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ALSO IN THIS ISSUE

ASBMB President, President-Elect Visit Congress

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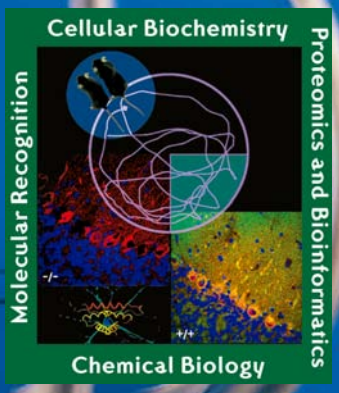
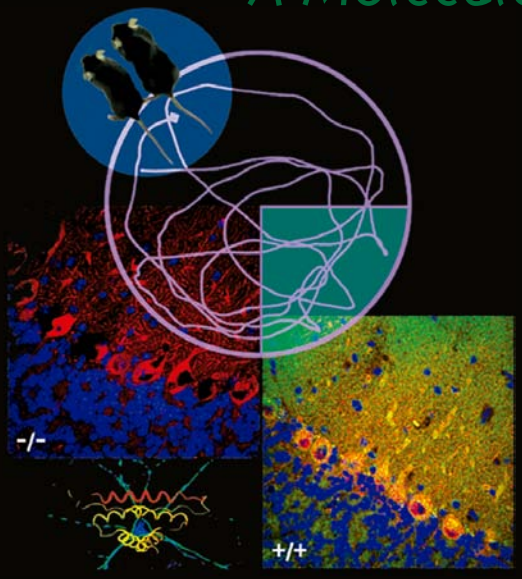


"A Molecular Exploration of the Cell"
ASBMB Annual Meeting
and 8th IUBMB Conference
June 12-16, 2004
Boston, Massachusetts

IUBMB/ASBMB 2004 LATE ABSTRACT DEADLINE: APRIL 21, 2004

IUBMB/ASBMB 2004

"A Molecular Exploration of the Cell"



June 12 – 16

Boston, MA

American Society for Biochemistry and Molecular Biology Annual Meeting and 8th IUBMB Conference

Proteomics and Bioinformatics ■ Chemical Biology ■ Molecular Recognition ■ Cellular Biochemistry

Opening Lecture

First Annual Herbert Tabor/Journal of Biological Chemistry *Lectureship*
Robert J. Lefkowitz, *HHMI, Duke University Medical Center*

Organized by:

John D. Scott, HHMI, *Vollum Institute;* Alexandra C. Newton, *UCSD;* Julio Celis, *Danish Cancer Society*, and the 2004 ASBMB Program Planning Committee

Cellular Organization and Dynamics
Organizer: Harald A. Stenmark, *Norwegian Rad. Hosp.*

Genomics, Proteomics and Bioinformatics
Organizers: Charlie Boone, *Univ. of Toronto* and Michael Snyder, *Yale Univ.*

Integration of Signaling Mechanisms
Organizer: Kjetil Tasken, *Univ. of Oslo, Norway*

Molecular and Cellular Biology of Lipids
Organizer: Dennis Vance, *Univ. of Alberta*

Molecular Recognition and Catalysis
Organizer: Jack E. Dixon, *UCSD*

Protein Modifications and Turnover
Organizer: William J. Lennarz, *SUNY at Stony Brook*

Protein Structure, Catalysis and Dynamics
Organizer: Susan Taylor, *UCSD*

Regulation of Gene Expression and Chromosome Transactions
Organizer: Joan W. Conaway, *Stowers Inst. for Med. Res.*

Signaling Pathways in Disease
Organizers: Alexandra Newton, *UCSD* and John D. Scott, *HHMI, Vollum Inst.*

The Future of Education and Professional Development in the Molecular Life Sciences
Organizer: J. Ellis Bell, *Univ. of Richmond*

For further information:

ASBMB
9650 Rockville Pike
Bethesda, MD 20814
Tel: 301-634-7145
Fax: 301-634-7126
Email: asbmb@asbmb.faseb.org
http://www.asbmb.org

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ASBMB Today

AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY

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Volume 3, Issue 1

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Please direct any comments or questions concerning *ASBMB Today* to:

John D. Thompson
Editor, *ASBMB Today*
9650 Rockville Pike
Bethesda, MD 20814-3996
Phone: 301-634-7145; Fax: 301-634-7126
E-mail: jthompson@asbmb.faseb.org

A Pro-Life Texas Legislator's Response to Criticism for Supporting SCNT

The following interview was conducted with Texas State Representative Rob Eissler (R-Woodlands) to obtain his thoughts on his efforts to resolve the issue of advancing the use of somatic cell nuclear transfer in biomedical research. Eissler, just as Senator Orrin Hatch (R-Utah), has wrestled with his own system of ethical behavior while considering the impact of such research on regenerative medicine and the advancement of all biomedical research.

Eissler, a freshman member of the Texas House of Representatives, has come under fire from the Texas Right to Life Coalition for his efforts to defeat a legislative ban on Somatic Cell Nuclear Transfer (SCNT) research in the state House of Representatives last year.

ASBMB Today has been covering this issue since its inception last spring, and Society staff visited the state in October to attend a meeting in Austin of local SCNT advocates, Texans for Advancement of Medical Research (TAMR).

Eissler, a staunch pro-life politician, agreed to take some questions from ASBMB's Public Affairs Officer, Peter Farnham, to discuss his position on SCNT. Following are his responses.

ASBMB Today: *You are a supporter of Somatic Cell Nuclear Transfer research. What led you to your decision to support this research?*

Eissler: I don't believe that SCNT is human cloning although some of its attributes may lead some to think that it is. It is research that gives promise for a potential cure for a whole list of diseases and defects. The quality of life that children have to endure with diabetes and all of its accompanying problems is incentive enough to encourage us to do anything we can to help produce a cure. The potential for a cure for paralysis and Parkinson's could affect millions of Americans.

I am still looking for evidence that will convince me that SCNT is human cloning.

ASBMB Today: *You are a pro-life legislator with a grade of 94 on the Texas Right To Life Coalition scorecard. Why do you think that TRTLC would take the view that your position on SCNT is not pro-life?*

Eissler: They feel that SCNT creates human embryos and that any research that is harvesting stem cells from the SCNT procedure is destroying human life.

ASBMB Today: *Do you think there will be continued attempts to ban SCNT research in Texas?*

Eissler: Until the question is answered to the satisfaction of everyone as to whether or not SCNT is human cloning, there will always be attempts by one group or another who disagree with the definition of SCNT.

ASBMB Today: *Have you received any adverse political fallout from your constituents about your efforts last year to defeat the proposed ban on SCNT research in Texas?*

Eissler: My constituents know that I am not in favor of human cloning.

ASBMB Today: *What advice would you give to scientists in Texas who are concerned about attempts to stifle potential lifesaving research in your state?*

Eissler: I would tell them to get involved in the political process. They should make direct contact with their state legislators, and members of the U.S. Congress and relay to them the importance of their research. Let them know the extent to which researchers have advanced in actually producing a cure for multiple diseases. In my own district, there is a Research Forest that is not only contributing to finding

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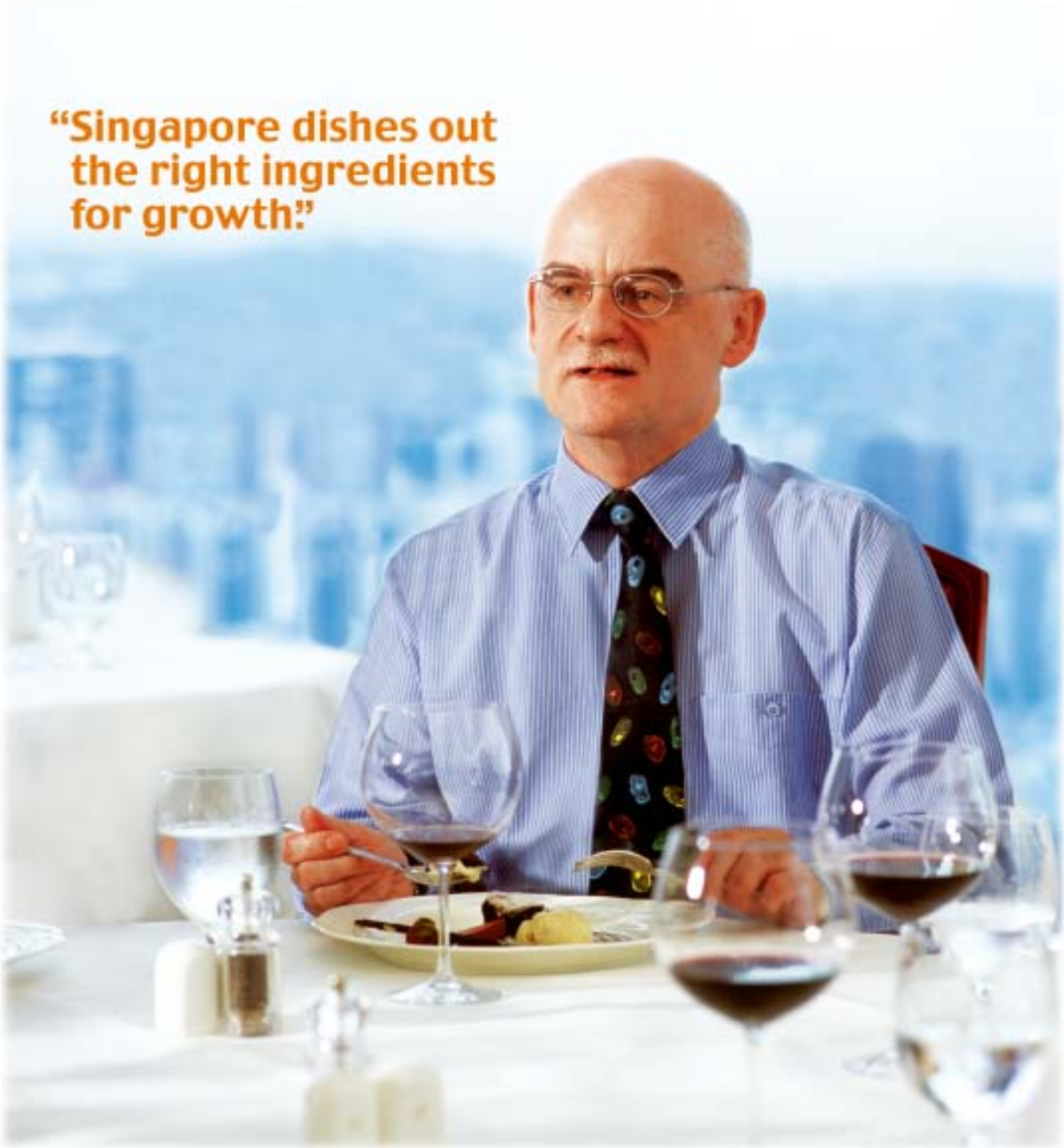
"Singapore dishes out the right ingredients for growth."



