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# ASBMB Today

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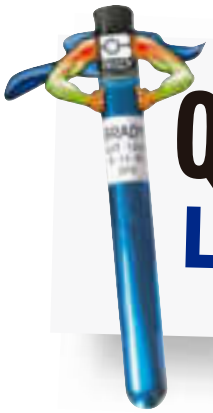
AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY



# On the Cutting-Edge

## *Annual Meeting Highlights*

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# ASBMB Today

AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY

AUGUST 2004,
Volume 3, Issue 5


ON THE COVER:

**12 Cutting-Edge Symposia Highlighted IUBMB/ASBMB Meeting**

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# Member Sees 'No Shortage' of Scientists in U.S.

Dear Editor:

I wish to respond to the recent article in the *ASBMB Today* by Peter Farnham regarding ASBMB's position that there is a shortage of scientists in the U.S. and that more relaxed immigration policies are needed to increase the number of foreign scientists to meet this demand.

Having been in both academia as well as industry for the past 25 years I find the ASBMB's assertion to be very difficult to believe, if not completely preposterous. to the point of being dishonest. The 'real' data are distorted or ignored and the conclusions are merely self serving by academia. Let us face reality here, foreign scientists 'in training' provide a cheap labor pool for academic researchers. There is no current or future shortage of well trained scientists from the U.S. This is at least true in my field of biochemistry. In fact, I have found quite the opposite.

Jobs for good, well trained scientists born in the U.S. are extraordinarily difficult to come by and they have been for the past 20 years. Many of my colleagues, with Ph.D. degrees from major universities with productive track records, have shared with me their desire NOT to encourage their own children to go into to science because there is no reward at the end of a long journey of hard work and dedication.

Industry is also blame for this perceived 'shortage.' Many of my colleagues at the ripe old age of 40 to 50 find themselves to be 'too senior' to be employed by U.S. companies. I know this for a fact. My own company of 10 years said "there simply are not enough jobs for senior scientists here."

There are many outstanding scientists who could contribute immensely to solving this country's problems, but they are just sitting idle at home. Or, they are so underemployed that they do not use their training or scientific acumen. Getting an advanced degree was a waste of time. Our country should be ashamed that it treats its scientists like disposable plastic bags. Once used, discard in the landfill.

The ASBMB is severely out of touch with reality and serves only its own interests. Why doesn't the ASBMB spend its efforts trying to encourage the government to hire home trained scientists that are unemployed, rather than just amplifying an already abysmal job market? Why is the ASBMB not more aggressive about seeing that experienced scientists are not thrown by the wayside, not because they didn't do a good job or that they didn't help their companies make money, but simply because they got older?

Wake up ASBMB, be honest, there is a great labor pool out there already, willing and able to contribute. I wonder why the NSB report to the government doesn't solicit input from those multitudes who currently need jobs?

It is truly shameful.

*Sincerely,*
Thomas G. Warner, Ph.D.
ASBMB member for many years.
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San Carlos, CA 94070
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by Peter Farnham, CAE, ASBMB Public Affairs Officer

# NIH Gets Just Over 2% in

The House Labor-HHS-Education Appropriations Subcommittee marked up its FY 2005 spending bill July 8. The subcommittee unanimously approved $200 million more than President Bush had requested for 2005 education and health programs, with a Democratic bid for even more education spending quashed along party lines.

The Labor-HHS Appropriations Subcommittee voted 18-0 to send the $492.3 billion spending bill to the full appropriations committee, which planned to mark it up the following week. The measure contains $142.5 billion in discretionary funding, a $3 billion, 2.2 percent increase over fiscal 2004. This is slightly higher, just $202 million more, than the amount President Bush requested in February. The bill includes $349.8 billion in mandatory spending for entitlement programs such as Medicaid.

The bill funds NIH at the President's level, $28.5 billion, or about $727 million more than FY 2004. All institutes and centers are funded at the Administration's requested levels. This appropriation was far short of the $30.6 billion advocated for by ASBMB and the rest of the biomedical research community for FY 2005.

ASBMB President Judith Bond, Pennsylvania State University College of Medicine, stated that "We all realize that public funds are needed to support many worthy projects, but the nation's health is an investment, not an expenditure." She expressed concern that the subcommittee-approved level of funding for NIH does not even equal the increased cost due to biomedical inflation. Dr. Bond noted, "This is, in effect a cut in the NIH budget. It is likely that this will lead to a loss of as many as 640 grants this fiscal year. This has serious implications for biomedical research. For one thing, it makes it even more difficult for new ideas to be pursued. It is the American people who ultimately suffer from this slowdown in total effort to explore new strategies that might lead to progress in the war against disease."

The Centers for Disease Control and Prevention would receive $4.2 billion, $138 million less than fiscal 2004 but $15 million more than the Bush request. The decrease reflects reduced spending on infrastructure projects.

Subcommittee Chairman Ralph Regula of Ohio acknowledged that his panel was operating under tight budget constraints, which limited increases for politically popular programs such as medical research, funding for Title I schools serving low-income students, and state grants for education of disabled children.

"We would all like to have more money," Regula said. He added that the bill represented "the best use of the funds available" under the proposed FY 2005 budget resolution.

### The Obey Amendment

Regula opened the mark-up hearing by asking if there were any members who wanted to comment on the bill. Ranking Democrat Dave Obey of Wisconsin complained bitterly about the bill's shortcomings, although he acknowledged that Regula had done the best he could with the allocation he had received under the budget resolution.

Obey mentioned that the NIH increase in the bill was the smallest in 19 years and did not keep up with the Biomedical Research and Development Price Index (a measure of biomedical inflation, commonly referred to as the "Bird-Pie"). Obey, quoting NIH-provided statistics, said that the proposed funding level would require NIH to cut the number of new and competing grants by 640 from last year if they were all to be funded at the level of medical inflation.

When Obey was finished, Regula noted the increases for education in

*This is, in effect a cut in the NIH budget. It is likely that this will lead to a loss of as many as 640 grants this fiscal year. This has serious implications for biomedical research. For one thing, it makes it even more difficult for new ideas to be pursued. It is the American people who ultimately suffer from this slowdown in total effort to explore new strategies that might lead to progress in the war against disease.*

—ASBMB President Judith Bond

# House Subcommittee Markup

the bill and added that "NIH has to look at how they spend the money we give them." He said that giving automatic increases to NIH does not automatically guarantee quality.

Obey then offered his amendment to add $7.4 billion to the bill, including a $5.6 billion increase for education and about $500 million more for NIH. This was the same amendment he brought to the House floor in late June during debate on the budget resolution. Obey proposed a 30 percent reduction in tax cuts enacted in 2001 and 2003 for those with annual incomes of more than $1 million.

During discussion of the amendment, Rep. Randy "Duke" Duke Cunningham (R-CA) told a somewhat laborious story about two pig farmers who raised their pigs on their own and then were taxed by the government. The story appeared to be a metaphor, representing how the amendment would hurt small businesses.

Cunningham's story, although not exactly the rhetorical high point of the day, seemed nonetheless to have been effective, as the Obey amendment failed on a party-line vote of 7-11. While Obey may again try to attach it to the bill when the full committee meets, realistically, there is little chance it will pass.

The bill was scheduled to go to the House floor the week of July 19.

A press release and a table detailing the subcommittee's bill are available on the ASBMB website, www.asbmb.org, under the "What's New" column on our homepage. Click on the link and you will be connected to a House Appropriations Committee page giving full details.

by Peter Farnham, CAE, ASBMB Public Affairs Officer

# House Subcommittee Holds

The House Energy and Commerce Subcommittee on Oversight and Investigations held a third hearing, June 22, on the issue of NIH Conflicts of Interests. The event was titled "NIH Ethics Concerns: Consulting Arrangements and Outside Awards".

During opening statements by members of the committee a theme emerged: NIH is the crown jewel of the federal government, but these problems have cast a luster on this organization. Thus, something must be done to preserve the integrity of NIH. Congresswoman DeGette said that even rare cases must be prevented because the public trust of NIH is at stake and Congresswoman Schakowsky said that Americans must have faith in the biomedical research infrastructure. Dr. Zerhouni even commented that these incidents have lowered moral at NIH and that people want to fix the problem quickly. To accomplish that, Dr. Zerhouni laid out additional new policies; some which he said could be done internally while others may require new legislation. These include:

- A ban on ownership of drug company or biotech stocks by some key employees.
- Restricted stock ownership for all other employees.
- No membership on corporate boards.
- The creation of a centralized registry of all outside arrangements and a public list of the awards that employees may receive.
- A prohibition of all paid consulting or speaking engagements at institutions that receive NIH funding.

For a more detailed explanation of these rules, see Dr. Zerhouni's testimony at: http://energycommerce.house.gov/108/Hearings/06222004hearing1312/Zerhouni2076.htm

Zerhouni's actions were well received by the committee. Congressman Stearns said that NIH will be better [because of these rules] and Chairman Greenwood commended Dr. Zerhouni on his efforts, "your work meets my approval." During questioning, some members of the panel brought up past problems that have lead to previous hearings, such as those that were reported in the December 2003 *LA Times* article. A few members asked how these rules would have changed those events. Zerhouni said that many of those problems would have been taken care of under the proposed guidelines.

Another point of interest revolved around the issue of NIH reauthorization. While the topic was not mentioned frequently, two members—Joe Barton and Michael Bilirakis—did bring it up. During opening statements, Chairman Barton said that during his Chairmanship he wants to hold government agencies accountable for their actions and that the subcommittee is uncovering problems that will build a roadmap to solutions as we go forward with reauthorization. Congressman Bilirakis said that during the reauthorization he and Chairman Barton wanted to make the Directors position stronger and suggested that Zerhouni submit to the committee, in writing, what can be done.

During the final round of questioning of Dr. Zerhouni, Congresswoman DeGette asked Chairman Greenwood to hold open the option for a future hearing to examine the effect of the new rules.

## NIH, Hospital Probes Could Produce Legislative Responses

House Energy and Commerce Oversight and Investigations Subcommittee Chairman Jim Greenwood, R-Pa., said today he is considering drafting legislation to address findings of all three of the panel's ongoing health investigations. Greenwood has been examining potential conflicts-of-interest at the National Institutes of Health, hospital billing practices and the use of anti-depressant drugs in children. Greenwood told health reporters he is closest to readying legislation in response to the NIH investigation, which has uncovered cases of questionable awards and speaking fees given to scientists involved in grant-making and the extensive use of a federal law that allows higher salaries for temporary employees. After a series of discussions, NIH Director Zerhouni is making changes, Greenwood said, including barring awards to scientists involved in the grant-making process.

These changes also include forbidding some scientists from serving on corporate boards or owning stock in drug or biotechnology companies, and increasing public disclosure of their outside income. Greenwood said he wants to remove existing salary caps and "let it go to market rate" but with an open and transpar-

# Third NIH Oversight Hearing

ent system. "I want to set up a system in which you ought to be able to pay people what you need to get them," he said. Finding a vehicle for such legislation could be difficult. The obvious place would be an NIH reauthorization bill, which Energy and Commerce Chairman Barton has said he wants this year. "So would I," said Greenwood. "I'd like to fly, too. But I don't think it's going to happen." He said an NIH bill faces not only a fight over embryonic stem cell research but also "people will want to play the 'don't study sex' game," a reference to social conservatives' questioning of some NIH grants.

