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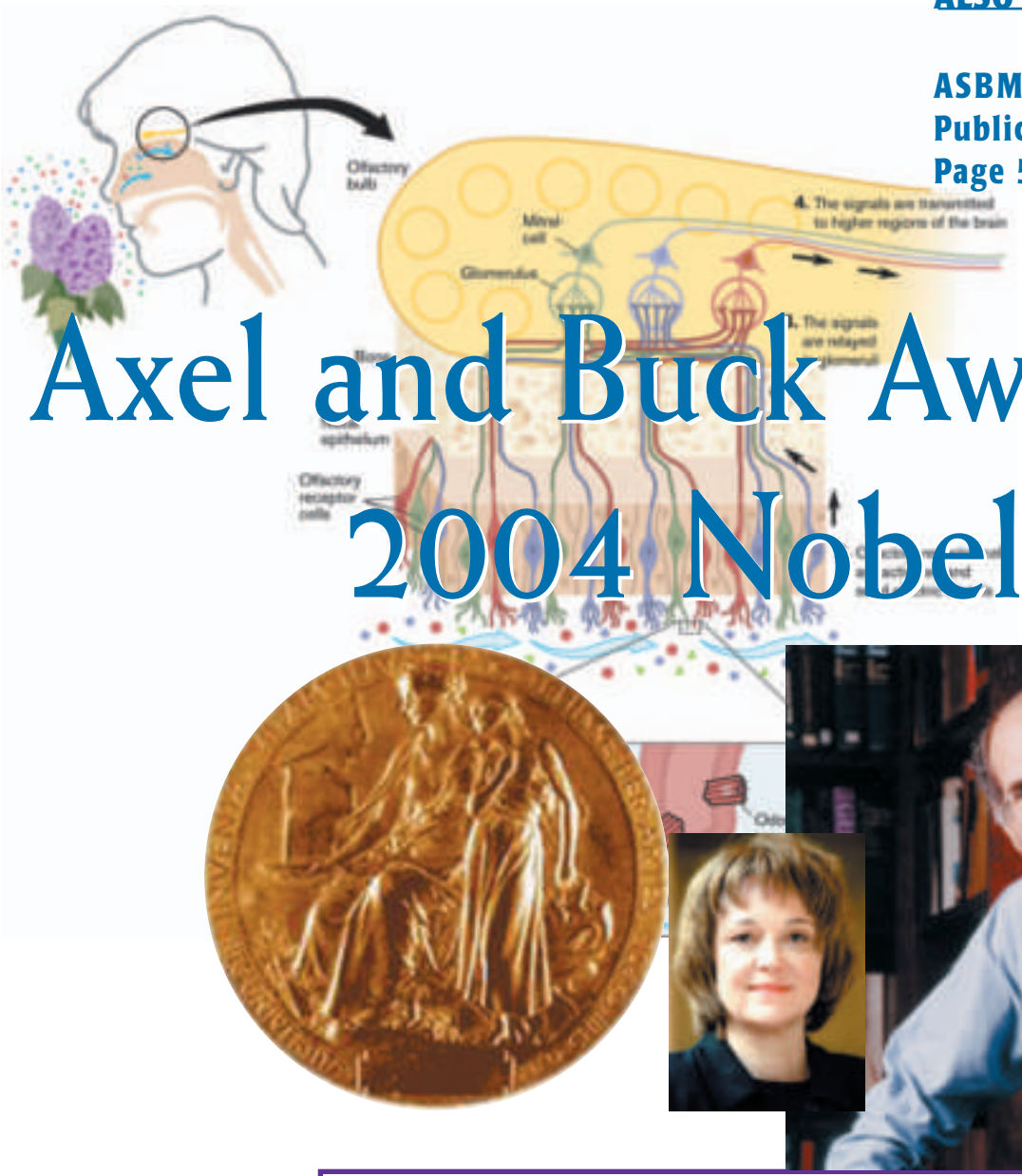
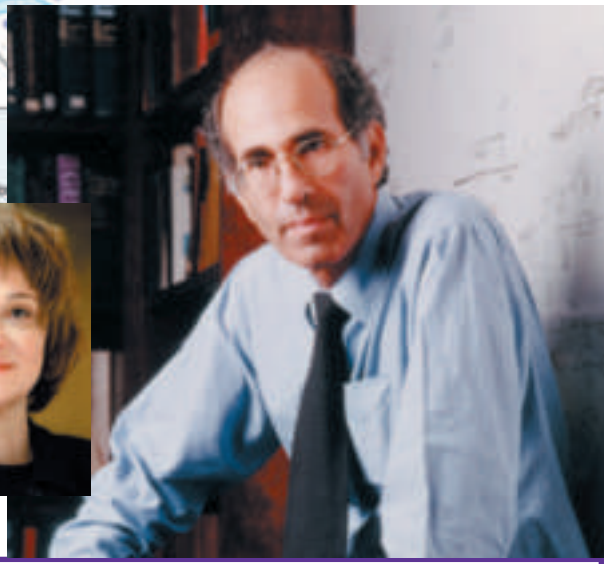
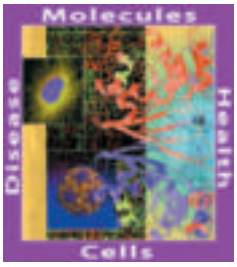


Axel and Buck Awarded 2004 Nobel Prize





SAN DIEGO 2005:

Call for Late-Breaking Abstracts

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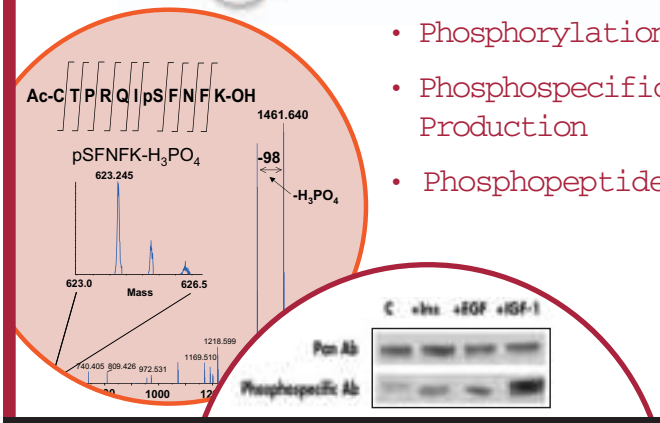

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ASBMB Today

AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY

NOVEMBER 2004,
Volume 3, Issue 8

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[The following letter, dated September 7, to ASBMB President Judith Bond, is in response to the Society's support of an American Association for the Advancement of Science (AAAS) paper, "Statement and Recommendations on Visa Problems Harming America's Scientific, Economic, and Security Interests." An article announcing ASBMB's support for the AAAS statement appeared on page 6 in the June issue of *ASBMB Today*.]