Food connoisseur Professor Barry Halliwell knows a winning recipe when he sees one. That's why he's convinced that Singapore is the ideal base for his groundbreaking research in molecular nutrition.

"Singapore offers me many opportunities to make a difference," says the Executive Director of the Graduate School of Integrative Sciences and Engineering at the National University of Singapore.

Identified by the Institute for Science Information as one of the most cited scientists in Biology and Biochemistry, Halliwell's work on free radicals and cellular toxicity is world-renowned.

This former Professor of Medical Biochemistry at King's College, London, is delighted with Singapore's investments in the entire value chain of biomedical sciences activities. Topping it off, Biopolis, the pioneering epicentre of biomedical research, which is located amidst lush greenery and cool cafés, can house up to 2,000 scientists.

If you want to be savouring a biomedical breakthrough on your menu, send your resume to bms@cs.org.sg or visit www.contactsingapore.org.sg today. It could be your best entrée.

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by Peter Farnham, CAE, ASBMB Public Affairs Officer

2005 Budget Resolution Clears Senate, But Not House

The Senate approved a 2005 budget resolution in the early morning hours of March 12 with some improvement in funding for the National Institutes of Health through the good offices of Senator Arlen Specter (R-PA), NIH's best friend in Congress this year. However, it remains to be seen if the amendment will ultimately impact on NIH spending in this very difficult budgetary year.

Senator Specter offered an amendment during floor debate on the resolution to increase NIH funding this year by $2 billion, to be paid for by offsetting cuts in travel and other administrative expenses throughout the federal government. The amendment passed by a vote of 72-24. It passed in spite of a harsh floor speech by Senator Pete Domenici (R-NM), attacking the NIH and its supporters as "pigs."

A second amendment to increase NIH funding, offered by Senator Tom Harkin (D-IA), failed by a vote of 32-64. This amendment would have boosted the federal tax on a pack of cigarettes by 61 cents, with the money raised going to fund NIH. A virtually united Republican Senate majority, joined by tobacco state Democrats, combined to defeat the amendment handily.

After all amendments had been considered, the Senate passed the 2005 budget resolution early on March 12 and then went into recess, taking the next week off. The House is considering its version of the budget resolution as of this writing (mid-March) but has not approved it yet.

A Budget Resolution Lesson

In order to judge the impact of the amendments discussed above on NIH funding this year, it is instructive to look at some of the details of the budget process. Both the House and Senate approve a budget resolution, and their respective versions are then taken to a conference committee to resolve differences between them. However, unlike other legislation, the president does not sign this bill into law.

The budget resolution divides the budget up into about two dozen broad categories called "functions." For example, function 250, Science and Technology, contains funding for the National Science Foundation and a few other science-related programs at the Department of Energy and elsewhere. Function 550, Health, contains funding for the NIH.

The budget resolution also divides up federal spending into several categories that are even broader than functions. The largest is mandatory spending, that is, spending required by law (this would include Medicaid and Medicare, social security spending, and the like). A second category is interest on the national debt. These two categories account for about two-thirds of the federal budget, this year pegged at $2.36 trillion. The remainder of the funding in the budget resolution is called domestic discretionary spending, which this year amounts to $814 billion under terms of the Senate plan. About half of this total pays for national defense. Literally everything else in the federal government—including funding for science at NIH and NSF—is paid for out of non-defense domestic discretionary spending.

The domestic discretionary spending number is also the only number that the Appropriations Committee has to pay attention to; the Appropriations Committee is required to spend no more on domestic programs than whatever total figure the Budget Committee comes up with for domestic discretionary spending. In addition, the Appropriations Committee is free to ignore the figures the budget resolution specifies for the various functions. Thus, amendments to the budget resolution that merely shift money around between functions, as the Specter amendment did ($2 billion into Function 550, to be taken from Function 920 which funds administration and travel) is not something the Appropriations Committee is required to comply with. The only way an amendment to the budget resolution can impact total spending for a particular program is if the total for discretionary spending is increased.

Thus, the Specter amendment, which did not raise total discretionary spending, passed handily. The Harkin amendment, which would have raised total discretionary spending by raising taxes on cigarettes, did not pass.

This is not to say, however, that the Specter amendment was without value. First, Senator Specter is a member of the Senate Appropriations Com-

Continued on next page

A Day on Capitol Hill: President Masters and President-Elect Bond Visit House and Senate Offices

Despite the rain and cold, Tuesday, March 16, was a busy day for ASBMB President Bettie Sue Masters and President-elect Judith Bond, who spent most of the day visiting various Congressional offices. The two were accompanied by ASBMB Public Affairs Officer Peter Farnham, who guided them through the labyrinth-like congressional office buildings that can often be confusing for those unfamiliar with them.

Meetings were held with a variety of congressional staff, both in the House and Senate, and from the personal offices of members and senators as well as with staff on the House and Senate appropriations committees.

The ASBMB delegation also met personally with Rep. Chris Bell (D-Texas), a freshman representative from the Houston area. Bell received a framed certificate from ASBMB in recognition of his work last summer on behalf of NIH funding. He organized an effort to generate a "dear colleague" letter on behalf of increases for NIH that garnered 213 signatures, almost half the House. This was a very impressive accomplishment, especially for a freshman legislator. Unfortunately, Bell will not be returning to Congress next year, as he lost his primary due to a mid-term redistricting plan adopted in Texas that changed the composition and demographics of his district.

Rep. Chris Bell holding his award from ASBMB with (L to R) Public Affairs Officer Peter Farnham, President Bettie Sue Masters, and President-elect Judith Bond during a visit to Bell's Capitol Hill office on March 16.

The ASBMB officials made the case for increased NIH funding, but the message received from the Hill was that this is going to be a tough sell, especially this year. There is a widespread perception on the Hill that since the NIH budget was doubled over five years ending in 2003, its problems are taken care of for now and other needs can and should be addressed. Drs. Masters and Bond acknowledged this, and repeatedly expressed the biomedical research community's gratitude for the doubling. However, they also indicated that an agency the size of NIH requires support at a constant level to prevent deterioration of its research and training programs.

It is clear from the visits that the National Science Foundation is a far less well-known federal agency, and considerable attention should be paid to increasing its visibility. ASBMB has long maintained an interest in the NSF, and Drs. Masters and Bond spent some of each meeting talking up the kinds of research NSF funds—virtually every other academic scientific discipline receives a major portion of its funding from NSF, a fact few people they met with seemed to realize. They were also surprised to hear that the agency is less than 20% the size of NIH, receiving just over $5 billion last year. The importance of the chemistry, physics, mathematics, and computational research that NSF funds on the biomedical research enterprise was repeatedly stressed during the visit.

Finally, the ASBMB visitors discussed with Senate staff the promise of somatic cell nuclear transfer techniques and stem cell research.

