molecular Biology of Lipids
George M. Carman, Rutgers University
Christian R.H. Raetz, Duke University

Structure, Function, and Biogenesis of Cell Membranes
William Dowhan, University of Texas-Houston Medical School

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Juliette Bell, Fayetteville State Univ.

Issues in Breast Cancer Among Minority Populations
K.V. Venkatachalam,
Nova Southeastern University

Minorities and the HIV/AIDS Epidemic
Juliette Bell,
Fayetteville State University

EPD/MAC Symposium – Undergraduate Student/Faculty Science
Joseph Provost,
Minnesota State University-Moorhead,
Mark A. Wallert,
Minnesota State University-Moorhead
and Phillip A. Ortiz,
Empire State College

EPD/MAC Symposium – Outreach and Public Education
Neena Grover, Colorado College

Public Affairs Advisory Committee Symposia

William R. Brinkley,
Baylor College of Medicine

Teaching the Science of Evolution Under the Threat of Alternative Views
William R. Brinkley, Ken Miller,
Don Johanson, Eugenie Scott, Ted Peters

Education and Professional Development:

Focus on the Future, Shape the Debate
J. Ellis Bell, Univ. of Richmond

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Edmond H. Fischer, University of Washington School of Medicine and
Edwin G. Krebs, University of Washington School of Medicine

Current Themes in Molecular Evolution
Michael M. Cox,
University of Wisconsin – Madison

Plenary Lecture: Integrity and Independence of Scientific Thought
Elizabeth Blackburn, UCSF

Matching Expectations: Employers and Education in the Molecular Life Sciences
Joy A. McMillan,
Madison Area Technical College

The Classroom of the Future
J. Ellis Bell, Univ. of Richmond

Workshops

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Al Burlingame, UCSF and
Sue Weintraub, UTHSC, San Antonio

Surface Plasmon Resonance and Proteomics
Eileen Lafer, UTHSC, San Antonio

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- **ASBMB Award for Exemplary Contributions to Education**
- **ASBMB-Merck Award**
- **Avanti Award in Lipids**
- **FASEB Excellence in Science Award**
- **Herbert A. Sober Lectureship**
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- **Opening Centennial Celebration Reception**
- **ASBMB/JBC Birthday Bash, A Taste of San Francisco**
- **ASBMB 5k Fun Run**
- **An Evening with the San Francisco Symphony**

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Graduate or Postdoctoral Travel Award

Undergraduate Student Travel Award

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Special Events

10th Annual Undergraduate Student Research Achievement Award Poster Competition, Saturday, April 1, 2006

ASBMB Graduate Student and Postdoctoral Travel Award Symposium, Saturday, April 1, 2006

ABRF/ASBMB Symposium

Minority Scientists Mixer

Women Scientists' Mentoring/Networking Session and Reception

Graduate Student and Postdoctoral Mentoring/Networking Session and Reception

ASBMB Business Meeting

Abstract Deadline: November 2, 2005

www.asbmb.org/meetings

by Peter Farnham, CAE, ASBMB Public Affairs Officer

NIH, NSF Funding Bills Begin to Move

Almost a month after the start of the 2006 fiscal year, the two major funding bills for biomedical science began to make progress towards the President's desk and his eventual signature.

A tough conference is likely regarding the Labor/HHS appropriations bill, which funds the National Institutes of Health. On October 27, the Senate passed its version of the bill, providing the agency with $29.4 billion for FY2006, a $1 billion increase over the FY2005 NIH appropriation and $908 million more than the House proposed (the House bill, passed last summer, funds NIH at $28.5 billion).

The bill cleared the Senate 94-3, and will have to be reconciled in conference with the House bill. Senate appropriators used a fair amount of budgetary sleight of hand to provide funding for several programs, including NIH. These tricks include such maneuvers as moving the pay date on certain programs into FY2007 so these funds will count against next year's appropriations bill. House leaders are adamantly opposed to such tricks and have called the practice a "nonstarter." They emphasized this a few days after the Senate passed its bill by voting not to add any additional money to the L/HHS bill (which would be needed to meet the Senate numbers).

As you may know, ASBMB is supporting the Senate figure for NIH. As of this writing, House and Senate appropriators hoped to finish their work by Thanksgiving, although they may be done even earlier, as the government is currently operating with funding provided by a continuing resolution that expires on November 18. The congressional leadership is trying to complete work on the L/HHS conference report by November 17.

Complicating the funding situation is the newly-found fiscal conservatism of the Republican controlled Congress in the wake of Hurricanes Katrina and Rita. The rank and file membership, particularly in the House, began to agitate for spending cuts to offset at least some of the money appropriated to support hurricane relief, and the leadership changed its tune dramatically in October. Thus, a reconciliation bill is now working its way through Congress that would cut billions of dollars out of already passed spending bills. The House is looking at as much as $50 billion in cuts, and the Senate bill cuts spending by almost $40 billion. It is thus very likely that most spending programs will suffer at least some trimming before the bills become law.

Amendments

The Senate added $8 billion to the overall bill to prepare for and fight a possible bird flu pandemic; the House bill does not include this money, but the President announced a bird flu emergency action plan in early November, so the House will likely find the necessary funds.

The Senate bill also includes an amendment calling for more a more streamlined process to facilitate foreign student access to American academic institutions. The text came from a bill ASBMB supported last April addressing the issue of foreign students.

Regarding stem cells, Senate L/HHS Appropriations Subcommittee Chairman Arlen Specter (R-PA) agreed to defer offering his stem cell research bill (which ASBMB supports) as an amendment to the appropriations bill. Majority Leader Bill Frist (R-TN) pledged to bring the issue up early next year; so the long-expected vote on this contentious issue may finally occur as early as February.

NSF Funding Up Modestly

House and Senate conferees treated NSF "very well," according to NSF staff, who noted that the final number for the agency was $5.65 billion, 3.3% above funding for Fiscal 2005 and a percentage point about the President's request. Research funding at NSF is up 4% to almost $4.4 billion, and funding for science education programs is up almost 10%.

However, NSF staff points out a caveat to these relatively good numbers. An across-the-board cut is likely because the conferees ran out of money to fund all the programs in the bill. So far, the number being talked about is a 0.3% cut in all programs, which would reduce NSF's bottom line by $17 million.

Thus, biomedical research funding is still doing relatively well despite a very tough fiscal environment. This indicates continued congressional support for science funding, even though there are huge competing demands for federal dollars. Unfortunately, the fundamental picture—not enough money to fund all worthy programs—is unlikely to change much in the next few years.

Broad Federal Effort Urgently Needed to Create New, High-Quality Jobs in the 21st Century

The vitality of the United States' science and technology enterprise has made this country a world leader for decades, allowing Americans to benefit from a high standard of living and national security. But in a new world where advanced knowledge is widespread and low-cost labor readily available, U.S. advantages in the marketplace and in science and technology have begun to erode. A new report from the National Academies, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future,* recommends a comprehensive and coordinated federal effort to bolster U.S. competitiveness in these areas so that the nation will consistently gain from the opportunities offered by rapid globalization.

