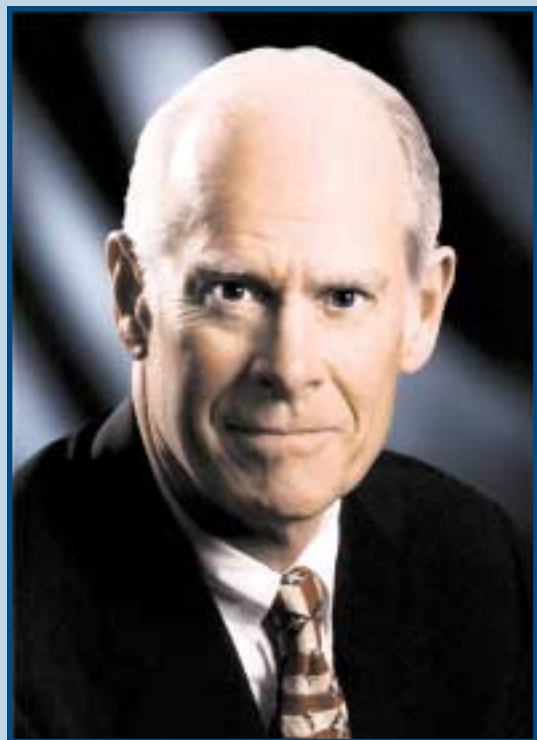


ASBMB *Today*

Constituent Society of FASEB

AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY



Former Congressman John Porter

Should the President's priorities prevail over the scientific judgment of NIH? What are you as an individual investigator going to do to keep science free of politics?

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**ASBMB Calls for \$8 Billion
Budget for NSF By 2005**

**Samuel Cushman Receives
ADA's Banting Medal**

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Theme V: Metabolism – Pathways and Regulation
Organized by Luciano Rosetti, *Albert Einstein Col of Med.* and Patricia Babbitt, *UCSF*

Theme VI: Signaling Pathways
Organized by Natalie G. Ahn, *Univ. of Colorado*

Theme VII: Genomics, Proteomics and Bioinformatics
Organized by Patricia Babbitt, *UCSF*

Theme VIII: Protein Synthesis, Folding and Turnover
Organized by Cecile M. Pickart, *John Hopkins Sch. Hygiene and Pub. Hlth.*

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Organized by Michael Dahmus, *UC, Davis*

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Organized by Stephen H. White, *UC, Irvine*

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Organized by A. Stephen Dahms, *California State Univ. System Biotechnology Program*

More Opportunities to Present Your Research!

Over 300 scientists will be selected from the abstracts submitted to ASBMB Topic Categories to make oral presentations. Scientific sessions corresponding to the above themes will be held each day in which speakers from the volunteered abstracts will present. Oral presenters will also present a poster at the meeting.

Opening Lecture
Roderick MacKinnon, *The Rockefeller Univ.*

For more information contact:
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is a monthly publication
of The American Society for
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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

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Needed: New Ways

My experience derives from U.K. teaching. However, I am a frequent enough visitor to the United States to have some confidence that my views may be of interest, in part, to an American audience.

I read Dr. Farnsworth's insightful letter in *ASBMB News* with a great deal of interest. I think he identifies accurately the problem of rote learning of discrete facts rather than integrative learning of concepts. Although I post-doc'd in the U.S., I have no direct experience of U.S. undergraduate or high school education, but on my frequent visits to U.S. labs I hear similar comments to Dr. Farnsworth's. It is a demonstrable fact that students I teach (chemistry and biochemistry) in the U.K. know less and can do less than a generation ago. All of the post-docs in my lab come from outside the U.K.

My own personal view is that there are several causes for this in the U.K. We have moved to a modular system, where the emphasis is on discrete pieces of learning. Each module cannot assume too much prior knowledge,

given the bewildering combination of modules students may have previously taken. We are also seeing a drop in the quality and quantity of students entering science relative to the arts, management, medicine (an undergraduate degree in the U.K.), and veterinary medicine. Even those with relatively good qualifications in mathematics from school, are often stumped by simple formulae. The fatal, final factor is a huge well meaning drive for "quality assurance" or "value for money" in education at all levels. In essence the government wants us to prove that their money is being well spent. For this we must produce numbers.

In the U.K., I think universities have lacked the imagination or the courage or the ability to devise assessments which can measure integrative learning. In years gone past, with monolithic courses lasting for years and bright students, it happened by default. Now to produce defensible assessments (that very concept encapsulates the problem), we end up asking our

Tell Us What You Think

We appreciate receiving letters that are suitable for publication from ASBMB members regarding issues of importance or commenting on articles appearing in *ASBMB Today*. Letters should be sent to the editor, John Thompson, at the address found at left. Letters must be signed and must contain the writer's address and telephone number. The editor reserves the right to edit all letters.

to Measure Learning



We need to think of new ways to measure integrative learning of concepts across the breadth of a subject. Further, these measures will need to be accepted by students and the paymasters, as indications of quality.

students to perform tasks which require mainly rote learning of small chunks of knowledge, are easily meas-

ured, and whose objectives can be clearly set out.

In essence, we use methods of assessment no different than the days of integrated multi-year courses. As a student's progress through the system is measured by their performance of these tasks, we establish a feedback loop. The result is the question asked of and despised by every lecturer, "Do I need to know this?" I probably despise it so much because I know in my heart that it is my fault. The same mechanisms operate in U.K. schools, with results that everyone at university can see—decreased literacy and numerical skills, despite increasing scores on government tests.

I think that as community we need to think of new ways to measure inte-

grative learning of concepts across the breadth of a subject. Further, these measures will need to be accepted by students and the paymasters, as indications of quality. The pressure to justify and account for public money will not go away. This is not an easy task, but if as I suspect, the U.S. and the U.K. share some of the above problems, then perhaps as a community we can work together to find solutions.

James H. Naismith
Professor of Chemical Biology
BBSRC Career Development Fellow
Centre for Biomolecular Sciences
The North Haugh
The University
St. Andrews
Fife Scotland, U.K., KY16

Is your Directory listing correct?



Update your online record
anytime during the year.

To update your online listing in the *FASEB Directory of Members*, visit www.faseb.org and click on "Member Directory."

Click "Update Member Info" at the top of your screen to make changes. All changes must be entered before July 31, 2002, to be included in the 2003 printed directory.

Please note: There is a time delay between submitting revisions and their actual appearance online.

ASBMB Calls for \$8 Billion Budget for NSF By 2005

Calling for a National Science Foundation budget of approximately \$8 billion by the end of 2005, ASBMB President Robert Wells testified April 16 before the House Appropriations Subcommittee on VA/HUD and Independent Agencies.

Following his testimony, Wells paid visits to several legislators from the Texas delegation, meeting with staff from the offices of Senators Kay Bailey Hutchison and Phil Gramm, and Rep. Ken Bentsen. Wells' term as ASBMB President ends July 1, when he will become FASEB President-Elect.

Following is the oral statement made by the ASBMB President. A more detailed written version of Dr. Wells' statement is available on the Society's website at <http://www.asbmb.org>.

Good morning, Mr. Chairman, and members of the Subcommittee.

ASBMB believes that the NSF budget should increase by at least 15 percent this year, to a total of \$5.5 billion. We support a rate of increase in the NSF budget so it can reach approximately \$8 billion by Fiscal Year 2005—double the size it was in 2001.

NSF clearly deserves your strong support. NSF's performance is excellent by almost any measure, and this fact has been recognized by the Administration, with NSF being the only federal agency receiving stellar marks for financial management.

OMB Director Mitch Daniels also singled out NSF for praise in remarks made last fall. And of course, I would also like to thank you, Mr. Chairman, and your subcommittee, for your own efforts last year and in previous years, to boost the budget

for the agency. However, we continue to support a 15 percent increase for this under-funded, but vital, federal agency.

ASBMB believes that NSF's core programs are where most of our proposed increases should go. Such core programs feature basic scientific research on subjects chosen by principal investigators. These "investigator-initiated" projects have historically been the source of most scientific progress.

Unfortunately, at NSF, too few grants are funded, and the ones that are funded are too small and not long enough.

Therefore, we support a major increase in the average size and duration of NSF grants. The average NSF grant is typically in the range of \$125,000, but needs to be

at least twice this size. In addition, on average, an NSF grant lasts about three years. While this is an improvement over the average duration in the late 1990s, it is still 1-2 years shorter than the ideal. The amount and type of science funded by the NSF will suffer if these disparities are not addressed.

Another important and necessary mission of NSF is support for science and mathematics education.

NSF also supports small but important programs on DNA sequencing of microorganisms that may be of importance in bioterrorist attacks, and on how these microbes behave in the environment. We think this is certainly an important role for the agency to continue.

Mr. Chairman, I would like to close on a personal note. I was honored to receive continuous NSF support for my own research on a series of grants entitled "Studies with Defined Deoxyribonucleic Acids" for more than a quarter of a century. I finally declined further support in 1994, since I felt the agency should fund a new young investigator, for whom this support would be as vital as it was for me in the early years of my career (1967). Thus, I have profound respect, and even affection, for this agency that played such an important role in my career, and I urge you to take steps to ensure that this critical role—as an incubator of new scientific talent—be allowed to continue through your generous treatment of its budget.

A 15 percent increase this year, to a total of \$5.5 billion, would be an excellent way to start.

I am pleased to answer any questions you may have. ☺



ASBMB President Robert Wells

Pump Up the Volume!

MORE MEMBERS MEAN WE HAVE A LOUDER VOICE IN WASHINGTON

Stem cell research. Cloning. Doubling the NIH budget—and what happens next. Bioterrorism. Combating misconduct in science. Living with HIV. Feeding a hungry world. The human genome project. Molecular medicine. Designer drugs. Today's headlines covering subjects in which biochemists and molecular biologists play parts are only going to get more frequent in coming years.

You can help shape the debate by helping to pump up the volume of the one organization that works on all these issues solely from the perspective of biochemists and molecular biologists—ASBMB. The larger ASBMB's membership, the more powerful we all become. Supporting your society by encouraging your students and postdocs to join is vital to ensuring that ASBMB will continue to build its influence.

