MAY 2006

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ASBMB Today

AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY

MAY 2006
Volume 5, Issue 2

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Comments

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Ethics in Science: What Has Happened to It?

To the Editor:

There has been a recent rash of reports about falsifying data in scientific articles that were published in good journals (e.g., *Science*), however, there is a more subtle and important danger to science, i.e., warping the discussion in a paper to prove a false theory by ignoring all of the data in the literature that are contrary to the false theory, and by misinterpreting (deliberately?) one's own experimental data, and by incorrectly re-interpreting the data of others, and by incorrectly reporting the results of others.

Then there is the wonderment of why the reviewers of well-known journals (e.g., *BioEssays, Proc Natl Acad Sci, J Bacteriol, Annu Rev Genet, J Biol Chem*) did not catch these falsehoods and bad science, and/or why the editors did not choose appropriate reviewers.

All of these improper actions came recently from several papers published in "good journals" by one laboratory. This laboratory, and its graduates, are determined to prove that excision repair is the only repair function that exists in cells after exposure to ultraviolet (UV) radiation, even though there exists 30 years of work showing the importance of recombinational DNA repair. Recombinational DNA repair accounts for 50% of survival after UV irradiation, and excision repair accounts for 50%, i.e., not the 100% that some authors would have you believe (for a review on recombinational DNA repair, and the citation of some of these bad papers.

An author from another laboratory states that "It has recently become clear that the recombinational repair of stalled replication forks is the primary function of homologous recombination systems in bacteria." This statement totally ignores the problems that a cell faces when its DNA, which was replicated prior to UV irradiation, is damaged, and where two DNA duplexes exist, and where replication restart has no relevance, but recombinational DNA repair is very important. To be generous, these authors seem to be totally unaware of the literature.

What can be done to make authors read the literature, and make editors send papers to reviewers who are knowledgeable of the literature, and for editors to make sure that the reviewers do their jobs properly?

It is really stupid to falsify data, because the basis of science it to repeat published data, and then to take research on that subject to the next level. Therefore, false data will soon be found out, but at great expense to science.

However, the more subtle form of falsification, about which I speak, is usually believed (it came from a "good" laboratory, and was published in "good" journals), and it will remain in the scientific literature forever as "fact", and it will waste the time and money of unsuspecting students and scientists who will design experiments based upon these bad papers.

In religion one can often be forgiven for one's sins, **but no one should be forgiven for sins against science.**

Kendric C. Smith, Ph.D.
Professor Emeritus
Stanford University School of Medicine

Dr. Judith Bond

Lookin' Back and Movin' On

The *JBC* and the ASBMB culminated their Centennial Celebrations at the annual meeting in San Francisco during the first week in April. There was a lot to celebrate! The twentieth century was a period of discovery, characterization, and analysis of the fundamental components of living systems. Since the end of the twentieth century, attention has been focused upon expression, interaction, and integration of molecules, large and small, into living systems. Now characterization and analysis is focused on networks, dynamics and the "omics" rather than individual classes of molecules. We foresee leaps in the understanding of the chemical basis of living systems and the application of that knowledge to agricultural and pharmaceutical gains, and the prevention, amelioration and cure of disease.

Over the last 100 years, the Society and our Journals have grown and matured. Membership in the Society has grown steadily to approximately 12,000.

The Society has changed from a small honorific Society electing members with lifetime achievements of great impact, to one that welcomes scientists at many different levels of achievement who share an interest in our mission: "*Promoting understanding of the molecular nature of life processes*."

We realize our mission by organizing meetings, promoting information exchange for professional development and diversity, engaging in advocacy for issues that impact our discipline and members, and through our publications. ASBMB is a leading scientific publisher; our journals include (in addition to the *JBC*) Molecular and Cellular Proteomics and the Journal of Lipid Research. We also publish an educational journal, Biochemistry and Molecular Biology Education (BAMBED) for the International Union of Biochemistry and Molecular Biology, and this ASBMB Today magazine. The *JBC* has grown dramatically over the years, due to interest and investment in science by our government, private organizations, and those of other countries (50% of our articles are from countries other than the USA). The *JBC* Editorial Board has increased from 22 in 1906 to 670 in 2006; the number of pages published per year has increased dramatically to approximately 45,000.

Herb Tabor has been at the helm of the *JBC* as Editor-in-Chief for 37 years, over a third of the lifespan of the *JBC*. His leadership has ensured innovation, quality, and fundamental, enduring science publication that stands the test of time.

Biochemistry, from its inception, has been an international discipline, with a community of scholars bound together by shared interests in the chemistry of life. Our recent celebratory meeting brought together scientists and trainees from around the world. A delegation from the Chinese Academy of Sciences presented a beautiful scroll to our Society for the Centennial Celebration.

This celebration would not have happened without the work of many

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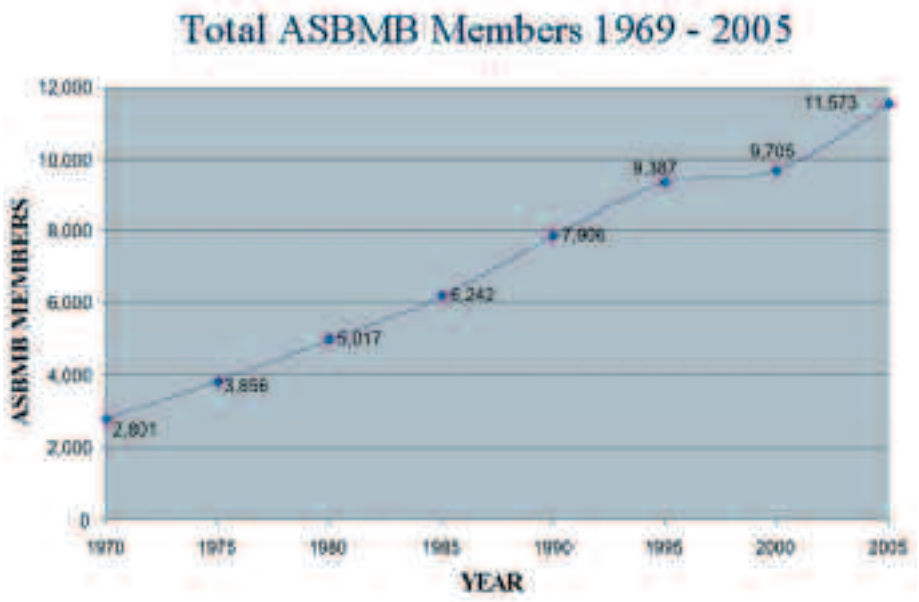

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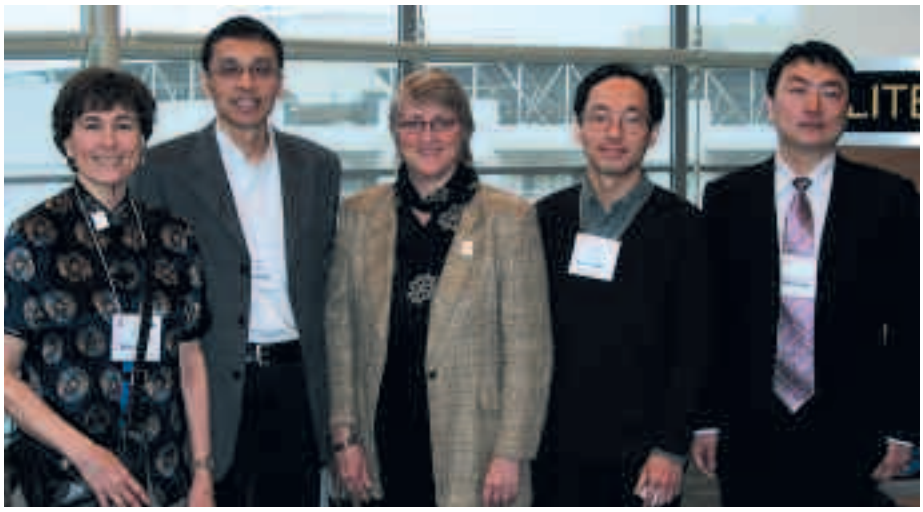
staff and Society members. I would like to mention a few of our staff who worked long hours behind the scenes: Barbara Gordon, Joan Geiling, Nancy Rodnan, Gail Pinder, Peter Farnham, Adrienne Fierro, Steve Miller, John Thompson, Ed Marklin, Patricia Roux, and Hector Martinez. Many volunteers contributed their time, thoughts, and energy to the celebration. The Centennial Committee conceived and developed the ideas for the History Panels. the ASBMB and *JBC* History Book, Video Interviews, Workshops, and "Meet the Nobel Laureates and Other Distinguished Members of our Society" sessions at the meeting.

The Associate Editors of the *JBC* also actively contributed to the Centennial Celebration by participating in sessions on "How to Publish in the *JBC*," and by volunteering for the "Dunk Tank." A special note of thanks is extended to *JBC* Associate Editor John Exton, who wrote the words, and to former Editorial Board member Jack Preiss, who adapted the music, to the "Publish or Perish" skit based on the Mikado. This skit, the Awards lectures, video interviews of ASBMB members, and many pictures from the meeting will be made available through the ASBMB website (www.asbmb.org) soon.

It was a great occasion; one that allows us to look back with pride on the many accomplishments and contributions of members of our discipline and Society. We now turn eagerly to the next "100 Years of Forward Thinking."

Judith S. Bond
President, ASBMB

Chinese Delegation Visits ASBMB



ASBMB President Judith Bond and President-Elect Heidi Hamm welcomed a delegation of Chinese scientists to Centennial Meeting. From left are President Bond, Dr Naihe Jing, President-Elect Hamm, Dr. Weiping Jiang and Mr. Xuefeng Liu. The Chinese delegation brought the ancient scroll below as a gift. The scroll brings a message to our Society for "early victories and successes" as we move into the next century.