Dear Ms. Bond:

In May 2004 you joined with several of your colleagues in the American scientific, academic and engineering communities to express your concerns about post-September 11 border security requirements and the perceived impact they were having on these communities. We in the Bureau of Consular Affairs have been working with our colleagues in the Department of Homeland Security and other federal agencies to improve the processing of visa applications for students and researchers.

I will be the first to admit that new security procedures affecting students and scientists initially resulted in lengthy delays. Perhaps more importantly, a perception developed that it has become harder to study or conduct research in the United States. Misunderstandings about U.S. visa policies, coupled with inaccurate anecdotal information and factors unrelated to visa processing, fueled negative perceptions about study or research in the U.S., which may have actually discouraged students from applying to U.S. colleges and universities. I am keenly aware that scientific and academic exchanges underpin U.S. national security as surely as border protection against overt threats to the U.S., and we have worked relentlessly to ensure that the necessary security improvements to the visa process do not come at the cost of legitimate travelers. We have much success to report.

First, we have coordinated closely with the interagency community to ensure that special clearance procedures that impact the very small percentage of student visa applications that require them are processed as quickly as possible. Our efforts have had real results. As of September 2, 98 percent of all Visa Mantis cases are being cleared in less than 30 days. More than 2,000 ongoing cases were just cleared. Striving to enhance the transparency and predictability of the visa application process, we have recently begun posting visa appointment wait times on the internet at www.travel.state.gov. All of our embassies and consulates have been instructed to provide expedited visa

Improvement in Visa Processing

appointments to student visa applicants to ensure that eligible applicants can start their programs on time. Additionally, we continue to work closely with the Department of Homeland Security on issues related to the implementation of SEVIS and the Department of Homeland Security on issues related to the implementation of SEVIS and the SEVIS fee so that these programs can be as streamlined and as effective as possible.

Recent media reporting and our own visa statistics indicate that students, academics and scientists are returning to the U.S. in increasing numbers over last year. Overall, the number of nonimmigrant visa applications we receive is increasing, and we expect student visas to follow suit for the next academic year.

It is time to change the tenor of the dialogue on this issue and support the resurgence of students and scientists applying for—and receiving—their visas in a timely manner. I ask you to join with me in countering the lingering misperceptions regarding the visa application process and reinforcing our message that the United States continues to be a welcoming nation. I look forward to working with you to ensure that the United States remains the preeminent destination for students, academics and scientists.

Sincerely,
Maura Harty
Assistant Secretary of State
for Consular Affairs

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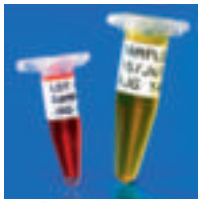

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ASBMB Comments on NIH Public Access Notice

In a September 22, 2004, letter to NIH Director Elias Zerhouni, ASBMB President Judith Bond signaled ASBMB's support for "the concept that scientific publications be made freely accessible to the public in a timely manner." Thus, ASBMB supports the recently proposed NIH policy of making NIH-funded research papers accessible to the public six months after publication.

Under the NIH proposal (announced in September in the NIH Guide to Grants and Contracts and the Federal Register), NIH requests "that its grantees and supported Principal Investigators provide the NIH with electronic copies of all final version manuscripts upon acceptance for publication if the research was supported in whole or in part by NIH funding." A "final manuscript" is defined as "the author's version resulting after all modifications due to the peer review process."

The NIH notice also states, "Six months after an NIH supported research study's publication—or sooner if the publisher agrees—the manuscript will be made available freely to the public through PubMed Central (PMC). If the publisher requests, the author's final version of the publication will be replaced in the PMC archive by the final publisher's copy with an appropriate link to the publisher's electronic database."

In ASBMB's letter to Dr. Zerhouni, Dr. Bond notes that while ASBMB supports the NIH's intent to provide public access to NIH-funded research manuscripts six months after publication, the NIH's proposal actually has little if any impact on ASBMB publications. "For ASBMB journals," she notes, "all manuscripts accepted for publication are freely available to the public online without delay." Manuscripts accepted for publication in JBC and other ASBMB journals, for example, appear in the Papers In Press (PIP) section of the JBC website within a day or two of acceptance. Thus, the ASBMB letter notes, "the NIH proposal will not enhance public access to ASBMB articles beyond that already in place."

ASBMB also notes its opposition to "the proposal that the final redacted publisher's version of papers be deposited in PubMed Central." While this was not strictly speaking a proposal in the NIH notice—the notice merely indicated that publishers could provide the final published version of the paper if they chose—Dr. Bond proposed instead that "the NIH link to the publisher's versions of the articles."

Linking was proposed for several reasons: to "avoid the existence of two official versions of the published documents, reducing files, and avoid government control of the scientific literature." Dr. Bond also noted the vast superiority of existing archives such as HighWire Press, which "offer advanced searching, enhanced functionality and many other reader services that are presently unavailable at PubMed Central and would require additional funding to provide." Finally, she noted that only about 40 percent of the Journal of Biological Chemistry's content was from NIH-supported investigators, so PubMed Central would house only a fraction of the biochemistry literature.

The ASBMB letter is on-line at the Society homepage (www.asbmb.org). Click on "public affairs", go to "policy statements," and scroll down to "electronic publishing." The statement is listed there.

The NIH notice on "Enhanced Public Access to NIH Research Information" appeared in the Federal Register on September 17 (69 FR 56074). Comments from the public are being accepted at "publicaccess@nih.gov" through November 16, 2004. ASBMB strongly urges all interested persons to comment on this important NIH notice.

ASBMB ANNUAL MEETING 2005

Call for Late-Breaking Abstracts

Deadline for Submission: Wednesday, February 9, 2005

Abstracts must be submitted electronically with payment of $90 and received on or before Wednesday, February 9, 2005.

Late-breaking abstracts will be accepted for special poster sessions to be scheduled on Tuesday, April 5, 2005.

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by Peter Farnham, CAE, ASBMB Public Affairs Officer

Senate Hearing on Stem Cell Controversy

On September 29, Senator Sam Brownback (R-KS) held a hearing in the Senate Subcommittee on Science, Technology and Space called "Embryonic Stem Cell Research: Exploring the Controversy." Although nothing new and revolutionary was revealed at the hearing, it was unusual for a Brownback-led hearing in that he invited human embryonic stem cell (hESC) proponents to testify, as well as opponents. Members attending in addition to Brownback included Ron Wyden (D-OR), John Ensign (R-NV) and Byron Dorgan (D-ND). It appeared to be a fairly partisan hearing, with Democrats generally in favor of hESC research, and Republicans opposed.