Greenwood said he also is ready to draft legislation to limit what hospitals can charge uninsured patients and require them to offer charity care to eligible uninsured patients if hospitals do not change their procedures. "No one who qualifies for charity care should end up paying charges" that are frequently inflated, he said. "I don't have a problem with people being asked to pay their [hospital] bill. I have a problem with people being asked to pay twice what everyone else does." Legislation, he said, might limit what hospitals could charge the uninsured to Medicare's rate plus a specified percentage. Greenwood was less certain about legislation in response to the investigation of the use of antidepressants in children, which uncovered cases of clinical trials that produced negative results that were never published. "You can imagine how delicate this is." If legislation is needed, it might require the publication of all clinical trial results, Greenwood added.

# Boston Publishing Symposium

By Peter Farnham, ASBMB Public Affairs Officer

The ASBMB Public Affairs Advisory Committee (PAAC) enjoyed a major success at the recent Society annual meeting in Boston when its public affairs symposium, "Where Should Scientists Publish: The Future of Scientific Communication," played to a standing-room only crowd. PAAC member Ralph Bradshaw, Editor of the Society's journal, *Molecular and Cellular Proteomics*, said, "The forum was conceived as an opportunity to look at the many issues presently confronting this enterprise from the point of view of scientists' needs. Hence the emphasis was not directly on business models and 'open access,' although both issues were certainly raised, but on what is presently lacking and what the likely changes will be downstream."

The symposium was also notable, several panelists and observers told ASBMB Today, for its generally temperate tone. This has not always been the case in symposia on scientific publishing, particularly in the last several years. The mostly reasonable discussion was directly tied to the original design, and the questions the panelists were asked to consider: the qualities in a journal that would lead one to recommend to a junior colleague that they publish in it, the scientific community's unmet needs that would warrant significant change in current publishing models, how well served is the public by the existence of differing models for publication of scientific literature, and what should the scientific publishing world look like in ten years' time?

"Interestingly," Dr. Bradshaw noted, "the sense that emerged, at least from my perspective, is that 'availability' of the literature is less a problem than 'fundability' of the literature, and that the established literature and journals, which are more likely to be around in the future, are more desirable as places to publish, providing they maintain high standards of peer review. No one thought that any particular business model or 'open access' approach was likely to be a predictor of these desired characteristics."

## UC Davis Lectureship Honors Founder Of Biological Chemistry Department

The University of California, Davis, School of Medicine has established an annual lectureship to honor the founder of the school's Department of Biological Chemistry. The Edwin G. Krebs Lectureship in Molecular Medicine celebrates the scientific contributions of Dr. Krebs, who in 1968 was the founding Chair of the Department of Biological Chemistry at UC Davis. The Department (now named Biochemistry and Molecular Medicine) launched the lectureship March 24, with a day-long symposium featuring graduate students/ postdoctoral fellows, all of whom were here with Dr. Krebs during part of his tenure, which lasted until 1977.

Krebs, who is now Emeritus Professor of Pharmacology and Biochemistry at the University of Washington School of Medicine and an HHMI Investigator, unraveled the complex pathways by which hormones and drugs regulate cellular functions. In 1955, he and Dr. Edmond Fischer, working in the Department of Biochemistry at the University of Washington, discovered the process of protein phosphorylation and dephosphorylation, which mediates hormone stimulation with the metabolism of glycogen, a complex carbohydrate used as energy storage in the cell. They identified the enzyme phosphorylase kinase, which represented the first example of a protein kinase, a family of enzymes now known to regulate critical cellular functions.

In 1968, Dr. Krebs and his associates discovered cyclic AMP-dependent protein kinase, an enzyme central to a myriad of cellular activity. This work launched the scientific field of protein kinases. Members of the protein kinase family regulate cell growth, development, malignant transformation, and learning and memory in the nervous system. He and Dr. Fischer shared the 1992 Nobel Prize in Physiology and Medicine for their pioneering discovery of protein phosphorylation and dephosphorylation.

Currently, Dr. Krebs laboratory at the University of Washington is concerned with the mechanisms involved in the intra-cellular transmission of hormone and growth factor signals. Of particular interest are mechanisms that involve the phosphorylation and dephosphorylation of proteins. One specific area of research addresses the question of how growth factor receptors possessing protein tyrosine kinase activity, e.g. the insulin, epidermal growth factor, and the platelet-derived growth factor receptors, regulate the phosphorylation of cellular proteins on serine or threonine residues. The laboratory is also interested in the mechanisms that are involved in programmed cell death or apoptosis.

# Sheds More Light than Heat

Each of three main speakers discussed the questions that framed the discussion from a unique perspective. Dr. Robert Simoni, Stanford University and deputy editor of the *Journal of Biological Chemistry*, discussed *JBC's* excellent track record in science publishing and (not surprisingly) recommended that scientists should publish their work in JBC "or journals like it". Among his points: on average, JBC makes a first decision on a submitted paper within 25 days, and accepts within 60 days (both well below HighWire Press averages as a whole); Google is becoming an increasingly important search engine for the JBC (the number of JBC hits originating in Google increased ten-fold from April 2003 to April 2004); having a wide variety of competing publishing models is good because the competition drives innovation; only 7 % of JBC authors support the "author pays" model of funding scientific publication. Dr. Simoni also expects fewer print journals in 10 years' time, and that on-line journals will become the "journals of record".

*Robert Simoni*

Michael Mabe, from Elsevier, gave an overview of journal publishing from the first scientific journal (published in 1665) and noted that for the future, he expected the journal model to remain viable (increases in co-authorship would not begin to affect journal viability for many years); the technology will continue to develop; and economic models will continue to develop as well. He estimated the average cost of publishing a scientific article to be in the $3,000 - $4,000 range; the author-pays model can result in important research not being published; almost 70 % of authors in a recent survey believed access to the literature was better (or much better) than it was five years ago; and that less than 5% of authors believed the general public was their primary audience (conversely, almost 90% wrote for fellow researchers).

The third speaker, Dr. Pat Brown, Stanford University, one of the founders of the Public Library of Science, gave an impassioned presentation advocating for the open access model. He cited a number of recent papers published in *PLOS Biology* and *PLOS Medicine* by eminent scientists, including an ASBMB award winner, as evidence that the PLOS model was working and attracting quality authors. He summed up by characterizing the PLOS model as "unassailable" in concept and design.

Few if any other members of the panel agreed with this assessment, however. Dr. Martin Frank, Executive Director of the American Physiological Society, noted his organization's strong support for the Washington, DC, Principles for Free Access to Science. The principles outline the commitment of not-for-profit publishers to work in partnership with scholarly communities such as libraries to ensure that these communities are sustained, science is advanced, research meets the highest standards and patient care is enhanced with accurate and timely information. The DC Principles provide what has been called the needed "middle ground" in the debate between those who advocate immediate unfettered online access to medical and scientific research findings and advocates of the current journal publishing system.

*Pat Brown*

*Michael Mabe*

It was clear from the discussions that access to the scientific literature, already as broad as it has ever been, is only likely to get broader in the coming decade. This does not mean, however, that there will be no place for traditional publishing. The well-established, well-cited journals will no doubt continue to be around, and scientists will no doubt continue to want to publish in them. The issue will be how to ensure that smaller, but nonetheless important, specialty journals will survive in the new environment. Dr. Catherine Drennan, MIT, another discussant, noted that "journals such as *Biochemistry and Molecular Biology Education* would not be able to survive with an author-pays model, and we need to consider the effects on all journals before making any drastic changes in publishing models."

Outgoing ASBMB President Bettie Sue Masters said, "the Public Affairs Advisory Committee should be justifiably proud of the Public Policy Forum. My personal opinion is that the ASBMB case was clear, convincing, and correct. Thanks again for this excellent addition to our meeting program."

***For ASBMB's take on access to scientific literature see next page.***

# A Professional Society's Take on

**The following statement by ASBMB President Judith S. Bond and Past-President Bettie Sue Masters was published July 14 on the journal *Nature's* online Web Focus site, http://www.nature.com/nature/focus/accessdebate/27.html**

The *Journal of Biological Chemistry (JBC)*, the flagship journal of the American Society for Biochemistry and Molecular Biology (ASBMB), will celebrate its centennial in 2005. The *JBC* predated the ASBMB by one year. This is notable in that a professional scientific society grew out of the need for a discipline-oriented scientific publication. The expertise represented by a discipline is a very important consideration in the establishment and/or maintenance of the scientific literature.

The *JBC* has been a premier scientific publication with a prestigious scientific following. It is known for the high quality of its peer-reviewed publications of fundamental advances in biochemistry and molecular biology. The ASBMB is now an international organization with over 12,000 members and approximately half of the *JBC*'s published authors are from foreign countries.

This growing international perspective has redefined the missions of the Society and its journals, which include ASBMB Today, the monthly magazine of the society, a newly established journal *Molecular and Cellular Proteomics (MCP)*, the newly acquired *Journal of Lipid Research (JLR)*; and the education journal *Biochemistry and Molecular Biology Education (BAMBED)*, which ASBMB publishes in collaboration with the International Union of Biochemistry and Molecular Biology. ASBMB is responsible financially for the success or failure of *BAMBED*, which has been undertaken as a service to the community of teachers and students of the discipline throughout the world.

The concept of publishing by scientific societies has been a long-standing one, beginning in the late 1800s for the biological sciences, to meet the obvious need of an area of scientific expertise with unique knowledge and skills to disseminate information to those who share an interest in the results of scientific inquiry and to promote further research in the specific area. It is important to maintain the depth of expertise represented by these learned societies for true peer review of science within the respective disciplines.

ASBMB has been highly innovative in the publishing arena. It was the first biomedical journal to be available electronically - in 1995. This resulted from an alliance between the *JBC* and HighWire Press that arose out of conversations among Robert Simoni (deputy editor of the *JBC*), Michael Keller and John Sack, all of Stanford University. ASBMB took on the financial risk of success or failure. Scientists and societies rapidly saw the potential for new forms and features of scientific communication, and Science and Proceedings of the National Academy of Sciences USA soon joined *JBC* online.

In 2001, *JBC* introduced Papers in Press (PIPs), which makes manuscripts available online the day they are accepted for publication, and permits free access to *JBC* papers to anyone. PIPs remain online even after the final edited and printed version of the manuscript appears, which takes around 8 weeks. The original date of publication of a manuscript is when it appears as a PIP, and PIPs remain on-line even after the editorial process is completed and the final form is published. Thus, the content of *JBC* publications is freely available online to everyone, and meets the criteria of a truly 'open access' journal.

More recently, *JBC* has provided free, on-line, full text searchable access to every published article since its inception in 1905. The *JLR* now also provides free, on-line access to every published article since its founding in 1959. Many other journals are now following suit but only a few have succeeded in achieving the goal of making their entire contents available in such a form. This activity was undertaken with the view of providing a vital service to the biological sciences community but it was not done without considerable thought and concern about its financial implications. The cost of this process was in excess of $700,000. The financial stability of the ASBMB and our business model for publishing has allowed our non-profit organization to take on such expenses, to serve our readers, authors and science. Our expenses are paid by a combination of sources, primarily by page charges to authors and subscriptions to individuals and libraries. In a recent survey of over a 1,000 *JBC* authors, over 80 percent preferred this mode of covering expenses to other models, such as authors or institutions paying all the costs.