The Growing Crisis for Investigators

By Judith Bond, ASBMB President, Heidi Hamm, President-elect, and Peter Farnham, ASBMB Public Affairs Officer

It is an especially difficult time for biomedical research funding, particularly at the National Institutes of Health (NIH). There are at least three components that are contributing to the funding crisis. Below we lay out what we think these components are, and over the next couple of issues of *ASBMB Today,* we will discuss each in detail.

The first problem is that the NIH budget is not keeping up with "biomedical inflation," let alone growing. Furthermore, there seems to be no hope for broad improvement in funding during this deficit-ridden period, although our many champions in Congress are doing their best to add more money to the L/HHS appropriations bill, some of which will, no doubt, flow to the NIH. In addition, the biomedical research community and its advocates are in general doing an excellent job in working with our champions in Congress. Of course, we can always do better, and in an upcoming editorial, we will discuss actions you may take to help.

Second, along with stagnant budgets since 2003, the last year of the 5-year doubling campaign, is the fact that a smaller portion of the total NIH budget is being spent on the most vital contributor to the American preeminence in biomedical research: the investigator-initiated R01. Over the past four or five years, program announcements, RFAs and RFPs, the Small Business Innovation Research Program, research contracts, the NIH Roadmap initiative, and others—most of which are worth supporting—are receiving a growing portion of the NIH budget at the expense of investigator-initiated research grants. This is driving success rates down to near historic lows; and the young investigator is especially threatened.

A third factor contributing to the worsening funding situation, at least for biochemistry, molecular biology, and cell biology, is the reorganization of study sections that has taken place in recent years at the Center for Scientific Review (CSR). While there were many good reasons for carrying out this reorganization, a key component of the plan was supposed to be regular review of the new structure to insure that it was functioning properly. However, it appears that the review component of the reorganization plan has dropped by the wayside, so that the effectiveness of the new structure is not being adequately monitored.

Judith Bond, ASBMB President, and Heidi Hamm, President-elect

It is perceived that there is a shortage of volunteers from the biomedical research community willing to serve on study sections; however, over 700 ASBMB members volunteered in a recent survey to serve on NIH study sections if asked. These names were passed along to the new head of the CSR, Dr. Tony Scarpa. He is aware of the problems associated with study sections that are too large and have too few scientists to support them adequately, and he is working hard to correct the situation. We will continue to work with him; we hope we can offer your additional suggestions and thoughts for his consideration.

All of these changes leading to the current situation have been small and incremental, and none would, in and of itself, be a problem in a more hospitable budget environment. However, in the current difficult funding situation, each incremental change contributes to a growing shortfall for investigator-driven research—a shortfall that is now approaching crisis proportions. The most alarming aspect of the crisis is that highly-trained individuals, both new and seasoned investigators, are being forced to leave the science enterprise—in spite of the fact that NIH is funded at near historic levels. What makes it worse is that we are in a golden age of discovery, in which the possibilities for great scientific advances have never been more likely.

The ASBMB will continue to be a very active part of the dialogue to ensure that there is a next generation of scientists to capitalize on the current science. We need constructive ideas on how to do this, and we welcome all your ideas, criticisms, and analysis. Therefore, we hope you will let us know your thoughts on these complex subjects in coming weeks.

by Peter Farnham, CAE, ASBMB Public Affairs Officer

Budget Resolution Runs into Roadblocks in House

The House leadership pulled the 2007 budget resolution from the House floor on April 6 and then returned home for a two-week recess over the Easter/Passover holiday. Majority Leader John Boehner (R-OH) remains publicly upbeat and is committed to trying to get a Budget Resolution passed in the House, but it will be a difficult task.

The budget resolution is an internal congressional blueprint for spending that does not have to be signed by the president. It also does not actually appropriate money; rather, it lays out a congressional plan on how to spend money once appropriated. However, appropriators have a great deal of discretion in how they allocate money under the plan, and in fact do not have to follow the specific program recommendations in the budget resolution at all in most cases. They are, however, limited by the amount of discretionary spending they have available.

The President introduced his budget for FY 2007 in February, and the Senate passed its version of the budget resolution in March. The Senate bill includes about $7 billion more for health and education spending above the President's request, inserted largely at the behest of Senator Arlen Specter (R-PA).

House republicans, however, are split between two factions. Fiscal conservatives are very worried about the growing federal deficit and the national debt, and have proposed tough new rules to reign in earmarks, which is not sitting well with members of the Appropriations Committee.

The second faction is a group of about two dozen Republican moderates who insist on more spending on health and education programs. In a House where the Republican majority is not huge, this group of moderates has enough votes to control what happens, provided House Democrats remain unified and the moderates vote with them. The moderates are led by Delaware Republican Mike Castle.

Whether or not Boehner and the rest of the House leadership can square the circle between these two factions depends on the mood of Members when they return (and have heard from their constituents). For now, however, no one on either side is showing signs of compromise.

If the House and Senate cannot agree on a joint budget resolution, the two houses may proceed to allocate money under their own versions of the resolution and worry about working out the differences during the conferences on the appropriations bills later this summer and fall. While most observers hope that the House will go along with the additional $7 billion for health and education programs that is in the Senate bill, it is more likely that some compromise figure will be agreed to. However, any improvement over the President's proposal would be a positive development.

So what about appropriations?

The Senate will probably allocate a great deal more money to its L/HHS subcommittee than will the House, thanks to the Specter amendment, and the bill will probably be adopted by the full Senate well before the House passes its version. Assuming at some point each house passes a L/HHS bill, any conference committee would likely be difficult. If moderates are successful in convincing House conferees to go along with the likely more generous Senate version, House conservatives may then work to defeat the conference bill. Even though it is an election year, fiscal conservatives were elected by constituents who support restraint in government spending, and thus for a fiscal conservative to turn into a "big spender" might not play well on the hustings in many districts.

If a L/HHS appropriations bill does not pass before the fall elections, the alternative is "government by continuing resolution," that is, a series of short-term spending bills that fund agencies at the previous year's level until a new bill can be agreed upon.

The bottom line is that this is going to be a very tough year for NIH funding. The agency has begun to lose purchasing power since its budget was doubled (down 10 percent in purchasing power since the end of 2003) and if flat budgets continue to be approved—without even additions to compensate for inflation—the stress NIH and the biomedical research community is currently experiencing is only going to get worse.

It is vital that each of you, especially those living or working in a district where the representative is a republican, begin to contact your Member of Congress and two senators to advocate as forcefully as you can for increased spending for NIH this year. The ASBMB staff can assist you in this regard; please contact pfarnham@asbmb.org for additional information and advice.

Evolution Watch

Symposium on Teaching Evolution Held at EB Meeting

The ASBMB Public Affairs Advisory Committee's symposium on "Teaching the Science of Evolution Under the Threat of Alternative Views" was held on April 4 during the recently concluded EB meeting in San Francisco.

Talks were presented by four experts in the field of evolution or related public policy issues. Leading off was Dr. Ken Miller, Brown University, a nationally-recognized expert on evolution who was a featured expert witness in the recently concluded trial in Dover, Pennsylvania. The second speaker was Dr. Don Johanson, Arizona State University, a world-renown paleoanthropologist who is the discoverer of the "Lucy" fossil, a 3.2 million year old hominid that is now recognized as one of the human species' earliest ancestors. The third speaker was Rev. Ted Peters, Center for Theology and the Natural Sciences, who spoke on the many permutations of theology as it pertains to explaining evolution. Finally, Dr. Eugenie Scott, executive director of the National Center for Science Education, spoke on the common arguments used against evolution by advocates for both creationism and its close cousin, intelligent design.

If you missed it, please don't worry—the session was digitally videotaped, and the talks will be available for viewing through the ASBMB website in the next few weeks. Also, thanks to a generous grant from the International Union of Biochemistry and Molecular Biology, ASBMB will be producing a CD-ROM of the symposium for distribution to high school science teachers. Look for further information on this in the next issue of *ASBMB Today* and on the ASBMB website

Oklahoma ID Bill Advances

HB2107, a measure that has been introduced in the Oklahoma legislature, would give teachers the "academic freedom" to teach the "full range of scientific views on the biological or chemical origins of life," and also prevent teachers from grading students on their beliefs. The sponsor of the measure, state Rep. Sally Kern, says it would encourage critical thinking by exposing students to all sides of the scientific debate about evolution.

HB 2107 bill passed the Oklahoma House in April and the state Senate is now poised to act on it. If the measure passes the Senate, it would go to Gov. Brad Henry, who could sign it or veto it.

In a March 19 op-ed piece published in *the Oklahoman*, the largest newspaper in the state, AAAS CEO Alan Leshner urged legislators to reject the measure. Leshner stressed that efforts to thwart the teaching of evolution in the classroom create an artificial conflict between religion and science, and divide and distract us during a time of unprecedented national and global challenges.

Maryland ID Bills Die at End of Session

The Maryland General Assembly adjourned on April 10, without acting on two anti-evolution bills that had been introduced earlier in the year.

House Bill 1531 provided that teachers in Maryland's public schools and faculty members in Maryland's institutions of higher education "shall have the affirmative right and freedom to present scientific information [sic] to the full range of scientific views in any curricula or course of learning;" a subsequent provision repeated this language and added the phrase, "including intelligent design." A hearing was held on the bill in late March, and it was then reported unfavorably.