Ethics Addressed in First Panel

The first panel explored some of the ethical issues involved in the debate over whether to use hESC or not. It mainly focused on exploring the question of when life begins. Dr. Laurie Zoloth, Director of Bioethics at Northwestern University Center for Genetic Medicine, presented the pro-hESC perspective, while Richard Doerflinger, Deputy Director of the Secretariat for Pro-Life Activities at the U.S. Conference of Catholic Bishops, presented opposition to hESC research.

Zoloth maintained the view that an embryo, particularly one created by *in vitro* fertilization techniques and due to be discarded, was not the moral equivalent of a human being. She explained the religious, historical and philosophical framework and precedents for that perspective. She noted that nearly all Jews, most Muslims, and many Buddhists and Protestants believe it "morally imperative" to use human blastocysts to create stem cell lines if it can lead to saving lives or healing.

Doerflinger testified that an embryo already is recognized as a member of the human family in numerous areas of federal law. He said, "At every stage of development, the unborn child in the womb is protected by federal homicide laws as a separate victim when there is a violent attack upon his or her mother." He added that the same embryo is recognized in federal health regulations as a patient eligible for prenatal care. He also repeated his belief that life begins at the moment of fertilization, and any destruction of an embryo after that was equivalent to the taking of a human life. He also indicated his opposition to in vitro fertilization.

Senator Brownback insisted in his opening remarks that "when we say life begins at the earliest stage, biology is being discussed, not theology." He continued, "To assert that an embryo is not a human life is inaccurate . . . the issue of where human life begins is at the heart of what we're discussing" during the hearing.

Panel focuses on potential for cures, therapies

Dr. George Daley, Associate Professor of Pediatrics, Harvard School of Medicine, testified for hESC, on behalf of the American Society for Cell Biology. He focused on the current state

Continued on page 9

New Terms for Stem Cell Research

The International Society for Stem Cell Research (ISSCR) has recently approved several new terms for stem cell research. First, the ISSCR recommends use of the acronym "hESC" in place of any other acronyms that have been used to reference "human embryonic stem cells" derived from pre-implantation blastocysts produced by sperm-egg fertilization. ISSCR also recommends use of the term "nuclear transfer" to replace the term "therapeutic cloning." Cells created by nuclear transfer should be described as "NT stem cells," or "NTSC."

According to an ISSCR statement, "the inaccurate use in various public and scientific venues of various terms dealing with the production of stem cell lines by the transfer of body cell (somatic) nuclei into enucleated eggs of the same species, and the negative connotation of the commercial term 'therapeutic cloning,' make a change in terminology necessary. The aim of this terminology change is to provide accurate, standardized terminology that will facilitate frank scientific, ethical and public debate on stem cells and their potential for medicine."

ISSCR encourages its members and the scientific press to use these these terminologies in publications, presentations and communications.

The complete statement is available on the ISSCR website, at www.isscr.org

Congress Adjourns Without Completing Work; Lame Duck Session Planned

Congress abandoned all efforts to complete work on remaining funding bills in late September, instead shifting efforts to passing a continuing resolution (CR) before adjournment, scheduled for mid-October. The CR would fund the government at Fiscal Year 2004 levels through the upcoming election; it would be in effect until November 20. Congress plans to reconvene sometime in November to finish up the 12 remaining appropriations bills. So far, the only bill signed into law is the defense appropriations bill.

The two appropriations bills ASBMB is most concerned about—Labor/HHS and HUD/VA—are currently languishing in legislative limbo with no progress expected before Thanksgiving. Further, there is a good chance that they will be lumped into an omnibus appropriations bill, in which some or all of the remaining bills are combined into a gigantic funding vehicle. It would (in theory) be easier for Congress to pass one appropriations bill rather than twelve; however, such a course is fraught with danger, as a small group of recalcitrant lawmakers could hold up the whole bill over one or two small, relatively unimportant provisions.

House, Senate Differ on NIH Funding

Funding for the National Institutes of Health (NIH) is found in the Labor/HHS appropriations bill, and this year's version passed the House on September 9. The 2005 spending bill supported the President's request for NIH—$28.6 billion, about $700 million, or a 2.7 % increase, above 2004 levels. The Senate version passed the Appropriations Committee on September 15, and contains some additional funds for NIH. The Senate bill funds NIH at $28.9 billion, about $1.1 billion, a 4 % increase, over the fiscal year 2004 bill's total.

Rep. Ralph Regula (R-OH), chairman of the House Appropriations subcommittee, on September 21. In some good news for this chronically underfunded agency, the Senate bill raises the NSF budget by $167 million, matching the President's request. The Senate bill would fund NSF at $5.74 billion in fiscal year 2005. Although this amounts to only a 3 % increase, it stands in sharp contrast to the $111 million cut proposed in the House appropriations bill, which passed the House Appropriations Committee on July 22.

The Senate bill would fund NSF at $5.74 billion. Although this amounts to only a 3 % increase, it stands in sharp contrast to the $111 million cut proposed in the House.

NSF advocates, while pleased with the Senate action relative to what would have been in store if the House version had become law, are under no illusions about what the future holds. The House and Senate versions must be reconciled in conference, which means a "split the difference" figure resulting in an increase somewhere in the $50 million range is a real possibility. The Senate proposal is also far short of the total for FY 2005 recommended in the NSF authorization bill—$7.38 billion—which President Bush signed into law with great fanfare in December 2002. This bill would double the NSF budget over five years.

The committee report accompanying the Senate appropriations bill acknowledges the deviation from the NSF doubling plan: "The Committee continues to be supportive of…the pursuit of a doubling path for NSF funding. However, due to funding constraints, the Committee is not able to provide such funding at this time, but will continue to pursue these efforts in the future."

Lasker Award Goes to Elwood Jensen

The 2004 Lasker Award for Basic Medical Research has been presented to Elwood Jensen, Charles B. Huggins Distinguished Service Professor Emeritus in the Ben May Institute for Cancer Research at the University of Chicago. He shares the award with Dr. Pierre Chambon, Institute of Genetics and Molecular and Cellular Biology in Strasbourg, France, and Dr. Ronald M. Evans, Salk Institute for Biological Studies and the Howard Hughes Medical Institute.

They were selected for their discovery of the "superfamily of nuclear hormone receptors and the elucidation of a unifying mechanism that regulates embryonic development and diverse metabolic pathways." The implications of this research for understanding human disease and accelerating drug discovery "have been profound and hold much promise for the future," notes the announcement from the Lasker Foundation. This awards were presented at a luncheon ceremony, October 1, in New York City.