In the end, the open access, cost structure and the quality of the *JBC* peer-review system, have been appreciated by our readers, authors, libraries and scientific institutions. Submissions to the Journal continue to increase, as do citations. These capabilities of *JBC* are now available for other journals of

# Access to Scientific Literature

ASBMB as they have become incorporated into the publication network. It is important to note that societies, such as ASBMB, have been providing these innovations and that a measure of competition in continuing to provide such in the market place is vital to the success of the industry.

In order to handle the large volume of manuscripts that the fields of biochemistry and molecular biology encompass, it has been necessary to maintain a sizeable panel of associate editors (21) with editorial offices that handle approximately 600 manuscripts each per year. The editorial board consists of over 600 members to cover the various areas of expertise needed for peer review of the variety of manuscripts. These individuals each handle between 20-60 manuscripts per year to produce more than 50,000 printed manuscript pages in the *JBC*. In organizing a journal of any type, it is important that the reviewing board be willing and qualified to review. In addition, there are approximately 16 full-time staff in the Society office that support the ASBMB publication mission.

To quote Declan Butler, editor of this Nature Web Focus series, 'the core functions of publishing at its best share a commitment to impose intellectual rigour and high editorial standards on an exponentially increasing body of knowledge. As the flood of information grows, more and not less human editorial skill will be needed to focus and make sense of it' (our emphasis). We assert that this is one of the prime responsibilities of all publishers, whether for-profit or not-for-profit. The incentives to serve as an editor include the prestige of Editorial Board membership because, in the case of society-based publications, there is no remuneration for such service. Therefore, the major costs are to pay for the actual maintenance of servers, the Associate Editor offices (secretarial, computer and telephone services), hands-on training sessions for online reviewing, and editorial and print costs.

The subject of editorial independence cannot be ignored. Depending upon the business model, unless large submission charges are levied, there may be a tendency to lower the standards of review to permit more manuscripts to be published. There is risk, for example, in an author-pays-all-costs publication model that standards could be influenced by the acceptance rate of manuscripts.

***ASBMB has been highly innovative in the publishing arena. JBC was the first biomedical journal to be available electronically —in 1995***

This is not the case with society-based, not-for-profit publishers, particularly if the business model does not rely solely on page charges to authors. The maintenance of high standards is, indeed, the creed for these publishers, since there is pride in knowing that publishing in their journals is held in high regard. The major safeguard is the selection of editors with the appropriate expertise and the knowledge that one's peers are overseeing the standards of the publication.

There are many challenges remaining in the publishing industry. One of these is the archiving of digital information in a safe, permanent and easily retrievable medium. There have been many attempts to address this problem but none has surfaced as the satisfactory answer. It would seem that all publishers should be making efforts to achieve an effective archiving system and that much of the energy being expended by various factions in the present debate would be better spent in answering this need.

It is difficult to estimate how much archiving will cost because we do not yet know the modality that will be used ultimately. Most agree that there probably should be multiple sites for archiving, and that the systems must be updated and corrected continually. There is probably no single solution and innovations of various types should be pursued and implemented. Regardless of which publishing model one espouses, the fact that the industry is moving toward predominantly digital publication will necessitate a viable and redundant archiving system.

As any believer in the free enterprise system would espouse, it is better to allow and, indeed, to encourage competition among various modes of publication. Societies, for the most part, believe that their discipline-based journals offer a high standard of review and great depth and breadth of scrutiny due to the expertise represented by the society members or by those chosen to serve on their respective editorial boards, whether members or not.

ASBMB welcomes the involvement of all publishers in making the scientific literature more openly accessible to all interested readers and challenges those who would say otherwise to prove that such competition is not a healthy incentive to new innovations in submission, review and publication. The burden of such progress rests upon all, and the ASBMB submits that it has been a prime contributor to this progress and intends to remain so.

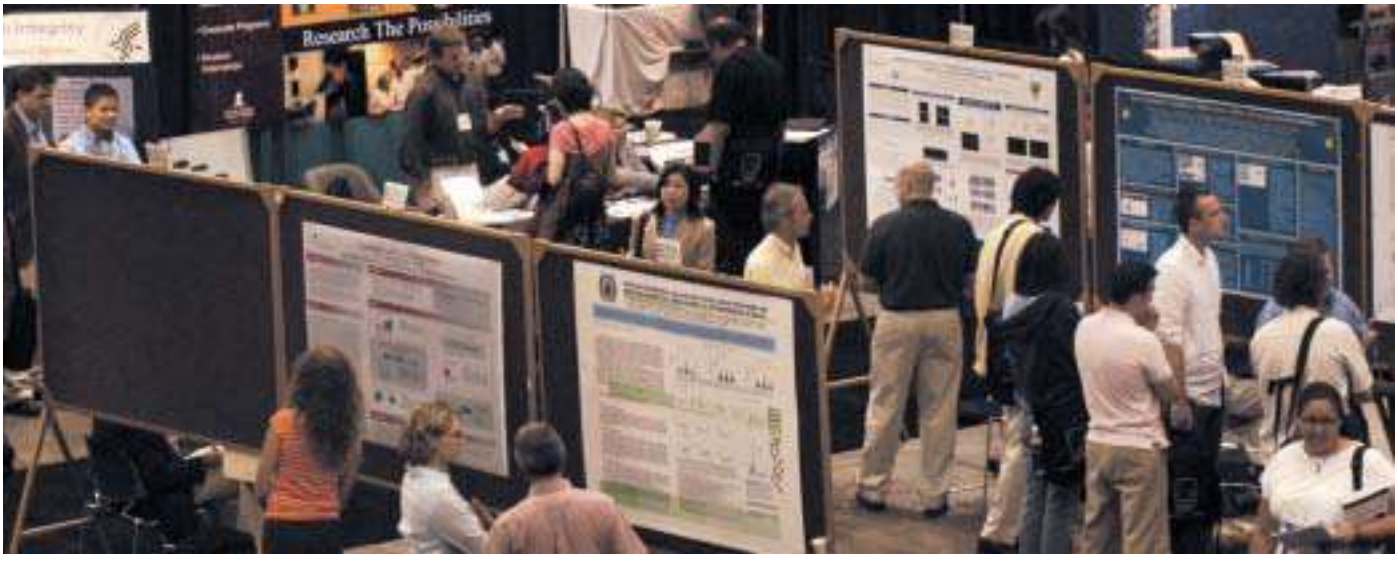

# On the Cu

## Symposia Highlighted IUBMB/ASBMB Annual Meeting

From the opening day's Herbert Tabor/*Journal of Biological Chemistry* Lectureship to the final day's symposia, IUBMB/ASBMB was an outstanding experience for some 3,000 attendees who came to Boston from institutions in the United States and all around the world.

Reflecting on the meeting, ASBMB President Judith S. Bond said, "I was delighted with the scope and strength of the science at the Boston meetings, and the vigorous dialogue with our international colleagues. Attendees were treated to special cutting-edge symposia that focused on advances in science and public policy issues that are challenging our profession. The sessions captured the pulse of the fundamental basis of the life sciences, as did the enthusiastic presentations of our next generation of scientists, the undergraduates and graduate students."

Robert J. Lefkowitz of Duke University Medical Center, opened the meeting with the Herbert Tabor/*Journal of Biological Chemistry* Lecture. His topic was "Seven Membrane Spanning Receptors." Dr Lefkowitz is known for his seminal research on this group that constitutes by far the largest and most ubiquitous family of receptors in nature. Continuing research on these receptors in the Lefkowitz laboratory is contributing to the development of a wide range of drugs to treat disorders including heart disease, high blood pressure, and asthma.



Annual Meeting Photos by Ellen Dallager Photography


# ttting-Edge

Other award-winning lecturers were:

Steven Almo, Albert Einstein College of Medicine, recipient of the ASBMB-Amgen Award, is a world leader in structural biology who has developing a unique program in the cytoskeleton and functional analysis of contractile and allergenic proteins. His lecture topic was the "Structural Basis for T-cell Costimulation."

"Cytochrome c Oxidase and the Particulate Methane Monooxygenase" was the topic for William C. Rose Award recipient Sunney I. Chan, California Institute of Technology. His most recent research interests have been broadly based in the area of physical biochemistry, with particular emphasis on bioenergetics and the structure and function of membrane proteins, magnetic resonance spectroscopy, and bio-inorganic chemistry.

Stanford University School of Medicine's Ronald W. Davis, a world leader in biotechnology, delivered the Herbert A. Sober Lecture. "New Genomic Technology for Yeast and Human" was he topic for Dr. Davis whose lab was instrumental in the development of phage lambda vectors, which are now the most common method for the primary cloning of cDNA molecules using *E. coli*.

Schering-Plough Research Institute Award recipient Pehr A. B. Harbury of the Stanford University School of Medicine, spoke on "DNA Display in vitro Evolution of Combinatorial Chemistry Libraries." Dr. Harbury has developed new methods for characterizing the folding determinants and folding behavior especially of larger proteins and has used them to characterize the folding of yeast triosephosphate isomerase. These methods are expected to be widely used and speed the development of proteomics.

The recipient of the ASBMB-Avanti Award in Lipids, William L. Smith, University of Michigan Medical School, is known as an outstanding experimentalist whose prolific career has yielded seminal work in the areas of eicosanoid biosynthesis, the physiology of polyunsaturated fatty acids, and the action of prostaglandins. The topic of his lecture was "Prostaglandin Endoperoxide H Synathses/Cyclogenases."

*At left: Undergraduate Poster Competition was center of attention on exhibit floor.*

*ASBMB Booth was busy throughout the meeting with staffers answering members' questions and providing others with membership applications and explanations of the Society's services for members.*

"The Structure of MHC Proteins and the Therapy of Multiple Sclerosis" was the topic for Harvard's Jack L. Strominger, recipient of the 2004 ASBMB-Merck Award for outstanding contributions to research in biochemistry and molecular biology. Dr. Strominger has been a pioneer in the discovery of the structures of both class I and class II human major histocompatibility complex antigens and their recognition of self and foreign peptides for presentation to the immune system.

In addition to the awards lectures, the meeting's 10 separate symposia provided a rich diet of research findings while special sessions focused on such topics as minority affairs, public affairs, the future of education and professional development for young scientists, undergraduate grant writing and networking, the ASBMB digital library, and other areas.