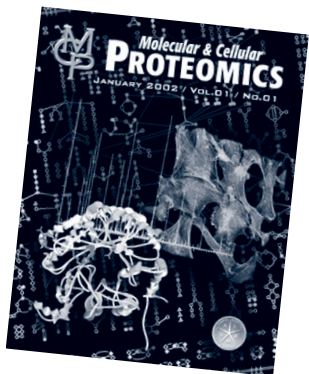
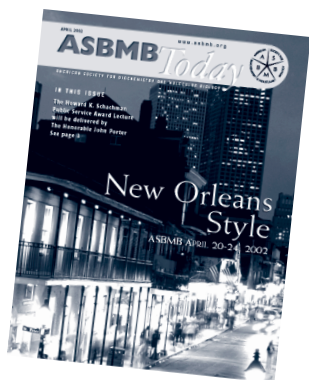
In addition to helping ASBMB better represent you, you'll be doing your students and postdocs a big favor. ASBMB membership brings many benefits—increased clout in the legislative and regulatory arenas of Washington, DC, is a big one, but not the only one. Among other benefits they receive are:

- ◆ Access to FASEB career resources
- ◆ Free access to AAAS' *ScienceNOW* and *Science's NextWave*.
- ◆ Discounts on ASBMB meeting registration fees.
- ◆ Fellowship travel awards, career networking, and employment assistance.
- ◆ Free subscriptions to a variety of publications, including the *Journal of Biological Chemistry* (online), *MCP Online*, ASBMB's new magazine *ASBMB Today*, and *The Scientist*.
- ◆ Discounts on other publications including *The Journal of Lipid Research* and *Biochemistry and Molecular Biology Education*.
- ◆ A free copy of the *FASEB Member Directory* and the *FASEB Journal*.

Furthermore, an undergraduate can join for only \$20, and associate members can join for only \$65—half the regular membership cost.

Do your students a favor and have them join today! ASBMB will benefit from the increased numbers and enthusiasm that your students will provide, and they'll benefit too.

Find out more about membership benefits and other information by visiting our website (www.asbmb.org) or by contacting our Membership and Subscriptions Manager, Kathie Cullins, at kcullins@asbmb.faseb.org



Senate Approves Bush Choice as NIH Director

On May 2, the Senate confirmed Dr. Elias Zerhouni, M.D., as the new director of the National Institutes of Health. There was no discernible opposition to the appointment which President Bush had announced in a Rose Garden ceremony on March 26. Zerhouni was Chairman of the Russell H. Morgan Department of Radiology and Radiological Science at Johns Hopkins and was a Professor of Radiology and Biomedical Engineering. He has also served as Vice Dean for Research at The Johns Hopkins University School of Medicine.


The Senate held its confirmation hearing on April 30. In the elaborate dance of courtesy, ritual and tradition that usually accompanies such events, Zerhouni was fulsomely introduced by Senators Barbara Mikulski and Paul Sarbanes, both democrats of Maryland. Zerhouni's entire family was in attendance, and of course he introduced them. Substantively, Zerhouni fielded the questions he received with skill and grace. Senator Paul Wellstone (D-MN) asked whether Zerhouni would work to increase the number of human stem cell lines that could be used beyond the 78 that President Bush approved in his policy decision of August 2001. Zerhouni, while careful to defend the President's decision, indicated his intention to reconsider the issue if research results warranted.

Bush lauded Zerhouni's expertise in biomedical research and his strong

management skills in his March Rose Garden remarks. "Dr. Zerhouni and his wife immigrated to America from Algeria with \$300 in their pocket, but a dream of opportunity....He is an expert in biomedical research, and is committed to extending [its] benefits to all Americans, and all humanity.

"Dr. Zerhouni is well-prepared to manage this rapidly growing institution [NIH] during times of great new opportunity and urgent biodefense needs. He has supervised research at Johns Hopkins, one of our nation's leading research facilities. One former colleague calls him a quadruple threat: a doctor who excels at teaching, researching, patient care and management. Dr. Zerhouni shares my view that human life is precious, and should not be exploited or destroyed for the benefits of others. And he shares my view that the promise of ethically conducted medical research is limitless.

"As Director of the NIH, Dr. Zerhouni will be at the forefront of our efforts to promote biomedical research with a careful regard for the bounds of medical ethics."

Zerhouni will assume his duties at NIH as soon as he is sworn in. 



Dr. Elias Zerhouni

Carmona Nominated as Surgeon General

President Bush, in March, nominated Richard Carmona, M.D., as Surgeon General.

According to a White House fact sheet, Dr. Carmona is currently Clinical Professor of Surgery, Public Health, and Family and Community Medicine at the University of Arizona, as well as Chairman of the State of Arizona Southern Regional Emergency Medical System. Carmona served as an Army Green Beret in Vietnam, and has also served as a police officer, a SWAT team member, and a nurse. He was named Physician of the Year in 1993 for Pima County, Arizona, and is a past recipient of the Top Cops award from the National Association of Police Organizations.

The President has indicated that he wants Carmona to focus on three health issues:

Ensuring that America is prepared to respond to major public health emergencies, such as bioterrorism;

Leading a new initiative that focuses on prevention, fitness and healthy living as keys to reducing disease and improving medical care; and

Speaking out regularly to the nation about the health dangers of alcohol and drug abuse.

NIH's Mini-Med School Attracts Large, Diverse Audience

By Peter Farnham, Public Affairs Officer

"I try to stay a little dirty." This tongue-in-cheek comment was the laugh line of the night at the kickoff presentation for the NIH's annual "mini-med school," held April 11 at the Natcher building on the NIH campus. The comment was made by Dr. John Finerty, Chief of the Cellular Immunology and AIDS Lymphoma Section and Hematology Branch of the National Cancer Institute, NIH. His comment was in response to a question from the audience on whether his training in microbiology had affected how he lived his life.

Finerty, the mini-med school's opening lecturer, spoke on Basic Microbiology, the first of seven weekly two-hour presentations. The always popular program, which began in 1994, is an initiative of the NIH Office of Science Education, and is held each spring at NIH. This year, over 500 local residents signed up to take the course.

Finerty's comment was only partly in jest. His point was related to the problem of resistance—reduced resistance to bacterial infection among developed world populations, and the growing resistance to antibiotics of many bacteria. "We live in a super clean society," Finerty noted. Resistance to infection is actually more developed in populations that are more exposed to bacteria than we are. Thus, being "a little dirty" is a good way to increase one's own personal resistance to disease. Of course, he strongly recommended washing one's hands regularly, particularly before handling food and after using the bathroom, but said that he did not routinely use antibacterial soaps and


cleansers. Not only does this help one develop resistance to disease—it also slows down the evolution of resistant strains of bacteria by lessening their exposure to antibacterials.

The mini-med school meets each Thursday night between April 11 and May 23. In addition to basic microbiology, topics covered include immunology; emerging and re-emerging infectious diseases; clinical microbiology; epidemiologic principles; vaccines; and understanding the "bio" in bioterrorism. Instructors include some of the NIH's top scientists, including ASBMB member Gary J. Nabel and Dr. Anthony Fauci.



Attendees, at least based on those at the opening lecture, are a diverse mix of high school and undergraduate students, some NIH non-medical staff, and a large number of local retirees. The program is free and open to any-

one; about 10% of the audience had taken the course before. A "diploma" is presented at the end of the seven weeks.

The course is an excellent overview of a number of highly complex topics, and seems best suited to the educated non-scientist. Similar programs are run at about 70 medical schools around the country, according to Dr. Bruce Fuchs of the NIH Office of Science Education. 

Minority Affairs Workshop To Focus on 'Grantsmanship'

The ASBMB Minority Affairs Committee will be participating in the planning and implementation of a program begun by the NIDDK entitled Network of Minority Research Investigators Ad Hoc Task Force.

The goal of this program is to provide training to current and potential NIDDK grant holders so that they are more likely to receive, and maintain, funding. Included are issues that face grant applicants and recipients such as "grantsmanship," time, and lab management. Unlike many other programs that ask participants to return the training in-

vestment with service to the community, this program asks nothing in return other than that the investigators do their science.

The workshop is scheduled for November 7 and 8, 2002, on the NIH campus in Bethesda, Maryland. At this time the ASBMB MAC is seeking to create a list of scientists who may like to be invited to this all-expenses paid training workshop. If you are interested in participating in the workshop, or know someone who may be, please forward their names to Phillip Ortiz, chairperson of the ASBMB MAC, at portiz@esc.edu.

ASBMB Members Honored

Three ASBMB members were among the six recipients of ASPET Awards for 2002.

Professor **Eric E. Johnson** of the Scripps Research Institute was presented with the **2002 Bernard B. Brodie Award in Drug Metabolism**. The Award, which is given every other year by ASPET, honors the fundamental contributions of Bernard B. Brodie in the field of drug metabolism.

Johnson received his B.S. from the University of Texas at Austin and his Ph.D. in Chemistry from the University of Illinois at Urbana-Champaign. Following postdoctoral work at Urbana-Champaign, he moved to The Scripps Research Institute in 1973.

The Award honors Johnson for his pioneering contributions to our understanding of the structure, function, and regulation of liver cytochrome P450 enzymes obtained during his studies over the past 25 years. He has also elucidated the role of cytochromes P450 as a major antigenic factor for liver kidney microsomal autoantibodies in idiopathic autoimmune hepatitis. Another significant scientific contribution is determination of the first ever crystallographic structure of a membrane-bound



Eric E. Johnson

cytochrome P450, CYP2C5. Johnson's work has revolutionized approaches to understanding the structural basis of human P450 function and has tremendous implications for drug design, development, and therapy.

William B. Pratt, M.D., Professor of Pharmacology at the University of Pittsburgh is the recipient of the **2002 Goodman and Gilmer Award in Drug Receptor Pharmacology**. He received the Award for his pioneering contributions to our understanding of how steroids work that resulted from his investigations into steroid receptors.

Dr. Pratt completed his undergraduate work in Art with a studio concentration in sculpture at Dartmouth

ASBMB Member To Share Inaugural Wiley Prize in the Biomedical Sciences

H. Robert Horvitz, Professor of Biology at the Massachusetts Institute of Technology and an HHMI Investigator, is a co-winner of the inaugural Wiley Prize in Biomedical Sciences. Sharing the award with Horvitz is Stanley J. Korsmeyer, M.D., a researcher at Dana-Farber Cancer Institute.