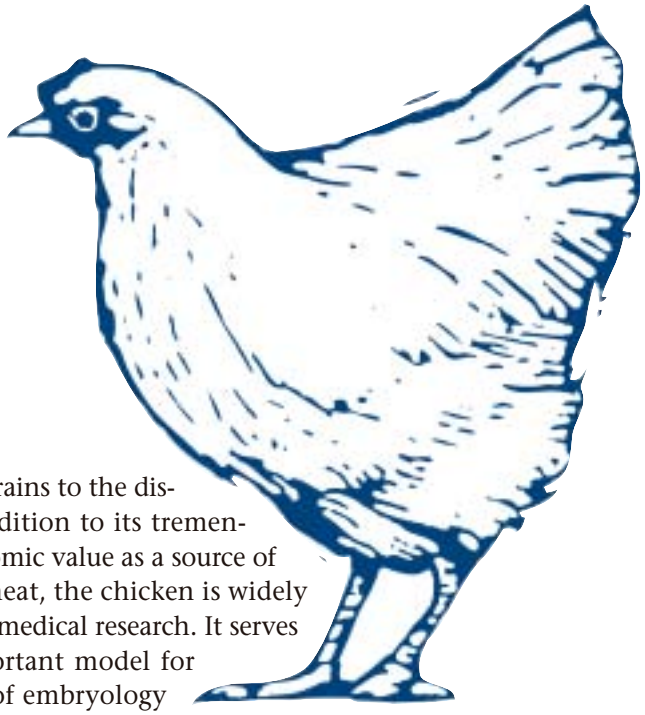
By the end of the last appointment, at 6:00 p.m., your elected leadership departed the Hill but had the satisfaction of knowing that a solid day of representing ASBMB's interests had been accomplished.

Continued from previous page

mittee, and in fact chairs its Labor/HHS Subcommittee (which appropriates funds for NIH). He is thus in an excellent position to bring about an increase in NIH funding. Second, even if he were not in this key position, that his amendment passed by a 3-1 margin is a clear indication of Senatorial intent and thus could be used as a powerful symbolic weapon.

Updates on the budget and appropriations process for 2005 will be posted regularly on the ASBMB homepage, at www.asbmb.org. Look for this information under the "What's New" column.

Chicken Genome Now Available



The National Human Genome Research Institute (NHGRI) has announced that the first draft of the chicken genome sequence has been deposited into free public databases for use by biomedical and agricultural researchers around the globe. A team led by Richard Wilson, Ph.D., from the Washington University School of Medicine in St. Louis successfully assembled the genome of the Red Jungle Fowl, the ancestor of domestic chickens. Comprised of about 1 billion DNA base pairs, the chicken genome is the first avian genome to be sequenced.

The Washington University researchers have deposited the initial assembly, which is based on seven-fold sequence coverage of the chicken genome, into the public database, GenBank (www.ncbi.nih.gov/Genbank). In turn, GenBank will distribute the sequence data to the European Molecular Biology Laboratory's Nucleotide Sequence Database, EMBL-Bank (www.ebi.ac.uk/embl/index.html), and the DNA Data Bank of Japan, DDBJ (www.ddbj.nig.ac.jp).

To facilitate comparative genomic analysis, the researchers also have aligned the draft version of the chicken sequence with the human sequence. Those alignments can be scanned using the University of California, Santa Cruz Genome Browser, (http://genome.ucsc.edu/cgi-bin/hgGateway); the National Center for Biotechnology Information Map Viewer, (www.ncbi.nlm.nih.gov/mapview); and the European Bioinformatics Institute Ensembl system, (http://www.ensembl.org/). Sequencing of the genome began in March 2003 and NHGRI provided about $13 million in funding for the project.

In addition, using the *Gallus gallus* genome sequence assembled by Washington University as a reference framework, an international team, led by the Beijing Genomics Institute in China and supported by the Wellcome Trust in Britain, has created a map of genetic variation for three different strains of domestic chickens. The strains were a broiler strain from the United Kingdom, a layer strain from Sweden and a Silkie strain from China. To make the map, researchers identified and analyzed about 2 million genetic variation sites, mostly single nucleotide polymorphisms (SNPs). The genetic variation data will soon be deposited into GenBank, from which the data will be freely accessible to researchers worldwide.

Recent outbreaks of avian flu have accelerated scientists' interest in learning more about the chicken genome and how genetic variation may play a role in the susceptibility of different strains to the disease. In addition to its tremendous economic value as a source of eggs and meat, the chicken is widely used in biomedical research. It serves as an important model for the study of embryology and development, as well as for research into the connection between viruses and some types of cancer.

The chicken also is well positioned from an evolutionary standpoint to provide an intermediate perspective between mammals, such as humans, and lower vertebrates, such as fish. By comparing the human genome sequence with those of other organisms, researchers can identify regions of similarity and difference. This information can help scientists better understand the structure and function of genes and thereby develop new strategies to combat human disease.

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Instant Index Eases Your Search in *JBC*

Vivisimo's Instant Index program, just added to the websites of *The Journal of Biological Chemistry, Journal of Lipid Research, Molecular and Cellular Proteomics,* and *Biochemistry and Molecular Biology Education,* will make your keyword searches work quicker and more efficiently.

We could pretend that keyword searches of full text are an excellent tool for finding the specific articles you need — since keyword searches are just about the only tool most search systems give you! - but often a searcher is faced with thousands of search results in response to a keyword search because systems like PubMed index over 12 million article abstracts, and the HighWire Portal indexes all those abstracts plus the full text of over a million articles as well. But there is help for those who have to look for the needle in the haystack!

The HighWire Portal at http://highwire.stanford.edu recently added Vivisimo's Instant Index to help you spot those needles-in-the-haystack of a large result. This new tool takes advantage of the "I know it when I see it!" recognition ability we all have by augmenting the recall of the keywords to do a search, with the capability of seeing just the right use of a term in the context of a sentence or phrase. These tools are helpful when a scientific term used in a keyword search is ambiguous or multi-faceted, or when you are interested in only one aspect of many uses of that term; the tools are also useful when you are doing broad subject searches and can't provide very specific keywords.

The new tools are called KWIC (showing your search keywords in context) and Instant Index, which clusters items in your search results around major concepts. KWIC is shown in the first figure; here you see a search for the keywords "cytochrome oxidase" which returned over 13,000 citations. An Instant Index for a search on the term "mercury" is shown in the second figure.

KWIC

You can easily see from the example how KWIC can help you recognize articles that use your search terms in a relevant way in a sentence. Each citation in a search result will typically show you significant parts of the first two sentences in which your search terms are found in that citation. Not only can KWIC help you spot relevant results, but it can suggest additional terms or phrase-search criteria that you can use to narrow your result.

Instant Index

The Instant Index is a more subtle—and potentially more helpful—new feature. Each search that retrieves more than 50 items will have a hyperlink that will take you to the Instant Index built from the top 500 items in your search result. You can see the Instant Index hyperlink in the middle of the first figure; it is the last link in the box under the Search Results heading; click on that link, and a new window like the one in the second figure will open up. The left side of the new window shows the index to your results; like the index in the back of the book, it contains concepts and sub-concepts. To the right of each concept is the number of citations that match. If you click on the concept name, the right side of the window will change to display the citations for that concept; in the example, we've clicked on "Cell; Proteins" and are looking at a list of 36 citations for that concept that contain the keyword " mercury" from our search. If you click on the "+" sign, it will show you the concepts indexed under another concept.

SCNT continued ...

The technology that brings you the Instant Index is still being tuned, and we'd appreciate your feedback on whether and where you find it most helpful, and where you find otherwise. You may also find some interesting tests and uses for it. For example: try a search for your own papers, and see whether the clusters of topics match what you think you've written about! Or, if you have to deliver a lecture (or a course!) on a topic, you might do a search for that topic as a keyword search - perhaps asking for "review articles only"—and then see whether the resulting Instant Index suggests possible topics for your lecture outline.

Continued from page 2

cures but also to the economy of the district. The economic significance is vital all over Texas where there are many university research centers.

ASBMB Today: *What advice would you give to the right-to-life community in Texas about SCNT research and their attitudes toward it?*

Eissler: Part of my right-to-life philosophy is to take care of those who are already alive, and to do all I can to preserve their quality of life. I believe that stem cell research has the potential to preserve the dignity of human life and give us hope for curing diseases that affect millions of Texans. Many believe that this, in fact, is the right-to-life position. I say this with the full belief that we are not taking a human life to save a human life.

ASBMB Today: *Thank you.*

Epilogue: In 2003, 29 state legislatures considered bills to ban human cloning; unfortunately, most of these bills also included a ban on SCNT research in the state. So far, two states explicitly allow SCNT research—California and Massachusetts. Four explicitly ban it.

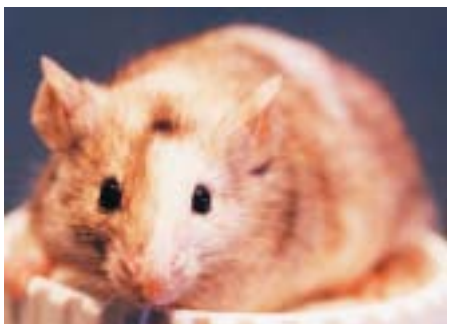
ASBMB will continue its efforts to monitor state legislation in this and other areas and will keep you informed.

Making of Mouse Marks Move Toward 'Mitochondrial Medicine'

There sits in most mammalian cells what amounts to a lockbox of DNA tucked away from the bulk of genetic material. While scientists routinely cut and paste snippets of life's blueprint to learn more about life and to treat disease, crucial DNA within cellular structures known as mitochondria has remained off-limits.

That's beginning to change, though, thanks in part to work described in the February 10 issue of the *Proceedings of the National Academy of Sciences* by a team from the University of Rochester Medical Center and the University of Melbourne in Australia. These scientists created a new kind of mouse by replacing the genetic material in the mitochondria of one species with that from another in a gene-swapping exercise necessary if doctors are to understand several currently untreatable human diseases.