Given the United States' history of economic and scientific pre-eminence, it is easy to be complacent about these complex issues, the report says. Following are some indicators that illustrate why decisive action is needed now:

- For the cost of one chemist or one engineer in the United States, a company can hire about five chemists in China or 11 engineers in India.
- Last year chemical companies shuttered 70 facilities in the United States and have tagged 40 more for closure. Of 120 chemical plants being built around the world with price tags of $1 billion or more, one is in the United States and 50 are in China.
- U.S. 12th-graders recently performed below the international average for 21 countries on a test of general knowledge in mathematics and science. In addition, an advanced mathematics assessment was administered to students in 15 other countries who were taking or had taken advanced math courses, and to U.S. students who were taking or had taken pre-calculus, calculus, or Advanced Placement calculus. Eleven countries outperformed the United States, and four scored similarly. None scored significantly below the United States.
- In 1999 only 41% of U.S. eighth-graders had a math teacher who had majored in mathematics at the undergraduate or graduate level or studied the subject for teacher certification, a figure that was considerably lower than the international average of 71%.

Last year more than 600,000 engineers graduated from institutions of higher education in China. In India, the figure was 350,000. In America, it was about 70,000. In 2001 U.S. industry spent more on tort litigation than on research and development.

To address these worrisome trends, the congressionally requested report makes four recommendations along with 20 implementation actions that federal policymakers should take.

"America must act now to preserve its strategic and economic security by capitalizing on its knowledge-based resources, particularly in S&T, and maintaining the most fertile environment for new and revitalized industries that create well-paying jobs," said committee chair Norman R. Augustine, retired chairman and CEO of Lockheed Martin Corp. "The building blocks of our economic leadership are wearing away. The challenges that America faces are immense."

Among the recommendations:

Vastly improve K-12 mathematics and science education. The report recommends creating a merit-based scholarship program to attract 10,000 exceptional students to math and science teaching careers each year. Four-year scholarships, worth up to $20,000 annually, should be designed to help some of the nation's top students obtain bachelor's degrees in physical or life sciences, engineering, or mathematics, with concurrent certification as K-12 math and science teachers. After graduation, they would be required to work for at least five years in public schools.

Sustain and strengthen the nation's commitment to long-term basic research. Policymakers should increase the national investment in basic research by 10% each year over the next seven years. Special attention should be paid to the physical sciences, engineering, mathematics, and information sciences, and to basic research funding for the U.S. Department of Defense, the report says.

Authorities should make 200 new research grants annually?worth $500,000 each, payable over five years?to the nation's most outstanding early-career researchers.

Develop, recruit, and retain top students, scientists, and engineers from both the United States and abroad. The U.S should be considered

Continued on page 20

Bridging the Sciences: Where Are We Now?

By Peter Farnham, CAE, ASBMB Public Affairs Officer

For the past three years, ASBMB has been participating in a coalition of scientific societies, spearheaded by the Biophysical Society, which aims to increase funding in the physical, mathematical, and computational sciences with an eye toward significantly impacting biomedical research. The coalition is working to determine how best to fund such research, and then find a way to make that funding source a reality.

The Bridging the Sciences Coalition began in the spring of 2003 when six societies, including ASBMB, agreed to participate. Most of those societies represented the biological sciences. As of October 2005, the Coalition has grown to 16 groups, including 14 professional societies that cover biology, chemistry, instrumentation, computer science, physics, and mathematics. The Coalition now represents over 280,000 research scientists.

Through meetings with members of Congress and their staffs, and with officials at various federal agencies, the Coalition's ideas have gained recognition and traction in the scientific community and in the halls of government. In 2004, the National Institutes of Health and the National Science Foundation held a joint meeting to discuss ways the federal government could facilitate research at the interface of the life and physical sciences. In 2005, draft legislation to reauthorize NIH included language establishing a bridging the sciences demonstration program (see sidebar).

In addition, other groups have picked up the ideas expressed by the Coalition, and have gone to Congress with similar messages. The Council on Competitiveness's National Innovation report, released in December 2004, called for the federal government to increase its investment in basic science research in order to keep the United States competitive globally.

Likewise, the October 2005 National Academies study, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future,* recommends that policymakers increase the federal investment in the physical, computational, and mathematical sciences by 10% per year for the next seven years. The report states that many advances in biomedical research are based on advances made through research in these other fields. Both reports also cite the need for the U.S. to fund more innovative, long-term research, not just research that will pay off in two to three years. This is also one of the basic arguments the Coalition has made.

Unfortunately, the federal funding environment we face as Congress works to finish the 2006 budget and start the 2007 budget is tougher than it was when ASBMB joined the Coali-

Continued on next page

The NIH Reauthorization Bill currently circulating in draft form includes the following language, excerpted from the section concerning the Bridging the Sciences program:

(a) BRIDGING THE SCIENCES.—

(1)…the Director of NIH, in consultation with the Director of the National Science Foundation and the Secretary of Energy, may allocate funds for the national research institutes and national centers to make grants for the purpose of improving the public health through demonstration projects for research at the interface between—

(A) the biological, [behavioral, and social sciences]; and

(B) the physical, chemical, mathematical, and computational sciences.

(2)…The Director shall establish goals, priorities, and methods of evaluation for research under paragraph (1), and shall provide for interagency collaboration with respect to such research. In developing such goals, priorities, and methods, the Director shall ensure that—

(A) the research reflects the vision of innovation and higher risk with long-term payoffs; and

(B) the research includes a wide spectrum of projects, funded at various levels, with varying time frames.

(3) PEER REVIEW.—A grant may be made under paragraph (1) only if the application for the grant has undergone technical and scientific peer review…and has been reviewed by the advisory council

NIH Rolls Out Electronic Grant Submission

Beginning with the receipt date of Dec. 1, 2005, NIH will require all its SBIR/STTR grant applicants to electronically submit their competing grants. NIH plans to transition all of its competing grant programs one by one from paper to electronic by May 2007. NIH's electronic submission timeline is available at http://era.nih.gov/ElectronicReceipt.

Electronic submission and grants administration will result in significant savings to the government and holds promise for shortening the time period from grant submission to award. NIH expects to eliminate approximately 200 million pieces of paper a year and reduce the costs of scanning, data entry, data validation, printing, and reproduction. Grant images will be very clear and in color. Efficiencies gained will benefit both NIH and its partner institutions.

NIH is also moving from its PHS398 application form to the new SF424 (R&R) application form. Every application via Grants.gov to NIH will need to come in on the new SF424 (R&R) form. An applicant will fill out the application package and upload it to Grants.gov; the NIH system will then retrieve it and produce a system-generated application online.

NIH announced its plans to phase in its new application process in the NIH Guide for Grants and Contracts on August 19 (see http://grants.nih.gov/grants/guide/notice-files/NOT-OD-05-067.html). There will be specific notices preceding the conversion of each grant program (a.k.a. mechanism). All competing applications will use the new form and process by May 2007.

NIH urges grantees to begin preparing for electronic submission as soon as possible. Institutions must register with Grants.gov. Institutions and principal investigators (PIs) must establish NIH eRA Commons accounts.