Horvitz, an ASBMB member, was selected for his seminal research on programmed cell death and the discovery that a genetic pathway accounts for

the programmed cell death within an organism. Korsmeyer was chosen for his discovery of the relationship between human lymphomas and



H. Robert Horvitz

the fundamental biological process of apoptosis. His experiments showed that cancer can develop when cancer-causing "oncogenes" block apoptosis and allow cells to grow in an uncontrolled and chaotic fashion.

"These pioneering researchers were chosen for their work in defining the genetic and molecular basis of programmed cell death. Their findings may lead to understanding the molecular basis of human development and the development of many diseases, especially cancer," said Dr. Günter Blobel, recipient of the 1999 Nobel Prize awarded for Physiology or Medicine and Professor of Cell Biology at Rockefeller University.

Blobel served as Chairman of the Awards Jury that selected Horvitz and Korsmeyer. Other members of

the jury included Dr. David J. Anderson, a developmental neurobiologist at the California Institute of Technology, and Dr. Qais Al-Awqati, a physiologist at Columbia University's College of Physicians and Surgeons.

The Wiley Foundation established the Wiley Prize in Biomedical Sciences to recognize contributions that have opened new fields of research or advanced novel concepts or their applications in a particular biomedical discipline. In addition, the Wiley Prize recognizes a specific contribution or a series of contributions that demonstrate significant leadership in the development of research concepts or their application. The award carries with it a \$25,000 grant and an invitation to present a lecture at Rockefeller University.

With ASPET Awards

College, and obtained his medical degree from the Yale School of Medicine. As a postdoctoral fellow at the Institute for Therapeutic Biochemistry at the University of Frankfurt, Pratt began his studies on steroid hormone action. He continued postdoctoral work at Stanford, where he studied glucocorticoids and identified the glucocorticoid receptor in mice, a major focus of his research.

After four years on the faculty of the Stanford Pharmacology Department, Pratt returned to Yale to complete his residency in Pediatrics. In 1973, he moved to the University of Michigan Medical School where he is Professor of Pharmacology, and has continued his study of glucocorticoid receptors. Perhaps his most important discovery in this realm was a 90 kDa heat shock protein, hsp90, which binds to and regulates steroid receptors. This finding revolutionized our understanding of how steroid receptors are regulated within cells, and it opened the new field of chaperone regulation of the function of many receptors and other proteins.

In addition to his pioneering research, Dr. Pratt has played a major role as a teacher of pharmacology. He is the author or co-author of seven reference books that also serve as textbooks, including the third edition of *Principles of Drug Action: The Basis of Pharmacology*, two editions of *The Anticancer Drugs*, and two of *The Antimicrobial Drugs*, all of which are in wide use today.



William B. Pratt

Professor **Alan C. Sartorelli** received the 2002 **Otto Kraye Award in Pharmacology**, which is presented to a pharmacologist in recognition of career-long contributions to the discipline. This Award is given to a distinguished investigator whose research has contributed significantly to defining mechanisms of action of drugs or other chemicals.

Professor Sartorelli received his B.S. in Pharmacy from Northeastern University, an M.S. in Chemistry from Middlebury College, and his Ph.D. from the University of Wisconsin. He was appointed to the faculty in the pharmacology department at Yale School of Medicine and was named the first Alfred Gilman Professor of Pharmacology. He chaired the department at Yale from 1977-84 and from 1998-2000 and led Yale's Comprehensive Cancer Center as Director from 1984-93.



Alan C. Sartorelli

At Yale's Comprehensive Cancer Center, he was instrumental in the organization and implementation of one of the earliest mobile mammography van programs that provided screening for more than 40,000 women in Connecticut. Dr. Sartorelli has made an unusually large number of important contributions to basic and applied aspects of cancer pharmacology. He is one of the pioneers of the concept that the induced differentiation of neoplastic cells may be an approach that could lead to therapeutic benefit. He has also developed and characterized the mechanisms of action of a number of cancer chemotherapeutic agents. ❧

Membership, President's Council on Bioethics

President Bush named the individuals listed below to serve on his Bioethics Advisory Council. The Council has been meeting since February, and is expected to release a report on its findings regarding human cloning by the end of the summer.

Leon R. Kass, University of Chicago (chair)

Elizabeth Blackburn, University of California at San Francisco

Stephen Carter, Yale Law School

Rebecca Dresser, Washington University School of Law

Daniel Foster, University of Texas Southwestern Medical School

Francis Fukuyama, Johns Hopkins University

Michael Gazzaniga, Dartmouth College

Robert P. George, Princeton University

Alfonso Gomez-Lobo, Georgetown University

Mary Ann Glendon, Harvard University

William B. Hurlbut, Stanford University

Charles Krauthammer, *The Washington Post* newspaper

William F. May, Southern Methodist University

Paul McHugh, Johns Hopkins University School of Medicine

Gilbert Meilaender, Valparaiso University

Janet D. Rowley, University of Chicago

Michael J. Sandel, Harvard University

James Q. Wilson, University of California at Los Angeles

ASBMB Members Elected to National Academy of Sciences

Nine ASBMB members were elected members of the National Academy of Sciences at the 139th annual meeting of the Academy in April. They were among 72 new members, and 15 foreign associates, among them another ASBMB member, who were chosen in recognition of their distinguished and continuing achievements in original research.

Election to membership in the Academy is considered one of the highest honors that can be accorded a U.S. scientist or engineer. Those elected at the April meeting bring the total number of active members to 1,907. Foreign associates total 330.

The National Academy of Sciences is a private organization of scientists and engineers dedicated to the furtherance of science and its use for the general welfare. It was established in 1863 by a congressional act of incorporation, signed by Abraham Lincoln, that calls

on the Academy to act as an official adviser to the federal government, upon request, in any matter of science or technology.

ASBMB members newly elected to the Academy are:

Jennifer A. Doudna, associate investigator, Howard Hughes Medical Institute, and Henry Ford II Professor, department of molecular biophysics and biochemistry, Yale University.

Charles T. Esmon, investigator, Howard Hughes Medical Institute; Lloyd Noble Chair in Cardiovascular Research; and Oklahoma Medical Research Foundation Professor, University of Oklahoma Health Science Center, Oklahoma City.

Laurie H. Glimcher, professor of medicine, Harvard Medical School, and Irene Heinz Given Professor of Immunology, Harvard School of Public Health.

Richard H. Goodman, director and senior scientist, Vollum Institute, and

vice chair of medicine, Oregon Health Sciences University, Portland.

Gail Roberta Martin, professor of anatomy and director, Program in Developmental Biology, University of California, San Francisco.

Rowena G. Matthews, Robert Greenberg Distinguished University Professor of Biological Chemistry, University of Michigan, Ann Arbor.

Richard V. Wolfenden, Alumni Distinguished Professor of Biochemistry, University of North Carolina, Chapel Hill.

Chi-Huey Wong, member, Skaggs Institute for Chemical Biology, and Ernest W. Hahn Professor and Chair in Chemistry, Scripps Research Institute.

Newly elected as a foreign associate was Jan-Åke Gustafsson, professor and chairman, Department of Medical Nutrition and director, Center for Biotechnology, Huddinge University Hospital, Karolinska Institutet, Sweden. ❧

Hans Neurath, 1909 -2002: 'Father' of UW Biochemistry Department

Hans Neurath, 92, Professor Emeritus and founder of the University of Washington's Biochemistry Department and of two scientific journals, died April 12 in Seattle after a heart attack.

Born in Vienna, Austria, in 1909, Dr. Neurath taught at Cornell University and Duke University before being appointed chairman of the newly established Department of Biochemistry at the University of Washington's School of Medicine in 1950. The author of more than 400 publications, he was the founding

Editor of *Biochemistry* and in 1990, at age 81, founded a new journal, *Protein Science*, which he served as Editor-in-Chief until 1998.

In 1975, he became scientific director at the Fred Hutchinson Cancer Research Center, while continuing research on proteins and enzymes at the University of Washington. His research included the study of proteolytic enzymes, or protein catalysts, that digest protein in the foods humans eat. Two years later, he resumed his protein research at the University of Washington as Professor Emeritus.

NIAID Director Wins Medical Research Prize

Anthony S. Fauci, Director of the National Institute of Allergy and Infectious Diseases and a visiting professor at numerous medical centers throughout the United States, has been named this year's winner of the \$500,000 Albany Medical Center Prize in Medicine and Biomedical Research.

Fauci received the nation's largest medical prize for his overall contributions to science, particularly in the development of effective therapies for rheumatology and diseases affecting the immune system, as well as for his distinguished public service. He has been the head of NIAID, a branch of the National Institutes of Health, since 1984.

Samuel Cushman Receives ADA's Banting Medal

Doctor Samuel W. Cushman has been selected to receive the Banting Medal for Scientific Achievement at the American Diabetes Association's 62nd Annual Scientific Sessions. The Banting Medal for Scientific Achievement is the American Diabetes Association's (ADA) highest honor for scientific achievement. Named for Frederick G. Banting, the co-discoverer of insulin, this award recognizes significant, long-term contributions to the understanding, treatment, or prevention of diabetes.

Currently chief of the Experimental Diabetes, Metabolism, and Nutrition Section of the National Institute of Diabetes and Digestive and Kidney Diseases at NIH, Cushman is a leading scientist in the field of insulin action. In a pivotal finding in the late 1970s, he and L. J. Wardzala at NIH, and independently, K. Suzuki and T. Kono at Vanderbilt University, demonstrated that insulin stimulates glucose transport into insulin-sensitive tissues by promoting the translocation of glucose transporters from an intracellular compartment to the plasma membrane.

The discovery of intracellular glucose transporters, subsequently shown to be GLUT4, turned out to be not only a major breakthrough in understanding the molecular mechanism of action of insulin on glucose transport, but of key importance to understanding the pathophysiology of insulin resistance and type 2 diabetes. This discovery has also led to enhanced knowledge of the mechanism of action of other hormones, peptides, and ligands which exert their effects through the translocation of proteins from intracellular sites to cell-surface membranes.