# ASBMB HONORS

*Robert J. Lefkowitz, who opened the meeting with the Herbert Tabor/Journal of Biological Chemistry Lecture, with JBC Editor Herbert Tabor (left) and Bruce Thomas, President and CEO of Cadmus, who presented the award.*

*Below: Ronald W. Davis, Professor in the Department of Biochemistry, Stanford University School of Medicine, accepts the Herbert A. Sober Lectureship from, at left, Robert Simoni, Deputy Editor of The Journal of Biological Chemistry. The award recognizes outstanding contributions to biochemical and molecular biological research, with particular emphasis on development of methods and techniques to aid in research.*

*Left: Schering-Plough Research Institute Award recipient Pehr A. B. Harbury, Stanford University School of Medicine, with ASBMB Past-President Bettie Sue-Masters.*

*Below Center: Philanthropist John Whitehead (at left) was presented with Howard K. Schachman Public Service Award by Public Affairs Advisory Committee Chair William Brinkley. The award recognized Schachman's diligent and constant efforts to promote congressional support for NIH funding.*

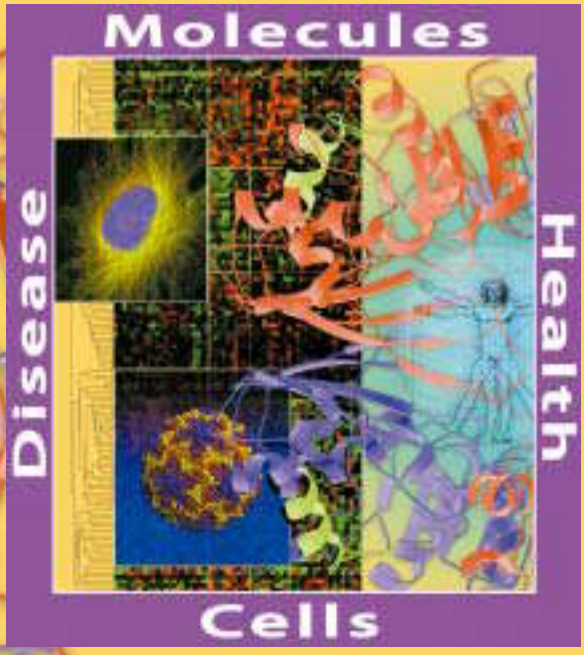
*Above: ASBMB-Avanti Award in Lipids recipient William L. Smith of the University of Michigan Medical School with Alexandra Newton, University of California, San Diego, who presented the award.*

*Above Right: Steven Almo, Albert Einstein College of Medicine, received the ASBMB-Amgen Award from Amgen representative Joe Kim.*

*Below Right: Harvard's Jack L. Strominger, with the 2004 ASBMB-Merck Award which was presented by Merck's Nancy Thornberry.*

*William C. Rose Award recipient Sunney I. Chan, California Institute of Technology, center, was presented with plaque by Jack Dixon, at right, who received the award in 2003. At left is Minor J. Coon, professor, University of Michigan Health Center.*

# See You Next Year in San Diego!




## 2005 ASBMB Annual Meeting

Held in conjunction with EB 2005

## April 2-6, 2005

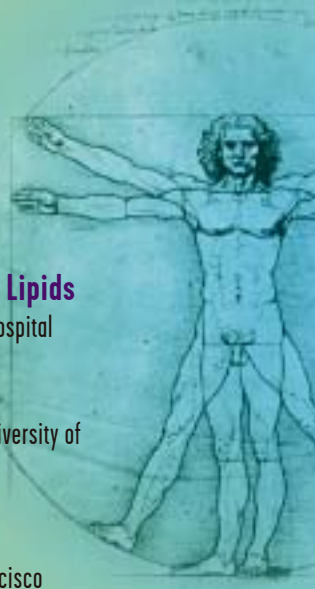
## San Diego, CA

### Meeting Organizers

Dennis R. Voelker, National Jewish Medical Research Center

Cecile Rochette-Egly, IGBMC, Strasbourg

and the 2005 ASBMB Program Planning Committee



### Symposia Themes

**Dynamics of Protein—Protein Interactions (Bumping in the Night)**
**Chair**: Ben Margolis, HHMI, University of Michigan

**DNA Replication and Interactive Repair and Recombinational Processes**
**Chair**: Charles S. McHenry, University of Colorado Health Sciences Center

**Coordinate Regulation of Transcription**
**Chair**: Cecile Rochette-Egly, IGBMC, Strasbourg

**Interactions and Functions of Glycoconjugates**
**Chair**: Mark A. Lehrman, University of Texas Southwestern Medical Center

**Integration and Organization of Signaling Pathways**
**Chair**: Alex Toker, Beth Israel Deaconess Medical Center

**Minority Affairs Committee Symposia**
**Chair**: Phillip A. Ortiz, Empire State College

**Biochemistry and Molecular Biology of Lipids**
**Chair**: Charles O. Rock, St. Jude Children's Research Hospital

**Organelle Biogenesis and Dynamics**
**Co-Chairs**: Carla Koehler, UCLA and Danny Schnell, University of Massachusetts, Amherst

**Proteolysis and Disease**
**Chair**: Charles Craik, University of California, San Francisco

**Catalysis: Structure, Function, and Evolution**
**Chair**: John A. Gerlt, University of Illinois, Urbana-Champaign

**Metabolic Regulatory Circuits**
**Chair**: M. Daniel Lane, Johns Hopkins University School of Medicine

**Genomes and Proteomes**
**Chair**: Andrew J. Link, Vanderbilt University

**Education in the Biomolecular Sciences: The Next Generation**
**Co-Chairs**: Judith G. Voet, Swarthmore College and Marion O'Leary, California State University at Sacramento

Experimental Biology 2005

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ASBMB American Society for Biochemistry and Molecular Biology

# Reflections of a Fortunate Biochemist

By Dr. Irwin Fridovich

While contemplating the writing of this article I reread some of my early publications and in so doing was appalled at my profound ignorance. That, of course, is the advantage of hindsight. It is also an indication of how much has been learned by me and by others during the intervening half-century. That is the beauty of science; it is a collaborative work in progress that builds knowledge and understanding of the real world. I hope it may be interesting (for readers concerned with the process as well as with the results) to recount how we progressed from abysmal naiveté to our current informed view of the biology of oxidation stress.

## Sulfite Oxidation

In 1949, Abraham Mazur introduced me to the wonders of biochemistry in an undergraduate course and then during a year spent working in his laboratory at Cornell Medical School. At the end of that year he recommended graduate work and sent me to Duke to work with Philip Handler, Chairman of the Department of Biochemistry. Handler was the most impressive person I ever met. He was blessed with a photographic memory, an incomparable mastery of language, and excellent judgment. He assigned me to work with Murray Heimberg, a senior graduate student.

We worked long hours, measuring O2 uptake with Warburg microrespirometers, and methylene blue bleaching in evacuated Thunberg tubes, with a Coleman colorimeter. We found that µhydroxysulfonic acids dissociated to carbonyl compounds plus sulfite and that sulfite was then oxidized to sulfate in the liver extracts we were studying. Thus began my long infatuation with sulfite oxidation.

It had already been established that sulfite was readily oxidized by a free radical chain mechanism, but I did not know this and had to discover it for myself. Thus I found that sulfite could reduce cytochrome c and, of course, at the same time cytochrome c could oxidize sulfite. When this was done anaerobically the stoichiometry was 2 cytochrome c reduced per sulfite oxidized, as expected. However, in the presence of dissolved O2 thousands of sulfites were oxidized per cytochrome c reduced. This could be rationalized by assuming that each time sulfite transferred an electron to cytochrome c, the resulting sulfur trioxyradical started a chain reaction between sulfite and O2.

The truly impressive amplification provided by this chain reaction fascinated me and so I played with it to see what it could be used for. Sulfite oxidation ultimately provided: an ultrasensitive manometric assay for xanthine oxidase; a method for detecting long lived flavin radicals generated photochemically; a method for ultrasensitive manometric actinometry; and much more.

## Xanthine Oxidase

It was sulfite oxidation that led to xanthine oxidase, which in turn led to superoxide and to the superoxide dismutases. Thus, a soluble fraction of liver, able to catalyze the oxidation of sulfite, lost this activity upon dialysis, and adding back the concentrated dialysate restored that activity. A search for the dialyzable cofactor of sulfite oxidation yielded hypoxanthine. Because hypoxanthine is a substrate for xanthine oxidase we were led to that enzyme. In time we realized that xanthine oxidase, when acting on its substrates aerobically, could initiate the oxidation of sulfite. This should have told me that xanthine oxidase was generating a radical from O2, and that radical ($O_2^-$) was initiating the oxidation of sulfite. However, I was woefully slow and that illumination was not achieved for several more years.

## A Diversion to Acetoacetic Decarboxylase

Work with xanthine oxidase was interrupted in 1962 by a year-long sabbatical spent with F. H. Westheimer in the Department of Chemistry at Harvard University. At our first meeting he invited me to work on anything I chose to do, but I wanted to explore some of his interests, which included decarboxylation.

When I returned to Duke Medical School, Philip Handler indicated that I should quit working on xanthine oxidase and branch out into other areas.

Steady state kinetic studies of enzyme action were then fashionable, and I had noticed that urea and guanidinium could competitively inhibit xanthine oxidase and could do so at concentrations far below those needed for unfolding proteins. The inhibitory power of guanidinium salts was found to vary markedly from lot to lot. I then isolated the symmetrical triazine that was responsible for this variability. While working with triazines I found some that were powerful inhibitors of uricase and was pleased to see this information applied to raising the urate level of mice by feeding them my uricase inhibitor.

Acetoacetic decarboxylase was not entirely abandoned, and we found that the activity of the isolated enzyme could be irreversibly doubled by mild heating. An incident that reveals the stature of Frank Westheimer deals with this autoactivation of acetoacetic decarboxylase. After exploring the phenomenon I submitted a descriptive manuscript to the *Journal of Biological Chemistry*. Editor John Edsall sent it for review to Westheimer, who called me

*Irwin Fridovich, seen here at his desk, was President of ASBMB in 1982 when it was still the American Society of Biological Chemistry.*

to say that he had the manuscript; that he had noticed the same autoactivation; that I was somewhat ahead on this project; and that he was recommending publication without revision. Would that everyone was as honest and generous as Frank Westheimer.

## On to Superoxide Dismutase

All the foregoing pales to insignificance beside the discovery of SOD. That xanthine oxidase might univalently reduce O2 had been enunciated, and the differences between the reduction of O2 to H2O2 and the roles of $O_2^-$ in mediating cytochrome c reduction, initiating sulfite oxidation, and eliciting lucigenin luminescence had been noted. However, such were the misconceptions among radiation chemists and physical chemists concerning the properties of $O_2^-$ that it seemed foolhardy to propose free $O_2^-$ as a product of the xanthine oxidase reaction. A fallback position that could still explain our many observations was to propose bound $O_2^-$. In that case cytochrome c would have to bind to xanthine oxidase, as would the protein competitive inhibitors of cytochrome c reduction.

At this point, Joe McCord joined my laboratory as a graduate student in 1967 and was asked to measure that presumed binding. After several heroic efforts provided no evidence for binding he decided to prove that there was no binding. He asked me whether Km was independent of enzyme concentration. I responded that it was, so long as substrate concentration exceeded enzyme concentration. With that assurance he produced kinetic data showing that Km xanthine was, as expected, independent of the concentration of xanthine oxidase. In contrast Km cytochrome c or Ki for the inhibitors of cytochrome c reduction was very much a function of the concentration of xanthine oxidase.

Previous misconceptions were swept away, and it was immediately clear that xanthine oxidase was releasing $O_2^-$ into free solution, where it could reduce cytochrome c, initiate sulfite oxidation, or be intercepted by the protein inhibitors of cytochrome c reduction. It was also clear that those inhibitors of cytochrome c reduction must be acting catalytically, and the only feasible way they could do so was by dismutating O2 into H2O2 + O2. Bravo Joe McCord!