House Bill 1228 would have required the state board of education "to prohibit the teaching or the discussion of the theory of intelligent design" in science classes and prohibit it from "requiring the teaching or the discussion of the theory of intelligent design in any class." But it also would have required the Board to "permit the teaching or the discussion of the theory of intelligent design in humanities or philosophy classes" and, moreover, to develop and disseminate instructional materials for that purpose. A hearing was held on this bill in early March, and it was reported unfavorably a month or so later.

Both bills had been introduced by Baltimore Democrat Emmett C. Burns.

Research Community to Congress: NIH Is Important!

As part of the uphill battle to secure adequate funding for the National Institutes of Health (NIH), the biomedical research community is refining its message to promote the importance of NIH to Congress and the public. Increasingly, lawmakers are asking what was achieved by doubling the NIH budget, and many remain unaware of the medical advances to which NIH has contributed. NIH Director, Elias Zerhouni, is leading the way by aggressively highlighting the improvements in human health due to medical research and describing how the budgetary increases are transforming medicine. Zerhouni's message on how NIH is creating a new paradigm in health care is based on what he refers to as the 3P's: medicine that is predictive, pre-emptive, and personalized. In recent interviews in both print and radio media, he has cited examples of NIH research advances that fall into each of these categories, from new diagnostic tools to vaccines to pharmacogenomics.

FASEB President and President-Elect, Bruce Bistrian and Leo Furcht, met with Zerhouni on March 22 to discuss ways in which FASEB could help NIH effectively deliver this message. The NIH Director suggested three ways in which FASEB might play a role: work with the other outside groups to ensure a consistent message; help the public and policymakers understand why research is important and outline the benefits that have accrued from the doubling; and encourage our FASEB society scientists to become more involved at the grassroots level. Fortunately, Bistrian and Furcht were able to describe FASEB initiatives already taking place in these areas. In early March, the FASEB Board of Directors created an ad hoc subcommittee to document the progress achieved through NIH funded research, with a particular emphasis on documenting the gains made during the recent doubling. Although the timeline of translating basic research makes this a challenging project, the committee is focusing on subspecialties in medicine, and is working with the FASEB societies to identify experts in the field who can speak to high impact medical advances and the state of the science. This information will supplement or go beyond existing FASEB products documenting the benefits of biomedical research, such as the Breakthroughs in Bioscience series or the annual Federal Funding Report.

In addition, FASEB is continuing to work with patient advocacy groups and others in the research community to develop a consistent communications strategy that connects NIH medical research to progress in human health care. As President Bistrian stated in a recent press release, "FASEB and the biomedical research community want Congress to understand that medical research translates to real treatments and real hope for real people." Zerhouni's wish to have scientists involved in grassroots action is also gaining momentum. On a recent NIH funding alert, scientists from the FASEB societies generated more than 8,400 letters to members of the Senate, and there are currently over 8,000 subscribers to FASEB's e-Action list. According to Jon Retzlaff, FASEB Director of Legislative Relations, it is biomedical researchers delivering the message that NIH is critical for both science and health that will make the difference on Capitol Hill. "Members of Congress need to be educated on how NIH funding is making a difference in their own states and districts," he said. "When scientists, patients, and academic institutions are all conveying the same message about NIH research – and the role it plays in finding treatments or preventing diseases - lawmakers will sit up and listen." For more about FASEB's advocacy activities, or to join the e-Action list, please visit: http://opa.faseb.org/pages/Advocacy/

ASBMB Members Elected to Academy

Nine ASBMB members were among the 72 new members and 18 foreign associates from 16 countries recently elected to the National Academy of Sciences in recognition of their distinguished and continuing achievements in original research.

"Election to the Academy is considered one of the highest honors in American science and engineering," said Ralph Cicerone, who became president of the Academy in 2005. Barbara Schaal, an NAS member since 1999 who was elected last year as the Academy's first woman vice president, noted, "This year's new class represents outstanding accomplishment in a wide variety of disciplines."

Those newly elected bring the total number of active members to 2,013. Foreign associates are nonvoting members of the Academy, with citizenship outside the United States. The election brings the total number of foreign associates to 371.

Additional information about the Academy and its members is available online at www.nasonline.org.

Newly elected ASBMB members and their affiliations at the time of election are:

Bonnie Bassler; investigator, Howard Hughes Medical Institute, and Professor of Molecular Biology, Department of Molecular Biology, Princeton University, Princeton, N.J.

David E. Clapham; Investigator, Howard Hughes Medical Institute, and A.R. Castenade Professor of Cardiovascular Research, Children's Hospital, Harvard Medical School, Boston

Don W. Cleveland; Professor and Head, Laboratory of Cell Biology, Ludwig Institute for Cancer Research, University of California, San Diego

Melanie H. Cobb; Jane and Bill Browning Jr. Chair in Medical Science, Southwestern Graduate School for Biomedical Sciences, and Professor, Department of Pharmacology, University of Texas Southwestern Medical Center, Dallas

Michael A. Marletta; Aldo DeBenedictis Professor of Chemistry, and Professor of Biochemistry and Molecular Biology, Department of Chemistry, University of California, Berkeley

Christian R.H. Raetz; George Barth Geller Professor of Biochemistry, Department of Biochemistry, Duke University Medical Center, Durham, N.C.

Jeffrey V. Ravetch; Theresa and Eugene M. Lang Professor, and Head, Laboratory of Genetics and Immunology, Rockefeller University, New York City

David W. Russell; McDermott Distinguished Professor, and Professor, Department of Molecular Genetics, University of Texas Southwestern Medical Center, Dallas

Carl Wu; chief, Laboratory of Molecular Cell Biology, National Cancer Institute, National Institutes of Health, Bethesda, Md.

A complete list of newly elected members is available on the National Academy of Scientists website at www.nasonline.org/site/PageServer.

Nominations for 2007 ASBMB Awards

Nominations for the 2007 Society Awards are now being solicited. The deadline for the receipt of nominations is June 15, 2006.

Nominations for all Awards should consist of::

- A letter of recommendation & additional letters of support
- Curriculum vitae (without the list of publications)
- A list of the nominee's most significant publications (not more than 10)
- A summary of the nominee's achievements (not to exceed two pages)

Nominations that were submitted for the 2005 and 2006 Awards may be reactivated, if the candidate remains eligible. All nominations and requests for nominations to be reactivated are to be submitted electronically.

To nominate a candidate for an award go to the ASBMB website, www.asbmb.org, and simply click on 2007 ASBMB Award Nominations where you will find a list of the 2007 awards. To nominate a candidate for an award or reactivate a 2005 or 2006 nomination, click on that award and you will see a description of the award, and links for nominating or reactivating.

Please note that the Awards Committee will aim to select candidates with the most appropriate and excellent accomplishments, keeping in mind that the awardees should reflect the diversity of the Society.

Awards open for nomination or the reactivation of a 2005 or 2006 nomination are:

ASBMB-MERCK AWARD • ASBMB-AMGEN AWARD • AVANTI AWARD IN LIPIDS • ASBMB/SCHERING-PLOUGH RESEARCH INSTITUTE AWARD • ASBMB-HOWARD K. SCHACHMAN PUBLIC SERVICE AWARD • ASBMB AWARD FOR EXEMPLARY CONTRIBUTIONS TO EDUCATION • WILLIAM C. ROSE AWARD

Annual Meeting Scientific Program

Meeting Organizers: Dr. Laurie S. Kaguni and Dr. George M. Carman

In addition to the multiple events celebrating the Society's 100th Anniversary, the 2006 ASBMB Annual Meeting was packed with a rich variety of award lectures, scientific sessions, and poster presentations. The scientific program, organized by Dr. George M. Carman and Dr. Laurie S. Kaguni, aimed to embrace the fundamental interest of the ASBMB membership, namely the "Chemistry of Life." The following are some scientific highlights from the meeting.

The Benefits of Eating Fish

In the William C. Rose Award lecture, Dr. William L. Smith of the University of Michigan Medical School described his findings on the anti-inflammatory, anti-thrombogenic, and anti-arrhythmic properties of omega 3 fatty acids from dietary fish oil. He reported that fish oil significantly diminishes the production and effectiveness of various prostaglandins that can accentuate inflammation and thrombosis.

Dietary fish oil causes its prostaglandin-lowering effects through three different mechanisms, said Smith. First, fewer prostaglandins are made from omega 3 fatty acids than omega 6 family of fatty acids. Second, omega 3 fatty acids compete with omega 6 fatty acids for the same binding site on the COX 1 enzyme that converts the omega 6 fatty acids to prostaglandin. Third, although omega 3 fatty acids also are converted to prostaglandins, the prostaglandins formed from omega 3 are generally 2 to 50 times less active than those formed from the omega 6 fatty acids from dietary plants.

William L. Smith of the University of Michigan Medical School receives the William C. Rose Award from Jack Dixon, a previous recipient of the award.

Blocking Bacterial Infection

Tuberculosis infection is a complex process that involves initial infection by *Mycobacterium tuberculosis* followed by a period during which the bacteria can lie dormant for years to decades. By elucidating the metabolic pathways that contribute to *M. tuberculosis* infection of lung tissue and survival during latency, Dr. Carolyn Bertozzi and her research team at the University of California, Berkeley, have discovered enzymes that are promising new drug targets. Bertozzi described her research in the "New Targets for Drug Discovery" session at the meeting.

On the surface of the *M. tuberculosis* bacterial envelope is a glycolipid virulence factor named sulfolipid-1 or SL-1. Dr. Bertozzi's group identified several enzymes in the pathway through which SL-1 is produced. They then determined the crystal structure of sulfotransferase, the first enzyme in the pathway, and now are using this information to design drugs that will block the enzyme and thus the production of SL-1.