Applicant organizations that choose electronic forms-based submission need to download PureEdge™ software, available free-of-charge from Grants.gov. Alternatively, to establish a system-to-system data exchange solution, institutions should contact Grants.gov or partner with an authorized Service Provider that already has developed a Grants.gov interface.

Grantees are encouraged to learn about the upcoming changes, to inform and educate their colleagues, and urge them to prepare for electronic submission," concludes Dr. Ruiz Bravo.

The following resources are available to assist the NIH grantee community with the transition to the electronic SF424 (R&R) application process:

For up-to-date, general information on electronic submission, the SF424 (R&R), and Service Providers, go to http://era.nih.gov/ElectronicReceipt.

For NIH funding opportunities, application guidelines, and grant-related resources, go to http://grants2.nih.gov/grants/oer.htm or contact NIH at GrantsInfo@nih.gov.

For information about Grants.gov registration, PureEdge™ software, forms navigation, and submission, go to http://grants.gov.

For information about NIH eRA Commons registration, application validation, and post-submission functionality, go to https:// commons.era.nih.gov/commons/.

tion. NIH will receive an increase this year that at best barely keeps pace with inflation, and NSF is slated to receive less than it did in 2004.

While the funding environment has changed, the reality that biomedical research advances depend to a large extent on advances in mathematics, physics, chemistry, and computational science, as well as in the fundamental life sciences, has not. Despite tighter budgets, biologists still need new and improved tools from these disciplines to make breakthroughs in their own work or to simplify their research methods. The difficulty of finding funding for research at the interface of the biological sciences and the physical, mathematical, and computational sciences remains.

The Coalition has made great strides in creating the awareness of and understanding for the need to fund research at the interface. While the funding situation now appears bleak, the federal budget outlook will one day be brighter. ASBMB participates in the Bridging the Sciences Coalition against the day when we can benefit from an improved federal research funding picture and make the Bridging the Sciences concept a reality.

Engineered Molecule Amplifies Body's Immune Response

By Nicole Kresge, Staff Science Writer

By altering a molecule called Stat1, which is involved in cellular immune signaling, scientists have succeeded in making the molecule more responsive and thus more efficient. This old protein with a new twist may eventually be used to improve the body's defense against infection.

Stat1 is involved in immune responses that are initiated by proteins called interferons. These proteins are produced by the cells of the immune system in response to challenges by foreign agents such as viruses, bacteria, parasites and tumor cells. Recently, interferon has also been shown to play a role in the body's surveillance against the development of cancer. Because of this role, recombinant interferon is often used for the treatment of certain fibrotic diseases as well as cancers.

Interferon binds to receptors on the surface of the cell, which then use Stat molecules to send signals to the nucleus to increase the expression of genes needed to defend the host against infection. A balance in the amount of Stat signaling caused by interferon is very important.

"When interferon levels are too low, the host is highly susceptible to infection," explains Dr. Michael J. Holtzman* of the Washington University School of Medicine in St. Louis, Missouri. "This also applies to Stat1. Children who are born with genetic deficiencies of Stat1 are also very susceptible to infection. In the more severe case, the children die in infancy of fatal viral infections. In less severe cases, they later develop infections due to mycobacteria. When interferon levels are too high, for example during treatment with interferon, there are side effects due to the increased non-specific response caused by excessive amounts of interferon."

Dr. Holtzman and his colleagues at the Washington University School of Medicine decided to try to improve the body's defense against infection without causing side effects that occur with interferon treatment by engineering a hyper-responsive Stat1 molecule. By increasing the efficiency of the Stat1 molecule, the host could have the benefits of increased Stat1 signaling even at the low levels of interferon normally present in the body. Their results appear as the "Paper of the Week" in the October 7 issue of the *Journal of Biological Chemistry*, an American Society for Biochemistry and Molecular Biology journal.

"Our paper is really quite simple in conceptual terms," says Dr. Holtzman. "It is well known that interferon provides a benefit to people by protecting them against infectious diseases and cancer. Unfortunately, administration of interferon is costly and short-lived and has significant side effects. We simply reasoned that it might be possible to improve the benefits of interferon by enhancing the way it produces its beneficial effects. We therefore improved a molecule, known as Stat1, that is responsible for relaying the benefits of interferon in the body."

Their initial *in vitro* results were promising, and the engineered Stat1 molecule exhibited an increased responsiveness to interferon. Following up on these discoveries, Dr. Holtzman and his colleagues are currently performing gene transfer experiments, using both recombinant viruses and transgenic mice, to establish the benefits of hyper-responsive Stat1 *in vivo* for treating viral infection and cancer. They are also screening for drugs that might increase Stat1 responsiveness.

Dr. Michael J. Holtzman

These experiments may eventually lead to many improvements in cancer therapy as well as the treatment of other infections. Basically, any situation in which interferon hyper-responsiveness might be beneficial will profit from Dr. Holtzman's research.

"One could use our strategy of improving Stat1 efficiency during the winter months in patients who are at risk for developing serious viral infections, for example children with asthma, or heart disease, or immune compromise," suggests Dr. Holtzman. "It may also be of benefit in situations where interferon therapy has been used, such as treatments for liver disease and lung fibrosis, as well as certain cancers. Improving Stat1 efficiency would allow for much lower doses of interferon to be used, decreasing cost and side effect profile. In terms of diagnosis, it may be possible to screen patients for the level of Stat1 responsiveness to interferon, and if found to be low, that would make them candidates for a strategy to improve Stat1 responsiveness using our methods."

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Structure of Biological 'Transistor' in Higher Organisms Detailed

Researchers are unveiling the first detailed view of the architecture of a natural "transistor" that ensures the proper flow of potassium ions in cells. The research group, which had previously determined the structure of voltage-sensing membrane channels in primitive bacteria, has now advanced their understanding to channels in higher organisms, including mammals.

The advance, made possible in part by some clever chemistry that permitted fragile protein crystals to grow in a more "native" environment, is likely to offer new insights into how the channels function in the brain and heart. These channels control the flow of potassium ions through the cell membrane in response to voltage changes across the cell membrane.

The researchers, led by Howard Hughes Medical Institute investigator Roderick MacKinnon,* presented their findings in two papers published on July 8, 2005, in *Science Express*, the online counterpart of the journal *Science*. Co-authors Stephen Long and Ernest Campbell are members of MacKinnon's laboratory at The Rockefeller University.

Voltage-dependent potassium channels are molecular machines that aid in propagating electrical impulses in the brain and heart. They are made up of large proteins that form a pore that spans the cell membrane. In previous studies, MacKinnon and his colleagues had determined the structure of the ion channel's voltage sensor by studying channels from an ancient, primitive archaebacterium. MacKinnon said that differences exist between the channels in primitive organisms and in higher organisms, so it was important to progress to exploring the structure of these channels in higher organisms.

The researchers chose to study the structure of Kv1.2, a member of the Shaker family of voltage-dependent potassium channels found in higher organisms, including mammals. The Shaker family channels are particularly important to study, said MacKinnon, because they have been used in most of the functional studies of voltage-dependent potassium ion channels over the past few decades.