Now we knew exactly what to do, and the SOD activity in bovine erythrocytes proved to be abundant and stable and it was soon purified. Moreover its activity was demonstrated using electrochemically generated $O_2^-$ in place of the flux of $O_2^-$ made by xanthine oxidase and using tetranitromethane in place of cytochrome c. Joe and I felt like kids in a toy shop. We could and did use the newfound SOD to explore the role of $O_2^-$ in diverse reactions and to measure the effect of reaction conditions on the proportion of univalent over divalent O2 reduction by xanthine oxidase. We recognized that our Cu,Zn-SOD had long been studied by others as an abundant cuproprotein of unknown function and given the names hepatocuprein, cerebrocuprein, hemocuprein, etc.

## Physiological Function of SODs

If $O_2^-$ could be made in quantity by xanthine oxidase, it seemed obvious that it would be made by other enzymes as well, and if it could readily cause the oxidation of sulfite and of epinephrine, it could surely cause unwanted oxidations within cells. If SODs were so active and abundant, it seemed to us that they must serve as a defense against $O_2^-$, much as catalases defend against H2O2. Those views demanded support, which was soon forthcoming. Thus a survey of microorganisms revealed that aerobes contained abundant SOD, whereas obligate anaerobes contained little or none. In addition SOD was seen to be induced by aerobic growth, and the induced level of SOD protected against the lethality of hyperbaric O2. More definitive evidence was provided by the phenotypic deficits of the SOD-null mutants produced by Danielle Touati. In the fullness of time SOD-null mutants were prepared in a variety of prokaryotes, in yeast, and then in mice.

## An Iron-containing SOD

We had seen the blue-green Cu,Zn-SOD from erythrocytes and the reddish Mn-SOD from E. coli and from

liver mitochondria. Yet it was clear that there was another SOD in E. coli. This was revealed by the activity stain devised by Charles Beauchamp in 1972. Fred Yost launched into the isolation of this new E. coli SOD. As he approached the successful isolation of this SOD I noticed that the normally outgoing Yost was going out of his way to avoid me. When I asked his good friend Mick Gregory about this I was told that Fred's SOD had the wrong color and he was afraid I would not like this result. I was delighted with this new SOD, which proved to contain iron. In E. coli the Fe-SOD proved to be constitutive and was present in aerobic or anaerobic cultures. The Mn-SOD, in contrast, was expressed only in aerobic cultures and was subsequently shown to be regulated as part of the soxRS regulon.

## An Old Bottle of Glycerol

During the summer of 1980 my daughter Sharon was working in my laboratory to isolate an SOD from plant mitochondria. Each morning on the way to the laboratory we stopped at a market and purchased a head of cauliflower. Because Sharon's goal was the mitochondrial Mn-SOD, she included $CN^-$ in the assay mixtures to suppress activity due to the Cu,Zn-SOD. After a while she found that the plant Mn-SOD was unstable and I suggested that 10% glycerol might stabilize it. Sharon soon reported that $CN^-$ plus glycerol could reduce cytochrome c. The only possible explanation seemed to be an impurity in the glycerol, which had been on the shelf for over 10 years. Glycerol from a fresh bottle did not support the reduction of cytochrome c so we tried an oxidation product of glycerol, glyceraldehyde. $CN^-$ plus glyceraldehyde, or a variety of other µhydroxycarbonyls could reduce cytochrome c or O2. This seemed bizarre because CN had been used with such compounds to synthesize sugars for over a century. Had no one noticed the oxidation? Perusal of old literature on the Fischer-Kiliani synthesis, in which aldose sugars were incubated with CN yielding a cyanohydrin that could then be hydrolyzed and reduced to the isomeric pair of longer chain sugars, finally led to a paper whose author specified filling the flask to the top and sealing it tightly with a rubber stopper before incubating it overnight. He must have noticed a decrease in yield when these simple means of excluding oxygen were not used. Subsequent study of the mechanism of this cyanide-catalyzed oxidation of sugars revealed a role for enediolate tautomers and radical intermediates. This chemistry is now pertinent to the process of non-enzymic glycation thought to be important in diabetes mellitus and in aging.

## How Super Is Superoxide?

Increasing intracellular production of $O_2^-$ by raising pO2 alone, or by adding a redox cycling compounds, or by mutational deletion of SOD, imposes nutritional auxotrophies, such as the need for branched chain amino acids. O. R. Brown suggested that this was because of inactivation of the dihydroxyacid dehydratase that catalyzes the penultimate step in the relevant biosynthetic pathway. The possibility that $O_2^-$ could directly inactivate this dehydratase was exciting because there were still those who were asserting that $O_2^-$ was a biologically benign species. We found that $O_2^-$ did inactivate this enzyme and other [4Fe-4S] cluster-containing dehydratases, such as the 6-phosphogluconate dehydratase and aconitase.

## Motivation and Funding

The work that led to the discovery of the superoxide dismutases did not seem, at the time, to have any relevance to human health or disease. It was merely interesting, and we were motivated purely by curiosity. At the time, that was enough justification and one could get funding from the National Institutes of Health to support such work. Alas that is no longer enough and one has to envision health relevance or not get funded.

In recent years we have been: exploring the role of oxidative stress in heat shock and stationary phase death; finding a Cu,Zn-SOD in the periplasm of E. coli; clarifying the subcellular distribution of SODs in liver cells; making low molecular weight catalysts of the dismutation reaction, that may be useful as pharmaceuticals for treating reperfusion injuries and inflammations; exploring the role of oxygen-derived radicals in adaptive mutagenesis; explaining the nutritional auxotrophies imposed by lack of SOD activity; studying the basis of the oxygen-dependent toxicity of short chain sugars; adding to the list of enzymes that are known to be controlled by the soxRS regulon; and wondering whether the univalent oxidation of carbon dioxide to the carbonate monoanion radical is a factor in oxidative stress. Curiosity remains undiminished at age 74 and so there will be more, if health and strength allow.

*The author of this article, Irwin Fridovich, Department of Biochemistry, Duke University Medical Center, received his doctorate from Duke University in 1955 and was President of ASBMB in 1982 when it was still the American Society of Biological Chemistry. Dr. Fridovich is the author of 440 articles 389 of which can be retrieved on PubMed.*

Portions of this article were previously printed in *The Journal of Biological Chemistry.*

# *The Journal of Lipid Research* Inaugurates New Series of Thematic Reviews

The June 2004 issue of *The Journal of Lipid Research* inaugurated a new Thematic Series, The Pathogenesis of Atherosclerosis, which highlights the etiology of the disease that results from disturbances in lipid and lipoprotein metabolism. Atherosclerosis, with its complications of myocardial infarction, stroke and peripheral vascular disease, is still the major source of morbidity and mortality in the industrialized world, and has been forecast to be the major cause of death from disease in the entire world by the year 2020.

Atherogenesis is a disease that, at its earliest phase, appears to be present even in fetal life, and it evolves slowly over decades, impacted by a myriad of environmental and genetic factors. Clearly, hypercholesterolemia is a dominant risk factor for this disease, and innumerable clinical trials of various hypolipidemic agents now document the efficacy of cholesterol-lowering therapy. However, atherosclerosis is a complex and multifactorial disease, and even if one accepts the "new" dogma that any LDL value above 50 mg/ dl is potentially atherogenic, it is not likely that this target will be achieved in a large percentage of patients anytime soon, and, more importantly, will not be achieved in the population as a whole.

Furthermore, there still remains an enormous degree of heterogeneity in disease expression among individuals with equivalent LDL values and even equivalent degrees of other known risk factors. This is emphasized by the two to three decade differences, or more, in expression of CVD that have been observed even among subjects with Homozygous Familial Hypercholesterolemia, who uniformly have exceedingly high LDL values. Even among populations treated with effective hypolipidemic agents, such as the statins, there remains a very large residual of disease activity, a point often lost sight of. Clearly, the complexities of lipid and lipoprotein metabolism, and the differing responses of vascular wall cells to the interplay of lipoproteins and to the vast array of circulating cellular and blood elements, are enormous. To add to the complexity, there is an enormous contribution of both environmental and genetic factors that individually and synergistically affect different aspects of the disease process, effecting both protective and proatherogenic consequences in the face of LDL values above the ideal.

The initial paper in this Thematic Series provided a detailed review and comprehensive bibliography of a timely subject, namely, the status of the oxidation hypothesis. In future reviews, *JLR* will explore the role of infection and inflammation, the role of nuclear hormone receptors, and how the use of genetic studies can help sort out the immense complexities that mediate these aspects of atherogenesis. Future series will focus on the many other biological factors that affect atherosclerosis, such as the role of immune function and the emerging evidence of the enormous contribution of adipose tissue to disturbances in lipid metabolism and inflammation.

In coming issues, *JLR* will also present a fascinating insight into the History of the Cholesterol Hypothesis, as seen from the perspective of Dr. Daniel Steinberg, one of the leaders in the "cholesterol wars," who has played a pivotal role in bringing to recognition the now widely accepted notion that the "lower the cholesterol level the better." The initial installment in this series will be found in the September issue.

Titles in current series, The Pathogenesis of Atherosclerosis, coordinated by Joseph L. Witztum, are:

**June –** The oxidation hypothesis of atherogenesis: the role of oxidized phospholipids and HDL, by Navab et al.

**July –** Effects of infection and inflammation on lipid and lipoprotein metabolism: mechanisms and consequences to the host, by Khovidhunkit et al.

**September –** An interpreted history of the cholesterol controversy: part 1, by Daniel Steinberg

**October –** How do we unravel the complex genetics involved in atherogenesis? by Aldons J. Lusis

**November –** The role of nuclear hormone receptors in cardiovascular disease, by Christopher Glass

A new thematic series, The Immune System and Atherogenesis, is scheduled to begin in December 2004, accompanied by an editorial from its coordinator, Godfrey Getz. Topics to be covered in this series include: Macrophages and Scavenger Receptors, Acute Phase Proteins, Toll-Like Receptors, Natural Antibodies, Unusual Lymphocyte Subsets, and Cytokines.

# Four in a Row for Delaware At Undergraduate Poster Competition

An HHMI-sponsored student, Amanda Peters from the University of Delaware, was one of the first place winners at the annual ASBMB Undergraduate Poster Competition at the Annual Meeting in Boston. This is the fourth year in a row that undergraduate students from the University of Delaware have received ASBMB first place poster awards in this competition and cumulatively they have received more such awards than students from any other school during this period. Funding from HHMI has made it possible for these students to attend the ASBMB meetings and has supported the research of most of the students. In addition to her success in the poster competition and based on her submitted abstract, Peters was selected to present her work in a symposium on cholesterol homeostasis.

Grand Prize Winner in the competition was **Francesca Mendoza**, California State University, Fullerton, who received a $500 prize and a certificate.

First Prize winners who received $100 and a certificate were:

**Jimmy Hernandez**, California State University, Fullerton.

**Lee S. Jacobson**, Wesleyan University and University of Regensburg, Germany.

**Kathryn McCulloch**, Ball State University, Indiana

**Nijee Sharma**, Lake Forest College, Illinois.

**Nicole Wick**, Ball State University, Indiana.

The University of Delaware has over 80 undergraduate research students working in faculty laboratories this summer (about half have partial or full HHMI sponsorship). They were scheduled to present their work at the university's summer Undergraduate Research Symposium on August 11. It is from this larger group that students will emerge to present at next year's ASBMB undergraduate poster competition in San Diego, April 2-6, 2005.

*Grand Prize Winner Francesca Mendoza of California State University, Fullerton, and mentor.*

The undergraduate Poster Competition was sponsored by *The Biochemical Journal* and the Graduate Poster Competition was sponsored by Cell Press.