Bertozzi is also investigating the metabolic pathways that may be important for the bacteria to survive during its latency period. The first step in one pathway involves the enzyme APS reductase. She and her research team generated a mutant strain of the

Featured 'Chemistry of Life'

tuberculosis bacteria that is deficient in APS. When mice were infected with this strain of the bacteria, it was found to be significantly less virulent than wild-type tuberculosis. Additional studies suggested that deficiencies in the type of metabolites produced by the APS reductase enzyme made tuberculosis bacteria more susceptible to nitric oxide and other oxidizing agents generated by the host cell.

Using Telomerase to Treat Cancer

The enzyme telomerase, once associated only with its role in replenishing the DNA in telomeres, now appears to be a factor in cancer progression. Dr. Elizabeth Blackburn, University of California at San Francisco Cancer Center, described her research group's studies on telomere and telomerase and how telomerase can be manipulated to fight disease and improve human health studies in the "Telomeres and Senescence" session.

Lower amounts of telomerase activity are present in many normal cells, where telomerase helps replenish normal tissue. In cancer cells, however, telomerase is much more active, and human cancers typically become dependent on these greatly elevated levels of telomerase to keep dividing indefinitely. Blackburn's research team found that knocking down high telom-

ASBMB & jbc 100 YEARS
Chemistry of Life

Chemistry of Life

Nobelist Paul Berg shares his thoughts with the next generation of scientists in an informal discourse in the ASBMB Lounge.

erase levels quickly inhibited cancer cell growth, even without shortening the telomeres, and altered the gene-expression profile of the cell to indicate diminished cancer progression.

The scientists also found a way to turn the high level of telomerase commonly found in cancer cells into a liability for the cancer. The researchers re-engineered telomerase so it would instruct the telomere to make mutant telomeric DNA. The telomeres with the intentionally faulty DNA were toxic to the cancer cells, quickly prompting them to undergo self-inflicted cell death. In pre-clinical tests, this approach had potent effects in blocking tumor growth.

Stabilizing Proteins to Combat Neurodegenerative Disease

In the "New Targets for Drug Discovery" session, Dr. Jeffery W. Kelly at The Scripps Research Institute described his work on the mechanisms through which protein misfolding cause neurodegenerative diseases such as Alzheimer's and Parkinson's.

Using this mechanistic understanding, Kelly has designed and synthesized small molecules to stabilize proteins against misfolding. These include small molecule chemical "chaperones" that stabilize a protein's three-dimensional structure, allowing it to travel and function more efficiently, as well as stabilizer molecules that allow proteins to function and not form amyloid.

This work is leading to the creation of first in class drugs for the amelioration of folding diseases. Two such molecules are in phase 3 clinical trials for the treatment of peripheral neuropathy, and Dr. Kelly believes the laboratory will have good compounds against Alzheimer's and Parkinson's disease within the decade.

HIV Transmission among Black Women

The HIV epidemic in the US increasingly affects black, heterosexual women in the South. In 2003, the HIV infection rate for black women in North Carolina was 14 times that of white women. In a session titled, "Minorities and the HIV/AIDS Epidemic," Dr. Fatu Monique Forna of the Centers for Disease Control and Prevention spoke about a case-control study that was conducted to identify factors associated with HIV infection among HIV-positive and HIV-negative black women residing in North Carolina.

Forna and her colleagues found that HIV-positive women were significantly more likely to be unemployed; receive public assistance; have 20 or more lifetime sexual partners; have a history of herpes; use crack/cocaine; have received money for sex; and to report a partner with a history of incarceration. They were less likely to have discussed sexual and behavioral histories with their male partners. Dr. Forna concluded that these findings demonstrate the need for a multi-dimensional approach to address HIV transmission in this population. Low levels of communication between sexually active black women and their partners may act as a barrier to sexual and behavioral risk reduction.

The Origin of the RNA World

It now seems almost certain that there once was an RNA World, that is a world in which RNA functioned as a genetic polymer and supported enzyme-like catalytic activity. Peptides may or may not have been important in this world but, if they were, they could not have been made by a process similar to modern day protein synthesis. The origin of the RNA World, therefore, has become a major focus of work on the origin of life. It is possible that RNA was the first replicating molecule that supported a complex "biological" organization.

Dr. Leslie E. Orgel of the Salk Institute discussed attempts to understand the origin of non-enzymatic nucleotide synthesis, nucleotide polymerization and polynucleotide replication in his talk in the "Current Themes in Molecular Evolution" session. He concluded that despite substantial successes, the obstacles to the prebiotic synthesis and replication of RNA are formidable. In response to the difficulties faced by an "RNA first" scenario, many researchers have begun to investigate simpler systems that might have evolved first, and then

"invented" RNA. These efforts have revealed a substantial number of novel polymers that have simpler backbones than that of RNA but still form pairing structures more or less related to RNA.

Hope for Hepatitis C Therapy from a MicroRNA

Recently, Dr. Peter Sarnow and a team of Stanford University scientists reported that the hepatitis C virus needs a specific microRNA, named miR-122, in order to replicate in cultured liver cells. When the scientists inactivated the microRNA, the amount of hepatitis C virus RNA was reduced by approximately 80 percent. The discovery was widely heralded for its potential to develop new antiviral agents against hepatitis C, the most common blood-borne viral infection in the United States.

Sarnow discussed his most recent findings in this work in the "RNA Structure and Translation" session on the final day of the meeting. The Sarnow team found that miR-122 binds to a specific noncoding binding region in virus, called target 5′ NCR. They also discovered that miR-122 does not affect mRNA translation or mRNA stability, which suggests that it alters mRNA abundance by increasing RNA replication.

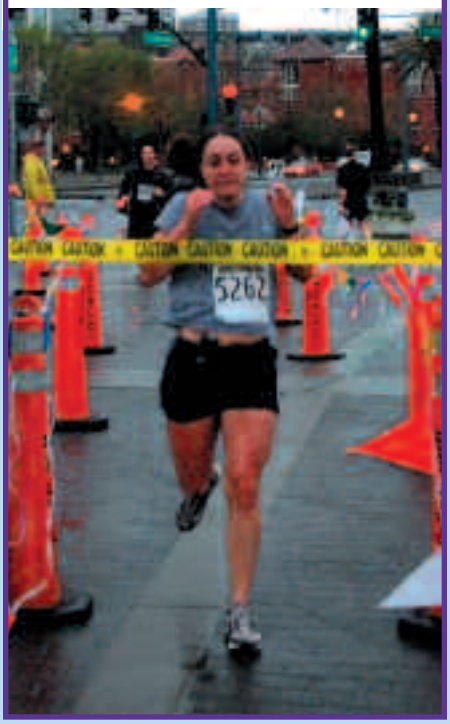
Mildred Cohn, first female president of the ASBMB speaking at the Women's Networking Session.

It Was Fun, Too...

A smash hit of the Birthday Bash was the trio of President-Elect Heidi Hamm, President Judith Bond, and Past-President Bettie Sue Masters in their performance,"Three Little Presidents Are We." This was part of a skit called "Publish or Perish" based on The Mikado by Gilbert and Sullivan. The music was adapted from the original by Jack Preiss and the words were by John Exton, both of whom are ASBMB members.

The dunk tank was a big hit at the Birthday Bash. ASBMB Publications Director Nancy Rodnan keeps a watchful eye on JBC *Deputy Editor Bob Simoni perched over a sea of water in the dunk tank as he waits for the next pitch to again dunk him into the water. Associate Editors who were "dunked" included Norma Allewell, David Russell, Jim Siedow, and William Smith.*

A special feature of the Centennial Meeting was a 5K Fun Run. Despite being conducted in some of San Francisco's finest drizzle there was a great turnout. Finishing first among the men was Nicolas Vitale from Strasbourg, France, in a time of 20:03. First among the women was Christine Freeman from the VA Medical Center at the University of Michigan. Her time was 22:30.



ASBMB Honors

Above: Herbert Tabor/Journal of Biological Chemistry Lectureship was the opening event of the ASBMB Centennial meeting. Seen at the award presentation are (left to right) Nobel Laureate Arthur Kornberg, JBC Editor Herbert Tabor, Bruce Thomas of Cadmus which sponsored the award, award recipient Charles C. Richardson of Harvard Medical School, and ASBMB President Judith Bond.

Left: Zorina Galis of Eli Lilly presents FASEB Excellence in Science Award to Marilyn Farquhar who shared the award with Elaine Fuchs.

Below Left: Michael Snyder, at left, presented Herbert A. Sober Lectureship award to J.R.Yates III of Scripps Research Institute.

Below: HHMI President Thomas Cech accepts ASBMB Award for Exemplary Contributions to Education from Craig Cameron of Pennsylvania State University. The topic for Cech's lecture was "Always a Teacher, Always a Student."

Schering-Plough Research Institute Award is presented to J.M. Berger by Schering-Plough Biopharma's Paul Heyworth.

FASEB President-Elect Leo Furcht presents FASEB Excellence in Science Award to Elaine Fuchs who shared the award with Marilyn Farquhar.

Richard W. Hanson receives the ASBMB-Merck Award from Gerard Waters, Director of Merck Research Labs.

ASBMB/AMGEN Award was presented to Ali Shilatifard. Pictured above are Joan Conaway of the Stowers Institute for Medical Research, Marc Learned of Amgen and Shilatifard, St. Louis University, School of Medicine.

At presentation of Avanti Award in Lipids were, from left, previous winner of the award Ed Dennis, this year's recipient Dennis Vance, Walter Shaw of Avanti, and ASBMB President Judith Bond.