Cushman completed his undergraduate work at Bowdoin College. After obtaining his doctorate in physiologi-

cal chemistry and cell biology at Rockefeller University and completing a postdoctoral fellowship at the Institut de Biochimie Clinique in Switzerland, he joined the laboratory of Lester B. Salans, M.D., at Dartmouth Medical School. In 1976, he moved to NIH.

Since the publication of the pivotal findings on glucose transporters in 1978 and 1980, Cushman's laboratory has published the results of numerous studies that have broadened our un-

skeletal muscle, and their regulation. A primary goal is to elucidate the mechanisms of insulin-resistant glucose transport. Further attention is also aimed at characterizing the acute effects of insulin on the subcellular trafficking of proteins of the immune system. A new effort is in progress with using DNA microarray technology to identify novel adipose cell and skeletal muscle proteins that contribute to human insulin resistance.



Doctor Samuel Cushman and assistants at work in his laboratory. The Banting Medal recipient is currently working on the use of DNA microarray technology to identify novel adipose cell and skeletal muscle proteins that contribute to human insulin resistance.

derstanding of the subcellular compartmentalization and cycling of GLUT4, its regulation, and its involvement in the complex network of protein and signaling molecules that control cellular metabolism. The Cushman laboratory has also demonstrated the crucial importance of the number of intracellular glucose transporter molecules to the magnitude of the glucose transport response to insulin, and thus to perturbed insulin action in altered metabolic states.

Currently, Cushman's laboratory is focused on further establishing the molecular and cell biological details of the glucose transporter subcellular trafficking pathways in adipose cells and

Speaking of Cushman as a person, one former student, Philip Ortiz, said, "He is a great scientist and an equally good person. He has made a great impact on my career and development as a scientist. As chair of ASBMB's Minority Affairs Committee, I am very aware of efforts to diversify the scientific community. One look at his lab and it is obvious that Sam is an outstanding contributor to this goal." ❧

Scientists

“Science advocates cannot do it alone. They need the commitment, the involvement, the help of all caring scientists and their representative professional societies to steer public policy affecting science in the right direction.” That was the message former Congressman John Porter brought to the ASBMB Annual Meeting. Following is the complete text of his address on receiving the first Howard K. Schachman Public Service Award, which recognizes his role in the doubling of the NIH budget.

I could not be more honored to be the very first recipient of the Society’s Schachman Public Service Award.

I accept it in the spirit of Dr. Schachman—in the recognition of the importance of public service to science, but also—I hope—in recognition of the Society’s and science’s new commitment to be more involved in the policy side of science and in the formulation of public policy related to science.

Bill Brinkley is a premier example of someone who has been deeply involved in science and public policy, who has given countless hours of his valuable time to impact public policy decisions, and to let his voice be heard at the highest levels as an advocate for science.

If you want to know someone who has made a difference for science, you want to know Bill Brinkley, and I’m proud to have received this first ASBMB public service award from his able hands.

I served for 21 years on the public side as part of your support team.

I am not a scientist but I am a science advocate—someone who has a basic understanding of science and its relationship to government, someone who appreciates science and marvels at your immense achievements, someone who is inspired by the progress already achieved in understanding the human

organism (and others) and by the exciting possibilities of research that lie ahead.

As someone who not only cheers you on but attempts—now working outside government—to continue to secure the resources you need for your vital work, we need to talk!

Science advocates can only go so far for you.

Bill Brinkley and Peter Farnham, who does a magnificent job for you in Washington, can only go so far for you.

You can’t abdicate to advocates your responsibilities as scientists and citizens of this great country and our world at large.

Let me give you some examples.

I can assume that a substantial part of the resources that you depend on as investigators come from peer reviewed grants from NIH.

The President in his February budget message to Congress proposed a fifth year of 15% increases for the National Institutes of Health which would complete a process doubling funding for biomedical research from \$13 billion just four years ago to \$27 billion by this October.

We know that the President’s \$3.7 billion increase for NIH for the next fiscal year contains a large amount of money for research and facilities related to protecting America from



ANSWERING QUESTIONS from the audience after delivering his address, Porter re-emphasized the need for scientists to make their voices heard on critical issues affecting science that are now under consideration by Congress and the Administration.

bioterrorism and taps on NIH funds for activities related to biomedical research but not available for research grants themselves.

Nevertheless the President kept his promise to complete the doubling process in a time of a faltering economy and great needs for direct military funding.

How many of you bothered to write the President or call the White House to say “Thank you”?

Called on to Make Their Voices Heard in Washington

You think they won't notice?

Believe me, they do.

You think they won't care?

The President's Office of Management and Budget is right now working on the next fiscal year's budget.

If the response of the scientific community to this year's large increase is tepid at best, that says two things to the White House:

First, scientists don't care, or worse, are ungrateful for the federal resources they receive; and

Second, the science community is so uninvolved—so weak and unorganized

As someone who not only cheers you on but attempts—now working outside government—to continue to secure the resources you need for your vital work, we need to talk!

as a political force—that in the future they can be ignored.

What will that mean?

That Mitch Daniels, the OMB Director can proceed with his plan for post-doubling budgets for NIH in the 2% increase range.

Yes, that's what is planned unless all of us, working together, can head it off at the pass, and we can't do that sitting on our hands.

As Bob Rich, of FASEB, recently calculated, 2% increases for the next five years would entirely negate the five

years of 15% increases leaving us just where we started.

Is that a result we can live with?

I suggest 10% increases for NIH is a reasonable figure after doubling to sustain research momentum and take advantage of the good science that is available.

You and I could easily and rationally argue for much more, but politics is the art of the possible.

How many of you will write the President, urging a 10% increase in the future?

And even more importantly—because Congress, not the White House, appropriates the money—how many of you will visit, call or write your Congressional representatives—your Congressperson and your two Senators—to work for this kind of sustaining funding for NIH?

There are other issues—and other questions for you.

Let me go back to a few weeks ago when we had no named appointee for NIH Director, for Surgeon General, for Director of the Centers for Disease Control and Prevention (CDC), nor for FDA Director.

And although the President has announced he is sending to Congress for confirmation Dr. Elias Zerhouni as NIH Director and Dr. Richard Carmona as Surgeon General, he has named no one for CDC, no one for FDA, which has been vacant over 16 months, and five institutes within NIH have no directors.

These are science positions in an Administration that took almost a year to select a Science Advisor to the President.

Shouldn't the science community be concerned?

Shouldn't the science community be heard from?

The CDC position requires no Senate confirmation.

This is an important public health and research post.

You know and I know that the President and the White House are being impacted by those who think the United States should have a saliva test for appointees to federal health policy posts.

Shouldn't the science community—the professional societies and every individual researcher—be on record—loudly—that we need the best possible people for these appointments, people respected and acclaimed within the community, rather than someone who meets some philosophical standard?

I believe that all saliva tests—of the right or left—are wrong.

I believe they're un-American.

I believe they're intolerable in any society devoted to promoting the very best and brightest.

Would Oliver Wendell Holmes or Louis Brandeis have made it to the Supreme Court bench through such a maze?

Frankly, during the long months that these and other positions have been vacant, I have been astounded at the silence of the science community, the abdication of the field to those looking, frankly, not for excellence in science, but through some philosophical filter.

Where has the science community been?

Today, right this moment, there is pending before Congress, legislation going right to the heart of the freedom of scientific inquiry that has always been the hallmark of our country.

A bill—already passed by the



ASBMB President Robert Wells discussing research issues with a group of post doctoral fellows and graduate students from his lab between symposia at EB2002. "What a tremendous opportunity this is for students and fellows in training to experience the breadth of biomedical sciences," says Wells, who regularly brings his entire lab to the ASBMB Annual Meeting.

House—would make research into DNA replacement therapies—so-called “therapeutic cloning” and the importation from abroad of the results of such research unlawful.

A scientist who conducted somatic cell nuclear transfer research or an individual who went overseas to pursue therapies that might be developed from such research to address diabetes or Parkinson’s disease would be subject to fines and imprisonment.

Let me repeat: this legislation would subject a scientist to a prison term for pursuing research!

Can it possibly pass?

Yes.

If this legislation passes the Senate, the President will sign it.

The only physician in the Senate, Senator Frist of Tennessee, a thoracic surgeon, has endorsed it—though not the prohibition on importation—giving other Senators cover to vote for it.

Where is the research community?

While advocacy groups like Research!America have spoken out and been working against it, I have seen not the slightest mention of the dangers of criminalizing scientific inquiry this way by the professional societies.

Many brilliant contributors to American biomedical research have come from across the world and have enriched American science and advanced American scientific achievement beyond measure.

Didn’t they come here to be free of government directing or restricting where their studies and intuition

might lead them?

What will the passage of this bill mean to those elsewhere who might otherwise have come to and benefited our society?

There is more:

In his budget proposal, the President suggested greatly increasing funding for cancer research, meaning less for research that might be related to other diseases that afflict humankind.

Congress—I should tell you—has almost always refrained from substituting its political judgment for scientific judgment as to which areas of research should be pursued.

Should the President’s priorities prevail over the scientific judgment of NIH?

What are you as an individual investigator going to do to keep science free of politics?

Still more:

Federal funding for the physical sciences has not kept up with that for the life sciences, even though they are now more and more closely intertwined.

Indeed, the kind of research you now pursue is completely dependent on information technology and physics and bio-engineering.

Shouldn’t the scientific community be impacting federal policy makers on the importance of increasing funding for the physical sciences as well as the life sciences?

Research!America, together with ASTRA and others, is attempting to do so.

Are you?

Finally—though the supply of issues for citizen scientists is far from exhausted—what about the plan of the Secretary of Health and Human Services to transfer all communications functions from NIH and CDC and the Surgeon General and FDA to his direct

control, so that scientists from these agencies can no longer speak for them directly to the media and the American people?

Is this okay?

What are you doing to prevent its happening?

I know that it may seem ungrateful, even rude, for the recipient of this great honor from one of America’s most prestigious scientific societies to come here and challenge you in these ways.

But let me return to my opening

Should the President’s priorities prevail over the scientific judgment of NIH?