"What we call mitochondrial medicine–how specific mitochondrial mutations and deficiencies lead to disease–didn't even exist 15 years ago. Now the field is in its infancy. The ultimate goal is improved treatment for people with disorders that currently can't be treated," says ASBMB member Carl A. Pinkert, Professor of Pathology and Laboratory Medicine, Center for Aging and Developmental Biology at Rochester, who led the Rochester team.



Elizabeth A. Roberts, UCSD.

The creation of the new kind of mouse is the result of several years of painstaking research by two groups of scientists working together across the globe. The work marks one of the most successful forays yet into the manipulation of DNA in the mitochondria.

"We used an approach that had a high risk of failure, but one that will now provide exciting new insights into how mitochondrial genes may affect the way common diseases express themselves," says Dr. Ian Trounce of the University of Melbourne in Australia, whose team did much of the laboratory work.

Trouble with the cell's powerhouse, the mitochondrion, can touch upon scores of diseases. In diseases that become more common as people age—from infertility and diabetes to cancer, Alzheimer's and Parkinson's diseases—faltering mitochondria are known to play a role. And the cellular machinery is at the heart of several less common inherited diseases that affect patients more drastically at a younger age. When a cell's mitochondria fail, the massive power loss not only injures or kills the cell but can even lead to organ failure or death.

For technical reasons, the tiny bit of genetic code carried inside the mitochondria—just 37 genes out of tens of thousands of genes overall in humans—has remained largely off limits to researchers. After all, most cells have anywhere from a few hundred to a few thousand mitochondria, compared to just one nucleus, making the nucleus the easiest and most likely target for manipulation.

"We've had the ability to modify genes in the nucleus for more than 20 years," says Dr. Pinkert, "but it is technologically more challenging to change mitochondrial DNA. It is difficult to isolate and change mitochondria in large numbers without doing major damage to the cell."

In the research described in the PNAS paper, he and Dr. Trounce started out with 1,136 mouse embryos into which they injected stem cells containing mitochondria from another mouse species. Ultimately, after another generation of breeding, the team ended up with just six "germline" offspring containing only the introduced mitochondria—in effect, "transplanted" mitochondria from another species. All six were males, and just three lived longer than one day.

"While we're pleased with the success we did have, we have a lot of work ahead of us to figure out why the numbers are so low," says Dr. Pinkert. "It's important to work this out, if we are to develop models of disease that will allow us to create new strategies and therapies for patients with incurable metabolic diseases affected by mitochondrial function."

George Carman to Receive Supelco/ Nicholas Pelick—AOCS Research Award

George M. Carman, Professor of Food Science at Rutgers University, has been selected to receive the Supelco/Nicholas Pelick—American Oil Chemists Society (AOCS) Research Award. The award is sponsored by Supelco, Inc., a Division of Sigma-Aldrich, Bellefonte, Pennsylvania, and Nicholas Pelick, a longtime member and past president of AOCS. Dr. Carman, an ASBMB member and Chair of the 2004 Meetings Committee, will accept the award and deliver a lecture at the 2004 AOCS Annual Meeting and Expo, May 9-12 in Cincinnati. The award recognizes outstanding original research in fats, oils, lipid chemistry, or biochemistry. Preference is given to those actively associated with research, and who have made discoveries that have influenced their fields of endeavor.

Regulation of Phospholipid Metabolism/Signaling in Yeast

Dr. Carman's research utilizes molecular genetic and biochemical approaches to study the regulation of phospholipid metabolism in the yeast *Saccharomyces cerevisiae*. Phospholipids are essential molecules that contribute to the structural definition of cell membranes, and participate in the regulation of cellular processes as signaling molecules and as reservoirs of lipid messengers.

The Carman laboratory discovered that key enzymes are regulated by membrane- and cytosolic-associated components and by covalent modification by protein kinases. These forms of enzyme regulation have profound effects on membrane phospholipid composition and have important medical implications for understanding the molecular basis for various diseases.The Carman laboratory has made significant contributions to the understanding of phospholipid synthesis in yeast through the purification and characterization of several enzymes and the isolation and characterization of key genes. The laboratory played a key role in the discovery that expression of phospholipid biosynthetic enzymes is regulated by phospholipid precursors and the mineral zinc; and that key enzymes are regulated by membrane- and cytosolic-associated components and by covalent modification by protein kinases. These forms of enzyme regulation have profound effects on membrane phospholipid composition and have important medical implications for understanding the molecular basis for various diseases.

George M. Carman

Two research projects are currently funded by grants from the National Institutes of Health. One project addresses the hypothesis that phosphorylation of phospholipid biosynthetic enzymes represents a mechanism by which pathways of signal transduction mediate phospholipid metabolism. Key enzymes being studied include *CKI1*-encoded choline kinase and *URA7*-encoded CTP synthetase. Unregulated levels of these two enzymes are common properties of various cancers in humans. The other project addresses the hypothesis that the novel phospholipid diacylglycerol pyrophosphate and/or its metabolism play a role in cellular responses to various stress conditions including nutrient deprivation. Key enzymes being studied include *DPP1*-encoded diacylglycerol pyrophosphate phosphatase and *CHO1*-encoded phosphatidylserine synthase. LPP1-encoded phosphatidate phosphatase, and phosphatidate kinase.

Teaching

In addition to his research, Dr. Carman teaches two courses at Rutgers, Food Chemistry and Food Enzymology.

Food Chemistry, an undergraduate course, is designed to apply basic scientific principles to food systems and practical applications. Chemical/biochemical reactions of carbohydrates, lipids, proteins, and other constituents in fresh and processed foods are discussed with respect to food quality. Reaction conditions and processes that affect color, flavor, texture, nutrition, and safety of food are emphasized. As part of a group project, students develop novel food concepts based on chemical/biochemical processes. Grades are based on written examinations, class participation, oral, and written reports.

Continued on page 15

Marsupial Among Organisms Next in Line for Sequencing NHGRI Also Targeting Insects, Worms, And Fungi

The Large-Scale Sequencing Research Network this year began sequencing the genomes of over a dozen organisms, including the first marsupial to have its DNA deciphered. The research network, supported by the National Human Genome Research Institute (NHGRI) is part of an effort to further advance understanding of the human genome.

The efforts will be carried out by the five sequencing centers in the NHGRI-supported network: Agencourt Bioscience Corp.; Baylor College of Medicine; The Eli & Edythe L. Broad Institute, Massachusetts Institute of Technology (MIT); The Institute for Genomic Research (TIGR), J. Craig Venter Science Foundation Joint Technology Center; and Washington University School of Medicine, St. Louis.

The first marsupial selected for sequencing is a gray short-tailed, South American opossum (*Monodelphis domestica*). The opossum's position in the evolutionary tree provides a major reason to obtain its DNA sequence. Opossums and humans diverged from a common ancestor 130 million years ago, providing a unique midpoint on the evolutionary timeline for comparative studies involving other mammals, such as the mouse, which diverged from human 75 million years ago; and non-mammalian relatives, such as birds, which diverged from human 300 to 350 million years ago.

Photo courtesy of Eric Day, Virginia Technical University.

Researchers are also sequencing the genome of this red flour beetle.

Marsupials are unique among mammals because their young are born at an extremely early stage of development, attach to their mother's teats, and complete their development while in a protective pouch. This makes the young readily available for early developmental research. *Monodelphis* is the only laboratory animal known in which ultraviolet radiation alone can cause melanoma. Having the sequence of its genome will help researchers learn more about the molecular basis of melanoma and its progression, as well as in developing new therapies and preventive treatments.

In 2004, scientists at the Broad Institute will produce a draft sequence of the opossum genome and also begin working on the genomes of four fungi (*Candida albicans, Candida tropicalis, Lodderomyces elongisporus, Saccharomyces cerevisiae*). Some of these are important because of their threat to human health, while others hold the potential to reveal basic biological processes.

Baylor College of Medicine's Human Genome Sequencing Center is to begin sequencing the genome of the red flour beetle (*Tribolium castaneum*). Understanding the genome of the red flour beetle is expected to help control this major pest in stored grain and cereal products. The Houston group is also working on a draft of the purple sea urchin genome and continues to sequence the genomes of the cow and the rhesus macaque in collaboration with Washington University and TIGR.

Photo courtesy of Paul Samollow, Southwest Foundation for Biomedical Research, San Antonio.

NHGRI-supported researchers are sequencing the genome of this marsupial.

During 2004, scientists at the Washington University School of Medicine will sequence the genomes of three species of roundworm (*Caenorhabditis remanei, Caenorhabditis japonica, and CB5161-Caenorhabditis sp. 1*), adding to the two species completed (*Caenorhabditis elegans* and *Caenorhabditis briggsae*). This group is already assembling a working draft of the chicken genome, as well as sequencing the genomes of two species of fruitfly (Drosophila simulans, Drosophila yakuba) and the flatworm (Schmidtea mediterranea), a laboratory organism known for its ability to regenerate a complete individual from a severed body part.

TIGR plans to sequence the genome of a species of fruitfly (*Drosophila willistoni*) and Agincourt Bioscience will focus in 2004 on sequencing an additional five species of fruitfly (*Drosophila ananassae, Drosophila erecta, Drosophila grimshawi, Drosophila mojavensis and Drosophila virilis*).