Dr. Jensen is being honored for his pioneering research on how steroid hormones, such as estrogen, exert their influence. His discoveries explained how these hormones work, which led to the development of drugs that can enhance or inhibit the process.

In the 1950s, biochemists thought a hormone entered a cell, where a series of oxidation and reduction reactions with estrogen provided needed energy for the growth stimulation and other specific actions shown by estrogens.

From the late 1950s to the 1970s Dr. Jensen entirely overturned that notion. Working with estrogen, he proved that hormones do not undergo chemical change. Instead, they bind to a receptor protein within the cell. This hormone-receptor complex then travels to the cell nucleus, where it regulates gene expression. At the time, this idea was heresy. When he first presented preliminary data at a 1958 meeting in Vienna, only five people attended, three of whom were the other speakers. In the next 20 years though, he convinced his colleagues by publishing a series of major and highly original discoveries in four related areas of hormone research.

Dr. Jensen is being honored for his pioneering research on how steroid hormones, such as estrogen, exert their influence. His discoveries led to the development of drugs that can enhance or inhibit the process.

Dr. Jensen discovered the estrogen receptor, the first receptor found for any hormone. In 1958, using a radioactive marker, he showed that only the tissues that respond to estrogen, such as those of the female reproductive tract, were able to concentrate injected estrogen from the blood. This specific uptake suggested that these cells must contain binding proteins, which he called "estrogen receptors."

Dr. Elwood Jensen

In 1967, he and Dr. Jack Gorski of the University of Wisconsin showed that these putative receptors were macromolecules that could be extracted from these tissues. With this method, Dr. Jensen showed that when estrogen bound to this receptor, the compound then migrated to the nucleus where it bound avidly and activated specific genes, stimulating new RNA synthesis. He subsequently devised a reliable test for the presence of estrogen receptors in breast cancer cells,and showed that women with receptor-rich breast cancers often have remissions following removal of the sources of estrogen, but cancers that contain few or no estrogen receptors do not respond to estrogen-blocking therapy.

By 1977, Dr. Jensen and Dr. Geoffrey Greene, also in the University of Chicago's Ben May Institute, had developed monoclonal antibodies directed against estrogen receptors, which enabled them to quickly and accurately detect and count estrogen receptors in breast and other tumors. This test became a standard part of care for breast cancer patients and as the Lasker Foundation noted, "transformed the treatment of breast cancer patients and saves or prolongs more than a 100,000 lives annually."

"Jensen's revolutionary discovery of estrogen receptors is beyond doubt one of the major achievements in biochemical endocrinology of our time," recalled Gene DeSombre, Professor Emeritus at the University of

Chicago, who worked with Dr. Jensen in the Ben May Institute as a postdoctoral fellow and then as a colleague. "His work is hallmarked by great technical ingenuity and conceptual novelty. His promulgation of simple yet profound ideas concerning the role of receptors in estrogen action have been of the greatest importance for research on the basic and clinical physiology not only of estrogens but also of all other categories of steroid hormones."

By the early 1970s, Dr. Jensen was searching for chemical, rather than surgical, ways to shield estrogen-dependent tumors from circulating hormones. He and Dr. Craig Jordan (then at Massachusetts' Worcester Foundation for Experimental Biology) found that women with cancers containing large amounts of estrogen receptor are likely to benefit from tamoxifen, which blocks some of the effects of estrogen. Patients with few or no receptors could immediately move on to chemotherapy rather than waiting months to find out that the tumors were growing despite tamoxifen treatment. Other researchers subsequently found that the receptors for the other major steroid hormones, such as testosterone, progesterone, and cortisone, worked essentially the same way.

In 1986, Dr. Pierre Chambon and Dr. Ronald Evans separately but simultaneously discovered that the steroid hormone receptors were merely the tip of the iceberg of a large family of structurally related nuclear receptors with 48 members. They unearthed a number of these receptors, which revealed new regulatory systems that control the body's response to essential nutrients (such as Vitamin A), fat-soluble signaling molecules (such as fatty acids and bile acids), and drugs (such as the glitazones used to treat Type 2 diabetes and retinoic acid for certain forms of acute leukemia).

These three individuals "created the field of nuclear hormone receptor research, which now occupies a large area of biological and medical investigation," said Dr. Joseph L. Goldstein, Chair of the international jury of researchers that selects recipients of the Lasker Awards, and a recipent of both the Lasker Award for Basic Medical Research and the Nobel Prize in Medicine in 1985.

They revealed the "unexpected and unifying mechanism by which many signaling molecules regulate a plethora of key physiological pathways that operate from embryonic development through adulthood. They discovered a family of proteins that allows chemicals as diverse as steroid hormones, Vitamin A, and thyroid hormone to perform in the body."

The Lasker Awards are the nation's most distinguished honor for outstanding contributions to basic and clinical medical research. Often called "America's Nobels," the Lasker Award has been awarded to 68 scientists who subsequently went on to receive the Nobel Prize, including 15 in the last 10 years. Lasker Award recipients receive an honorarium, a citation highlighting their achievements, and an inscribed statuette of the Winged Victory of Samothrace representing humanity's victory over disability, disease, and death.

Stem Cell Controversy
continued ...

Continued from page 6

of the science and the need for more stem cell lines, and disputed the claim that adult stem cells had equivalent potential to hESC.

Dr. Marc Hedrick of Macropore Biosurgery testified on his company's progress with adult stem cells derived from adipose tissue. In a similar vein, Dr. David Prentice of the Family Research Council argued for adult stem cell research and against hESC research.

The general tone set by Chairman Brownback was the great promise of adult stem cells (in his view), and how they are already producing therapies. This view was supported by Prentice and Hedrick. Clinical studies were cited in which patients suffering from heart disease were treated with bone marrow stem cells and showed improvement.

Dr. Daley maintained that there was no evidence in those studies that adult stem cells were showing plasticity (i.e. becoming new heart muscle), but rather seemed to be producing growth factors or other proteins that were restoring heart function.

The question posed most often was, if hESC were so promising, why weren't there any clinical trials involving this, the way there were for adult stem cells? Dr. Daley responded that adult stem cells had been studied for a half century or more, while hESC had been studied only since 1998.

Carrie Golash of FASEB's Office of Public Affairs contributed to this article.

Pharmacological Chaperones Show

By Nicole Kresge, Science Writer

Diseases, such as hypogonadotropic hypogonadism (HH), cystic fibrosis, and retinitis pigmentosa, are caused by misfolding mutations resulting in proteins being misrouted. Previous efforts at finding treatments for these diseases have focused on gene therapy. Now, an alternative therapy is emerging with the discovery that certain small molecules can restore correct routing—and therefore function—to mutant receptor proteins.