NIA Stem Cell Chief Resigns

Mahendra S. Rao, head of the stem cell group at the National Institute on Aging (NIA), has resigned his government post to join Invitrogen Corp, saying the U.S. ban on federal funding of new embryonic stem cell lines posed a formidable barrier to his research goals. The move prompted speculation about the future of the such researchin the U.S.

"It is very disappointing when any scientist feels that they must leave the NIH because of politically driven restrictions on important medical research," Lawrence Goldstein at the University of California, San Diego, School of Medicine, told *The Scientist*. "It bodes ill for our country's leadership in important areas of scientific research and sends a very negative message to scientists and to patients who depend upon our scientists to make progress on new understanding and treatments for terrible diseases."

As Vice President of Research for Invitrogen, Rao now leads the company's newly formed stem cell and regenerative medicine business. In announcing the appointment earlier this month, Claude Benchimol, Invitrogen's senior vice president of research and development, said in a statement that Rao's leadership would "enable our company's technology portfolio to grow and adapt as stem cell therapies become more prevalent in modern medicine."

Rao, who joined the NIA as a senior investigator in 2001, has spent the past several months winding down his lab in Baltimore. Rao said the agency has decided that it will no longer work on embryonic stem cells, but an NIA spokeswoman would only say that the agency is "assessing its research needs and is seeking another talented investigator to contribute to the broad interests of this program, as is typical in the departure and hiring of any scientific staff."

The departure sparked debate over whether Rao's absence at NIA is indicative of a broader erosion of stem cell research efforts in the United States. "I'm optimistic that the NIH will continue to work in the stem cell field," said one NIH scientist, who declined be identified. Rao, however, told *The Scientist* he believed that the country is poised to lose its leadership position, a sentiment shared by some stem cell research advocates.

"The refusal to fund new embryonic stem cell lines — or even allow any working with them by NIH or other federal agencies — definitely is having an impact on the pace of U.S. embryonic stem cell science, and shifting the comparative advantage elsewhere," said John A. Robertson, at the University of Texas School of Law at Austin and chair of the American Society of Reproductive Medicine's ethics committee. Recent funding cuts for the NIH "contribute to a very poor environment for biomedical research in the United States at present," he added.

Rao said he had "strong hopes" of affecting policy change from within government. "After all," he reasoned, "the policy was a temporary policy, which would be evaluated as changes occurred." In a 2005 study published in *Nature Genetics,* Rao and his colleagues showed that human embryonic stem cells accrue changes in their genomes that could make them unusable therapeutically when cultured at length. It was strong evidence, he believed, that the policy should be modified, at least to replace existing cell lines. He took the data to the NIH stem cell steering committee, whose members, he said, were quite supportive of the science.

"I have no complaints with the NIH on that front, but the bottom line was they didn't feel that this would be sufficient," Rao said. "And, unfortunately, it didn't seem to me that the policy was going to change in the next couple of years."

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.

Nico Mitro
University of Siena, Siena, Italy

Ryan J. Perry
Dalhousie University, Halifax, Canada

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

Education Department to Investigate Treatment of Women in Science

Starting this summer, the U.S. Education Department plans to conduct in-depth investigations of whether selected colleges and universities are complying with federal anti-bias laws in their treatment of women in math and science.

The inquiries will cover how women are treated as students (at both the undergraduate and graduate levels) and as faculty members (including questions about hiring, promotion and tenure). The investigations will be conducted by the Education Department's Office for Civil Rights as full "compliance reviews," which look broadly at institutional policies and practices, and tend to be much more thorough and sometimes last much longer than investigations of a specific complaint.

Stephanie Monroe, assistant education secretary for civil rights, has been quoted as saying that "about a half dozen" institutions would receive compliance reviews and that they could last from a few months to years in which actions would be monitored. The reviews will be conducted under the department's authority to enforce Title IX of the Education Amendments of 1972, which bars sex discrimination in education programs receiving federal funds. Compliance reviews frequently end with agreements in which institutions agree to change certain policies, and with policy guidance that is broadened to apply to colleges that were not reviewed.

The planned investigations on how women are treated in science would mark a huge expansion of federal enforcement activities on behalf of women in science. A Government Accountability Office report in 2004, which criticized enforcement as inadequate, found that in the previous 11 years, the Education Department had conducted a total of three compliance reviews with regard to how colleges and universities handled science and gender equity.

Monroe said that a final list of institutions for reviews had not be selected, and that they would come from places where the department had heard reports of possible problems in the treatment of women.

While the reviews will examine any policies that exclude women from programs or jobs, Monroe stressed that the discrimination women face as students or faculty members in math and science may be "subtle" and may not involve written rules but "barriers" that are still quite real. She said that the department would examine policies that result in women "feeling unwelcome in pursuing advanced degrees or tenured positions." Such policies might include patterns of "glass ceiling" assumptions in which women aren't considered for certain kinds of positions, or where women with children are automatically placed on a "Mommy track."

In cases where there are policies that hinder the advancement of women, Monroe said that colleges and universities would have a chance to defend those policies and that they would not be considered automatically to be illegal. Gender gaps in enrollment, employment or tenure rates could lead to close scrutiny, but not necessarily to a finding of discrimination, she said.

Monroe also said that "our job as a law enforcement agency is not to push or influence decision making in terms of women and men making choices, but to make sure that women and men have the same opportunities."

Jocelyn Samuels, vice president for education and employment at the National Women's Law Center, said that she was pleased to learn of the planned compliance reviews because Title IX enforcement in math and science "has not been a priority" for the department.

Samuels agreed with Monroe that much of the bias in this area is not of the "no women allowed" variety, but more subtle. "Discrimination is much broader than explicitly saying 'we don't want you here because you are a woman.' There can be all kinds of forms of discrimination," she said.

Samuels said that "the devil will be in the details," asking: "Are they going to ask the hard questions? What kinds of remedial measures will they require if they find that barriers exist?"

Barry Toiv, director of communications and public affairs for the Association of American Universities, said that these institutions are making "very serious efforts" to attract more women to math and science, at the student and faculty levels.

Butterflies Lose Body Fat during Metamorphosis

By Nicole Kresge, Staff Science Writer

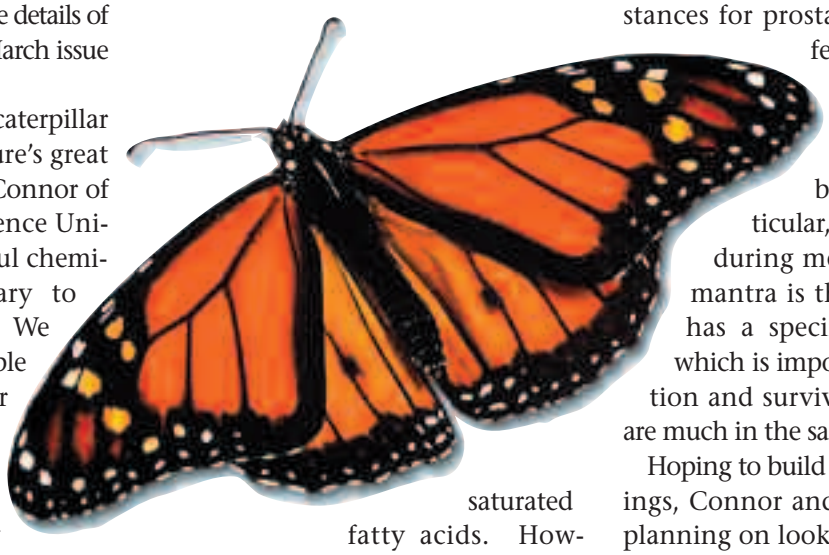
A group of scientists from Oregon have discovered that butterflies experience a great loss in body fat during metamorphosis. The details of their findings appear in the March issue of the *Journal of Lipid Research*.

"The transformation of a caterpillar to a butterfly is one on nature's great mysteries," says William E. Connor of the Oregon Health and Science University in Portland. "Powerful chemical mediators are necessary to produce this transformation. We hypothesized that considerable energy would be necessary for metamorphosis to occur. It appears as though the larva is sleeping, and one might think that very little energy would be required in hibernation, but the reverse must be true since a great deal of metabolic activity is occurring in the butterfly chrysalis."

Because of this energy expenditure, Connor and his colleagues surmised that butterflies experience a great loss in body fat during metamorphosis. Using the Blue Morpho butterfly from the Butterfly Farm in Belize, the scientists analyzed the fatty acid composition and content of the butterflies, their diet, and their larva. They were able to do this easily because the larva feed solely on the leaves of the rain forest tree *Pterocarpus*, on which the butterfly lays its eggs.

On a daily basis, they measured the food consumption of the larva and then analyzed the fatty acid composition and content of the diet as well as the larva. Once the larva had transformed into butterflies, the researchers examined the fatty acid composition and content of the butterfly.

They found that both the diet and the tissues of the larva and butterfly had a high concentration of polyunsaturated fatty acids. However, the larva had a much higher total fatty acid content than the butterfly, indicating that the transformation from larva to butterfly drastically reduced the total fatty acid content.



"We were particularly impressed with how the caterpillar concentrated these polyunsaturated fatty acids and then transferred them to the butterfly," says Connor. "The polyunsaturated fatty acids can act as precursor substances for prostaglandin and other ferments that may be very necessary in the health of both the larva and the butterfly and, in particular, the transformation during metamorphosis. The mantra is that every organism has a specific dietary pattern which is important for its maturation and survival. Human beings are much in the same category."

Hoping to build on these initial findings, Connor and his colleagues are planning on looking at the Monarch butterfly next. Monarch larva feed exclusively on milkweed, and Connor has already started growing milkweed and analyzing it for this purpose. "It has very high polyunsaturated fatty acid composition, much like the leaves in Belize which the Blue Morpho caterpillar feeds on," explains Connor.