NHGRI-supported researchers are sequencing the genome of this marsupial. Photo courtesy of Paul Samollow, Southwest Foundation for Biomedical Research, San Antonio.

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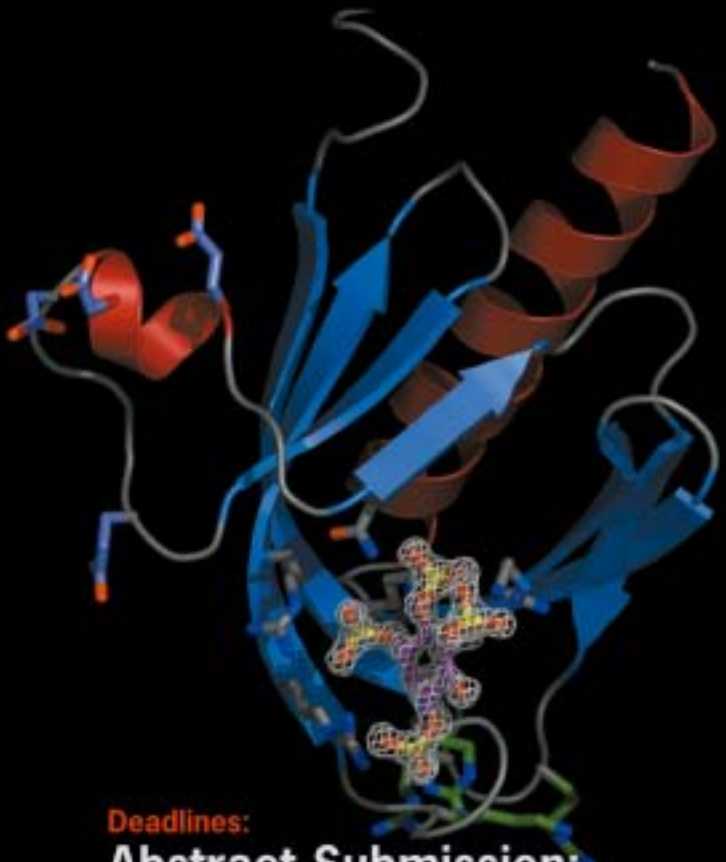

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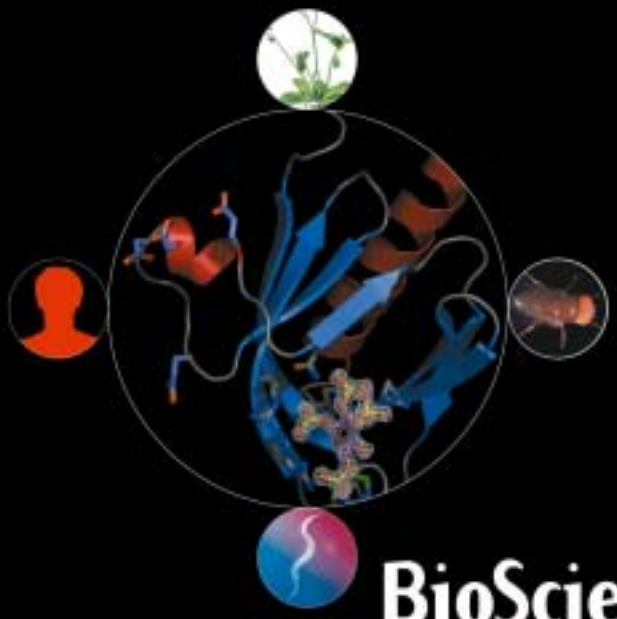

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Tony Hunter, Raymond DuBois Awarded Landon-AACR Prizes for Cancer Research

Two scientists whose landmark discoveries in basic and translational research set the stage for new ways to treat and prevent cancer have been honored with the prestigious Landon-AACR Prizes for Cancer Research.

These prizes, offered by the Kirk A. and Dorothy P. Landon Foundation and the American Association for Cancer Research (AACR), are the largest offered to cancer researchers from a professional society of their peers. Each recipient received an unrestricted cash award of $200,000 and presented a scientific lecture at the AACR Annual Meeting, March 27-31 in Orlando, Florida.

Raymond N. DuBois, the Hortense B. Ingram Professor of Molecular Oncology and the Vanderbilt-Ingram Cancer Center's associate director for cancer prevention, control and population-based research, in Nashville, received the Dorothy P. Landon-AACR Prize for Translational Cancer Research; and Tony Hunter, Professor of Molecular and Cell Biology at The Salk Institute for Biological Studies in La Jolla, Calif., was awarded the Kirk A. Landon-AACR Prize for Basic Research.

"The work of these two scientists has resulted in significant breakthroughs in our understanding, treatment and prevention of cancer today," said Margaret Foti, AACR's Chief Executive Officer.

Dr. DuBois, an ASBMB member, was honored for his groundbreaking contributions to the understanding of the role of an enzyme called cyclooxygenase-2 or COX-2 in cancer and the potential for COX-2 inhibition in preventing and treating cancers. Dr. DuBois was the first to report the link between COX-2 and colon cancer, which set in motion later work that defined potential mechanisms and chemopreventive strategies to inhibit this enzyme's activity. Dr. DuBois performed the bench research that formed the underpinnings for this line of studies, and he then carried his findings into clinical trials. Several COX-2 inhibitor drugs, which suppress inflammation in the body, have either been approved or are being tested in patients to combat tumor formation and growth.

Dr. Raymond DuBois

Dr. Tony Hunter

"I was surprised and humbled to learn that I'd been chosen to receive the Dorothy P. Landon Prize for Translational Cancer Research. It's a tremendous honor," said Dr. DuBois. "Throughout my career I have been very fortunate to be associated with outstanding laboratory staff, students, postdocs and collaborators who have kept the faith and made this work possible.

"Recognition, such as this Landon award, is important to promote translational research activity and we are acutely aware of the need to hasten our efforts to better understand strategies and targets for cancer prevention so that we may save lives and reduce morbidity from this dreaded disease."

Since 1979, Dr. Hunter has been investigating the role of critical molecular signals in the regulation, development and growth of cells and what happens when this process goes awry in cancer. Among other significant findings, Hunter discovered how phosphate molecules stimulate cell growth when they are attached to proteins by enzymes called tyrosine kinases. Hunter's work has led to intensive study of these kinases worldwide, which ultimately yielded several anticancer drugs that block the activity of tyrosine kinases. Many of these drugs are now undergoing clinical trials, and one—Gleevec—has been approved for treatment of chronic myelogenous leukemia.

The Landon-AACR Prizes in Cancer Research were launched in the summer of 2002 to promote, recognize and reward seminal contributions to our understanding of cancer through basic and translational cancer research. These distinguished scientific prizes bring heightened public attention to landmark achievements in the continuing effort to prevent and cure cancer through quality research.

Supelco/ Nicholas Pelick–AOCS Research Award continued...

Continued from page 11

A graduate course, Food Enzymology, covers basic and applied aspects of the enzymology important to food systems. The basic aspects of the course include: methods of measuring enzymatic activities; extraction of enzymes from microbial, plant and animal systems; methods of enzyme purification and characterization; and regulation of enzyme activities by activators, inhibitors, and by covalent modification. Applied aspects of the course focus on enzymes used by the food industry and methods for controlling endogenous enzyme activities. Students develop novel food concepts based on enzymatic reactions/processes. Grades are based on written examinations, class participation, oral, and written reports.

Dr. Carman, a Fellow of the American Academy of Microbiology, is also a recipient of the Selman A. Waksman Honorary Lectureship Award, the Rutgers University Board of Trustees Award for Excellence in Research, and the New Jersey Agricultural Experiment Station Research Excellence Award. He is a former chair and organizer of the Gordon Research Conference on Lipid Metabolism and the Keystone Symposium on Lipid Second Messengers, and also the *Journal of Biological Chemistry* editorial board and Physiological Chemistry Study Section of the National Institutes of Health. Currently he serves as an Executive Editor for *Analytical Biochemistry and Biochimica et Biophysica Acta*, and as *Associate Editor of the Journal of Lipid Research*.

He received his B.A. degree from William Paterson College, M.S. from Seton Hall University, and Ph.D. from the University of Massachusetts. His postdoctoral training was at the University of Texas Medical School in Houston.

New Study Identifies Inhibitor of Anthrax Toxin

A research team led by scientists at Beth Israel Deaconess Medical Center (BIDMC) and Harvard Medical School (HMS) has identified a group of small molecules that inhibit a deadly toxin associated with inhalational anthrax.

Described in the January 2004 issue of *Nature Structural & Molecular Biology (*www.nature.com) these findings could eventually lead to the development of a protease inhibitor drug, which in combination with antibiotics could be used to treat anthrax cases later in the disease, at a point when antibiotics alone are no longer effective.

"Unlike most types of bacteria, Bacillus anthracis has the ability to produce large amounts of a toxin that can kill the patient even after antibiotics have destroyed the bacteria," explained the study's senior author, ASBMB member Lewis Cantley, Chief of the Division of Signal Transduction at BIDMC and Professor of Systems Biology at HMS. "This toxin is released within days of the initial infection, and is impervious to antibiotics." Because the initial symptoms of the disease–fever, cough and chest pain–mimic colds and flu, early diagnosis is extremely difficult; and consequently some 90 percent of all cases of inhalational anthrax prove fatal.