What are you as an individual investigator going to do to keep science free of politics?

statement: Science advocates cannot do it alone.

They need the commitment, the involvement, the help of all caring scientists and their representative professional societies, to steer public policy affecting science in the right direction.

Scientists have tremendous respect in America.

When you speak, the people listen.


But you must speak! Loudly. Publicly.

There are numerous challenges before us.

They are our collective and individual responsibilities.

Let’s—all of us—work together to meet them.

Thank you for this high honor.

Thank you for listening to me. 

Secrets of the Sequence: New TV Program Tells the Genome Story

A weekly news magazine that went on the air April 5, on over 100 public television stations which cover more than 75 percent of U.S. households, aims to tell the story of the genome in a way that will be easily understood by the general public.

The sequencing of the human genome will revolutionize health care and has the potential to feed the world's hungry, while at the same time stem cell research, genetically modified food and the possibility of human cloning produce doubt, uncertainty, and sometimes even fear among the public. *Secrets of the Sequence* was cre-

ated to inform the public, in an entertaining manner, and allay any concerns about genomic research.

"The concept," explained the program's producer, Jonathan Ward, "is that a one- or two-hour show explaining gene sequence would be very informative, but would not stick with people. It would get a gee whiz reaction, but only for a short term. The idea is for this series, *Secrets of the Sequence*, to run for over a year for in-depth penetration."

The programs will include scientists, philosophers, and ethicists who will address the public's questions about the fundamental human issues surround-

The sequencing of the human genome will revolutionize health care and has the potential to feed the world's hungry.

ing research in the biosciences and the potential conflict of interest in industries sponsoring research at universities.

In addition to the U.S., the program will be shown in the U.K., France, Canada, Japan, China, and several other countries.

Science Does Not Operate in a Vacuum

"Ethical considerations and people's values can influence where the sciences go and how we train future generations of scientists," according to the Advisory Board for *Secrets of the Sequence*. "Scientific discoveries, in turn, have tremendous implications for public and economic policy. In the post-genome era of the 21st century, the university research community and the corporate community involved in research must offer the public an opportunity to engage in a dialogue about genetic and other life sciences discoveries."

The Advisory Board is composed of institutions working with the program producers to highlight the importance of public education in the life sciences. Board members are: Virginia Commonwealth University, Harvard University, the Medical Research Council/Laboratory of Molecular Biology in Cambridge, England, the University of California-San Francisco, University of Michigan, and the University of Wisconsin-Madison. Corporate underwriters for the series include Oracle, Pfizer Foundation, and Pfizer. 

Website Offers Pointers On Security For Labs

Researchers at the U.S. Department of Energy's Lawrence Berkeley National Laboratory have developed a concise, relatively jargon-free Website offering the best up-to-the-minute scientific advice on how to respond in the case of such an attack against a building and its occupants: <http://securebuildings.lbl.gov>.

Developed by scientists at Berkeley Lab's Environmental Energy Technologies Division (EETD), the website contains pointers for emergency service personnel in two areas: How to reduce the vulnerability of buildings to chemical/biological agents before an attack in the long- and short-term timeframes, and what actions to take using a building's heating, ventilation, air conditioning (HVAC) system to control

the spread of these agents into and inside the building during an emergency.

"The advice on the site represents the consensus of scientists who have had extensive experience studying the physics and chemistry of the indoor environment, and the diffusion of air and pollutants through building interiors," according to Ashok Gadgil, senior staff scientist and leader of EETD's Airflow and Pollutant Transport Group.

The researchers plan to update the site as new research results on protecting buildings from chemical and biological attacks become available. The site is not designed to address large-scale, accidental releases such as those at a chemical manufacturing plant, nuclear facility, or oil refinery.

Alzheimer's Disease: New Insights, Possible Remedies

The unprecedented increase in life expectancy that occurred in the twentieth century brought with an unexpected and unwanted accompaniment to long life. That unforeseen downside to longer living is Alzheimer's disease (AD) which now affects some 4 million Americans of all races and ethnic groups and some 20 million to 30 million people worldwide.

Will the increasing elderly population of the country, as well as Europe and other areas where lives are becoming longer, mean even more people robbed of their most human qualities—memory, reasoning, judgment, and language? Or is help on the way?

That was the topic addressed by Dennis Selkoe, M.D., of Harvard Medical School, at an April meeting of the Congressional Biomedical Research Caucus.

Progress in genetics, biochemistry, and animal modeling during the past 15 years has produced a revolution in our understanding of the cause and mechanism of AD. It seems that the premature loss of brain cells required for memory and thinking results from the build up of a small, sticky protein, amyloid beta-protein (A β). Recently, two enzymes that generate A β were identified, and that finding led to the discovery of specific inhibitors for both of these enzymes. Further research resulted in the development of methods, including the use of a new AD-fighting vaccine, to erase excess A β from the brain.

Some of these potential treatments have reached the initial stage of human trials. If these, and other emerging therapies, prove successful, the result will be a triumph of reduc-



Alzheimer's disease (AD) now affects some 4 million Americans of all races and ethnic groups and some 20 million to 30 million people worldwide.

tionist science applied to the most complex biological system on the planet—the human cerebral cortex. The resulting impact on healthcare costs related to treating or preventing Alzheimer's disease will be enormous.

In responding to questions from the audience, the Harvard Medical School professor made the following points:

Seven or eight times as many people are working on Alzheimer's research

than 10 years ago, thanks to congressional support for NIH funding.

AD is a little more common in women. There is a possibility that the decline in levels of estrogen after menopause may increase proneness to Alzheimer's.

AD brings with it a lack of recognition of the progress of the disease, so that people are unaware that they have Alzheimer's. ∞

NIGMS Strategy for FY 2002 Grants

NIGMS anticipates that competing research project grants for FY 2002 will be about seven percent larger than for fiscal 2001 and the total size of the average award will be about a third more than in FY 98, when budget levels began to rise substantially.

The size of budget requests in new applications are 60% higher than they were in FY 98, while budgets requested in R-01 continuation applications have increased by only some 30% over the same period.

Research project grants (RPGs) total 85% to 90% of the NIGMS research budget, and R-01 grants

represent approximately 85% of RPG awards. Consequently, the resources required to support ongoing grants have also increased substantially. NIGMS therefore considers financial management of R-01's essential to its financial management strategy. As a result, NIGMS has announced that smaller reductions will be made in R-01 awards than in new (Type-1) awards. All reductions will be considered on a case-by-case basis.

With appropriate financial management, NIGMS plans to make approximately as many new RPG awards in FY 2002 as in each of the previous three fiscal years.

2000-2001 Graduation Survey Results

For the 2000-2001 graduation survey ASBMB incorporated the option to submit the survey directly on the web. Of the 192 schools responding to this year's survey, almost half (95) chose to respond using this mode. While the number of schools responding was lower than in past years, the number of bachelors and masters degrees reported were the same (bachelors) or up (masters). The number of doctoral graduates were down from previous years, probably due to the smaller number of large institutions reporting. For the first time in the four years of reporting, the number of women obtaining bachelors degrees exceeded the number of men. This year the number of masters degrees obtained by women was smaller than the number received

by men, the opposite of last year. Over the four years of the survey, the number of women receiving masters degrees are almost identical. As found in previous years, more doctoral degrees are earned by men than by women.

The number of minorities receiving bachelor degrees is up for American Indians, Black, Hispanic, and Pacific Islander categories. None of these groups showed any significant change at the graduate level. Overall, the number of Asian students is down at each level. Again, this may be a reflection of the different mix of schools reporting this year.

The average size of the faculty in departments reporting was 12.3 males and 3.7 females, with a school size of 11,800. This is essentially the same av-

erage school size and number of total faculty per department with a slight increase in the percentage of women faculty. Again this could be because of the departments reporting.

For these surveys to be truly representative of the field we depend upon departments reporting. If you wish to see if your department reported this year, go to the Graduation Survey link in the Education Section of the ASBMB website. It is also necessary to know which departments offer degrees. A list of departments that we know offer Biochemistry or Molecular Biology degrees can also be found on the ASBMB website. If members know of additional departments offering degrees, please notify Kelly Gull at the Bethesda office. ☞

Students Graduated, July 1, 2000–June 30, 2001

	Bachelors			Masters			Doctoral		
	M	F	Total	M	F	Total	M	F	Total
American Indian or Alaskan Native	6	22	28	6	4	10	2	0	2
Asian	184	201	385	35	26	61	33	21	54
Black, not of Hispanic origin	46	68	114	4	9	13	5	5	10
Hispanic	54	41	95	9	1	10	3	8	11
Pacific Islander	14	18	32	0	2	2	0	1	1
White, not of Hispanic Origin	648	662	1310	115	74	189	157	114	271
International Students	30	42	72	25	31	56	64	37	101
Total	982	1054	2036	194	147	341	264	186	450

by John D. Thompson, Editor

'Speed Bumps' Won't Stop Biotechnology Development

Despite some recent bad news, the biotechnology industry is still poised for significant progress this year and multiple signs point to the industry's development, according to an analysis, *Biotechnology: Mere Speed Bumps on the Road to Development*, by Frost & Sullivan Consulting and Market Research.

The combined effects of the sequencing of the human genome and progress in functional genomics and proteomics, are creating vast amounts of data that will potentially add value to the drug discovery process. However, with all the hype surrounding these huge leaps forward in biotechnology it is easy to forget the complex process of drug discovery and the many years it can take to produce a marketable drug. While increased efficiencies are considered sure to come, when they will appear remains to be seen.

Indeed, it has been argued that a surge of novel targets might lead to development time and expense being expended on targets that are poorly characterized and which could result in failure during the costly clinical stages of development.

What was heralded as a banner year in biotechnology with 13 drugs expected to reach the market has begun instead with a wave of bad news regarding the development of nine anticipated launches. Despite the bad news, Frost & Sullivan believes that biotechnology is still poised for significant progress in 2002 and sees multiple signs pointing to the industry's development.

As a result of economic pressures coupled with the loss of patent protection on a number of blockbuster drugs, pharmaceutical firms are under tremendous pressures to increase efficiencies in

their discovery efforts. Indeed "big pharma" is increasingly looking to biotechnology for innovation and many indications in the market indicate that biotech is coming of age.