The team analyzed the structure of a Kv1.2 channel from the rat using x-ray crystallography. They had to overcome a major technical challenge to produce pure crystals of the Kv1.2 channel protein. The scientists developed a technique to crystallize the protein while maintaining it in a mixture of detergent and lipid, which more closely mimicked the oily cell membrane in which the channel exists naturally. "This is a significant technical advance that I hope will turn out to be important for crystallization of other membrane proteins," said MacKinnon.

The researchers' earlier structural studies of the bacterial channel revealed that the voltage-sensing molecular gates control potassium flow by snapping open or shut. However, said MacKinnon, understanding the precise mechanism of this movement was thwarted because the voltage-sensing structure was contorted in the crystallized bacterial protein.

"We could deduce some things about how the voltage sensor worked," he said. "But identifying this voltage-sensor gate led us to experiments that told us that it moves a lot through the membrane when the channel opens. However, that channel couldn't really tell us how the gate attached to the pore was made to open and close."

The crystals of the Kv1.2 channel appear to preserve the natural conformation of the voltage sensor. This enabled the researchers to discern that the gate was attached by a hinge-like "linker" that is coupled to the pore through which potassium flows. "This connection was totally broken in the earlier structure, so we couldn't say anything about how the motions of the voltage sensor are coupled to the pore," said MacKinnon. "That had to be left to complete speculation."

Dr. Roderick MacKinnon

In contrast to other membrane proteins, he noted, the voltage-dependent potassium channels have separate domains inside the membrane, the pore and voltage sensors, that are only weakly attached to each other. "Imagine, if you could grab a `normal' membrane protein by its edge and pick it up, it would stay together as a rigid unit," he said. "But pick up a voltage-dependent channel by its voltage sensor, and it would kind of tip over, since its attachment to the pore is so tenuous. It's the way nature has evolved this little voltage sensor, like a little molecular voltmeter floating in the membrane, to open and close the pore."

By analyzing where the amino acid arginines are positioned within the voltage sensor, the researchers gleaned additional insights into the mechanism by which the voltage-sensing paddles open and close the pore. These electrically charged arginine residues play a key role in the function of the voltage sensor to control the opening and closing of the channel pore.

In the current study, the protein of the Kv1.2 channel was crystallized

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Soy Protein Reduces Effects of Diabetes on Liver

By Nicole Kresge, Staff Science Writer

A group of researchers from Mexico has discovered that a diet rich in soy protein may alleviate fatty liver, a disease which often accompanies diabetes. The details of their findings appeared in the September 2005 issue of the *Journal of Lipid Research*, an American Society for Biochemistry and Molecular Biology journal.

The high levels of insulin and insulin-resistance that accompany diabetes are often associated with fatty liver or hepatic steatosis, an untreatable condition that can lead to chronic liver disease and death. In this condition, large lipid-filled compartments accumulate in the cells of the liver due to an increase in production of fatty acids in the liver. The end result is an enlarged liver.

Following up research that indicated that eating soy protein reduces lipid production and prevents hyperinsulinemia (the loss of effectiveness of insulin), Dr. Nimbe Torres, of the Instituto Nacional de Ciencias Medicas y Nutricion in Mexico, investigated the effects of a diet high in soy protein on the development of fatty liver associated with diabetes.

Dr. Torres fed Zucker diabetic fatty rats that develop hyperinsulinemia and hepatic steatosis a diet of soy protein for 160 days. She found that the consumption of soy protein prevented the accumulation of triglycerides and cholesterol in the liver despite the development of obesity and hyperinsulinemia in the rats.

"We also observed that the effects of soy protein were due to a low expression of genes involved in the synthesis of fatty acids and triglycerides in the liver," explained Dr. Torres. "These changes were due to a reduction in the transcription factors that control the expression of genes involved in lipid production."

In addition, levels of a transcription factor involved in controlling genes involved in fatty acid breakdown, as well as its target genes, were increased in rats fed soy protein. Thus, feeding rats a soy-rich diet reduced the amount of fatty acid in their liver by not only reducing lipid production but also by increasing its breakdown.

Although further research is needed, Dr. Torres believes that consuming soy protein could very well reduce insulin resistance, renal damage, and fatty liver, improving quality of life.

Leeches Provide Source for Cardiovascular Drugs

By Nicole Kresge, Staff Science Writer

The leech has recently confirmed its biomedical interest for scientists by showing that it contains an extensive list of new potential molecules that may become useful tools in the treatment of cardiovascular diseases. The details of this research appear in the October issue of *Molecular and Cellular Proteomics*.

Scientists have increasingly turned to blood-feeding invertebrates as a source for drugs and lead compounds to treat cardiovascular disease because these animals have evolved highly efficient mechanisms to feed on their hosts by blocking blood coagulation.

"Most heart attacks and strokes are associated with a blocked artery," explains study author Oscar Yanes. "In some cases, blood clots may cause the blockage of arteries that lead to cardiovascular disease. People with cardiovascular disease typically have an increased tendency to form blood clots, and a decreased ability to dissolve clots before they can do any damage. Therefore, compounds interrupting the blood coagulation cascade may inhibit thrombus development."

Using a strategy dubbed "Intensity Fading MALDI MS," Yanes and his colleagues at the Universitat Autònoma de Barcelona analyzed peptides and small proteins in the saliva of the medical leech *Hirudo medicinalis* for their ability to bind to molecules called serine proteases. This is a fast and extremely sensitive mass spectrometry-based analytical approach. Most of the coagulation factors involved in blood coagulation cascade are enzymes that belong to the serine protease family. Thus molecules that can bind to and block the action of such serine proteases can prevent coagulation.

Of the nearly 2,000 molecules the researches screened, more than 75 of them interacted specifically with the serine protease used throughout the work as target molecule. Sixteen of these binding molecules were isolated and subsequently characterized as new inhibitors that had potential to be used as drugs in treating cardiovascular disease.

The researchers chose to zero in on small proteins and peptides for several reasons, including the fact that most of the important biopharmaceutical products approved for therapeutic applications are polypeptides within a low molecular mass and because leeches have developed a battery of serine protease inhibitors in the small molecule range.

Although these new serine protease inhibitors are a long way from being used to treat cardiovascular disease, they do represent several important leads in the search for more effective anticoagulant and fibrinolytic drugs.

Encouraged by their present success, Yanes and his colleagues are planning to apply their novel approach to the screening of additional types of leeches as well as different blood sucking animals. "Leeches belong to an extensive family with a large number of species and subspecies, which have evolved highly efficient mechanisms to block blood coagulation," notes Yanes. "Considering the fast adaptation to this kind of nutrition, resulting in accelerated evolutionary selection and fixation of very specific interactions between serine protease inhibitors of the leech and proteases of the host, we think that screening additional types of leeches will lead to the discovery of very specific compounds blocking specific serine proteases of the coagulation cascade."

Type 2 Diabetes: Problems in the Furnace

A detectable decline in energy production by mitochondria seems to be a key problem leading to insulin resistance, and thus to type 2 diabetes, according to studies by Howard Hughes Medical Institute researchers.

The research team said that insulin resistance, an impaired response to the presence of insulin, is detectable as early as 20 years before the symptoms of diabetes become evident. In fact, insulin resistance is now seen as the best predictor that type 2 diabetes will eventually develop, said the study's senior author, Gerald I. Shulman,* Howard Hughes Medical Institute Investigator at the Yale University School of Medicine.