"Toxins act in two ways," said BIDMC scientist and first author Dr. Benjamin Turk. "First, they cripple the cells that fight bacterial infection, thereby enabling the spread of bacteria early in the disease. Later in the process," he added, "they contribute to the death of macrophage cells, leading to the shutdown of the body's immune system." In fact, autopsies of patients who have died from inhalational anthrax reveal that the high doses of antibiotics have killed the bacteria, indicating that the patients have died from the toxins rather than a persistent infection.

Using a "mixture-based peptide library" technique developed by Dr. Turk, the researchers analyzed trillions of peptides to determine an optimal peptide substrate for lethal factor, the active agent in the anthrax toxin. Based on the structure of the optimal substrate, small molecule inhibitors were identified. Finally, crystal structures of lethal factor protease bound to its optimal substrate and to small molecule inhibitors revealed new approaches to enable the design of better inhibitors that might prove effective for clinical use.

The mechanism by which anthrax lethal factor kills human cells is not yet clear. The protease activity of this toxin is known to attack a family of protein kinases called map kinase kinases (MEKKs), which mediate many cellular responses, including cytokine release and cell survival. The availability of drug inhibitors may facilitate the understanding of the effect of lethal factor on these pathways. Protease inhibitor drugs have gained popularity in recent years, notably in the treatment of HIV infections. They work by disabling native protease enzymes and "lock up" the enzyme, thus rendering it ineffectual.

"There could be a number of advantages to taking this approach in attacking inhalational anthrax," noted Dr. Cantley. "Unlike an anti-serum, which would require that whole populations be vaccinated—regardless of whether or not an anthrax outbreak developed—a therapeutic combination of antibiotics and protease inhibitor drugs wouldn't have to be used except in the incidence of actual disease. This approach would not only reduce the risk of side effects, but could also prove cost effective."

Researchers Share $500,000 Crafoord Award for Arthritis Work

Two U.S. researchers who studied molecular mechanisms behind the migration of white blood cells have been awarded the Crafoord Prize in Polyarthritis by the Royal Swedish Academy of Sciences.

ASBMB member Timothy A. Springer, Latham Family Professor of Pathology at Harvard Medical School, and Dr. Eugene C. Butcher of Stanford University will share the $500,000 prize, which was established in 1980 to promote basic research in mathematics, astronomy, the biosciences, the geosciences, and polyarthritis.

The arthritis prize holds a special place among the other more general Crafoord awards because Holger Crafoord, who established the fund with his wife Anna-Greta, suffered badly with the disease.

Dr. Springer was cited for mapping a different group of adhesion molecules in the cell membrane, the integrins.

Dr. Butcher was recognized by the committee for identifying the selectin family of proteins, which are located in the cell membrane of white blood cells and which bind to carbohydrate chains on the surface of blood vessels and regulate blood cell movement.

"The mechanisms mapped by the prizewinners are also interesting subjects for medical treatment of diseases in which the white blood cells attack tissues, such as rheumatic disease or multiple sclerosis," the academy said in a statement.

Butcher and Springer will receive their prize at a ceremony in Stockholm on September 22 this year, following a 2-day symposium in Lund, the hometown of the Crafoords, and Stockholm.

Graduation Survey Results, July 1, 2002 to June 30, 2003

As is the usual trend, the numbers of schools known to offer degrees in Biochemistry and/or Molecular Biology, the number of schools reporting, and the number of students graduation at all three levels has increased from last year. Several responding schools noted the increase in departments offering biotechnology degrees. At this time we have no category for these degrees.

This year the survey was sent to 515 schools known to offer degrees in biochemistry, molecular biology, or chemistry with a biochemical emphasis. This year ASBMB offered to create a link to the schools that responded. We received responses from 245. Some of the schools either gave sex or racial categories only so one additional column and one additional row were added at the appropriate place.

One trend that is continuing is the increased percentage of women obtaining degrees at all levels. For the first time during the survey, more women were reported to have received Masters degrees than men, and the gap at the Ph.D. level narrowed noticeably (3.8% difference this year compared to 18.6% last year). At the bachelors level the number of women graduates has exceeded male graduates for several years.

Of continuing concern is the number of degrees offered to minorities. While the numbers at the bachelor and Ph.D. levels are the same or higher than last year, the numbers are about the same as the numbers two years ago. Unfortunately the numbers of minority Masters degrees are down for the second year in a row. A list of the schools reporting the highest number of graduates in each category can be found as supplemental information on the ASBMB website, www.asbmb.org, under Education.

Average and median faculty size and composition has remained fairly constant at 12.4 male, 3.4 female (average), 10.5 male, 3.0 female (median). The average size of the reporting schools was 11,300 students, but the median size was much smaller at 6,900 students. Tables and bar graphs on these distributions can be found at the same supplemental site as above.

These graduation surveys are only as representative as the responses from departments. Check our list of schools to see if your department responded to the survey and to check the list of programs known to offer degrees at some level. Those schools that responded are marked in red. If you know of any schools that offer a degree in biochemistry, molecular biology, or chemistry with a biochemistry emphasis and are not listed, please contact us via email at education@asbmb.faseb.org.

Students Graduated, July 1, 2001–June 30, 2002

	BA/BS			MS			PhD			
	M	F	**Total**	M	F	**Total**	M	F	Unspec.	**Total**
American Indian or Alaskan Native	4	6	**10**	1	1	**2**	2	3		**5**
Asian	164	218	**382**	20	20	**40**	44	37		**81**
Black, not of Hispanic origin	38	59	**97**	2	4	**6**	6	8		**14**
Hispanic	55	73	**128**	9	8	**17**	13	14	2	**29**
Pacific Islander	8	12	**20**	0	2	**2**	3	0		**3**
White, not of Hispanic Origin	903	914	**1817**	104	105	**209**	254	225	2	**481**
International Students	40	46	**86**	20	36	**56**	69	71	1	**141**
Unspecified	**26**	**4**	**30**	**0**	**1**	**1**	**2**	**2**		**4**
Total	1238	1332	**2570**	156	177	**333**	393	360	5	**749**

Don't Leave Georgia's Children Behind

The following message by Alan I. Leshner, CEO, of the American Association for the Advancement of Science is reprinted from that association's website.

At a time when educators and legislators across the nation are trying to find the best ways to guarantee that no child is left behind, Georgia's youth now risk receiving an inadequate education that will make them stragglers in this age of science and technology: The Georgia Department of Education has scrubbed important concepts about evolution from the proposed science learning standards for high-school students.

Fear of debate over "the man-monkey thing," as one local teacher described it, could leave Georgia's students lagging behind their peers from other regions. The current situation is sadly ironic, given Georgia's heritage of discovery and innovation-from the pre-historic days of North Georgia's native mound builders, to the Spanish exploration of South Georgia some 500 years ago.

Erasing evolution from the science curriculum may stave off controversy with creationists, "intelligent design" advocates and others with differing viewpoints. But, it also will mean Georgia's students don't understand the full range of core scientific concepts.

The Department of Education's initial goal was commendable. By revising the curriculum to emphasize deeper, more meaningful knowledge of key concepts, they sought to improve students' performance. The need for such reform is clear: Scholastic Aptitude Test (SAT) scores by Georgia high-school seniors in 2002-2003 were the lowest among all 50 states, averaging 984 out of a possible 1,600 points, better only than the District of Columbia, and much lower than the national average of 1,026.

In preparing draft standards, Georgia officials sought permission from the American Association for the Advancement of Science (AAAS), the world's largest general science society, to draw upon our national Project 2061 benchmarks— so named because all students should understand basic science principles by the year Halley's Comet reappears.

Imagine our surprise to find that the resulting Georgia text omits large portions of the Project 2061 evolution benchmarks for grades 9-12, whereas other sections on life-science goals, from heredity to the diversity of life, remain intact in their entirety. Curiously missing from the proposed Georgia standards are our benchmarks dealing with such basic concepts as the origins of life on Earth; common descent; mechanisms of natural selection; information on how natural selection and common descent provide a scientific explanation for evidence in the fossil record; and the similarity within the diversity of existing organisms.

Moreover, one section of the Georgia draft could open the door for teaching non-science based concepts such as creationism or intelligent design theory in science classrooms, and that would be wrong. The scientific community respects diverse viewpoints, and we have no problem, of course, with teaching philosophy and moral concepts in non-science courses. But, such concepts should not be taught as equivalent to scientific theories in science classrooms, lest we mislead students about the criteria for something to be considered scientific. To reap the full benefits of science and technology, it is just as important to know what is and isn't science-based, as it is to know the scientific content itself.

We can understand why state officials may have preferred to side-step evolution: Nobody loves controversy when it's pointed at them, and Georgia's education officials have seen more than their fair share of the stick's sharp end lately. Less than two years ago, debate erupted in Cobb County when the District School Board affixed "disclaimer stickers" to science textbooks, erroneously alerting students that "evolution is a theory, not a fact, regarding the origin of living things." Though the Board's position softened somewhat following a lawsuit, it's clear that Georgia educators are challenged to navigate many complex sensitivities concerning evolution.

But, sticking our heads in the sand-or sticking disclaimers on textbooks—won't make evolution go away: It will only place Georgia students at a disadvantage in the race to secure slots at top universities, and later, in the workforce and the global arena.