This development in the industry is demonstrated by several factors, including the increased leverage that biotechnology firms have in negotiating deals with big pharmaceutical companies. Industry mergers and acquisitions activity was, as recently as 1999, dominated by large pharmaceuticals with some \$12 billion in acquisitions. However, this number was dwarfed in 2001 by biotechnology acquirers which spent roughly \$23 billion in acquisitions. Finally, valuations reflect that industry development—witness the \$60 billion market cap of Amgen—exceeds that of pharmaceutical industry bellwether Pharmacia.

India Seeks Growth via Bioinformatics

India's Department of Biotechnology (DBT) has pledged \$65 million for genomics research over the next five years, and plans to expand the nation's network-based bioinformatics program. This program currently involves 57 universities and public-funded institutions involved in database creation, molecular modeling, and algorithm development.

India has seen an influx of private participants in bioinformatics. These start-ups are working on the generation of intellectual property, including bioinformatics products, as well as research for domestic and international clients in the biotechnology

and pharmaceutical sectors. The Indian bioinformatics market was considered worth some \$25 million in 2001—about 51 % of the country's overall biotechnology market. Growth is estimated at an annual rate of 30%.

India's principle advantage is a low cost of development, high success rates enjoyed by its bioinformatics companies, plus strong government support for the biotech sector and the availability of technical expertise. A low level of competition, a strong IT infrastructure, and skilled manpower are also seen as advantages.

Albany University's High-Tech Vision

A \$35 million investment in New York state's Capital Region is taking shape at the University of Albany campus. When it is completed at the end of the year, the 118,000-square-foot building could see 1,000 researchers from the university and private companies doing advanced work in areas such as nanoelectronics and nanophotonics. A business incubator also will be housed there.

New York's Governor George Pataki, who designated the institution a Center of Excellence in Nanotechnology, pledged \$50 million in state money for the building project.

Signs of Growth in Bioinformatics

In March, three firsts—a nationwide computing grid, a cross-disciplinary conference, and a computer-based disease model—were evidence to the rapid growth of bioinformatics.

In the middle of the month, in Boston, the first commercial conference that brought biologists and information technologists together under the same roof was held. Earlier that month, three partners joined in the first major alliance aimed solely at using bioinformatics to speed drug development for a specific disease,

and, as the month came to a close, computing giants took the first step toward creating a nationwide computing grid that will do for post-genome research what the Internet has done for communication.

“There’s no doubt we’re on the verge of a revolution,” is how Compaq Chairman and CEO Michael Capellas opened his keynote address at the BioIT World conference in Boston. He predicted that by next year bioinformatics will—directly or indirectly—account for about 20% of the nation’s gross domestic product.

Capellas spoke in the wake of Compaq’s alliance with the American Diabetes Association (ADA) and Entelos, a small California-based biotech firm. For this venture, Compaq will be providing high-performance servers, which will be run by Entelos to develop a highly sophisticated model of type 2 (adult-onset) diabetes.

The result will be the Diabetes PhysioLab, a large-scale mathematical

model of type 2 diabetes that will provide drug-development information to a select number of pharmaceutical and biotech firms. Rather than testing promising diabetes drugs in cell culture or live animals, the companies will be able to try them out in the PhysioLab.

The virtual diabetes patient began with Entelos engineers who modeled normal homeostasis and then introduced known results from genetics, aging, cell modeling, metabolic factors—over 7,000 parameters and more than 300 experiments.

In the final week of the month, IBM and the Department of Energy (DOE) announced a collaboration on a nationwide computing grid that will help researchers tackle the computing challenges posed by genomics. The DOE Science Grid started with two IBM supercomputers and a massive storage repository. By December it is expected to process over five trillion calculations per second.

Syngenta to Share Rice Genome, With Restrictions

The Swiss agrochemical group, Syngenta AG, has announced that it will share genetic information about the rice plant with academics, but not put it into the public Genebank database. Syngenta, one of the world’s largest agrochemical and seed companies, said the compromise would give public-sector researchers access to its work while protecting its commercial interests.

“If we were to put our material in Genebank it would be available to our competitors as well as to academicians,” a company spokeswoman said. “The academic community will have access through a CD-ROM... they will have to make a request via their university that they will use it for academic purposes and not commercial purposes.”

Without such protection, Syngenta fears that competitors will grab its data to patent important genes, then sue Syngenta if it tries to exploit them itself.

Eli Lilly Gets Award

Eli Lilly and Company has received the Translational Medicine Award cosponsored by the University of California-San Diego (UCSD) Institute of Molecular Medicine, the Salk Institute of Biological Studies, and the journal, *Nature Medicine*. The award was presented at the 2002 Days of Molecular Medicine Symposium in recognition of Lilly’s new biotech product, Xigris (drotrecogin alfa (activated)). The award honors pioneering work in molecular medicine that leads to therapeutic advances for human diseases.

Prior to the development of Xigris there had been many failed attempts at bringing a severe sepsis treatment to market. Eli Lilly’s creation of one of the most complex biotech compounds ever produced was the result of 20 years of research and development. The Activated Protein C molecule is among the largest molecules used to make a biotech compound, measuring more than 400 amino acids in length as compared with, for example, the 51 amino-acid-length Humulin.

Big Payoffs from Undergraduates' Research

The research that Diana C. Hargreaves performed while still an undergraduate at Haverford College has taken her a long way, literally and figuratively. She was invited to travel from her college in southeastern Pennsylvania to a national gathering of immunologists at Asilomar near Monterey, California, to present her work. While there, she landed a job at an HHMI investigator's lab at the University of California, San Francisco (UCSF), and she hopes her research experience will help open doors to graduate school and an immunology career.

Hargreaves is one of a growing number of undergraduates who not only conduct research, but have the opportunity to make formal presentations about it alongside full-fledged scientists. Over the past five years, more than 5,700 undergraduates have received HHMI support to participate in this way at scientific meetings.

Hargreaves took her first step on the research ladder as part of an interdisciplinary program supported by an HHMI grant. The chemistry major's project was to help Haverford biology professor Judy Owen design a more efficient system for isolating certain regulatory regions of genes that are expressed after B-cell activation. Because Owen believes that students who have made major contributions to the work of her lab should be invited to accompany her to scientific meetings, Hargreaves found herself at the age of 21, presenting a poster at the 2000 Midwinter Conference of Immunologists at Asilomar.

"I was pretty scared," she recalls. "I was the youngest person there by a long shot. But it was really good to be part of that scientific community, to get feedback on a national level and to

be exposed to what was going on in the field of immunology as a whole."

The Federation of American Societies for Experimental Biology 2001 meeting in Orlando, Florida, made a similar impression on Hesham Attaya. Now a junior majoring in biochemistry at Texas Tech University, he presented a poster on his research into human metastatic pancreatic cancer-cell expression of a particular enzyme, plasmalemmal vacuolar type proton ATPase. "It was amazing to me how principal investigators, postdocs and graduate and undergraduate students from around the world come together to talk about science," he

"My lab encourages undergraduates to present their work at national and international meetings."

—Raul Martinez-Zaguilan

says. He was impressed with the lack of condescension. "Many people came to see my poster and talked to me as a peer, not a student."

"My laboratory encourages undergraduates to present their work at national and international meetings," says Raul Martinez Zaguilan, a professor of physiology and Attaya's mentor. "Hesham's poster won one of the top 10 undergraduate research awards in a competition organized by ASBMB at the FASEB meeting in Orlando, and that is a major accomplishment."

Attaya says his participation in the meeting inspired him to pursue an M.D.-Ph.D. and a research career.

Texas Tech sends several undergraduates on similar adventures every year.

Larry Blanton, biology professor and director of Texas Tech's HHMI-supported undergraduate program, calls presenting at scientific meetings "one of the most meaningful parts of an undergraduate's research experience. Participating in these meetings makes them realize that they are active participants in the creation of knowledge, rather than passive recipients of delivered facts."

Such presentations also help students clarify their thoughts about research, notes Washington University in St. Louis biology professor Sarah Elgin, director of a similar program there. "They must understand and explain their research problem and experimental approach, and report on the outcomes," she says.

Scheduling trips to scientific conferences can pose problems for undergraduates, but they aren't insurmountable. Elgin recalls a student who would have to miss a mid-term exam in one of her classes in order to present his research at a national meeting. Instead, she faxed the exam to the student's mentor, who served as proctor while the student took the exam during the meeting, hundreds of miles from St.

Continued on Page 22

ASBMB Undergraduate Travel Awards

Funds are available to assist undergraduate students participating in the ASBMB Undergraduate Poster Competition during the EB2003 Meeting, April 11-15, 2003, in San Diego. For information contact:

ASBMB, 9650 Rockville Pike, Bethesda, MD 20814-3996

Ph: 301-634-7145; Fx: 301-634-7126; email: kgull@asbmb.faseb.org

The HighWire Press Portal: Search and Track your Favorite Journals Easily

In the February issue, *ASBMB News* introduced the new “portal” site from Stanford’s HighWire Press: the HighWire Library of the Sciences and Medicine (<http://highwire.stanford.edu>). In March we began a series of short articles highlighting tools or features of this new site for researchers’ sore eyes, starting with the ability to quickly see which articles are freely available to you. This month we continue the series with a look at how you can have the system keep track of your favorite journals, including the *JBC*, *Molecular & Cellular Proteomics*, *Biochemistry and Molecular Biology Education*, and the *Journal of Lipid Research*.

The new HighWire portal allows you to instantly search abstracts from all 4,500 journals in Medline, plus the full-text of over 325 journals hosted by Stanford’s HighWire Press. For the full-text journals, a registered user (registration is free, and takes less than a minute) can tell the portal which of the HighWire-hosted titles are your “favorite journals”. Then, some special capabilities are available for those designated favorites.

The portal’s designers observed that labs typically monitor a few dozen journals, and that individuals in labs each take responsibility for knowing what is new and important in just a handful among those journals. So the system has features to help you take a narrow focus when you want to search several journals — but only your favorites — and to help you keep track of new content in these favorite journals.