Scientists have found that small pharmacological chaperones (or "pharmacoperones") that stabilize the mutant proteins enable them to be routed correctly. These pharmacoperones reshape misfolded proteins, allowing them to pass the quality control apparatus of the cell and undergo proper routing. The molecules are then able to function indistinguishably from wild type molecules. The efficacy of this approach is changing the scientists think about the effect of mutations and suggests that mutants are frequently misrouted, but otherwise potentially functional proteins.

"This has profound implications for therapeutic approaches since correction of protein routing has proven to be much less challenging than replacement of a defective gene with a perfect one using gene therapy," says P. Michael Conn,* Associate Director of the Oregon National Primate Research Center.

The therapeutic potential of pharmacoperones has been demonstrated by Dr. Conn and his colleagues. The researchers showed that all but three of 18 naturally occurring mutations causing HH in humans, as well as other "designer" mutants with truncations and deletions, can be rescued in vitro by the pharmacoperone IN3, despite the fact that the mutations are widely scattered throughout the receptor protein.

HH is characterized by delayed sexual development and abnormally low levels of sex steroids and gonadotropic hormones. The disorder is caused by misfolding mutations in the gonadotropin-releasing (GnRH) receptor. Although the misfolded proteins

Promise for Disease Treatment

are not irreversibly damaged by the mutation, they are retained in the endoplasmic reticulum. This retention prevents the receptors from reaching the plasma membrane where they normally bind GnRH and activate a signaling pathway leading to gonadotropin transcription.

"As part of normal routing to the plasma membrane from the endoplasmic reticulum, many proteins, notably G- protein coupled receptors, such as the GnRH receptor, appear to oligomerize. It turns out that mutants can oligomerize with wild type molecules, causing wild type molecules to misroute, as well; this is the basis of a dominant negative effect. In vivo this means that the mutant can have a disproportionately large effect—one that may be rescued by pharmacoperones," notes Dr. Conn. This discovery was recently published by Dr. Conn and his colleagues in the July 2004 issue of *Molecular Endocrinology*.

IN3 was originally designed by Merck as an orally active, nonpeptide receptor antagonist for the GnRH receptor. "IN3 and other pharmacoperones are small hydrophobic molecules that enter cells and act as molecular scaffolding—causing otherwise misfolded protein mutants to fold correctly and route correctly," explains Dr. Conn. "Once the correctly folded mutant arrives at the membrane, it is stabilized by hydrophobic interactions with the membrane and the drug can be removed, leaving a fully competent receptor with characteristics of the wild type receptor." In addition to IN3, an indole structure, Dr. Conn's lab has successfully used other chemical classes of pharmacoperones—quinolones and erythromycin macrolides from TAP and Abbott Laboratories, respectively—showing that mutants which rescue well with one chemical class, also rescue with another.

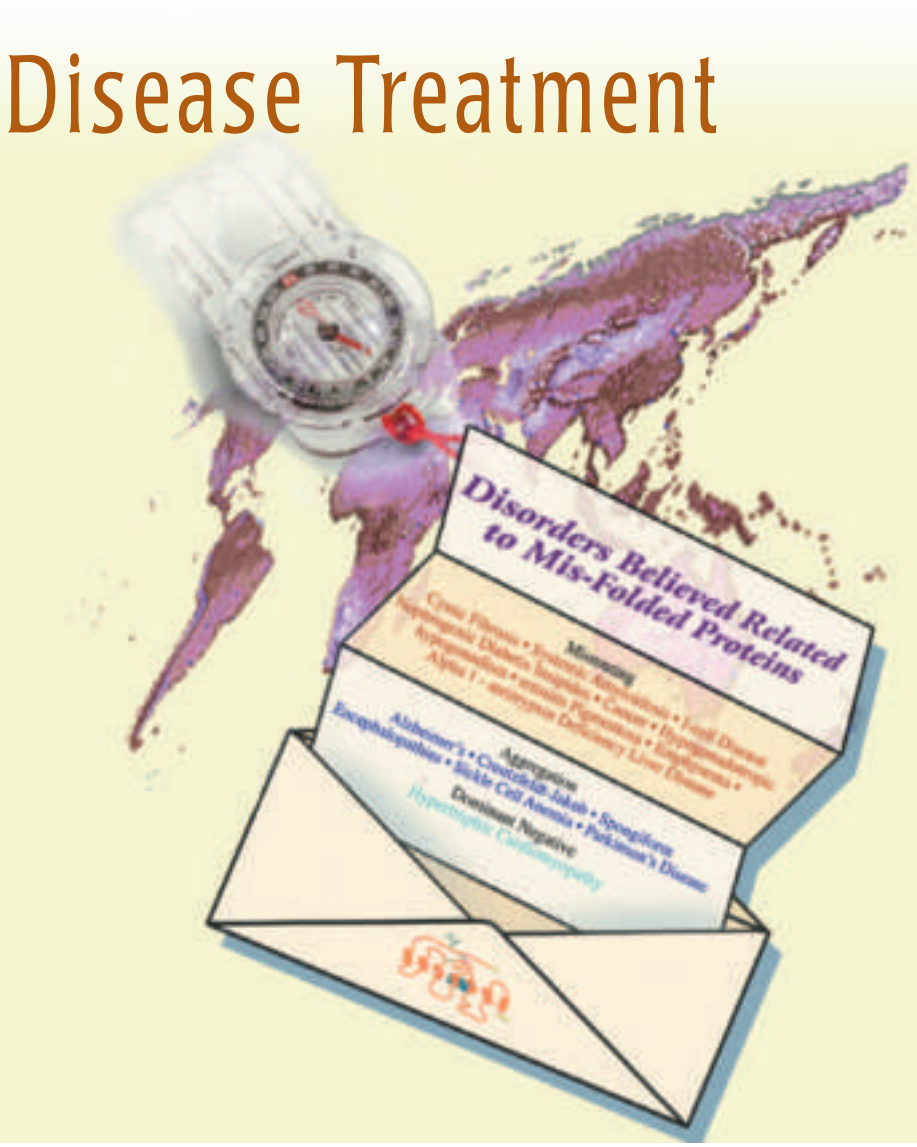


Image by Joel Ito and P. Michael Conn.

Mutants of the gonadotropin releasing hormone (GnRH) receptor (shown on envelope) are frequently mis-routed, but otherwise functional, proteins that can be rescued by pharmacological chaperones—small molecules that cause them to fold correctly, then route to the correct cellular compartment. The observation that many human and animal diseases are caused by misfolded proteins is drawing attention to the efficacy of this approach as a therapeutic venue.