In the new study examining how insulin interacts with the energy-producing mitochondria inside living cells, Shulman and his colleagues found that the rate of insulin-stimulated energy production by mitochondria is significantly reduced in the muscles of lean, healthy young adults who have already developed insulin resistance and who are at increased risk of developing diabetes later in life.

"This is further evidence that people who are prone to develop diabetes have signs of mitochondrial dysfunction," he explained, noting that this is important because mitochondria are the "energy factories" inside cells and produce most of the chemical power needed to sustain life.

The new research, which is published in the September 2005 issue of the journal *PLoS Medicine*, indicates that a decreased ability to burn sugars and fats efficiently is an early and central part of the diabetes problem. Their new data also suggest the basic defect lies within the mitochondria, which exist in almost every cell.

The young adults studied by the research team are the offspring of parents who have type 2 diabetes, adding support to the idea that the risk can be inherited, and that the problem begins well before diabetes symptoms become evident. In an earlier research study published in the journal *Science*, Shulman and his colleagues had also found that healthy, lean older individuals have a major reduction in mitochondrial energy production that leads to accumulation of fat inside muscle cells resulting in insulin resistance. "These data may explain the increased prevalence of type 2 diabetes that occurs with aging" Shulman said.

> ***"This is further evidence that people who are prone to develop diabetes have signs of mitochondrial dysfunction,"***
>
> **—Gerald Shulman**

In the new studies, Shulman and his Yale colleagues discovered that the mitochondria in muscle cells respond poorly to insulin stimulation. Normal mitochondria react to insulin by boosting production of an energy-carrying molecule, ATP, by 90%. But the mitochondria from the insulin-resistant people they tested only boosted ATP production by 5%.

"These data demonstrate that insulin-stimulated rates of ATP synthesis are reduced in the insulin-resistant offspring of parents with Type 2 diabetes," the researchers wrote. Their work offers new insight into the early steps in the development of insulin resistance, and offers important clues to where the problem lies.

Among their findings was also evidence for a severe reduction in the amount of insulin stimulated phosphorus transport into the muscle cells of the insulin-resistant participants. This also points to a dramatic defect in insulin signaling and may explain the observed abnormalities in insulin-stimulated power production in the insulin-resistant study subjects, since phosphorus is a key element in the mitochondrion's complex energy-production process, the oxidative-phosphorylation pathway.

"Type 2 diabetes affects about 171 million people worldwide, and the number of people likely to be affected by diabetes is expected to double by 2030," Shulman noted. "Type 2 Diabetes develops when resistance to insulin action is combined with impaired insulin secretion, resulting in a severe oversupply of sugars and fats in the blood. Studies have demonstrated the presence of insulin resistance in virtually all patients with type 2 diabetes."

Structure continued ...

Continued from page 16

with the potassium pore in the open position. MacKinnon's lab is now focused on producing crystals of the channel protein with the pore in a closed conformation. "We can now see the switch when it is open," said MacKinnon. "It will be extremely useful to see what this switch looks like closed. It will be tricky to trap the channel in the closed state, but we have several ideas on how to do it."

Basic studies of the function of voltage-sensing ion channels could ultimately lead to new ideas that may aid in designing drugs to control the channels' function in a precise way. Given the ubiquity of voltage-gated channels in the brain, heart and muscle, such drugs could prove useful in treating a broad array of disorders. "However, while we believe the pharmaceutical industry will be very interested in the structure we have deduced, these basic findings are many steps away from application," MacKinnon emphasized.

* *ASBMB member*=

AAMC Award for Distinguished Research in the Biomedical Sciences

Stuart H. Orkin,* has been selected to receive the AAMC Award for Distinguished Research in the Biomedical Sciences. Orkin is the David G. Nathan Professor of Pediatrics, Harvard Medical School Chair, Department of Pediatric Oncology, Dana-Farber Cancer Institute Howard Hughes Medical Investigator, Children's Hospital Boston

"More than any other investigator, Stuart Orkin has dominated the field of blood disorders for the past twenty-five years," says Joseph Martin, Dean of the Faculty of Medicine at Harvard Medical School. Dr. Orkin's work has greatly improved the ability to diagnose blood disorders, leukemia and other diseases, and has helped to develop new and improved treatments for these conditions. His research not only revolutionized the molecular pathology of inherited disorders, but provided the standard by which similar work is now measured.

Before Dr. Orkin began his research, the molecular bases of inherited blood disorders had been largely undefined. It was his initial major research that provided medical science with its first look at a comprehensive molecular dissection of an inherited disorder-thalassemia (a group of genetic blood disorders). His work paved the way for DNA-based prenatal diagnosis of these disorders. Later in his career, Orkin used reverse genetics to unlock the mysteries behind a form of chronic granulomatous disease-an inherited, disabling abnormality of the immune system-resulting in a novel treatment for patients with the disease.

Today, in a research environment marked by heightened interest in stem cell research, Orkin's groundbreaking work has taken on new relevance; he has shown how different sets of genes are activated in stem cells to cause them to produce red blood cells, white blood cells and platelets.

Dr. Orkin received his undergraduate degree in life sciences from the Massachusetts Institute of Technology and his medical degree from Harvard Medical School. He completed postdoctoral research at the National Institutes of Health and clinical training in pediatrics and hematology-oncology at Children's Hospital Boston.

**ASBMB member.*

Federal Effort to Create Jobs continued ...

Continued from page 11

the most attractive setting in the world to study and conduct research, the report says.

- Each year, policymakers should provide 25,000 new, competitive four-year undergraduate scholarships and 5,000 new graduate fellowships to U.S. citizens enrolled in physical science, life science, engineering, and mathematics programs at U.S. colleges and universities.
- Policymakers should provide a one-year automatic visa extension that allows international students to remain in the United States to seek employment, if they have received doctorates or the equivalent in science, technology, engineering, mathematics, or other fields of national need from qualified U.S. institutions.

Ensure that the United States is the premier place in the world for innovation. This can be accomplished by actions such as modernizing the U.S. patent system (including such actions as shielding research uses of patented inventions from infringement liability, and changing patent laws that hinder innovation in specific industries), realigning tax policies to encourage innovation, and ensuring affordable broadband Internet access.

- Policymakers should provide tax incentives to encourage innovation in the United States, including making permanent the Research and Experimentation Tax Credit, designed to encourage companies that increase their R&D spending above a predetermined level. Additionally, Congress and the administration should increase the allowable credit from 20% to 40% of qualifying R&D investments.

The complete report can be read online at http://national-academies.org.

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.

Demian Barbas
University of Montreal

Eric Bergeron
University of Montreal

Matthew T. Flowers
University of Wisconsin, Madison

Azharul Islam
Tottori University

Graduation Survey Results

The responses to this year's survey were disappointingly low. Even though we increased the number of schools with known programs from 572 to 808 (41% increase), the number of responses this year (203) were down 9% from last year (223). While the number of graduates reported in the Bachelors and Masters degrees were down by 4-5%, the number of Doctoral graduates increased by 9%. Almost all of the increase in Doctorates can be attributed to the report from one school. Some of the low results might be attributed to inability to respond to the September reminder and the urgent need to begin the recovery from the devastation of hurricane Katrina.