*Competitors from the University of Georgia formed one of the largest group of entrants at the event.*

Photos courtesy of J. Ellis Bell

# MAC Symposium Addresses the Problem of Obesity from Different Perspectives

By Nicole Kresge, Staff Writer

The 2004 Annual Meeting marked the first scientific symposium for the ASBMB Minority Affairs Committee (MAC). Breaking from the tradition of holding issues-based symposia, MAC Chair Phillip A. Ortiz of Empire State College and member Thomas D. Landefeld of California State University, Dominguez Hills, organized a series of talks to explore the problem of obesity from four different perspectives, resulting in a hybrid issues-scientific symposium.

This change in focus was motivated by a variety of factors. "Over the past few years we had delivered a bunch of excellent issues sessions, had mastered the issues symposium, and felt that we had an obligation to address issues of heath disparities," said Dr. Ortiz.

Dr. Ortiz opened the symposium by sharing some alarming facts on obesity trends. Currently, 65% of American adults are either overweight or obese, and the obesity epidemic is the number one health threat in the United States. According to the Centers for Disease Control, approximately 300,000 people die each year from obesity-related diseases including cardiovascular disease, diabetes, and cancer. For a variety of reasons explored in the symposium, women, children, and minorities are particularly affected by obesity.

In most people, obesity is associated with insulin resistance. The first speaker, Dr. Desmond Hunt, a postdoctoral fellow in the laboratory of Dr. Samuel Cushman at the National Institutes of Health, discussed his work on deciphering the link between insulin resistance and adipose cells. Dr. Hunt looked at the effects of rosiglitazone, an anti-diabetic drug that improves insulin sensitivity, on adipose cells in fa/fa obese Zucker rats (a commonly-used genetic model for obesity).

As expected, obese mice that were given oral rosiglitazone showed improvements in whole body glucose disposal and insulin sensitivity. These obese mice also experienced increases in the fraction of small adipose cells, adipose cell proliferation, and apoptosis. The gene expression pattern of various adipose cell-derived proteins that play a role in insulin sensitivity was also altered in the treated mice. "In a nutshell," said Dr. Hunt, "adipose cells play a critical role in regulating whole body insulin sensitivity."

Turning the focus from biology to nutrition, Dr. Betty Kennedy of the Pennington Biomedical Research Center described the "Rolling Store" project —a unique approach to providing access to healthy foods for poor women in the Lower Mississippi Delta. This six month pilot project was created to examine the impact of the availability of better food choices on preventing weight gain in the residents of a region that has one of the nation's highest rates of households with incomes below the federal poverty line.

Forty low-income, African American women participated in the study and were given weekly information on healthy eating and exercise. Half the women were also allowed to shop, cost free, at the Rolling Store – a food delivery truck stocked with healthy food choices such as fruits and vegetables. Dr. Kennedy found that the women who only received information continued to gain weight, while those women who received information and had access to healthy foods once a week not only lost weight but also experienced improved self-esteem. Dr. Kennedy believes these findings indicate that the Rolling Store approach is a realistic and inexpensive means to overcoming both economic and geographic barriers to healthy diets in poor, rural communities.

In addition to biology and nutrition, culture and environment can contribute to the problem of obesity, especially in minority populations. Dr. Kristie J. Lancaster of New York University addressed this issue in her discussion of why Black and Latino Americans have a higher prevalence of obesity and obesity-related disease than White Americans.

Dr. Lancaster found that cultural influences play a large role in dictating body image and eating habits in Black and Latino populations. For example, both cultures tend to be more accepting of larger body size and both view food as a huge component of cultural identity. Unfortunately, traditional African American dishes tend to be high in sodium, sugar, and fat, but low in fruits and vegetables.

Environmental influences such as lower socioeconomic status and a lack of healthy food choices also affect weight negatively in Black and Latino populations. Dr. Lancaster indicated that we need to understand the culture, traditions, and environment of minority populations in order to better affect change in eating habits.

The last scheduled speaker, New York State Assemblyman Felix W. Ortiz, no relation to Dr. Ortiz, was unable to attend the session due to a family emergency, but his slides were presented for the audience in his absence. Assembly-

*Continued on next page*

# Obesity ... Continued

*ontinued from page 21*

man Ortiz' presentation detailed his efforts to address the problem of obesity at school, at home, and in the community via legislation. The majority of these bills focus on children, as the Assemblyman believes that it is more effective to prevent obesity rather than treat it later on in life. Some of the obesity-related legislation Assemblyman Ortiz has sponsored includes creating a Childhood Obesity Prevention Program, requiring fast food chains to display nutrition information, prohibiting the sale of un-nutritious foods in school vending machines, and imposing a "Fat Tax" on video games, movies, and certain unhealthy foods.

Overall, Dr. Ortiz felt the symposium was a great success. "I expect that this will be the first of a series of symposia in which the MAC extends its impact on the ASBMB," said Dr. Ortiz. "We have been in a tremendous period of growth and transition – over the past few years the MAC has split away from the Education and Professional Development Committee, has gained a seat at the executive council table, is beginning to bring attention to the issues facing people of diverse backgrounds, and is working to draw in (and engage) scientists from diverse backgrounds. I believe that if one examines all these factors, as a whole, it becomes apparent that the MAC is on the verge of entering another era of significant growth."

Because of the success of their first scientific symposium, the MAC plans, for the first time in its history, on having two symposia next year – one issues-based symposium on mentoring and one scientific symposium on global nutrition. The symposium on global nutrition will be co-organized by Dr. Lancaster and Dr. Ortiz.

# Undergraduate Affiliate Network Launches Newsletter

This past June, ASBMB's Undergraduate Affiliate Network (UAN) launched the first issue of its national newsletter, *Enzymatic*. The newsletter, whose motto is "Success comes from having a community," is edited by Dr. Ellis Bell, Professor of Chemistry at the University of Richmond and co-chair of the ASBMB Education and Professional Development Committee (EPD).

Dr. Bell said *Enzymatic* was created because, "there is a community in education in biochemistry and molecular biology all across the country in small schools where often only one or maybe two faculty are in the same general area of biochemistry and molecular biology. There are also students out there in a similar position—only a few of them interested in biochemistry and molecular biology. The newsletter is a way to keep them informed of what is going on, to help them feel as though they are part of a larger community."

*Enzymatic* will be published six times a year and will contain features on UAN participants and highlights from regional and national meetings. The newsletter will also focus on outreach activities, teaching and learning innovations, and how to assess what students learn. Dr. Bell hopes that *Enzymatic* will eventually become a forum for discussions about what students really need to know and how best to assess that.

The UAN was formed last year by the EPD to create a community for undergraduates interested in biochemistry and molecular biology. "In many ways the UAN goals have really defined what *Enzymatic* is aiming to achieve—we are trying to connect students and faculty. A famous politician once said 'it takes a village' to raise a child. In this day and age 'it takes a national and international community' to raise a science student! *Enzymatic* and the UAN are aiming to build that community," said Dr. Bell.

*Enzymatic* is available on the ASBMB website, www.asbmb.org, under the "Education" heading on our homepage.

**2ND Int. Conference on Phospholipases A2 and 8TH Int. Congress on Platelet-Activating Factor and Related Lipid Mediators**

**October 6-9, Berlin , Germany**

Contact: Dr. Santosh Nigam, Eicosanoid & Lipid Res. Div., Univ. Medical

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Email: nigam@zedat.fu-berlin.de
Websites: http//:userpage.fu-berlin.de/~nigam
http://www.fu-berlin.de/info/konferenzen

# Brain Serotonin Enzyme Finding Might Explain Psychiatric Disorders

Researchers at Duke University Medical Center have provided the first direct evidence in mice for the role of an enzyme that specifically controls the production of serotonin in the brain. Different versions of that serotonin enzyme have a major effect on brain levels of the chemical messenger, which has been linked to many basic behavioral and physiological functions including mood, emotion, sleep and appetite, the researchers reported in the July 9, 2004, issue of Science. The finding has major implications for understanding psychiatric disorders and their treatment, the researchers said.

Serotonin is a neurotransmitter, a chemical that one neuron uses to trigger a nerve impulse in its neighbors. Serotonin levels can profoundly affect brain function, and therefore behavior.

"For the first time, we've identified a naturally occurring genetic difference that controls the production of serotonin in the brain," said Howard Hughes Medical Institute investigator Marc Caron,* James B. Duke Professor of Cell Biology at Duke and senior author of the study.

The finding in mice sets the stage for new insights into the role the serotonin-producing enzyme and the gene that encodes it might play in animal behavior and human psychiatric disorders, said the researchers. Low levels of serotonin have been implicated in many disorders such as depression, anxiety, post-traumatic stress disorder and attention deficit hyperactivity disorder.

The enzyme might also influence patients' responses to the class of drugs known as selective serotonin re-uptake inhibitors or SSRIs, they added. SSRIs include paroxetine (Paxil), sertraline (Zoloft) and fluoxetine (Prozac). The influence of the serotonin enzyme raises the possibility that a genetic test to distinguish which version of the gene a patient has could predict the patient's response to the drugs, Dr. Caron said.

The brain is a network of billions of neurons. When stimulated, neurons fire, sending a wave of electrical charge from one end to the other. To bridge the gap between nerves, the neurons release chemical neurotransmitters, SUCH AS serotonin, that set off an impulse in receiving neurons. Once the original cell has passed its message on, it sops up the chemical it released to damp that signal and prepare for the next.

If serotonin levels are decreased, as may occur in patients with depression and other psychiatric disorders, communication among neurons stalls. SSRIs counteract the breakdown by slowing the re-uptake of serotonin, allowing the body to make the best use of abnormally low levels of the chemical messenger, the researchers explained.

Scientists had long considered the enzyme known as tryptophan hydroxylase (Tph1) to be the sole enzyme governing serotonin synthesis in the nervous system, Dr. Caron said. Last year, however, researchers at another institution found that a second enzyme, tryptophan hydroxylase-2 (Tph2), is present in the brain, while the earlier discovered Tph1 is found primarily in peripheral nerves.

The Duke team screened the brains of several mouse strains for the Tph2 gene. To their surprise, said Dr. Xiaodong Zhang, lead author of the study, they found not one version of the gene, but two.

The two gene variants differed in a single DNA unit, called a nucleotide. That difference altered the gene so that it produced a variant of the enzyme with a different amino acid unit and raised the possibility that the change might alter the protein function and production of serotonin, he added.

Studying the effects of the enzyme variants in cultured cells, the researchers found that they had a major effect on the amount of serotonin the cells produced, the team found. That difference was also evident in the mice, the researchers reported. A mouse strain with one variant produced 50 to 70 percent less serotonin in their brains than did mice with the other variant.

"This single genetic difference has a huge impact on serotonin levels, confirming that the gene is fundamental in the synthesis of brain serotonin," reported Dr. Zhang.

The findings will have an immediate practical impact, the researcher added, "Mouse strains that are the subject of much biomedical research have been known to have behavioral differences related to serotonin levels. Now we've identified a major gene responsible."

Exploiting these findings might provide a useful approach to developing animal models of serotonin-related disorders, added Dr. Martin Beaulieu, a co-author on the study.