AAMC Teaching Material Available on Web

The Association of American Medical Colleges (AAMC) has made available, on its new MedEdPORTAL resource, an index of freely available teaching materials that have been formally peer-reviewed. The web address is www.aamc.org/mededportal/

The AAMC is asking for your assistance as it continues to evaluate and expand the growing MedEdPORTAL system. You may browse the modest but growing list of MedEdPORTAL resources grouped by disciplines/specialties at services.aamc.org/jsp/mededportal/browseBy.do

While users are encouraged to register, searching MedEdPORTAL does not require users to log in.

Faculty are encouraged to search the system and submit their teaching materials to MedEdPORTAL in order to enhance the collection. Please send questions or comments to mededportal@aamc.org.

When Good DNA Goes Bad

When otherwise normal DNA adopts an unusual shape called Z-DNA, it can lead to the kind of genetic instability associated with cancers such as leukemia and lymphoma, according to a study by researchers at the University of Texas M. D. Anderson Cancer Center.

The study, issued in advance of the February 21, 2006, edition of the *Proceedings of the National Academy of Sciences*, demonstrates for the first time that the oddly shaped DNA can cause DNA breaks in mammalian cells. Interestingly, these sequences prone to forming Z-DNA are often found in genetic "hot spots," areas of DNA known to be prone to the genetic rearrangements associated with cancer. About 90% of patients with Burkitt's lymphoma, for example, have DNA breaks that map to regions with the potential to form these odd DNA structures.

Dr. Karen Vasquez

"Our study shows that DNA itself can act as a mutagen, resulting in genetic instability," says Karen Vasquez,* lead author of the study and Assistant Professor of Carcinogenesis at M.D. Anderson's Science Park Research Division in Smithville, Texas. "The discovery opens up a new field of inquiry into the role of DNA shape in genomic instability and cancer."

Imagine untwisting the DNA ladder and then winding it up the other way. The result is a twisted mess with segments jutting out left and right, and the all important base pairs that hold the DNA code zigzagging in a jagged zipper shape. Scientists call this left-hand twist Z-DNA. This is a far cry from the graceful right-hand twisted helix that has become an iconic symbol of biology. It just doesn't look right, and it doesn't act right either, according to Vasquez. This awkward shape puts strain on the DNA, and as Vasquez and her colleagues showed, can cause the DNA molecule to break completely apart.

The left-handed 'zigzag' nature of the Z-DNA backbone is depicted in the center of the molecule with canonical B-DNA on the ends. Single-stranded areas of ~3-4 base pairs are formed at the B-Z junctions.

(Wang & Vasquez, Mutation Research, 2006)

Scientists have known for many years that DNA can take shapes other than the typical twisted ladder form, but they weren't sure how often these alternate shapes occur inside cells.

Researchers who study these shapes had previously shown that Z-DNA can form only at certain DNA sequences because the shapes of the bases themselves contribute to Z-DNA formation. For example, the sequence CG repeated more than 14 times in a row is prone to forming Z-DNA, while the sequence AT is not as efficient at forming this structure. Analysis of the genome reveals that DNA sequences prone to forming the Z-DNA structure occur in 0.25 percent of the genome, according to Vasquez.

"We think that the DNA repair machinery may be involved in processing the Z-DNA structure differently in bacteria versus human cells."

—Dr. Karen Vasquez

She and her colleagues decided to find out whether Z-DNA itself had any effect on the DNA stability. To do that, post-doctoral fellow Guliang Wang made pieces of DNA designed to form the Z-DNA shape. The researchers then introduced plasmids containing these segments of DNA into bacterial cells and human cells in the laboratory. They then broke apart the cells and examined what happens to the DNA. They found that in bacterial cells, the Z-DNA caused small deletions or insertions of one or two DNA bases. But in human cells, the introduced Z-DNA led to large-scale deletions and rearrangements of the DNA molecule.

"We discovered that bacterial cells and human cells process the Z-DNA in different ways," she says. "We aren't sure why, but we think that the DNA repair machinery may be involved in processing the Z-DNA structure differently in bacteria versus human cells."

Since formation of Z-DNA is naturally occurring and can exist in the genome, the scientists next want to understand why cells can sometimes process the structure without creating double-stranded breaks. They also want to know why certain places in the genome become "hot spots" for these breaks, while other seemingly similar areas do not.

* *ASBMB member.*

Juliette Bell Named Provost and Vice Chancellor for Academic Affairs At Fayetteville State

A biochemist who was valedictorian of her high school and college graduating classes and was once cited as a "Giant in Science" is the new Vice Provost and Chancellor for Academic Affairs at Fayetteville State University.

Dr. Juliette B. Bell, Dean of the College of Basic and Applied Sciences, Professor of Chemistry, and Director of the Biomedical Research Program at FSU was confirmed for the appointment in January 2006 during a meeting of the University of North Carolina Board of Govemors in Chapel Hill. Bell was selected for the position after a nationwide search.

"Dr. Bell is a renowned scholar and a highly qualified administrator," said FSU Chancellor T.J. Bryan. "We are extremely fortunate to have someone of her caliber; she will play a vital role in FSU's quest to increase its academic offerings at both the undergraduate and graduate levels."

Bell, a native of Talladega, Alabama, earned her Bachelor of Arts degree in chemistry from Talladega College. She earned a doctorate in chemistry with a concentration in biochemistry from Atlanta University in 1987. That same year, she joined the University of North Carolina at Chapel Hill as a postdoctoral fellow in the Department of Biochemistry and Nutrition. While at UNC-Chapel Hill, Dr. Bell was named a Carolina Minority Postdoctoral Scholar and also received a National Research Service Award Postdoctoral Fellowship from the National Institutes of Health. In 1990, Bell joined the Laboratory of Molecular Genetics at the National Institute of Environmental Health Sciences in Research Triangle Park, North Carolina, as a Senior Staff Fellow. After serving in that capacity for two years, she joined the faculty of FSU in 1992 as an associate professor and later as director of the Biomedical Research Program. She was appointed as interim dean of the newly formed College of Basic and Applied Sciences in January 2004 and as dean in July that same year.

As dean, Dr. Bell led FSU in development of new 21st-century programs including biotechnology and forensic science, and the development and accreditation of the new B.S. degree in nursing.

Bell has earned numerous national honors and awards. In 1997, she earned the National Association for Educational Opportunity in Higher Education (NAFEO) Research Excellence Award. At FSU, she has been named Teacher of the Year for the Department of Natural Sciences four times and for the College of Arts and Sciences twice. She was named University Teacher of the Year in 1999-2000. Also, in 2000, she earned the prestigious University of North Carolina Board of Governors Award for Excellence in Teaching, and she was featured as one of 10 African-American Life Scientists in an exhibition at the Chicago Museum of Science and Industry titled "Defying Tradition: African American Women in Science and Technology". In September 2000, Dr. Bell was one of only four individuals in the nation to receive the "Millennium Award for Excellence in Teaching" from the White House Initiative on Historically Black Colleges and Universities. In 2001, she was awarded the "National Role Model Mentoring Award" by Minority Access, Inc.

Dr. Juliette B. Bell

Bell is a prolific grant writer, having garnered more than $6 million in grants to support biomedical research at FSU. She has also trained numerous undergraduate and master's students to enter biomedical professions. Her research on enzymes involved in DNA biosynthesis and mutagenesis has been presented at national conferences and has been published in professional journals. She is an active member of several national professional organizations, including the American Society for Biochemistry and Molecular Biology, for which she serves as the chairperson of the Minority Affairs Committee. She serves as an expert consultant on research and minority program issues to public, private, and governmental agencies such as the National Institutes of Health and the National Science Foundation.

Stanford Scientists Find Basic Defect in Cystic Fibrosis Airway Glands

By Nicole Kresge, Staff Science Writer

Scientists at Stanford University have determined that the buildup of sticky mucus found in cystic fibrosis is caused by a loss in the epithelial cell's ability to secrete fluid. This research appeared as the "Paper of the Week" in the March 17 issue of the *Journal of Biological Chemistry*.

Cystic fibrosis is the most common, fatal genetic disease in the United States. It causes the body to produce thick, sticky mucus that builds up in the lungs and blocks the airways. This makes it easy for bacteria to grow and leads to repeated serious lung infections. The thick, sticky mucus can also block tubes in the pancreas, preventing digestive enzymes from reaching the small intestine.

The disorder results from mutations in the gene for the cystic fibrosis transmembrane conductance regulator (CFTR), a membrane channel regulator essential for proper salt and water movement across some epithelia. Currently, there are two essentially opposite explanations for the inability of the body to clear mucus from the airways in cystic fibrosis. The first is that the defective CFTR is unable to aid in fluid secretion in cystic fibrosis airway glands. The second explanation is that the glands still secrete fluid via non-CFTR pathways, but the fluid is reabsorbed by other channels. In fact, it has been proposed that one of CFTR's functions is to inhibit the activity of a channel called the epithelial Na+ channel (ENaC).

Nam Soo Joo and colleagues at Stanford University attempted to determine which hypothesis was correct by measuring the secretion from glands from patients with cystic fibrosis and from normal pigs. They added ENaC inhibitors to the glands to determine if the channel plays a role in mucus clearance. The researchers found no evidence that the inhibitors altered secretion rates in either normal or cystic fibrosis glands. This suggested that loss of CFTR-mediated fluid secretion is the culprit in cystic fibrosis.