The "Unspecified" line includes the data from Canadian schools that cannot provide information on ethnic background and from U.S. departments that could not, or would not, provide this information.

The good news is that in the categories of both Bachelor degrees and Masters degrees, the number of reported graduates with American Indian/Alaskan Native, Hispanic, and Pacific Islander backgrounds were up—in the category of Pacific Islander the graduates reported receiving Bachelor degrees went from 16 to 38, and those receiving Masters degrees went from 5 to 16, the highest ever for either of these categories. The bad news is that, almost across the board, the responses for Black, not of Hispanic origin, were down by approximately one-third, although last year's numbers were the highest ever. We will have to wait until next year to determine if this is just an anomaly or a trend.

Women continue to outnumber men graduates at the Bachelors and Masters levels, but trail badly in the percentage of Doctorates given. The numbers at the Doctorate level were a bit skewed when one school reported over 100 graduates, all male.

The departments that replied showed the following number of degree offerings. Some departments offer a single degree titled Biochemistry and Molecular Biology; these were counted in each category. A list of schools reporting the highest number of graduates at each level and for each ethnicity at each level can be found at www.asbmb.org, under Education. Click on Graduation Survey, and look for the link to the Supplemental Information under the survey of interest.

	BA/BS	MA/MS	PhD
Biochemistry	106	63	71
Molecular Biology	27	32	36
Chemistry with Biochemical emphasis	57	24	19
Biotechnology	4	8	3

This survey is entirely dependent on the voluntary response from the departments. What we collect is at least one to two years ahead of the information published by the National Research Council. What is published here is only as representative of the activity in our profession as the responses from the departments. Please check our list of schools to see if your department responded to the survey. This information is available in both PDF and Excel formats through the above link, clicking on List of Schools. If you are aware of any schools that offer a degree in biochemistry, molecular biology, chemistry with a biochemistry emphasis, or biotechnology, and are not listed, please contact us via email at education@asbmb.org. With your help we can make this survey even better.

Students, Graduated, July 1, 2004 to June 30, 2005

	BS/BA			MS/MA			PhD		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
American Indian or Alaskan Native	6	6	12	1	3	4	0	2	2
Asian	190	220	410	37	27	64	146	20	166
Black, not of Hispanic origin	39	66	105	3	14	17	5	10	15
Hispanic	53	62	115	11	18	29	14	9	23
Pacific Islander	13	25	38	10	6	16	3	4	7
White, not of Hispanic origin	747	727	1474	110	130	240	187	116	303
International Students	41	78	119	23	22	45	98	77	175
Unspecified	76	110	186	13	7	20	4	4	8
Total	1165	1294	2459	208	227	435	457	242	699

by John D. Thompson, Editor

Biotechnology Groups Seek End of Bureaucratic Roadblock to Medical Research

Sixty patient, health,. and biotech groups have urged Congress to pass legislation that reverses a Small Business Administration (SBA) decision which has discouraged and halted new medical research.

In a letter, delivered to the leaders of Congress on November 9, the groups called for passage of (S.1263 and H.R. 2943) "Save America's Biotechnology Innovative Research (SABIR) Act," introduced by Sen. Kit Bond (R-MO) and Rep. Sam Graves (R-MO), which restores the eligibility for Small Business Innovation Research (SBIR) funding grants to biotechnology companies.

"This legislation is needed to eliminate the regulatory interpretation that is stifling promising research that could improve the health and lives of people living with many diseases including HIV, lupus, diabetes, leukemia, Alzheimer's and West Nile virus," said Jim Greenwood, BIO's President and CEO of the Biotechnology Industry Organization (BIO).

Suzanne R. Pattee, VP of the Cystic Fibrosis Foundation, said, "We support this legislation so that all small biotech companies will be eligible to apply for SBIR grants from National Institutes of Health (NIH).

"Patients with rare diseases, such as cystic fibrosis, often rely on small biotech companies to develop new treatments to save their lives. If biotech research that is validated by private equity investors support remains ineligible for SBIR grants, promising research will grind to a halt. Patients, not just companies, would suffer the consequences," said Pattee, herself a cystic fibrosis patient.

Under the SBA's interpretation of eligibility requirements for SBIR grants, companies that are 51% owned by a group of private investors no longer qualify. This interpretation is a departure from the eligibility assessment used in the first 21 years of the program. One-third of biotech companies which have brought drugs to market had received SBIR funding at some point.

One of the first victims of the SBIR's new interpretation of eligibility was Intronn Inc., a Gaithersburg, Maryland-based company that had to stop development of a cystic fibrosis RNA therapeutic after the government pulled its SBIR funding on learning that the firm had venture capital backing.

U.S. Venture-Capital Activity in Third Quarter Drives Total Up 9% Over Last Year

U.S. venture capital investing increased in the third quarter compared to the same period last year. This was the first year-over-year rise in 2005. In total 555 deals were completed, raising $5.49 billion, increases of 7% and 9%, respectively, from the third quarter of 2004, according to the Quarterly Venture Capital Report released by VentureOne and Ernst & Young LLP.

The 555 deals in the third quarter made it the largest three-month period so far in 2005. Although total dollars invested was down slightly from the second quarter, when $5.87 billion was invested, the year-to-date total of $16.19 billion is almost equal to that invested in the first nine months of 2004. This year's third-quarter total was bolstered by higher investments for information-technology (IT) companies: the amount invested in this category—$3.11 billion—was up 11% over the third quarter of 2004 and was the most invested in IT in a single quarter since the second quarter of 2004. The median size of IT deals was $7.2 million.

"The strong investment levels in information technology continue to be the result of a considerable amount of interest by investors in later-stage companies, as they see the potential for viable IPO and merger and acquisition exits such as the $337 million acquisition of Perabit Networks by Juniper Networks (Nasdaq: JNPR)," said Robb Browne, Venture Capital Advisory Group Leader for the San Francisco Bay Area for Ernst & Young. "Throughout 2005, we've seen later-stage deals make up more than 40% of all IT investments, compared to about 36% in 2004."

"This is a clear sign that investors still support early-stage innovative growth companies, both in information technology and, more significantly, in health care," said John Gabbert, Vice President of Worldwide Research for VentureOne. "Within IT, 31% of the financing rounds were for seed- and first-round deals, while for health care it was 44%—a strong indication that investors see much room for growth among these sectors."

In the health-care category, total deals reached 140 deals—11 more than in the same quarter a year ago. The amount invested, $1.66 billion, declined 3% from a year ago. However, medical-devices companies continued to garner growing investment interest, with 53 deals and $569.8 million invested—up 15% and 31%, respectively, from the third quarter of 2004.

MIT Launches Global Nanotech Push

Leaders of 10 research universities from around the world gathered at the Massachusetts Institute of Technology last month to launch an international collaboration to use nanotechnology tools for global health and medical research. The collaboration, called GEM4 for Global Enterprise for Micro-Mechanics and Molecular Medicine, seeks to apply global sourcing principles to research at the intersection of engineering and life sciences. The conference was organized by Subra Suresh, head of MIT's department of materials science and engineering.