The team plans to look for similar genetic differences and their influence on brain chemistry in humans with psychiatric disorders. In contrast to the inbred mouse strains, Caron suspects that humans likely bear many versions of the serotonin gene.

Collaborators on the research include Tatyana Sotnikova, Ph.D., and Raul Gainetdinov, M.D.

** ASBMB member.*

by John D. Thompson, Editor

# America's Biotech and Life Science Clusters Who's the Leader?

A June 2004 Milken Institute Report, "San Diego's Position and Economic Contributions," found San Diego to be the leader in the race among the nation's science-oriented regions to latch on to what they see as the growth industry of the twenty-first century—biotechnology.

Regional centers from all across the U.S. are fighting hard in this race to generate high-paying jobs and local prosperity. However, according to the report's authors, Ross DeVol, Perry Wong, Junghoon Ki, Armen Bedroussian and Rob Koepp, only a handful of metropolitan areas have succeeded on a scale necessary to ensure industry sustainability. At the top of that list is San Diego, followed closely by Boston and the Raleigh-Durham-Chapel Hill metro area. Another nine are also in the running.

"Clusters of existing and emerging science-based technologies are crucial factors in shaping the economic winners and losers of the first half of the 21st century," the authors state. "To create international comparative advantage in a knowledge-based economy, clustering innovative activity is imperative."

According to the study's Biotech Index, the top 12 metros (and their composite scores) are:

1. San Diego (100)
2. Boston (95.1)
3. Raleigh-Durham-Chapel Hill (92.5)
4. San Jose (87.8)
5. Seattle-Bellevue-Everett (83.8)
6. Washington, DC (79.4)
7. Philadelphia (76.5)
8. San Francisco (75.8)
9. Oakland (74.3)
10. Los Angeles-Long Beach (66.5)
11. Orange County, CA (54.1)
12. Austin-San Marcos (47.8)

The rankings are based on two factors: An infrastructure that allows a metro area to capitalize on its biotech knowledge and creativity, such as the quality of its workforce and amount of research and development dollars it receives; and the area's success in bringing ideas to the marketplace and creating companies, jobs, and products.

The study, prepared in cooperation with Deloitte & Touche LLP, focuses on the index's top metro, San Diego. That center's life sciences industry is directly and indirectly responsible for 55,600 jobs and $5.8 billion in income – 5.3 percent of the metro area's output.

The study measures each metro's strength in five categories: R&D inputs, risk capital, human capital, biotech workforce, and current impact. San Diego placed first in R&D inputs and current impact. San Jose was first in the risk capital category, while Raleigh-Durham-Chapel Hill was first in the human capital and biotech workforce categories.

If life sciences (which includes pharmaceuticals and medical devices) are included in the measurements, Boston would rank number one, followed by: San Diego (2), San Jose (3), Raleigh-Durham-Chapel Hill (4), Philadelphia (5), Seattle-Bellevue-Everett (6), San Francisco (7), Washington, D.C. (8), Oakland (9), Los Angeles (10), Orange County (11) and Austin-San Marcos (12).

# Biotech Brew Hits European Market

Spurned across the continent by food-fastidious Europeans, the biotechnology industry has turned in its quest for converts to the ultimate ice breaker—genetically modified beer. A consortium of the world's largest biotech companies led by Monsanto Co. helped fund a Swedish brewer's new light lager that's produced with the usual hops and barley—and touch of genetically engineered corn. Brew master Kenth Persson hopes to profit from the notoriety his biotech brew is generating, while biotech companies hope it can gently sway consumers as European regulators slowly reopen the continent to genetically altered foods.

The brewer won't say how many bottles have been sold since the beer was unveiled earlier this year in Denmark and Sweden. However, in July he told the Associated Press in that 4,000 bottles were on their way to stores and pubs in Germany, and was in talks with stores in the United Kingdom.

Mattias Zetterstrand, a Monsanto spokesman based in Stockholm, wouldn't say how much the biotech consortium contributed to the project, but said the companies have not purchased equity in the small Swedish brewer and won't share in sales of the beer. In addition to Monsanto, the companies involved in the project are Bayer CropScience, DuPont, Plant Science Sweden, Svaloef Weibull and Syngenta.

# Looking Ahead at BIO 2004

According to Biotechnology Heritage Award winner Leroy Hood,* within 10 years nanotools will allow an individual's genome to be sequenced in less than half an hour at a cost of under $1,000. Hood, President and Cofounder of the Institute for Systems Biology in Seattle, a non-profit research institute established to pioneer systems approaches to biology and medicine, made his prediction during the Industry Pioneers plenary session at BIO 2004, the annual meeting of the Biotechnology Industry Organization (BIO) in June.

The Chemical Heritage Foundation (CHF) and BIO presented the 6th Annual Biotechnology Heritage Award to Hood, one of the world's leading scientists in molecular biotechnology and genomics and one of the first advocates of the Human Genome Project, in June at BIO's annual meeting in San Francisco.

"Award-winning researcher, gifted entrepreneur, and brilliant innovator, Leroy Hood pioneered the techniques that made the rapid pace of the Human Genome Project possible," said Arnold Thackray, president of CHF. "Without his contribution, the sequencing of the human genome could have taken years or even decades longer."

Speaking in a panel discussion at the plenary session, Dr. Hood said he envisions the creation of handheld devices that perform many of the functions of the standard annual check-up with a physician, only with higher sensitivity. These devices will prick a person's thumb and subject a drop of blood to "dozens of measurements," which would be taken at regular intervals and transmitted to a physician electronically. That way, someone prone to getting heart disease in his 60s could start taking preventive pills in his 40s. Dr. Hood described this kind of early diagnosis and intervention as one of the upcoming "enormous revolutions" and opined that blood was poised to become a "window on disease." However, he warned, that this kind of biology represents a new way of thinking, one that current administrative structures aren't set up to handle.

Thomas J. Perkins, founding chairman of Genentech and co-founder of Kleiner Perkins Caulfield & Byers, agreed, adding that generally his venture capital firm builds companies around a technology. That way, he said, the company grows around the needs of the technology, and the best-fitting management can be brought in later.

*Dr. Leroy Hood*

Dr. Hood called on the federal research programs to focus on integrating research instead of simply funding individual researchers' projects. "There are the study sections that still view science the way we did it yesterday, so the proposals are evaluated in a way that reflects the past, rather than a way that predicts the future."

Perhaps the biggest challenge for pharmaceutical companies, claimed Dr. Hood, is that personalized diagnostics will shrink the markets for individual drugs. To continue to develop new therapies for such niche markets would require bringing development costs down.

*ASBMB member

## LigoCyte Pharmaceuticals Signs Agreement With Baylor College of Medicine

LigoCyte Pharmaceuticals, Inc. has executed an exclusive option from Baylor College of Medicine for a license to technologies related to norovirus vaccines and therapeutics.

"We are very excited to work with Baylor on the development of anti-norovirus strategies," said Dr. Robert Goodwin, LigoCyte's Chief Operating Officer. "Scientists at Baylor have been in the forefront of this field for over a decade."

With support from the Department of Defense, LigoCyte is developing products to combat norovirus infections. Researchers at Baylor College of Medicine, led by Dr. Mary K. Estes, successfully cloned the Norwalk virus genome in 1990 and have made considerable progress, culminating in a Phase I clinical study of an oral Norwalk vaccine. "It is wonderful to be able to join forces with Baylor and combine our programs in the norovirus field," commented Charles Richardson, Ph.D., LigoCyte's Vice President of Research & Development. "This relationship will allow us to quickly move new product candidates into the clinic."

# New Method Enables Researchers to Make Human SARS Antibodies Quickly

Human antibodies that thwart the SARS virus in mice can be mass-produced quickly using a new laboratory technique developed by an international research team collaborating with the National Institute of Allergy and Infectious Diseases (NIAID). The new technique could become an important tool for developing a cocktail of SARS-specific antibodies that might help protect people recently exposed to the SARS virus or at high risk of exposure. The technique could also make possible the development of a similar approach to prevent or treat other illnesses, such as HIV/AIDS and hepatitis C.

The report describing these findings appeared in the July 11, 2004, online issue of *Nature Medicine*.

"While much has been accomplished in our quest for a vaccine against SARS, a vaccine may provide little benefit to someone already infected," says Anthony S. Fauci, Director of NIAID. "Human SARS antibodies could offer a double benefit: they could be used as a potent frontline defense for health care workers and others at high risk of exposure and as an effective treatment for those individuals newly exposed to the virus." Currently, there is no specific effective treatment for SARS.

SARS is caused by a coronavirus, a family of viruses named for their spiky, crown-like appearance. Highly contagious, SARS typically begins with flu-like symptoms, such as fever, headache and muscle aches, and generally progresses to pneumonia. In the 2003 global outbreak, more than 8,000 people were infected with SARS, 9 percent of whom died. In April 2004, a small outbreak in China is suspected to have begun as a result of negligent laboratory practices.

In the current study, Dr. Elisabetta Traggiai, and Dr. Antonio Lanzavecchia, from the Institute for Research in Biomedicine, Bellinzona, Switzerland, together with an international research team, generated human antibodies against SARS more quickly and efficiently than with current methods. Collaborators Dr. Kanta Subbarao and Dr. Brian Murphy, both in NIAID's Laboratory of Infectious Diseases, demonstrated for the first time that human SARS antibodies, when injected into mice, effectively prevent the virus from multiplying in the respiratory system.

"The antibodies from people who have recovered from SARS may target different parts of the virus than antibodies generated by other animals, such as mice," explained Dr. Subbarao. "For this reason, antibodies from recovered patients that may have a proven effectiveness in fighting the disease are considered most desirable for a possible serotherapy against SARS."

Antibodies are made by special immune system cells called B cells that, to do their job, must first be switched on. In nature, this occurs when the body encounters a new or repeat foreign "invader." In the laboratory, researchers conventionally accomplish this by exposing the B cells to *Epstein Barr virus (EBV)*, a herpes virus that infects B cells, which in turn activates them. Unfortunately, this process is very inefficient, and only one or two B cells out of one hundred are activated this way.

Dr. Lanzavecchia and his team added a new ingredient to the mix that significantly boosts efficiency. Beginning with B cells from a recovered SARS patient, the researchers added a short stretch of synthetic DNA that mimics DNA found in bacteria and viruses. From 30 to 100 percent of the B cells—in this case called "memory" B cells because they had been exposed to the SARS virus before—were switched back on, enabling them to churn out SARS antibodies at a fast pace. In only a few weeks, the researchers screened hundreds of antibodies and obtained 35 that could neutralize the SARS virus in the laboratory. All the neutralizing antibodies targeted a key SARS protein, the spike protein, found on the virus surface.

Furthermore, when Dr. Subbarao and Dr. Murphy injected one of the neutralizing antibodies into mice, they found that these antibodies effectively thwarted the SARS virus from multiplying in the lower respiratory tract, which includes the lungs, and, to a lesser extent, in the upper respiratory tract, which includes the nasal cavity. According to Dr. Subbarao, these results are very promising because replication of SARS in the lungs of humans can result in pneumonia.