Search Scope – You can click a button on any search form and instantly restrict the scope of a search to include only your favorite journals. Note the radio button labeled “My Favorite Journals” in the center column of the HighWire home page shown (Figure 1).

Search-result Highlighting – In any search result display – whether limited to favorite journals or not — the portal will highlight citations from your favorite journals by show-

ing the journal cover over a purple bar (see Figure 2, showing citations from a search on “Cell Proliferation and Cell Fate”, with the recent *JBC* article highlighted).

Monitor new Content — The HighWire home page identifies what the most current content is in each of your favorite journals, and lists your favorite journals in order by most recent content date. It also provides quick links to the newest content, the journal home page, the current-issue Table of Contents page, and the search page for each of your

Figure 1

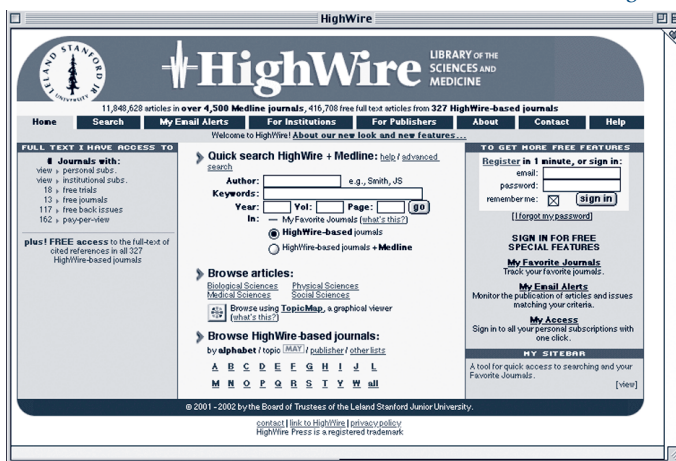
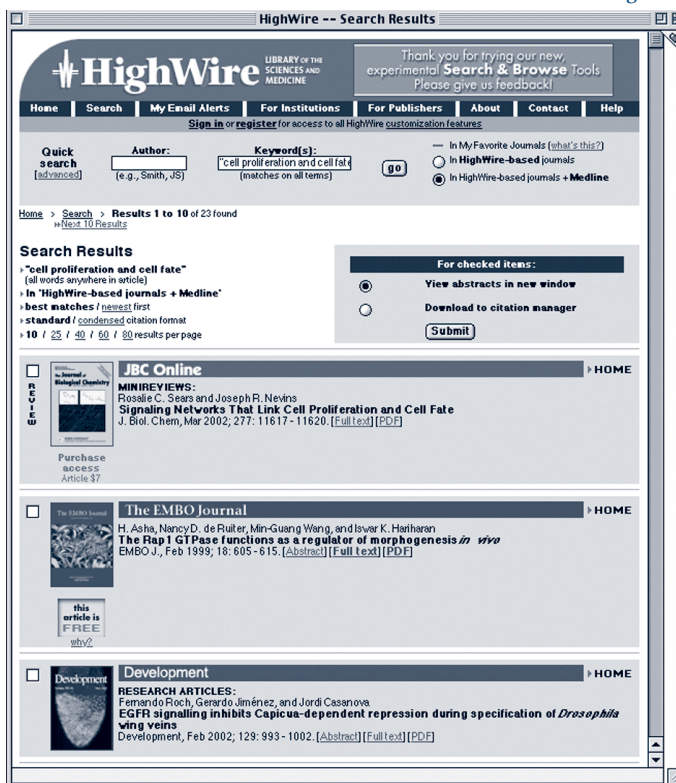


Figure 2



favorite journals. It also shows a tiny version of the new-issue cover for each journal. See the listing of My Favorite Journals in the right column of the HighWire home page shown. Later on, the portal will have a new alerting feature allowing you to restrict your Cite-Track alerts to include only your favorite journals.

Getting Started

To put these Favorite Journal features to work for you, you must tell the portal which journals are your favorites.

Step 1: If you haven't already, you will need to Register with the portal (this takes only a minute), by clicking on the Register link on the HighWire home page. If you have already registered, you will need to sign-in.

Step 2: After registering or signing in, first time users will see a "What is this?" link under the heading My Favorite Journals. Click on "What is this?" to be taken to a short summary of the My Favorite Journals feature, including the link "Create/Modify "My Favorite Journals' preferences".

Step 3: Click on the "Create/Modify

"My Favorite Journals' preferences" link and checkmark which journals are your favorites. After making your selections and clicking the submit button, you are returned to the portal home page, and the Favorite Journal features will be active, with a new [edit] link at the bottom of your selected journals. You can easily change your Favorite Journal list just by clicking on [edit].

Next month we'll look at how you can instantly retrieve an article—and often its full-text – just by typing its year, volume and first page citation information into the search form.

Here is the list of what we've covered in this series of short tips:

February: Introducing the "portal" at <http://highwire.stanford.edu>

March: Finding which articles are free is fast at the new portal.

April: Tailoring a search result: amend, sort, condense, investigate and download search results.

May: Keeping track of your favorite journals.

Coming next: Instant citation searches.

ASBMB Welcomes New Ph.D.'s

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

Sharon E. Campbell,
East Tennessee State University

Diego F. Gomez-Casati,
HB-INTECH

Vincent J.-P. Leveque, University
of Florida, Gainesville

Antonio Martinez-Ruiz,
Centro De Investigaciones
Biologicas – CSIC

Linda Petko,
Florida State University

Samuel J. Rulli, Tulane University

Tanya Q. Shang,
University of Washington

Undergraduate Research . . .

Continued from Page 20

Louis. The mentor returned it to Elgin by fax in time for grading with the rest of the class. "The faculty share a strong commitment to undergraduate research, so we are happy to work with students to make meeting participation possible," Elgin explains.

At the University of Delaware, where a dozen more undergraduates present research at professional meetings each year, biochemistry professor and HHMI program director Hal White explains, "Our objective is to provide an undergraduate track to a research career." Delaware senior Mike Usher is speeding along that track. Presenting his research into the

biochemical mechanisms underlying targeted gene repair at the 2001 FASEB meeting, he won a Pfizer summer research fellowship. The meeting, he says, gave him a taste of the way scientists from different disciplines can nurture each other's work. "I look at things from a biochemical viewpoint, and there I was talking to a molecular biologist about bacterial genetics," he recalls.

"We both took home some new ideas." Usher wants to earn an M.D.-Ph.D. and do clinical research.

Remember Hargreaves at Asilomar? One of the scientists who visited her poster was HHMI investigator Jason G. Cyster of UCSF. He was looking for a re-

search assistant, and Hargreaves was looking for a job after she graduated in May 2000. "I was impressed by the enthusiasm Diana showed as she took me through her poster and by the good understanding she demonstrated of the work she had been doing," Cyster recalls. Hargreaves has worked with Cyster ever since. She was first author on a paper published in the *Journal of Experimental Medicine* in 2001, and she is now applying to graduate school.

This article by Jennifer Boeth Donovan appeared in the March 2002 issue of the HHMI Bulletin and is reprinted with permission from the Howard Hughes Medical Institute.

Career Opportunities

POST-DOCTORAL FELLOWSHIPS

Hemostasis and Thrombosis

M.D. and Ph.D. candidates are invited to apply for a position on a NIH Training Program dealing with the Dynamics and Proteomics of the Blood Coagulation/Fibrinolysis System. Applicants must be citizens, noncitizens or permanent residents of the US.

Additional information can be found on our web site (<http://biochem.uvm.edu>). Minority applicants and women are encouraged to apply. Send CV to: Dr. Kenneth Mann, Biochemistry Department, Given Bldg., Rm. C401, 89 Beaumont Avenue, University of Vermont College of Medicine, Burlington, VT 05405-0068. Email: kmann@zoo.uvm.edu.

University of Michigan Health System Postdoctoral Position

NIH funded Postdoctoral position at University of Michigan Medical Center is available NIH funded immediately to study the physiology of the enteric nervous system. Applicants should have a strong background in neurophysiology. Experience in electrophysiology, cell culture and molecular biology is required. Interested applicants should submit curriculum vitae to:

Michael, W. Mulholland, M.D., Ph.D., University of Michigan Health System, 1500 E. Medical Center Drive, 2920 Taubman Center, Ann Arbor, MI 48109-0331 USA, Fax: 734-936-5830.

The University of Michigan is a non-discriminatory Affirmative Action Employer and strongly encourages females and minorities to apply.

Faculty Position:

The Department of Anatomy, Physiology and Cell Biology, School of Veterinary Medicine, University of California, Davis is recruiting an **Assistant/Associate Professor of Veterinary Anatomy/Cell Biology**. DVM or equivalent preferred. PhD required with advanced training in vertebrate anatomy/physiology/cell biology/molecular biology or associated field, such as bioengineering, orthopedics or pathology. Responsibilities will include teaching in the DVM professional curriculum. Demonstrated research record with potential to develop an independent research program in the area of musculoskeletal biology and ability to secure extramural funding. Salary dependent on qualifications and experience. Submit letter of intent, a curriculum vitae and the names of 3 references to Charles G. Plopper, Chair, Department of Anatomy, Physiology and Cell Biology, School of Veterinary Medicine, University of California, Davis, CA 95616, Attn: Terry Davison. To receive fullest consideration, applications must be received by August 15, 2002; position open until filled. AA/EOE.

Postdoctoral Associate, The University of Iowa Health Care, Department of Internal Medicine, Pulmonary, Critical Care and Occupational Medicine Division.

Postdoctoral position available for training related to **Molecular and Cellular Biology** of the lung. Postdoctoral position also available for training in Translation Research related to the lung. Requires an M.D. or a Ph.D.

Those interested in applying should contact: Gary W. Hunninghake, M.D., University of Iowa College of Medicine, 200 Hawkins Drive, C33 G General Hospital, Iowa City, IA 52242, Phone: (319) 356-4187, Fax: (319) 353-6406. Women and minorities are encouraged to apply.

Molecular Targets for Dietary Intervention in Disease

September 19-22, 2002, Location: Scheman Continuing Education Building, Iowa State University, Ames, Iowa. Deadlines: Abstracts due July 19, 2002. Registration is August 19, 2002. Travel grants: Students may apply. Applications due July 19, 2002.