From Atlanta's Olympic Village to Valdosta's Spanish moss and red-clay roads, Georgia is rich in natural and cultural diversity, built on a heritage of discovery. We urge state officials to honor Georgia's legacy of learning, by restoring the fundamental concept of evolution, now universally accepted within the scientific community, to the science learning standards for high-school students. Georgia students deserve no less than youth throughout the rest of the United States.

by John D. Thompson, Editor

Indian, Pakistani Biotechnologists Move to Link Forces

Scientists from India and Pakistan made history last month when they agreed to collaborate in biotechnology, the first time that these rivals have made such an agreement in any high-technology area. Five agreements were signed by a Pakistani delegation to the BioAsia 2004 meeting in Hyderabad, India. Three involve Indian biotechnology companies and two are with the All India Biotech Association (AIBA). Under the agreements, AIBA will help Pakistan to establish its own biotechnology association and will provide a list of Indian technologies available for licensing in Pakistan.

The agreements were described as "general in nature" by the Science and Development Network, which quoted AIBA executive Ashok Sadim Khan as saying, "We will have to see how they progress." He noted that. "complex issues will have to be dealt with" before the agreements are fully implemented, but expressed confidence that the pacts will result the openingof many avenues for collaboration.

Anwar Nasim, chairman of Pakistan's National Commission on Biotechnology and leader of the Pakistani delegation, also expressed optimism, telling *Nature*, "I will go back to my country extremely pleased." says who led the delegation. "Our academy has already received an invitation from the Indian National Science Academy (INSA) and we are considering it," he added. That invitation was extended, according to INSA secretary S. K. Sahni, because things move slowly at government-to-government level. In it, the INSA offered to open discussions with the Pakistan Academy of Sciences on common interests, such as agriculture and malaria.

Aventis Rejects Sanofi Bid

Aventis has rejected a hostile takeover bid by Sanofi-Synthélabo (Sanofi). "We firmly believe that this offer is not in the best interests of Aventis shareholders or employees. It undervalues the company, it carries significant risk, and it will cause job losses for limited strategic benefit," stated Igor Landau, Chairman of the Aventis Management Board. He said "Aventis shareholders should hold on to their shares as there is greater value ahead."

Aventis charged that the offer was opportunistically timed prior to Aventis announcing its targets for 2004-2007, which predict accelerated growth because of planned new products and growth in the sales of existing products. Consequently, the company claimed, "The offer clearly undervalues Aventis."

The company, which has been running in European newspapers four-page attacking the Sanofi proposal, says the bid fails to recognize Aventis' growth potential and is at a discount of 23.4% to the average multiple for the sector. Aventis also charges that the offer does not reflect the fact that Aventis will contribute the majority of the earnings of the combined company, but that due to double voting rights in Sanofi's shareholder structure, Aventis shareholders would only have about two-fifths of the voting rights of the combined company.

As of press time, Sanofi had not replied to the Aventis statement.

UT Southwestern-Dallas Startup Bought By NimbleGen Systems

Light Biology Inc., a startup biotech company based on technology developed at UT Southwestern Medical Center at Dallas, has been acquired by NimbleGen Systems Inc. of Madison, Wisconsin.

Light Biology was formed in the late 1990s, to commercialize technology developed by Harold Garner, Professor of Biochemistry and Internal Medicine at UT Southwestern. Using methods similar to those used for manufacturing semiconductors, Dr. Garner invented a new way to make DNA microarrays, which are used in scientific research to analyze the structure and function of genes at the molecular level. The system, Digital Optical Chemistry (DOC), uses Texas Instruments Digital Light Processing technology instead of traditional film processing to manufacture specialized DNA microarrays more quickly and cost effectively than previously possible. With the acquisition, NimbleGen now owns all of Light Biology's assets plus patent rights to the DOC technology.

Abbott Laboratories, Corixa Combine Chagas' Blood Screening Technology

Corixa Corporation has granted Abbott Laboratories non-exclusive rights to Corixa's recombinant TcF antigen for potential use in the development of a blood screening test to detect antibodies to the parasite known as *Trypanosoma cruzi (T.cruzi)*. *T.cruzi* causes Chagas' disease, a chronic, potentially lethal infection affecting a total of 16 million to 18 million people worldwide.

Chagas' disease primarily affects the nervous system and heart, causing severe neurological disorders as well as swelling or denervation of nervous tissue in the heart, colon and esophagus. The *T.cruzi* organism can circulate in the blood of afflicted individuals for many years after initial infection. Blood from an infected donor transfused into a recipient can lead to a transfusion-acquired infection. Blood banks have recognized the potential for *T.cruzi* getting into the U.S. blood supply and have expressed an interest in the development and evaluation of tests that could be used to prevent its transmission.

"Abbott is developing a blood screening test that could help to protect the nation's blood supply against Chagas' disease," said Jim Koziarz, Ph.D., vice president, research and development, diagnostics, Abbott Laboratories. "Corixa's antigen has shown promise, and we look forward to further evaluating Corixa's technology as part of our development program."

Abbott and Corixa also entered into five other licensing agreements. Four provide non-exclusive cross licenses to intellectual property owned by Abbott or Corixa, respectively, concerning two different cancer-associated antigens. In these agreements, Abbott received non-exclusive licenses from Corixa to develop certain diagnostic products and Corixa received non-exclusive licenses from Abbott to develop cancer vaccines and therapeutic drug monitoring products. In a separate agreement, Corixa granted Abbott non-exclusive rights to develop non-nucleic acid-based diagnostic assays intended to detect mammaglobin, a marker that appears to be significantly over-expressed in breast cancer.

All six agreements include payment of up-front fees, product development milestones and/or royalties on any product sales. Specific financial terms were not disclosed.

Caltech Ranked Second in 2003 Patent Awards

The California Institute of Technology for the first time moved into second place among all American universities in the number of annual patents awarded, according to the U.S. Patent and Trademark Office. For 2003, Caltech was awarded 139 patents, slightly ahead of MIT's 127 patents but behind the University of California System 's 439 patents.

According to the patent office, the University of Texas System was fourth on the 2003 list, with 96 patents, followed by Stanford University with 85. Others in the top 10 were the University of Wisconsin System (84), Johns Hopkins University (70), the University of Michigan (63), Columbia University (61), Cornell University (59), and the University of Florida (59).

China urged to step up GM efforts

The Chinese government is coming under pressure to boost its efforts to allow the commercial use of food crops that have been genetically modified to withstand insects, diseases and herbicides. According to the Science and Development Network, the main source of the pressure is from a report, recently released by senior Chinese biotech scientists, which urges the government to allow such planting to take place as soon as possible. Chinese researchers have developed several GM rice varieties, with field trials showing boosted yields and less chemical use. The scientists say that if GM rice was widely used by farmers, it would have an even greater impact than GM cotton.

GM cotton has become the miracle crop of China since commercial growth was permitted in 1996, and more than a half of China's cotton is now GM. One of the main reasons for this success, say its advocates, it that it has both helped farmers to cut their production costs by an average of almost 30 per cent, and reduce their exposure to chemicals.

Huang Jikun, an agricultural economist with the Agricultural Policy Research Centre, part of the Chinese Academy of Sciences, and one of the group urging that GM efforts should be stepped up, says that the Chinese government should invest U.S. $100 million a year from 2005 to support the commercial use of GM food, and carry out research into such use. The Ministry of Agriculture, however, said last month that the funding had not yet been finalized.

Stem Cells Found in Adults May Repair Nerves

It used to be considered dogma that a nerve, once injured, could never be repaired. Now, researchers have learned that some nerves, even nerves in parts of the brain, can regenerate or be replaced. By studying the chemical signals that encourage or impede the repair of nerves, researchers at the University of Washington (UW), the Salk Institute, and other institutions may contribute to eventual treatments for injured spines and diseased retinas, according to a presentation at the annual meeting of the American Association for the Advancement of Science (AAAS).

Much of this research focuses on stem cells, one of several types of general cells that can give rise to specialized cells, like neurons. It was once thought that human stem cells were only found in embryos, and in bone marrow, where they produce blood cells. But stem cells are also being found in adults, including the brain and the eye. For example, stems cells steadily replace dead neurons in the olfactory bulb, which transmits scent signals to the brain, and the hippocampal dentate gyrus, an area that organizes short-term memory.

However, the pace of stem-cell repairs in humans is slow. And in some cases, stem cells can even impede healing. Stem cells in an injured spinal cord can create a sticky scar that blocks nerve regeneration, according to Dr. Philip Horner, Assistant Professor in the Department of Neurosurgery in the UW School of Medicine.

"We've found that the axons, the parts of the nerves that transmit signals, try to regenerate after an injury but get caught in the scar. It's like they're stuck in the mud," Horner said. "We're studying ways that this process is regulated to see if it can be manipulated to promote healing. In other words, we're looking at ways to get the axons out of the mud. One way is to make the mud less sticky by manipulating stem cells that participate in scar formation. Another is to stimulate the axons to push through the scar by providing the cut nerves with molecules that induce elongation. We're using molecular signals called growth factors to simulate the growth of cultured nerve cells in the laboratory."