MIT's president, Susan Hockfield, said in an interview with the *Boston Globe* that the initiative could herald a new model for international research, with far-flung researchers sharing their expertise in person, online, and through teleconferencing. ''GEM4 is a new way of collaborating," Hockfield said. ''I am very interested in cultivating the kinds of activities that bring engineers and life scientists into conversation with one together."

Other nanotechnology research projects have focused heavily on diagnostics and testing the effectiveness of drugs. GEM4, though, will use tools like atomic force microscopes, laser tweezers, and nanoscale plate stretchers, staples at Suresh's three-year-old Nano-Mechanical Technology Lab at MIT, to study changes in human cells for research projects on infectious diseases like malaria and sickle cell anemia, cancers of the liver and pancreas, and cardiovascular diseases. "These are tools that were not available five years ago," said Suresh, who initially used them to examine how stresses affect materials. "They could help to answer one of the key questions as a disease progresses in the human body. What is the connection between the development of the disease and the ability of a cell to change shape, move through the body, and stick to a blood vessel wall?"

GEM4 grew out of Suresh's collaborations over the past two years with the National University of Singapore, which has a strong research program in microbiology, and Institut Pasteur of France, a leader in genetics research. Others that have signed on are the Harvard School of Public Health, the Max-Planck Institute in Germany, the University of Illinois, Georgia Institute of Technology, California Institute of Technology, Johns Hopkins University, and Chulabhorn Research Institute in Thailand.

Within the next few years, Suresh said, GEM4 hopes to attract tens of millions of dollars in research grants from US agencies such as the National Science Foundation and the National Institutes of Health, as well as foreign technology research funding sources.

In UK, Pharmaceutics Trade Balance Dips

The balance of trade in medicines has dipped over the first six months of this year, according to figures released in November by the Association of the British Pharmaceutical Industry (ABPI). The new figures show that there was a 14% drop in the trade balance over the first six months of the year compared with the same period of 2004—from £1,693 million ($2,928 million U.S.) to £1,449 million ($2,506 million U.S.). This was caused by a slight drop in exports over the January-June period from £5,967 million in 2004 to £5,839 million in 2005, and a small rise in imports over the same period, from £4,274 million to £4,390 million.

The ABPI warned in April this year that several key markers indicating the health of the industry had moved downward, including the industry's healthy trade balance. "These figures seem to confirm that there is cause for concern," said Dr. Richard Barker, Director General of the ABPI. "While the dip is small—and, of course, is only over six months rather than the full year—it sounds another warning signal.

"Among the reasons for the drop in the trade balance is the fact that manufacturers are finding the climate in the UK is no longer as globally competitive as in the past, as other countries offer specific incentives for local manufacture.

"We are therefore engaging with the Government about how best to retain the British pharmaceuticals manufacturing base, which has contributed so strongly to our balance of trade and levels of skilled employment."

by John D. Thompson, Editor

Australian Scientists Voice Concern Over Job Cuts

Scientists in Australia expressed concern in the wake of an announcement by the nation's major government science body, the Commonwealth Scientific and Industrial Research Organization (CSIRO), that it was planning to cut its research support staff by up to 25% in an effort to save money. CSIRO executives claimed the move would let the group spend more on science, but scientists said they saw the cuts as a move to give administrators the upper hand in making decisions about research.

In describing the plan at a Senate committee hearing last month Mike Whelan, the group's CFO, told the committee that a staff review was being undertaken in an effort to save $30 million a year ($21.9 million U.S.), and said the cuts would allow the organization to spend more money on science.

Whelan told *The Scientist* that the cuts would bring CSIRO in line with other comparable organizations. "We spend in the order of $985 million ($720 Million U.S.) a year and about one-third of that is on support," he said. "When we look at other organizations in our business…in some cases we spend about double what others spend on support."

He said that cutting back on the support expenditure would save the organization about $30 million a year by the third year. He added that job losses would most likely result from natural attrition, with forced redundancy being a worst-case scenario.

Rockeby to Launch Bird Flu Tests

Anti-fungal diagnostic company Rockeby Biomed will roll-out tests internationally for the potentially deadly bird flu virus after signing a major distribution deal. The Perth, Australia-based biotech said on November 15 that it had completed an agreement with Pacific Biotech in Thailand, giving it exclusive rights to two bird flu tests in the Asia-Pacific, Europe, and South African regions.

The first test, which takes 10 minutes, will be used on bird feces and blood to detect the bird flu strain, avian influenza virus antigen, H5N1. A second rapid-screening test will be used on people to detect the deadly H5N1 strain, which is known to have killed 63 people in four Asian countries since first discovered in the region two years ago and has led to the culling of 150 million birds worldwide. The H5N1 strain recently has spread to eastern Europe and is expected to move into the Middle East and Africa.

Rockeby spokesman Sze Wee Tan said the test had substantial advantages over other alternatives which relied on transferring samples to a laboratory.

"There is an urgent need for a quick, reliable test for avian flu," Dr. Tan said. "Compared to the H5N1 subtype isolated in 1997 and 2004, the 2005 variant is already more lethal to animals in laboratory testing and survives for longer in the environment."

Under the agreement, Pacific Biotech will manufacture the tests but they will carry the Rockeby brand.

Targeting Depression

Chemistry service provider Albany Molecular Research, Inc. (AMRI) and global pharmaceutical giant Bristol-Myers Squibb (BMS) announced the signing of a licensing deal that will see BMS develop and commercialize multiple potential products from AMRI's proprietary amine neurotransmitter reuptake inhibitors. The compounds were identified by AMRI as modulators of depression and other central nervous system disorders.

Under the terms of the agreement, AMRI will receive $8 million up front with BMS supplying another $10 million in research funding over three years to characterize existing compounds and identify new ones. AMRI will also be eligible for $66 million per compound in development and regulatory milestone payments for the first two compounds and another $22 million for subsequent compounds.

"We are excited by the commercial potential for these compounds and believe that ultimately there is a possibility that our combined efforts could yield multiple drugs with a range of different profiles as amine neurotransmitter reuptake inhibitors, useful for the treatment of several different CNS disease indications," said AMRI chairman, CEO, and President Thomas E. D'Ambra. "This licensing agreement reflects the significant efforts put into the program by AMRI scientists. However, we recognize it is time to put this technology into the hands of a company that is better suited, with the experience required to realize the significant commercial potential."

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The information in For Your Lab has been provided by manufacturers and suppliers of laboratory equipment. For further information about any of these products listed contacts are listed at the bottom of each panel. When contacting any of these companies, please mention that you saw their product in *ASBMB Today*. Please note that a listing in *ASBMB Today* does not imply an endorsement by the American Society for Biochemistry and Molecular Biology or by any of its members or staff.

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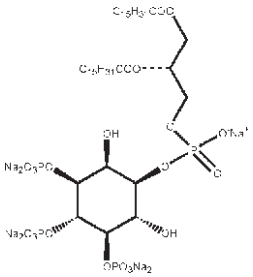

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ASSISTANT PROFESSOR
Niagara University

Biochemistry, Chemistry & Physics Department at Niagara University invites applications for a tenure-track faculty position in biochemistry (Fall 2006). PhD in biochemistry, preferably; successful post-doctoral experience, strong potential to develop an externally funded research program, demonstrate commitment to teaching at undergraduate level, and strong oral/written communication skills. Responsibilities: provision of high quality teaching and scholarship, mentoring students, supervising practica, and serving on departmental/college committees.