"We previously showed that cystic fibrosis airway glands have defective gland secretion in response to certain drugs," explains Joo. "The results of our present study provide evidence that the defective cystic fibrosis gland secretion is not due to a potentially excessive fluid reabsorption pathway within glands but is due most likely to a lack of fluid secretion from cystic fibrosis glands."

Cecile M. Pickart, 1954-2006

Former ASBMB Council member Cecile M. Pickart, Professor of Biochemistry and Molecular Biology at the Johns Hopkins Bloomberg School of Public Health, died April 5 after a long battle with kidney cancer. She was 51.

Pickart earned her bachelor's degree in 1976 from Furman University where she graduated summa cum laude and was co-valedictorian. An accomplished musician, she supported herself in college as a classical bass player. She went on to earn her doctorate in biochemistry from Brandeis University in 1982, which was followed by postdoctoral studies at the Institute for Cancer Research in Philadelphia, Pa. For 10 years, Pickart served on the faculty of the School of Medicine at the State University of New York at Buffalo. In 1995, she joined the Bloomberg School of Public Health as a professor in the Department of Biochemistry and Molecular Biology.

Throughout her career, Pickart's research focused on the role of ubiquitin, an essential protein involved in critical cellular processes, including the repair of DNA. Ubiquitin searches the body for damaged or misshapen proteins and signals them for destruction. The goal in understanding how ubiquitin works is to assist in the development of drugs for prevention or treatment of diseases including cancer, Parkinson's, Huntington's and Alzheimer's.

Pickart was highly regarded by her colleagues as an exceptionally talented and dedicated scientist and by her students as a caring mentor. Pickart's groundbreaking research findings on ubiquitin received great prominence and she was widely sought as an organizer of and speaker at international scientific conferences on the topic.

Funeral services were held at Bunting-Meyerhoff Interfaith and Community Services Center, Baltimore on Monday, April 10.

by John D. Thompson, Editor

Industry Study Finds Bioscience Fuels Jobs, Growth for States

States and regions across the country are working to develop and promote the growth of their bioscience bases, according to the study "Growing the Nation's Bioscience Sector: State Bioscience Initiatives 2006," released at Biotech 2006 by Battelle and the Biotechnology Industry Organization (BIO). The biosciences are a growing and vibrant sector of the U.S. economy, with more than 40,000 businesses employing 1.2 million people in all 50 states, Puerto Rico, and the District of Columbia.

"Growing the Nation's Bioscience Sector: State Bioscience Initiatives 2006" profiles state policies and programs that provide support to bioscience companies. The report also provides state-by-state employment data for all bioscience sectors, including drugs and pharmaceuticals, medical devices and equipment, research, testing and medical laboratories, and agricultural feedstocks and chemicals.

"This report shows that when states invest in building bioscience industries, they are at the same time making long-term investments in their citizenry with higher education – especially in science, math and technology. These investments pay off with high-wage, new economy jobs, in a growing industry," said Jim Greenwood, president and CEO of the BIO. "The industry's growth and the benefits are not just in health care, but also in agricultural, industrial and environmental biosciences."

Key findings of the report include:

Total employment in the biosciences in the United States reached 1.2 million in 2004, with bioscience workers found in all 50 states and Puerto Rico. The highest rate of growth in jobs is in the research, testing, and medical laboratories sector.

The nation's 1.2 million bioscience jobs generated an additional 5.8 million jobs in the economy. Each bioscience job in the United States generates 5.7 additional jobs in affiliated industries.

States are spending billions of dollars to support bioscience research and development, with research funds and construction of academic and medical facilities.

States are also using investment funds and tax incentives to attract large industry anchors, instead of solely focusing on launching and growing new bioscience ventures.

Smaller states that have not traditionally invested in building bioscience industries are beginning to do so.

All 50 states and Puerto Rico are working to develop and promote the growth of their bioscience bases. Each of these states recognizes that by focusing on its own strengths, it will succeed in capturing the economic benefits of bioscience discoveries.

The study was funded by BIO and Battelle, and is available on the BIO web site at www.bio.org/local/battelle2006/ and the Battelle web site at www.battelle.org/news/06/default.stm.

Clinton Highlights Biotechnology's Value

Former President Clinton, speaking April 11 at the BIO 2006 International Annual Convention, discussed the importance of biotechnology in addressing food security and health issues in the developing world.

"The first obligation of society is to feed its people," he stated. "Biotechnology can help us feed more people while addressing environmental concerns such as global climate change."

Clinton also discussed the importance of efficiently managing agricultural production. Climate change and top soil erosion are two key aspects of environmental health that agricultural biotechnology can address. The third is energy policy.

"I'm proud to have supported the development of crops improved through biotechnology and the creation of science-based regulations during my Administration. These crops reduce inputs, allow us to grow more food on less land, and easily transfer technology to people in the developing world. When we empower individuals to feed and care for their families, it is a good thing."

"All of these applications of biotechnology – agricultural, environmental, energy, medical – have the potential to lift people out of poverty. This integration of communities will lead to greater global security."

For Your Lab/For Your Lab/For Your Lab

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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by John D. Thompson, Editor

Innovation via Acquisition: Amgen Acquires Abgenix

Biotechnology company Amgen and Abgenix, a company specializing in the discovery, development and manufacture of human therapeutic antibodies, have signed a definitive merger agreement under which Amgen will acquire Abgenix for approximately $2.2 billion in cash plus the assumption of debt. Under the terms of the agreement, shareholders of Abgenix will receive $22.50 in cash per common share. Amgen anticipates a $0.05 to $0.10 dilution of adjusted earnings per share in 2006 and 2007 and for earnings to be accretive thereafter.

Amgen has been bullish about touting the fact that with the merger it now has full ownership of one of its most important advanced pipeline products, panitumumab, which it had been collaborating on with Abgenix since 2002. Amgen was already leading the development and commercialization strategy for panitumumab. The acquisition of Abgenix also eliminates a tiered royalty due to Abgenix on future sales of denosumab, another pipeline product that is in clinical trials.

In addition to securing various potential preclinical compounds and leads, Amgen also now owns the XenoMouse antibody technology developed by Abgenix, which was used in discovery efforts for panitumumab and denosumab.

"The XenoMouse technology is used to create fully human monoclonal antibodies, the goal of which is to develop antibodies that are less immunogenic," according to Trish Hawkins, an Amgen spokesperson. "That's an important goal in drug discovery and development efforts."

By creating a fully human monoclonal antibody, the XenoMouse technology ensures that there is no murine (mouse) protein in the antibodies, which avoids a human body's immune system response in the form of infusion reactions, allergic reactions or anaphylaxis.

Amgen believes that potential peak worldwide sales for panitumumab could reach $2 billion or more, assuming success of panitumumab in several clinical trials evaluating multiple lines of therapy in colorectal cancer and head and neck cancer. Hawkins suggests that with Amgen facing such large potential profits and now eliminating the need to pay royalties to Abgenix, this could help boost current and future preclinical efforts by making more money available to the company for research and development.

Agricultural Biotech the Focus for Taiwan

Taiwan's presence at the Biotechnology Industry Organization's convention, April 9-12 in Chicago, was decidedly green, with a heavy emphasis on the island's emerging agricultural biotech sector.

Agri-biotech, herbal medicine, and health food companies exhibiting at the event included:

Microbio has a product fermented from soybeans, which the company claims enhances the activity of natural killer cells and restores appetite and energy in cancer patients; modulates the immune system; and improves intestinal microflora.

The Sinphar Group is producing green tea extract health products that are expected to reach the market in 2007 as an FDA-approved medicine-grade ingredient. Green tea contains antioxidants that are potent in fighting free radicals and pro-oxidants; thought to help prevent some forms of cancer including colon, pancreatic, and stomach cancer; protecting against liver damage; and aiding in weight loss.

Well Shine Biotechnology Development Co., Ltd. has developed techniques to cultivate medicinal fungus to be used as a health food for improving the immune system. Using triterpenoid-rich Antrodia camphorate, a traditional Chinese medical fungal species, the company has received U.S., Taiwan, Hong Kong and China patents for its products.

Exon Science Inc. was at BIO 2006 displaying its gene-modified orchids, plants that resist cold or blight. The company also produces bioreactors for use in protein drug manufacturing facilities.

Favorgen Biotech Corp., while not an agri-biotech company, was at BIO 2006 showcasing its manufacturing capabilities for the production of high-quality molecular biology products and clinical chemical reagents.

Career Opportunities

SCIENTIST/ENGINEER (NORTHERN NJ)

Personnel Group of Warren/EDK Assoc.

Growing biotech company is seeking a scientist to develop and engineer cell lines and fermentation processes for protein expression. Will also have responsibility for lab scale bacterial and yeast fermentation. BS/MS and 3+ years industry exp desired. Contact Kelly Petrozelli at (908) 754-6000 or Kellyp@personnelgroup.com

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POSTDOCTORAL POSITIONS

New York Medical College

Postdoctoral positions available immediately to study the mechanism of bacterial DNA topoisomerase I and analyze/model interactions with novel antibacterial compounds (J. Biol. Chem. 280:38489, 2005). The research will combine HTS, chemical modification and mutagenesis. Demonstrated expertise in fluorescence spectroscopy, enzyme kinetics, protein purification, molecular modeling or bacterial genetics is desirable. Our campus is located 30 minutes north of New York City. Send CV, contact information for three references to:

Prof. Y.-C. Tse-Dinh
Department of Biochemistry & Molecular Biology
New York Medical College
Valhalla, NY 10595
Email: yuk-ching_tse-dinh@nymc.edu

Columbia University

Positions are available in the laboratory of Dr. Stephen L. Sturley at Columbia University, New York, at the level of postdoctoral fellow and require a Ph.D./MD, with experience in molecular biology and preferably, but not essentially, some knowledge of yeast genetics or lipid metabolism. The successful candidate will work on a project studying an aspect of our studies on lipid homeostasis. In particular we are searching for committed and motivated individuals for our studies on sterol transport and sphingolipid homeostasis and its role in neuro-degeneration. Salaries are of course commensurate with experience.Contact Steve Sturley at (212) 305 6304 or sls37@columbia.edu for further details.