A primary benefit of the new activation technique is that it generates a large pool of prospective antibodies from which to choose, so only the most effective SARS fighters can be chosen for use in a possible immune serum. Because viruses can mutate, however, more than one antibody will most likely be needed

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# New Members of ASBMB Council

Three new members named to the ASBMB Council at the June meeting are Joan Conaway, Investigator, Stowers Institute of Medical Research; Robert A. Copeland, Director, Enzymol and Mechanistic Pharmacol Department, GlaxoSmithKline; and William S. Sly, Professor and Chair, Biochemistry & Molecular Biology Departments, St. Louis University School of Medicine.

*ASBMB Today* asked them to share their thoughts about the Society and what they will bring to the Council. Following are there comments.

**Dr. Conaway:** I believe two of the most important things ASBMB does for its membership are to publish excellent journals and to sponsor scientific meetings. As a meeting attendee, I've in general had a preference for smaller meetings because of the increased opportunities for personal interactions with other scientists at the meeting. As a member of ASBMB's meetings committee, I've been a strong supporter of the idea that ASBMB should sponsor small, focused meetings such as the transcription and chromatin meeting to be held in Granlibakken this fall, and the meeting on redox signaling to be held at Kiawah. I'd very much like to see the small meetings program continue and grow.

*Dr. Joan Conaway*

I've also been very impressed with the development of the national meeting. I think the recent changes in meeting format (i.e. having up to 10 concurrent themes or small "meetings within the meeting" that together cover a significant number of areas of interest) pioneered by Claudia Kent and Vern Schramm when they organized the national meeting two years ago have really energized the meeting. I hope in future years we can find ways to enhance the meeting even more, perhaps by increasing the opportunities for informal interactions among attendees.

**Dr. Copeland:** Biochemistry has always been a discipline that bridges the chemical and biological sciences, and working at the interface between disciplines has been a constant feature of my career in science. Working as a biochemist in the pharmaceutical industry requires me to speak the common language of chemistry and to interpret this in the context of cellular and organismal biology, and human medicine. Actively maintaining an adjunct appointment at the University of Pennsylvania School of Medicine has allowed me to also be at the interface of academic and industrial science. This has afforded me many opportunities to interact with a diverse group of scientists including students, postdoctoral fellows and faculty, in addition to my industrial colleagues. I believe these experiences provide me with a unique perspective on the status, concerns and needs of the biochemistry and molecular biology community at large. I am excited to bring this unique perspective to my work on the ASBMB governance council.

*Dr. Robert Copeland*

**Dr. Sly** is an internationally known physician and scientist with four decades of experience in medical education, biomedical research, and administration. His career was evenly split between Washington University, where he began his academic career, and Saint Louis University, where he has spent the last 20 years as Chair of the Department of Biochemistry and Molecular Biology. In this position, he directs a vigorous faculty, which is active in research and medical education, and in graduate teaching through a departmental and interdepartmental graduate program.

*Dr. William Sly*

He has served 10 years on different NIH study sections and six years on scientific advisory panels for HHMI. He has been funded by the NIH throughout his academic career and currently directs two active research programs, both supported by R01 grants. He was elected to the National Academy of Sciences in 1989. His interests outside science include promoting justice and human rights, advocacy for the poor, and promoting understanding and tolerance in our increasingly polarized society.

*Continued from previous page*

to achieve the optimal protection or treatment, the researchers contend.

The researchers' next goal is to find additional antibodies against the SARS virus, focusing on those that attach most readily to the virus, are most potent against the virus, and can attach to more than one site on the spike protein.

# Calendar of Scientific Meetings

## AUGUST 2004

### 8th International Symposium on the Maillard Reaction

**August 28–September 1** • Charleston, South Carolina
For detailed information about the meeting, including abstract submission, a call for papers and deadlines.
Website: http://Maillard.chem.sc.edu
Email: Maillard@mail.chem.sc.edu

### International Congress on Biocatalysis 2004

**August 29–September 1** • University of Technology, Hamburg, Germany
Contact: Gerlinde Loebkens; FON +49-40-76618012
FAX +49-40-76618018; e-mail: loebkens@tutech.de
Website: www.biocat2004.de

### 5th Meeting on Methods in Protein Structure Analysis

**August 29-September 2** • University of Washington, Seattle
Ph: 206-706-8118; Email: mpsa2004@u.washington.edu
Website: http://depts.washington.edu/biowww/mpsa2004/

## SEPTEMBER 2004

### Relaxin 2004: Fourth International Conference on Relaxin and Related Peptides

**September 5–10** • Grand Teton National Park, Jackson Hole, WY
This conference will present recent advances on the chemistry, physiology, and pharmacology of relaxin, related peptides, and their receptors.
Email: relaxin-2004@ad.uiuc.edu
Website: http://www.life.uiuc.edu/relaxin2004/

### Stem Cell Biology: Development and Plasticity

**September 16–19** • Scheman Continuing Education Building Iowa State University, Ames, Iowa.
Abstracts due July 16, 2004; Registration deadline: August 16, 2004
Student Travel Grant Applications due July 16, 2004
Contact: Growth Factor and Signal Transduction Conferences Symposium Office
Ph: 515-294-7978; Fx: 515-294-2244; Email: gfst@iastate.edu
Website: http://www.bb.iastate.edu/-gfstlhomepg.htmi

### Cellular and Molecular Basis of Regeneration EuroConference on the Molecular Pathways Leading to Regeneration

**September 18–23** • San Feliu de Guixols, Spain
Contact: European Science Foundation, EURESCO Office
Ph: +33(0)3 88 76 71 35; Fx: +33 (0)3 88 36 69 87
Email: euresco@esf.org; Website: http://www.esf.org/euresco

## OCTOBER 2004

### Brain Uptake and Utilizaton of Fatty Acids

Sponsored by the Kennedy Krieger Institute and Department of Neurology, Johns Hopkins University School of Medicine
**October 7–9** • Holiday Inn Select, Bethesda, Maryland
Organizers: Paul Watkins, Kennedy Krieger Institute; James Hamilton, Boston University; Cecilia Hillard, Medical College of Wisconsin; and Arthur Spector, University of Iowa
Email: watkins@kennedykrieger.org

### Cytokines in Cancer and Immunity: Joint Conference of ICS and ISICR

**October 21–25** • San Juan, Puerto Rico
An exceptional meeting bringing together leading investigators in cytokine biology, cancer and immunology.
Keynote speakers: Michael Karin and Tak Mak.
Abstract deadline: June 11, 2004
Email: info@cytokines2004.org; Fax: 706 228-4685
Website: www.cytokines2004.org

### An ASBMB Sponsored Symposium: Redox Signaling in Biology and Disease

**October 21–24** • Kiawah Island, South Carolina
Organized by Larry Marnett, Vanderbilt U. and Roy J. Soberman, Harvard Med. School
Plenary Lecture: Regulation of Mammalian Clock Genes
Steven L. McKnight, U. of Texas, Southwestern Medical Center
Contact: Joan Geiling, Ph: 301-634-7145; Fax: 301-634-7126
Email: asbmb@asbmb.org; Website: www.asbmb.org

### An ASBMB Sponsored Symposium: Transcriptional Regulation by Chromatin and RNA Polymerase II

**October 29–November 1** • Granlibakken, Lake Tahoe, California
Organized by Ali Shilatifard, St. Louis U. School of Med.
Keynote Speakers: Joan Conaway and Ronald Conaway
Contact: Joan Geiling, Ph: 301-634-7145; Fax: 301-634-7126
Email: asbmb@asbmb.org; Website: www.asbmb.org

## NOVEMBER 2004

### 4th International Congress on Autoimmunity

**November 3–7** • Budapest, Hungary
Deadline for Receipt of Abstracts: June 20, 2004
Contact: 4th International Congress on Autoimmunity Kenes International—Global Congress Organisers and Association Management Services,17 Rue du Cendrier, PO Box 1726, CH-1211 Geneva 1, SWITZERLAND
Ph: +41 22 908 0488; Fx: +41 22 732 2850
Email: autoim04@kenes.com
Website: www.kenes.com/autoim2004

### American Association of Pharmaceutical Scientists AAPS Annual Meeting and Exposition

**November 7–11** • Baltimore, Maryland
Ph: 703 243 2800; Fx: 703 243 9650
Website: www.aapspharmaceutica.com/meetings/futuremeetings/

### First Latin-American Protein Society Meeting

**November 8–12** • Hotel do Frade, Rio de Janeiro, Brazil
Sponsored by The Protein Society, The Wellcome Trust, and Brazilian research funding agencies.
For more information: Dr. Alberto Spisni
Brazilian Synchrotron Light Laboratory, Campinas, Brazil, and Dept. Experimental Medicine, University of Parma, Italy
Caixa Postal 6192 - CEP 13084-971, Campinas, SP, Brazil
Ph: +55 19 3287-4520; Fx: +55 19 3287-4632
Email: alberto@lnls.br; Website: www.lnls.br/lapsm

### Second National Meeting of the American Society for Matrix Biology

**Nov 10–13** • San Diego, California
Contact: ASMB, 2019 Galisteo Street, Building I-1, Santa Fe, NM 87505; Ph: 505 989-4735; email: cindi@sciencemanagers.com
Website: http://www.asmb.net

## DECEMBER 2004

### American Society for Cell Biology, 44th Annual Meeting

**December 4-8** • Washington, DC
Ph: 301-347-9300; Fx: 301-347-9310
Website: http://www.ascb.org/

## APRIL 2005

### American Society for Biochemistry and Molecular Biology Annual Meeting in Conjunction with EB2005

April 2 – 6 • San Diego
Contact: Experimental Biology 2005, 9650 Rockville Pike
Bethesda, MD 20814-3008; Ph: 301-634-7010
Fax: 301-634-7014; www.faseb.org/meeting

## JULY 2005

### 30th FEBS Congress — 9th IUBMB Conference, 2005 The Protein World; Proteins and Peptides: Structure, Function and Organization; Science is Fun: A Conference for Your Creativity

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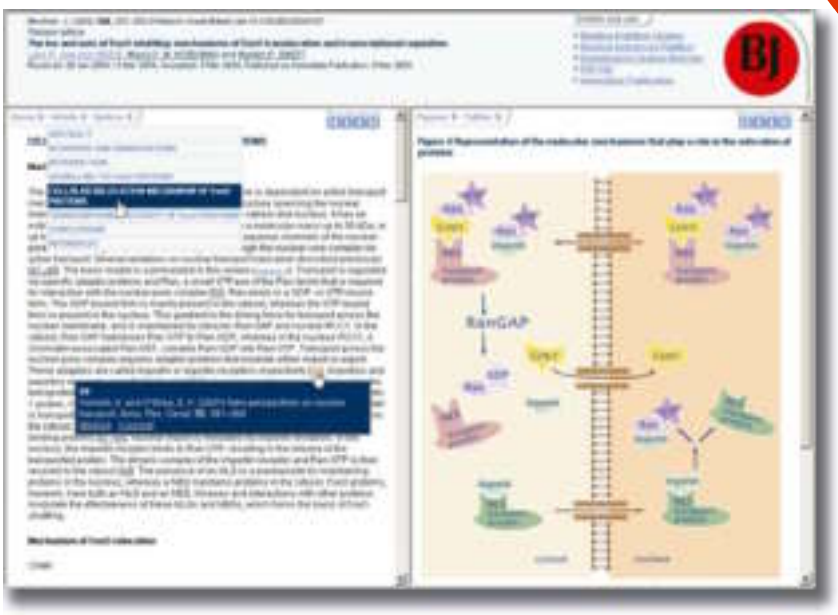

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