The success seen in these experiments suggests that this technique could potentially be used to treat HH and other diseases resulting from misfolded, yet otherwise competent receptor proteins. In addition, pharmacoperones could be used to prevent the accumulation and aggregation of proteins in neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, and prion diseases.

Small molecule protein ligands may also someday be used to cause proteins to undergo misfolding and removal. Dr. Conn explains, "Imagine that a kinase that causes cancer or a receptor required for fertility could, instead of being routed correctly, be 'shipwrecked' by a molecule that would cause it to become misfolded and targeted for destruction. The means of removing such proteins will likely present further opportunities for therapeutic intervention."

*ASBMB Member

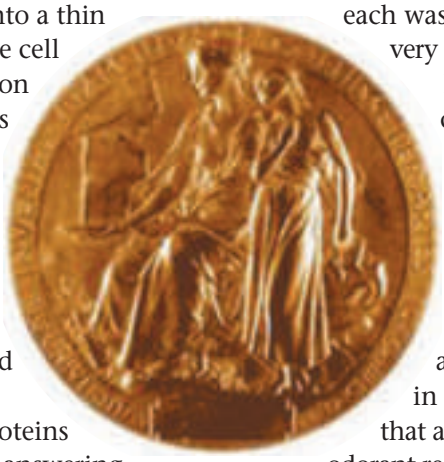
Axel, Buck Awarded 2004 Nobel

The Nobel Assembly at the Karolinska Institute announced last month that the 2004 Nobel Prize in Physiology or Medicine was awarded to Richard Axel, an HHMI Investigator at Columbia University College of Physicians and Surgeons, and Linda Buck, an HHMI Investigator at the Fred Hutchinson Cancer Research Center. The scientists were honored for discoveries that clarify how the olfactory system works.

Dr. Axel and Dr. Buck discovered a large gene family, comprised of some 1,000 different genes (three per cent of human genes) that give rise to an equivalent number of olfactory receptor types. These receptors are located on the olfactory receptor cells, which occupy a small area in the upper part of the nasal epithelium and detect the inhaled odorant molecules.

In 1991, Dr. Axel and Dr. Buck, then a postdoctoral fellow in the Axel lab, discovered a family of genes that encode the odorant receptors of the olfactory epithelium, a patch of cells on the wall of the nasal cavity. The olfactory epithelium contains some 5 million olfactory neurons that send messages directly to the olfactory bulb of the brain. When an odor excites a neuron, the signal travels along the nerve cell's axon and is transferred to the neurons in the olfactory bulb. This structure, located in the very front of the brain, is the clearinghouse for the sense of smell. From the olfactory bulb, odor signals are relayed to both the brain's higher cortex, which handles conscious thought processes, and to the limbic system, which generates emotional feelings.

Each olfactory neuron in the epithelium is topped by at least 10 hair-like cilia that protrude into a thin bath of mucus at the cell surface. Somewhere on these cilia, scientists were convinced, there must be receptor proteins that recognize and bind odorant molecules, thereby stimulating the cell to send signals to the brain.



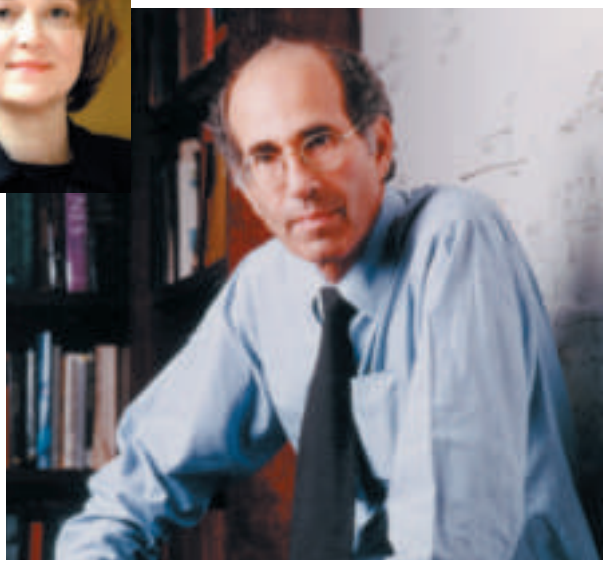
The receptor proteins would be the key to answering two basic questions about olfaction, explained Dr. Axel. First, how does the system respond to the thousands of molecules of different shapes and sizes that we call odorants, "does it use a restricted number of promiscuous receptors, or a large number of relatively specific receptors?" And second, how does the brain make use of these responses to discriminate between odors?

The string of discoveries that totally changed the study of olfaction resulted from a new emphasis on genetics. Instead of hunting for the receptor proteins directly, the two looked for genes that contained instructions for proteins found only in the olfactory epithelium.

Their efforts produced nothing at first. "Now we know why our initial schemes failed," said Dr. Axel. "It's because there are a large number of odorant receptors, and each was expressed only at a very low level."

Finally, Dr. Buck came up with what Dr. Axel calls "an extremely clever twist." She made three assumptions that drastically narrowed the field, allowing her to zero in on a group of genes that appear to code for the odorant receptor proteins.

Her first assumption—based on bits of evidence from various labs—was that the odorant receptors look a lot like rhodopsin, the receptor protein in rod cells of the eye. Rhodopsin and at least 40 other receptor proteins criss-cross the cell surface seven times, which gives them a characteristic, snake-like shape. They also function in similar ways, by interacting with G proteins to transmit signals to the cell's interior. Since many receptors of this type share certain DNA



Dr. Richard Axel (below) and Dr. Linda Buck (left)

Prize in Physiology or Medicine

sequences, she designed probes that would recognize these sequences in a pool of rat DNA.

Next, she assumed that the odorant receptors are members of a large family of related proteins. So she looked for groups of genes that had certain similarities. Third, the genes had to be expressed only in a rat's olfactory epithelium.

"Had we employed only one of these criteria, we would have had to sort through thousands more genes," said Dr. Axel. "This saved several years of drudgery."

Dr. Buck recalls that "I had tried so many things and had been working so hard for years, with nothing to show for it. So when I finally found the genes in 1991, I couldn't believe it! None of them had ever been seen before. They were all different but all related to each other. That was very satisfying."

"I had tried so many things and had been working so hard for years, with nothing to show for it. So when I finally found the genes in 1991, I couldn't believe it! None of them had ever been seen before. They were all different but all related to each other. That was very satisfying."