University of California, San Diego, School of Medicine

The University of California, San Diego, School of Medicine invites applications from PhD and MD backgrounds for a position as Assistant Research Scientist in the Division of Endocrinology and Metabolism http://medicine.ucsd.edu/endo/. The applicant must have an exemplary record of extramural funding and publication and be prepared to establish an independent research program, preferably in the area of blood vessel function and angiogenesis related to cardiovascular function and diabetes. Candidates should have experience in the physiology of vascular function and the relevant signaling mechanisms. The Endocrinology and Metabolism Division has a faculty of 14 physicians and 35 PhD scientists. Reply by May 22, 2006 to the division head Dr. W. Dillmann; or wdoffice@ucsd.edu. Applications received after the closing date will be accepted until the position is filled. UCSD is an AA/EOE with a strong institutional commitment to the excellence through diversity.

University of California, San Diego
Department of Medicine
9500 Gilman Drive (BSB/5068) #0618
La Jolla, CA 92093-0618
wdoffice@ucsd.edu

Calendar of Scientific Meetings

MAY 2006

Canadian Proteomics Initiative—The Sixth Annual International Conference

May 10–12 • University of Alberta, Edmonton, Canada
The program developed for CPI 2006 offers something for everyone with an interest in proteomics, bioinformatics, and structural biology. CPI will offer three post-conference workshops on May 13-14: Bioinformatics for Proteomics, Practical Proteomics, and Introduction to Transcriptomics.
Co-Chairs: Joel H. Weiner and David Wishart, University of Alberta. Contact: Steven Leard, steven@marketwhys.ca
phone: 780-414-1663; fax: 780-414-1664; Website: cpicanada.org

FEBS Special Meeting on Cellular Signaling -

May 26–June 1 • Dubrovnik, Croatia
www.dubrovnik-conference.org

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

JUNE 2006

20th IUBMB International Congress of Biochemistry and Molecular Biology and 11th FAOBMB Congress in conjunction with 79th Annual Meeting of the Japanese Biochemical Society and 29th Annual Meeting of the Molecular Biology Society of Japan

June 16–23 • Kyoto, Japan
Deadline for On-line Registration: May 18, 2006
Website: www.congre.co.jp/iubmb/registration.html

Bacterial Cell Surfaces
A Gordon Research Conference

June 25–30 • Colby-Sawyer College
New London, New Hampshire
Chairs: Ry Young and Arnold J. Driessen
Vice Chairs: Anne H. Delcour and Jeff Errington

4th Annual Meeting of the International Society for Stem Cell Research

June 29–July 1 • Metro Toronto Convention Centre
Toronto, Ontario, Canada
For information on the ISSCR Annual Meeting, contact ISSCR Headquarters: Ph: 847-509-1944; E-mail: isscr@isscr.org
Conference Administrator: Deb Pederson dpederson@isscr.org
Press Inquiries: Heather Gagnon hgagnon@isscr.org
Conference Director: Liz Freyn lfreyn@isscr.org

JULY 2006

Third Annual World Congress on Industrial Biotechnology and Bioprocessing

July 11–14 • Toronto, Canada
Sponsored by the Biotechnology Industry Organization (BIO), American Chemical Society (ACS), National Agriculture Biotechnology Council (NABC), Agri-Food Innovation Forum, and BIOTECanada.
Email: worldcongress@bio.org; Ph: 202-962-9200

ASCB 2006 Summer Meeting: Stem Cell Niches

July 15-18 • Boston University
Organized by Sean Morrison, HHMI/University of Michigan
Keynote: Allan Spradling, Carnegie Institute of Washington/HHMI
Session 4: Hematopoietic Stem Cell Niches (Cont.)
Session Chair: Fiona Doetsch
Session 5: New Niches for Stem Cells
Session Chair: David Scadden

17th International Symposium on Plant Lipids

July 16–21 • Michigan State University Campus, East Lansing
Organizer: Christoph Benning
For registration information, preliminary program, instructions for submitting abstracts, and for information on financial aid available for young scientists to attend the meeting, go to: www.ispl2006.msu.edu/. Members of underrepresented groups are especially encouraged to apply for financial aid.

Bioscience 2006: Bioscience for the 21st Century

July 23–27 • Glasgow, Scotland
Abstract Submission Deadline: April 13, 2006
Early Registration Deadline: May 22, 2006
For information: www.BioScience2006.org

Biochemical Journal Symposium
Literature, Legacy, Life

July 24 • Glasgow, Scotland
Celebrating 100 Years of Biochemistry
For information: www.BioScience2006.org

AUGUST 2006

ISPMB 2006 – 8th International Congress of Plant Molecular Biology

August 20–25 • Adelaide Convention Centre, South Australia
Abstract and Early Registration Deadline: Friday, March 3.
Online registration and abstract submission pages:
www.sallyjayconferences.com.au/ispmb2006/registration.htm
www.sallyjayconferences.com.au/ispmb2006/abstract.htm
Abstracts cannot be accepted without registration and payment. All abstracts must be submitted online, abstracts sent as attachments will not be accepted.
www.sallyjayconferences.com.au/ispmb2006/program.htm

SEPTEMBER 2006

5th European Congress of Biogerontology

September 16-20 • Istanbul, Turkey
Tel: +90 216 347 35 35 Pbx; Fax: +90 216 347 78 50
Email: okarabel@symcon.com.tr; Website: www.symcon.com.tr
Congress President Prof. Serif Akman, Etlik, Ankara , Turkey
Tel: +90 312 304 3306; Fax: +90 312 304 3300
E-mail: sakman@gata.edu.tr

The 33rd Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)

September 24–28 • Disney's Contemporary Resort, Lake Buena Vista, FL
Contact: FACSS, PO Box 24379, Santa Fe, NM 87502
Phone: 505-820-1648; Fax: 505-989-1073
Email: facss@facss.org; Web Page: www.facss.org

OCTOBER 2006

International Conference of Immunogenomics and Immunomics

October 8–12 • Budapest, Hungary
A joint meeting of 2nd Basic and Clinical Immunogenomics and 3rd Immunoinformatics (Immunomics) Conferences
Email: diamond@diamond-congress.hu
Website: www.bcii2006.org

4th International Conference on Structural Genomics

October 22 – 26 • Beijing, China
Website: http://www.sino-meetings.com/icsg2006/

NOVEMBER 2006

Transcriptional Regulation by Chromatin and RNA Polymerase I I

November 2–6 • Kiawah Island, South Carolina
Organizer: Ali Shilatifard, Saint Louis, University School of Medicine, Email: shilatia@slu.edu

Annual meeting of the Society for Glycobiology

November 15-18 • Los Angeles
Contacts: Linda Baum, President; lbaum@mednet.ucla.edu
Kelley Moremen, Secretary; moremen@uga.edu
Website: www.glycobiology.org

APRIL 2007

Second Workshop on Biophysics of Membrane-active Peptides

April 1 – 4 • Lisbon Science Museum, Portugal
The Lisbon Science Museum includes a 19th century lab and lecture room. Conference call for papers: special theme issue of J Pep Sci. Symposia: Membrane-translocating peptides / Cell penetrating peptides, Membrane-permeabilizing peptides / Antimicrobial peptides, Fusogenic peptides, and Structure and Dynamics in peptide-membrane interaction, Plenary lectures: Jöel Schneide: Bio-active properties of peptide surfaces. Robert Hancock: Antimicrobial peptides. Stuart McLaughlin: Electrostatic interaction of basic peptides with acidic lipids in membranes.
Abstract submission, January 15, 2007, Early registration, January 15, 2007, Faculty of Sciences, University of Lisbon, Miguel Castanho, Ph.D.
For Further information: www.biophysicsmap.com

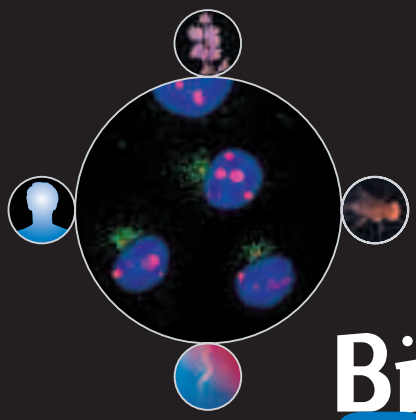
American Society for Biochemistry and Molecular Biology Annual Meeting in Conjunction with EB2007

April 28 – May 2 • Washington, DC
Contact: ASBMB 2007, 9650 Rockville Pike, Bethesda, MD 20814-3008
Ph: 301-634-7145
Email: meetings@asbmb.org
Website: www.asbmb.org/meetings

OCTOBER 2007

34th Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)

October 12–18 • Memphis Convention Center, Memphis, TN
Contact: FACSS, PO Box 24379, Santa Fe, NM 87502.
Ph: 505-820-1648; Fax: (505) 989-1073
Email: facss@facss.org; Web Page: www.facss.org



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- Donny Strosberg
- Mike Waterfield
- Lewis Wolpert

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- Ion channels
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- Coordination of cellular processes

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- Simon Boulton
- Phillip Hawkins
- Seamus Martin
- Kim Nasmyth
- Martin Raff
- Sir Gregory Winter

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Early Registration Deadline: Monday 22 May 2006

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