For more information, contact: Growth Factor and Signal Transduction Conferences, Symposium Office, Iowa State University, 3208 Molecular Biology Building, Ames, Iowa, 50011-3260. Tel: 515-294-7978, Fax: 515-294-2244, Email: gfst@iastate.edu. Or visit <http://molebio.iastate.edu/~gfst/phomepg.html>

Place your Career Ads in ASBMB Today

Recruitment advertising is available in *ASBMB Today* for \$12 per line, 10 line minimum. Copy is due by the first of the month prior to the issue month.

For advertising information call Valerie at FASEB AdNet, 800-43-FASEB ext. 7157 or 301-530-7157, Email adnet@faseb.org

Display space is also available for those desiring greater visibility. Please contact FASEB AdNet at 800-433-2732 ext. 7157 or 301-530-7157 or adnet@faseb.org for more information or to place your recruitment ad today.

Calendar of Scientific Meetings

MAY 2002

Proteomics: The Next Grand Biological Challenge

May 19-22 • Vanderbilt University
Contact: Division of Continual Medical Education
Ph: 615-322-4030; Fx: 615-322-4526;
Website: <http://medschool.mc.vanderbilt.edu/proteomics>

102nd American Society for Microbiology Meeting

May 19-23 • Salt Lake City, UT
Contact: American Society for Microbiology
<http://www.asm.org>; E-mail: meetingsinfo@asmusa.org
Tel.: 202-737-3600

The Next Step: Exploring the Proteome

May 21 • Bethesda, MD
Contact: National Institutes of Health
<http://proteome.nih.gov:8000>; Tel.: 301-594-6248
E-mail: StaR@EXTRA.NIDDK.NIH.gov

American Crystallographic Association in Conjunction with American Association for Crystal Growth

May 25-30 • San Antonio, Texas
Contact: Ph. 716-856-9060, ext 379; Fx. 716-852-4846;
Email: aca@hwi.buffalo.edu;
Website: <http://www.hwi.buffalo.edu/aca/>

JUNE 2002

50th Annual American Society for Mass Spectrometry

June 2-6 • Orlando, FL
Conference on Mass Spectrometry and Allied Topics
Contact: The American Society for Mass Spectrometry
<http://www.asms.org>; E-mail: office@asms.org; Tel.: 505-989-4517

HPLC 2002: 26th International Symposium on High Performance Liquid Phase Separations and Related Techniques

June 2-7 • Montreal, Quebec, Canada
Contact: HPLC Secretariat; E-mail: hplc2002@ums.lan.mcgill.ca
<http://www.medcor.mcgill.ca/hplc2002>; Tel.: 514-398-3770

Beyond Genome: In Silico Biology—Bioinformatics and Genome Research Proteomics

June 2-7 • San Diego, CA
Contact: Cambridge Health Institute; <http://www.healthtech.com>
E-mail: chi@healthtech.com; Tel.: 617-630-1300

45th Annual Canadian Federation of Biological Societies Meeting Themes: Neurological Development; Physical Activity, Nutrition and Chronic Disease

June 12-15 • Palais des Congres, Montreal, Canada
Contact: wantonious@cfbs.org; Website: <http://www.cfbs.org>

Proteomes: Structures, Changes, Interactions, and Function

June 20-23 • Iowa State University, Ames Iowa
Contact: Plant Sciences Symposium Office;
Ph. 515-294-7978; Fx. 515-294-2244; email: bmb@iastate.edu
Website: <http://molebio.iastate.edu>

AAPS National Biotechnology Conference

June 24-26 • San Diego, California
Contact: AAPS Meetings; Fax: 703-243-9532
Email: Meetings@aaps.org

International Conference: Genomics, Proteomics and Bioinformatics for Medicine

June 22-29 • Moscow, St. Petersburg, Russia
Contact: Professor A. I. Archakov; E-mail: gpbm2002@ibmh.msk.su
<http://www.ibmh.msk.su/gpbm2002/>; Tel.: 7-095-246-6980

AAPS National Biotechnology Conference

June 24-26 • San Diego, CA
Contact: American Association of Pharmaceutical Scientists
<http://www.aaps.org/meetings/biotech/index.asp>
E-mail: aaps@aapspharmaceutical.com/biotechnology
Tel.: 703-243-2800

Trends in Sample Preparation 2002

June 30-July 4 • Seggau-Castle, Austria
Contact: Institute for Analytical Chemistry
<http://www.analytchem.tugraz.at/acmr/en/events/home.html>
E-mail: trisp@analytchem.tu-graz.at; Tel.: 43-316873-8301

JULY 2002

European Cells and Materials: ECM III Cartilage & Joint Repair Tutorials, Basic Research, and Clinical Methods

July 1-3, 2002 • Congress Centre, Davos, Switzerland
<http://www.aofoundation.org/events/ao/ecm/organiser.shtml>

AUGUST 2002

Tissue Remodeling

August 1-4 • Iowa State University, Ames, Iowa
Contact: Growth Factor and Signal Transduction Conferences
Ph. 515-294-7978; Fx. 515-294-2244; Email: gfst@iastate.edu
Website: <http://molebio.iastate.edu>

American Society of Cell Biology: Nontraditional Functions of Ubiquitin and Ubiquitin-like Proteins

August 11-14 • Colorado Springs, Colorado
Contact: Delia Zielinski, ASCB; Ph: 301-347-9300
Fx: 301-347-9310; Email: dzielinski@ascb.org

SEPTEMBER 2002

5th Siena Meeting "From Genome to Proteome: Functional Proteomics"

September 2-5 • Siena, Italy

Contact: Denis Hochstrasser; E-mail: pallini@mailsrv.unisi.it
<http://www.unisi.it/eventi/proteome>

Computational Biophysics: Integrating Theoretical Physics and Biology

September 7-12 • San Feliu de Guixols, Spain

Contact: Dr. J. Hendekovic, European Science Foundation
Ph. +33 388 76 71 35; Fx. +33 388 36 69 87,
Email: euresco@esf.org

14th Meeting Methods of Protein Structure Analysis

September 8-12 • Valencia, Spain

Contact: Juan J. Calvete; <http://www.mpsa2002.ibv.csic.es/>
E-mail: mpsa2002@ibv.csic.es

Molecular Targets for Dietary Intervention in Disease

September 19-22 • Iowa State University, Ames, Iowa

Contact: Growth Factor and Signal Transduction Conferences
Ph: 515-294-7978; Fx: 515-294-2244; email: gfst@iastate.edu;
Website: <http://molebio.iastate.edu>

7th International Symposium on Dendritic Cells

September 19-24 • Bamberg, Germany

Contact: Prof. Dr. Alexander Steinkasserer
Ph: ++49-9131-853-6725; Fx: ++49-9131-853-5799;
e-mail: steinkasserer@derma.imed.uni-erlangen.de
Website: <http://www.dc2002.de/>

OCTOBER 2002

European Conference on Computational Biology 2002 in conjunction with the German Conference on Bioinformatics 2002

October 6-9 • Saarbruecken, Germany

Contact: <http://www.eccb2002.de>
E-mail: eccb.organizers@bioinf.uni-sb.de

Metabolic Engineering IV: Applied System Biology

October 6-11 • Il Ciocco, Castelvechio Pascoli Tuscany, Italy

Contact: United Engineering Foundation; Ph: 212-591-7836
Fax: 212-591-7441; Email: engfnd@aol.com
Website: <http://www.engfnd.org>
Registration: <http://www.engfnd.org/2ay.html>

9th Midwest Platelet and Vascular Biology Conference

October 11-13 • Washington University School of Medicine,
St. Louis, MO

Abstract and registration due August 15, 2002
Website: <http://www.biochem.wustl.edu/mwpc9/index.html>

Federation of Analytical Chemistry and Spectroscopy Societies

October 13-17 • Providence, Rhode Island

Contact: FACSS National Office; <http://www.facss.org>

The Applications of Proteomics

October 16-18 • Lille-Villeneuve d'Ascq, France

Contact: French Society for Electrophoresis and Proteomic
Analysis; Tel.: 33-3-20-43-40-97; <http://www.sfe-ices.org/>
E-mail: hubert.hondermarck@univ-lille1.fr

18th Asilomar Conference on Mass Spectrometry

October 18-22 • Asilomar, Pacific Grove, CA

Contact: American Society for Mass Spectrometry
<http://www.asms.org>; E-mail: office@asms.org; Tel.: 505-989-4517

Fourth HUGO Pacific Meeting and Fifth Asia-Pacific Conference on Human Genetics

October 27-30 • Pattaya, Chonburl, Thailand

Contact: Tel.: 66-2-8892557-8; <http://www.mu-st.net/hugothai/>

NOVEMBER 2002

AAPS Annual Meeting and Exposition

November 10-14 • Toronto, Ontario, Canada

Contact: AAPS Meetings; Fax: 703-243-9532 Email: Meetings@aaps.org

First Human Proteome Organizational (HUPO) Congress

November 21-24 • Versailles, France

Contact: <http://www.hupo.org>

DECEMBER 2002

13th International Conference on Genome Informatics

December 16-18 • Tokyo, Japan

Contact: <http://giw.ims.u-tokyo.ac.jp/giw2002/>
E-mail: giw@ims.u-tokyo.ac.jp

MARCH 2003

Keystone Symposium, Proteomics: Technologies and Applications

March 25-30 • Keystone Resort, Keystone, Colorado

Contact: Paul Lugauer; <http://www.keystonesymposia.org>
E-mail: info@keystone.symposia.org; Tel.: 970-262-1230 ext. 111

APRIL 2003

American Society for Biochemistry and Molecular Biology Annual Meeting in Conjunction with EB2003

April 11-15 • San Diego, California

Contact: EB2003 Office; Ph: 301-530-7010
Fx: 301-530-7014; Email: eb@faseb.org
Website: <http://www.faseb.org/meetings/eb2003>



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Molecular and Cellular Proteomics (ISSN 1535-9476) and MCP On-Line are published monthly by The American Society for Biochemistry and Molecular Biology, Inc., 9650 Rockville Pike, Bethesda, MD 20814, USA.

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