According to Dr. Thomas Reh, Professor in the UW Department of Biological Structure, the same types of cells that create scar tissue in the spinal column can create new cells in the retina of the eye, especially in young animals of some species, according to Reh. The retina is a delicate light-sensitive membrane that transmits light signals to the brain. Many eyes diseases that cause blindness, such as glaucoma and as age-related-macular-regeneration, damage the retina.

Salamanders don't get glaucoma because they can readily regenerate retinal cells. The same is true of newts, frogs, and some types of fish. "We're trying to understand the remarkable regenerative powers of these lower vertebrates, and through this understanding, develop strategies to stimulate regeneration in the human retina," said Dr.Reh.

While salamanders can regenerate retinal cells through their life, many other species lose this ability as they age. "At some point in each species life cycle, the stem cells in the retina make a transition from a regenerative cell to a cell that will make a scar in response to injury, like the cells that cause scars in the spinal cord," Dr. Reh said. "Chickens make the transition a few weeks after hatching in most of their retina, though they retain some limited capacity to regenerate retinal cells throughout life. In rats, it's only a matter of a few days after the cells are generated that they lose their ability to regenerate other retinal cells."

Human retinas seemingly can't repair themselves, yet in recent studies human retinal cells have grown new neurons when cultured in the laboratory. "The hope is that many of the molecular and cellular mechanisms necessary for regeneration, that serve amphibians so well, are still in place in humans," explained Dr.Reh. "Future studies from the nervous system, as well as other organ systems, should enable us to define the roadblocks in the regenerative process, and develop strategies to go around them."

Avanir Gets NIH Grant to Expand Development of Anti-Anthrax Antibodies

Avanir Pharmaceuticals has received an additional $750,000 grant from the National Institute of Allergy and Infectious Diseases (NIAID) for the firm's Human Antibodies for Exposure/Protection from Anthrax project. This grant follows the initial $100,000 grant from the Small Business Innovative Research (SBIR) program of NIAID that was awarded in October 2003. The funding will be used to further develop Avanir 's human monoclonal antibodies to anthrax toxins using its Xenerex technology.

Avanir 's Xenerex technology is used to generate fully human antibodies to target antigens, particularly infectious diseases, through the engraftment of human immune system cells into severe combined immunodeficient mice. The grant funding from NIAID supports the generation, evaluation and characterization of a panel of high affinity fully human antibodies to the protective antigen component of the anthrax tripartite toxin.

Symposium on Basis of Neurodegenerative Diseases

The Pan-American Association for Biochemistry and Molecular Biology (PABMB) and the Brazilian Society for Biochemistry and Molecular Biology (SBBq) will hold a satellite symposium, Neurochemical Basis of Neurodegenerative Diseases, May 14-15, immediately before the XXXIII Annual Meeting of SBBq, May 15-18.

PABMB is a multinational association of Scientific Societies in the fields of Biochemistry and Molecular Biology. In addition to Societies from North, Central and South America, PABMB also congregates the Portuguese and Spanish Biochemical Societies as adherent members. The main mission of PABMB is to foster, through a number of coordinated actions that include the organization of symposia and specialized meetings, the development of Science in the broad fields of Biochemistry and Molecular Biology in the American continent.

The Annual Meetings of SBBq take place in the small town of Caxambu in the mountains about 4 hours away by car from Rio de Janeiro, São Paulo or Belo Horizonte, and are very lively. The number of participants averages about 2,000 people, with large numbers of postdocs, graduate and undergraduate students, in addition to senior investigators working on all aspects of biochemistry and molecular biology, including neurobiology and developmental biology.

Registration for participants will be accepted until April 20 through the SBBq website (http://www.sbbq.org.br). The registration fee is R$ 80 for postdocs and investigators and R$ 40 for graduate (MSc and PhD) students. There will be no registration fee for undergraduate students. Payment of the may be made by nominal check (in Brazilian Reais or in U.S. dollars, in the case of foreign participants) made to the order of SBBq and sent to: Sociedade Brasileira de Bioquímica e Biologia Molecular, Av. Prof. Lineu Prestes 748, Bloco 3 superior, sala 0367, São Paulo, SP 05508-000. Please include your name and registration number in the back of the check for identification purposes.

For further information email the Organizing Committee (acrangel@bioqmed.ufrj.br). Depending on the availability of funds, partial travel support may be available for registered participants from Brazil and other Latin American countries. Upon registration, participants are required to indicate their interest in obtaining such support. Graduate students receiving fellowships from CNPq, FAPESP or other agencies that cover such expenses through "taxas de bancada" or "reservas técnicas" are not eligible to request financial support from the Symposium.

The photo above, which appeared with the article "Genomics Providing Clue to How HSV Works" on page 11 in the February issue of *ASBMB Today*, did not identify the subjects correctly. In the foreground is Martha Kramer and seated at the right is Fritz Roth. Standing at left is David Knipe and at right Don Coen.

Calendar of Scientific Meetings

MAY 2004

FEBS Lecture Course on Cellular Signaling & 4th Dubrovnik Signaling Conference

May 21-27 • Dubrovnik, Croatia
Application Deadline: March 1, 2004
The FEBS Lecture Course on Cellular Signaling and 4th Dubrovnik Signaling Conference are meeting jointly so that students who participate at the FEBS Lecture Course will also be able to attend all seminars and will have special tutorial sessions organized for their education.
TOPICS: Signaling cascades, Protein kinases and phosphatases, Cell compartmentalization and signaling, Receptor endocytosis and trafficking, Structural biology, GTPase signaling and diseases, Molecular targets for cancer therapy, Proteomics, Diabetes and Cardiovascular diseases
website: http://www.icst.irb.hr

The First Italian Proteome Society Congress

May 27-29 • Verona
Ph: 39 045 8027086; Email: lpsoit@netscape.net
Website: www.ipsoc.it

Gene Transcription in Yeast EuroConference

May 29–June 3 • 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

JUNE 2004

American Society for Biochemistry and Molecular Biology Annual Meeting and 8th IUBMB Conference

June 12–16 • Boston, Massachusetts
Contact: Joan Geiling; Ph: 301-634-7145; Fx: 301-634-7126
Email: jgeiling@asbmb.faseb.org;
Website: www.asbmb.org/meetings

Mathematical Models in Signaling Systems

June 16-18 • VanderbiltUniversity, Nashville
Ph.: 615-322-0672; Email: cme@vanderbilt.edu
Website: http://medschool.mc.vanderbilt.edu/vusc

Kingsbrook Jewish Medical Center Conference on Nutritional and Metabolic Aspects of Low Carbohydrate Diets.

June 18-19 • Brooklyn (New York) Marriott
Contact: Richard Feinman; Ph: 718-270-2252
Email: rfeinman@downstate.edu
Website: http://downstate.edu/kingsbrook

4th International Symposium on Hormonal Carcinogenesis

June 21-25 • Palau de la Musica, Valencia, Spain
Contact: Tandria Price/Dr. Jonathan J. Li
Dept. of Pharmacology, Toxicology and Therapeutics
University of Kansas Medical Center
Ph: 913-588-4744; Fx: 913-588-4740; Email: tprice@kumc.edu
Website: http://www.kumc.edu/hormonecancers

JULY 2004

International Conference on Genomics, Proteomics and Bioinformatics for Medicine

July 14-19 • 2004 Moscow, Russia
Fx: +7 (095) 245-0857
http://www.ibmh.msk.su/gpbm2004/english.htm

4th ANNUAL CONFERENCE OF FOCIS (Federation of Clinical Immunology Societies)

July 18-23 • Montréal, Canada
Early Registration: April 30, 2004
Website: www.immuno2004.org

AUGUST 2004

12th International Conference on Second Messengers and Phospoproteins

August 3–7 • Montreal, Canada
Contact: smp2004@eventsintl.com
Website: http://www.secondmessengers2004.ca

Macromolecular Organization & Cell Function

August 15-20 • Queen's College, Oxford, UK
Ph: 401-783-4011; Email: grc@grc.org
Website: http://www.grc.uri.edu/programs/2004/macromol.htm

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: homepage www.biocat2004.de

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

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

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/

Department Heads Take Note:

ASBMB Offers Free Membership to New Ph.D.s

ASBMB is now offering a free one-year Associate membership to all students who have, within the past year, earned a Ph.D. degree in the molecular life sciences or related areas.

ASBMB implemented this program as a way to recognize the significant accomplishment of earning the Ph.D., and to provide new Ph.D.s with something tangible and of economic value. Membership in ASBMB brings with it a free subscription to the online versions of the *Journal of Biological Chemistry* and *Molecular and Cellular Proteomics,* as well as subscriptions to *The Scientist* and the Society's magazine, *ASBMB Today*, discounts on other publications, and a host of other benefits.

The Society is asking department chairs to provide ASBMB with the names and addresses of each new Ph.D. recipient from their institutions. Upon receipt of this information, we will write the new Ph.D.s to congratulate them on their accomplishment and offer the free one-year membership in ASBMB. Names and addresses of the new Ph.D.s should be sent to:

Kathie Cullins
Membership and Subscriptions Manager
American Society for Biochemistry
& Molecular Biology
9650 Rockville Pike
Bethesda, MD 20814
Email: asbmb@asbmb.faseb.org

This is an ongoing project; please advise us whenever a student in your department earns the Ph.D., so that we can make this free membership offer to him or her.

MOLECULAR BIOLOGISTS

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