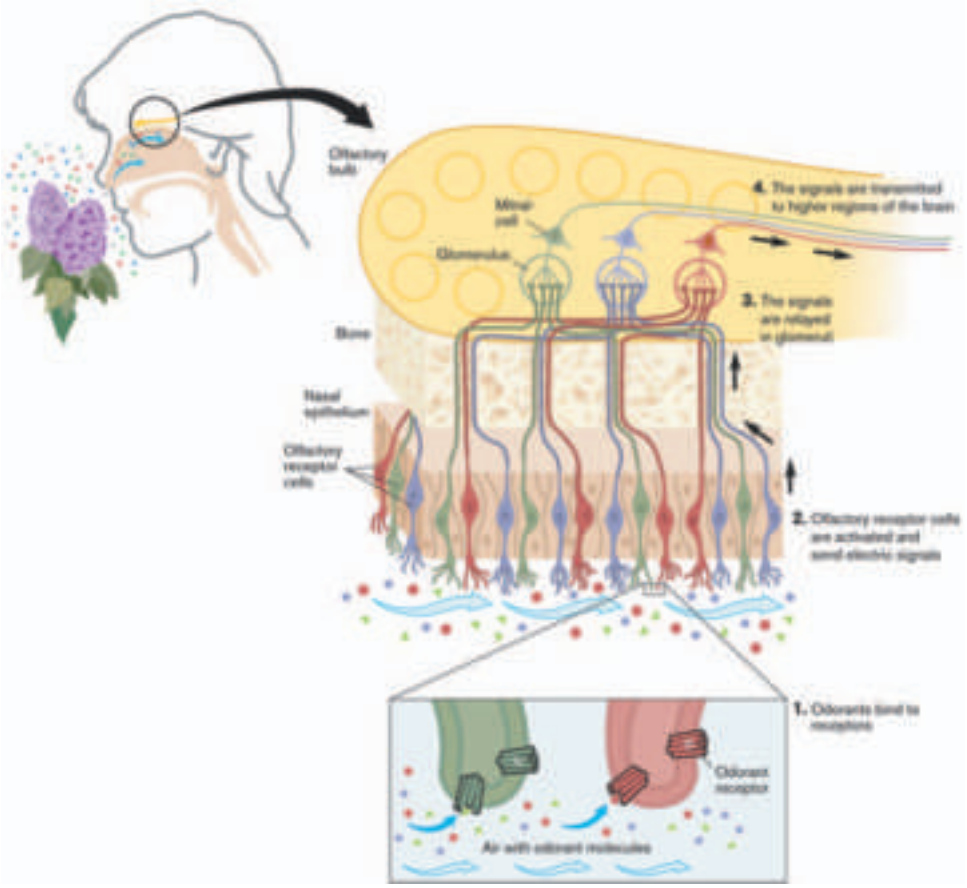
—Linda Buck

The discovery made it possible to study the sense of smell with the techniques of modern molecular and cell biology and to explore how the brain discriminates among odors.

It also allowed researchers to "pull out" the genes for similar receptor proteins in other species by searching through libraries of DNA from these species. Odorant receptors of humans, mice, catfish, dogs, and salamanders have been identified in this way.

The team's most surprising finding was that there are so many olfactory receptors. The 100 different genes the researchers identified first were just the tip of the iceberg. It now appears that there are between 500 and 1,000 separate receptor proteins on rat and mouse—and probably human—olfactory neurons.

Dr. Buck and Dr. Axel, an ASBMB member, also were co-recipients in 2003 of the third annual Perl-University of North Carolina Neuroscience Prize. Dr. Buck is a member of the Basic Sciences Division at the Fred Hutchinson Cancer Research Center in Seattle and Affiliate Professor at the University of Washington. Dr. Axel is University Professor of Biochemistry and Molecular Biophysics at Columbia University.



Odorant receptors and the organization of the olfactory system.

San Diego 2005

Coordinate Regulation of Transcription

Organizer : Cécile Rochette-Egly, Director of Research, IGBMC, Strasbourg, France

The correct regulation of gene expression is a vitally important process. Controlling which genes are turned on and when is essential for normal growth and development. Thus, cells have evolved elaborate mechanisms to ensure that genes are transcribed only when appropriate signals make their way to the nucleus. An elaborate and carefully orchestrated series of interactions and dissociations between transcriptional regulators ensures formation of appropriate chromatin structure and correct recruitment of the transcriptional machinery at the promoter. In addition, the dynamics of such interactions are fine tuned by a wide variety of post-translational modifications such as phosphorylation, acetylation, methylation and ubiquitination so that the correct proteins are present with the right activity, at the right place, and at the right time.

Equally important as transcription initiation is mRNA elongation and maturation. Indeed, it has become evident that mRNA processing occurs cotranscriptionally and also involves coordinated series of post-translational modifications that control the association and dissociation of protein complexes.

Dynamic and coordinated recruitment of activators and coregulators to gene promoters

A concept that has developed over the last several years is that transcriptional regulation of eukaryotic genes is a dynamic multistep process that involves the ordered assembly of multiprotein complexes of the basal transcription machinery and of multiple co-regulators on gene regulatory regions, concomitant with an alteration in local chromatin structure. In this session, Franck Gannon (EMBL-Heidelberg Foundation for Research and Technology) will provide a comprehensive picture of cyclical networks of association of the estrogen receptor and transcriptional coregulators with a target gene promoter, as determined by chromatin immunoprecipitation assays. Iannis Talianidis (Institute of Molecular Biology and Biotechnology, FORTH) will describe the dynamic ordered recruitment of transcription factors and chromatin remodelling complexes at the promoters of differentiation-induced genes. Then, how the ARC mediator complex which is a large multiprotein transcriptional co-activator, serves to transduce transcription activating signals from different classes of activators to the RNA polymerase II transcriptional machinery will be discussed by Anders M. Naar (Harvard Medical School).

Identification of new complexes that regulate transcription

Transcriptional activators recruit coregulators that contribute to transcriptional activation by helping to remodel chromatin structure and recruit RNA Polymerase II and its associated basal transcriptional machinery. Though a number of these co-regulators have been characterized, new adaptors are constantly being identified. In that context, Michael Rosenfeld (University of California, San Diego) will describe some new adaptors that promote exchange of corepressor and coactivator complexes required in transcriptional regulation.