Department is currently expanding and wishes to hire faculty that will encourage that growth. With many new state-of-the-art facilities, the successful candidate will have plenty of opportunity to develop a strong research platform and will be part of the newly founded Niagara University Academic Center for Integrated Sciences, which encourages collaborations with other departments as well as local industry. Initial start-up funds will be provided.
Located near the scenic Niagara Falls, Niagara University is a predominantly undergraduate liberal arts university in the Catholic Vincentian tradition Application letter, curriculum vitae, three letters of recommendation, teaching philosophy, and research plan to:

Dr. Mary McCourt
Chairperson, Chemistry,
Biochemistry, & Physics Department
Niagara University, NY 14109-2044

Applications reviewed until position filled.AA/EOE

CHAIR, DEPARTMENT OF BIOLOGICAL SCIENCES
Hampton University, Hampton, VA

The Department of Biological Sciences at Hampton University invites applications and nominations for the position of Department Chair. Located on the Chesapeake Bay in Hampton, Virginia, Hampton University (http://www.hamptonu.edu) offers 38 baccalaureate degree programs, 14 master's degree programs, and 4 doctoral degree programs. The total enrollment currently stands at approximately 6000 students. The Department of Biological Sciences offers programs leading to the B.S., M.A., and M.S. degrees. The department has an undergraduate enrollment of 400 students and a graduate enrollment of about 45 students. There are 20 members on the faculty.

The successful candidate will be expected to provide vision and leadership to further develop the undergraduate and graduate programs, research, and establish or maintain ties with other units on campus, community groups, and other educational and research entities.

Candidates must have an earned doctorate in an area of biological science; and have a distinguished scholarly record, which should be demonstrated by documented evidence of accomplishments in teaching, research, and service. A transcript of doctoral work is required. Administrative experience is desirable but not required. Other desirable qualifications include a history of external funding, and experience with program development in education and research. Salary is commensurate with experience.

The position is available starting in August, 2006. The deadline for receiving applications is January 15th, 2006. The application package should include information pertinent to the stated qualifications, a personal statement on

teaching and research, and three letters of reference. These materials should be sent to Dr. Isai T. Urasa, Search Committee Chair, Department of Chemistry, Hampton University, Hampton, VA 23668. Inquiries about the position may be made electronically at isai.urasa@hamptonu.edu. However, the application materials must be sent in hard copy.

Hampton University is an Equal Opportunity and Affirmative Action employer.

POSTDOCTORAL FELLOW/JUNIOR FACULTY

The Charles Carrington Prize in Molecular Mechanisms of Disease

The Department of Pathology at Stanford University School of Medicine, with support of the Wolfe and Gita Churg Foundation, annually awards this $5,000 prize to a postdoctoral fellow or junior faculty (within three years of the first appointment) for outstanding contributions to our understanding of molecular mechanisms of disease, especially those diseases affecting the cardiovascular or pulmonary system.

We seek help of the scientific community in identifying candidates for this prize. Please consider nominating outstanding individuals from your laboratory or elsewhere. The nomination process is simple: please inform your nominees and submit their curriculum vitae, bibliography, and a one-page description of their scientific contributions by March 31, 2006 to:

Stephen J. Galli, M.D., Chair
c/o Cynthia Llanes
Department of Pathology
Stanford University School of Medicine
300 Pasteur Drive, MC 5324
Stanford, CA 94305
cllanes@stanford.edu

GRADUATE STUDENT/POSTDOCTORAL FELLOW

The Cheryl Whitlock/Pathology Memorial Prize

A prize of $1,000 honoring the late Cheryl Whitlock is awarded to a nominee(s) who has made the most significant advance(s) in the fields of hematopoiesis and/or leukemia as a graduate student or postdoctoral fellow.

Nominees for the 2006 prize should be no more than 3 years beyond completion of postdoctoral training. The application should include a letter of nomination from the applicant's mentor or Department Chair (or equivalent) plus a C.V. and a one-page description of the achievement by March 31, 2006 to:

Stephen J. Galli, M.D.
Cheryl Whitlock Prize
c/o Cynthia Llanes
Department of Pathology
Stanford University School of Medicine
Stanford, CA 94305-5324

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Email: wilcoxch@georgetown.edu

Georgetown University strongly encourages women and minorities to apply and is an AA/EEO/ADA Employer.

Calendar of Scientific Meetings

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

Compartmentalization of Cyclic AMP Signalling

March 29-30 • King's College, Cambridge, UK
Contact: Meetings Office, Biochemical Society, 3rd Floor, Eagle House, 16 Proctor Street, London, WC1V 6NX
Email: meetings@biochemistry.org
Website: www.biochemistry.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

MAY 2006

CSBMCB International Meeting on Membrane Proteins in Health and Disease

May 31- June 4 • Niagara-on-the-Lake, Ontario, Canada
This Canadian Society of Biochemistry, Molecular and Cellular Biology sponsored meeting, held in Canada's wine country close to Niagara Falls, will feature cutting-edge sessions on Structural Biology of Membrane Proteins, Regulating Membrane Permeability, Dynamics of Membrane Proteins, Transporters and Disease, Trafficking Defects in Membrane Proteins, and Assembly and Disassembly of Membrane Proteins. Meeting organizer: Dr. Reinhart Reithmeier
Email: r.reithmeier@utoronto.ca
Website: www.csbmcb.ca/e_index.html

JULY 2006

Gordon Conference on Enzymes, Coenzymes & Metabolic Pathways

July 16 -21 • University of New England, Biddeford, Maine
For information contact:
Email: grc@grc.org
Ph: 401-783-4011 ext 100
Website: www.grc.uri.edu/06sched.htm#GRC

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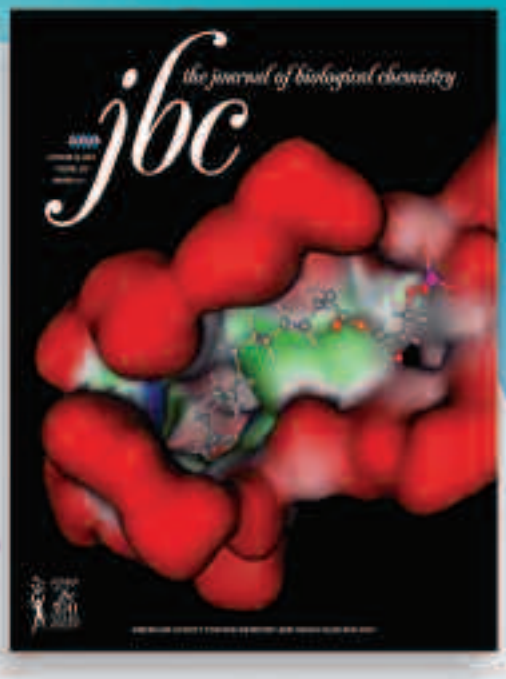

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