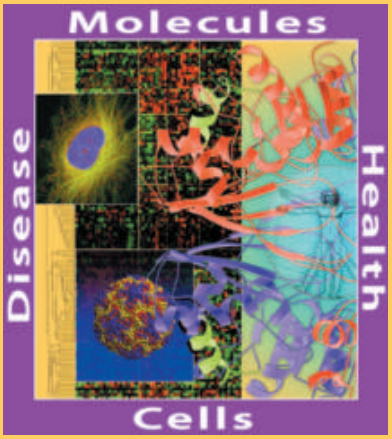
Dr. Cécile Rochette-Egly

Despite having a set of consensus subunits, the composition of the Mediator complex may differ depending on the target gene. Here, Joan Conaway (Stowers Institute) will describe studies on the structure and function of the mammalian Mediator complex. Finally, Patrick Cramer (University of Munich) will present new structural studies of RNA polymerase II complexes. Crystallographic models of the complete Polymerase II, together with new biochemical and electron microscopic data, will give insights into mechanisms of transcription initiation and elongation.

Transcription activators: integrators of diverse signaling pathways

This symposium will focus on how integration of signals from a number of pathways converge on transcription activators. Barbara Graves (University of Utah, Huntsman Cancer Institute), will discuss how phosphorylation by MAPKs induces conformational changes in members of the Ets family of transcription factors and thereby controls their activities. Similarly, Andrew Sharrocks (University of Manchester) will describe how MAPK-mediated phosphorylation of Elk1 regulates its ability to recruit coactivators. The chair of this symposium will be Cécile Rochette-Egly (IGBMC, Strasbourg) who will discuss how phosphorylation of nuclear retinoid receptors contributes to activation of

Continued on page 19



Coordinate Regulation of Transcription

Organizer: Cecile Rochette-Egly, C.U. de Strasbourg

2005 ASBMB Annual Meeting
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9650 Rockville Pike
Bethesda, MD 20814
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Dynamic and Coordinated Recruitment of Activators and Coregulators to Gene Promoters

The estrogen receptor as a transcription factor
Chair, Frank Gannon, EMBL-Heidelberg Foundation for Research and Technology

Dynamics of preinitiation complex assembly on the regulatory regions of differentiation-induced genes
Iannis Talianidis, Inst. of Molecular Biology and Biotechnology, FORTH

Structural and functional role of the human ARC/mediator co-activator in specific gene regulatory pathways
Anders M. Naar, Harvard Medical School

Integration of mRNA Processing with Transcription

Coupling of transcription with mRNA processing and chromatin
Chair, Stephen Buratowski, Harvard Medical School

Coordination of pre-mRNA processing with transcription by RNA polymerase II
David Bentley, Univ. of Colorado Health Sciences Ctr.

The polymerase and the poly(A) signal: mechanism of coupling processing with transcription in vitro and in vivo
Harold Martinson, Univ. of California, Los Angeles

Identification of New Complexes that Regulate Transcription

Transcriptional regulatory complexes
Chair, Joan Conaway, The Stowers Inst.

Structural basis of transcription by RNA polymerase II
Patrick Cramer, Univ. of Munich

Genome-wide transcriptional regulatory strategies in development and disease
Michael Rosenfeld, Univ. of California, San Diego

Transcription Activators: Integrators of Diverse Signaling Pathways

Nuclear retinoid receptors phosphorylation and the transcription of retinoid-target genes
Chair, Cecile Rochette-Egly, C.U. de Strasbourg

Structural framework for signaling to the transcription factor Ets-1
Barbara Graves, Univ. of Utah, Huntsman Cancer Inst.

Integration of signaling pathways by the ETS-domain transcription factor Elk-1
Andrew Sharrocks, The Univ. of Manchester

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Catalysis: Structure, Function, and Evolution

Organizer: John A. Gerlt, University of Illinois, Urbana Champaign

The large numbers of protein sequences and structures determined by genome sequencing and structural genomics projects are providing biochemists with an unprecedented information database for understanding how protein sequence and structure deliver biological function. Now, instead of studying one enzyme at a time, enzymologists can study superfamilies of enzymes, with the conserved elements of sequence and structure allowing Nature's strategies for catalysis to be defined. This meeting addresses several topics that capitalize on sequence, structure, and evolution to identify and apply principles of catalysis.

Intermediates in Enzyme Catalyzed Reactions

Chair: Debra Dunaway Mariano, University of New Mexico

Enzyme catalyzed reactions often involve the formation of transiently stable intermediates whose fate is determined by the structure of the active site. Although such intermediates are postulated to be intermediates in nonenzymatic reactions, their instability prevents detailed mechanistic and structural characterization. However, these intermediates often can be directly observed in active sites as a result of stabilizing interactions. This symposium highlights recent achievements in describing the structures and reactivities of intermediates in phosphoryl and prenyltransferases.

Nucleophilic Substitution At Phosphorus: Phosphorane Intermediates in Scaffolds Designed for Pushing and Metaphosphates in Scaffolds Designed for Pulling. Speaker: Debra Dunaway Mariano, University of New Mexico

The Prenyltransferase Superfamily: Evolution of New Reactions in the Isoprenoid Biosynthetic Pathway. Speaker: C. Dale Poulter, University of Utah

Hold Only Loosely, But Don't Let Go: Catalysis in the phosphomannomutase/phospho-glucomutase reaction. Speaker: Peter A. Tipton, University of Missouri, Columbia

Radical Enzymes

Chair: Wilfred A. van der Donk, University of Illinois, Urbana-Champaign

Long thought to be too unstable to be important, many examples of radical intermediates in enzyme catalyzed reaction have now been discovered and characterized. The generation, reactivity, and properties of these intermediates have yielded to detailed structural and mechanistic investigation. This symposium highlights the extraordinary detail that now can be achieved for characterizing the mechanisms of these reactions.

The Anatomy of a Radical Enzyme. Speaker: Catherine L. Drennan, MIT

Ribonucleotide Reductase: Unnatural Amino Acids to Interrogate Radical Initiation. Speaker: JoAnne Stubbe, MIT

Mechanistic Studies on Cyclooxygenase and Lipoxygenase. Speaker: Wilfred A. van der Donk, University of Illinois, Urbana Champaign

Natural Evolution of Enzyme Function

Chair: John A. Gerlt, University of Illinois, Urbana Champaign

The members of mechanistically diverse superfamilies catalyze different overall reactions that share a common partial reaction. Studies of these superfamilies are providing mechanistic and structural descriptions of how a small number of mutations in a progenitor can change the reaction, often via functionally promiscuous intermediates. Understanding Nature's strategies for changing the reaction catalyzed by an "old" active site template will provide important lessons for rational design of "new"enzymes. This symposium highlights three superfamilies for which the structural basis for functional divergence is now understood.

Mechanistic Diversity and Evolution of Function in the Vicinal Oxygen Chelate Superfamily. Speaker: Richard N. Armstrong, Vanderbilt University

Evolving, Designing, and Discovering New Enzymes in the Enolase Superfamily. Speaker: John A. Gerlt, University of Illinois, Urbana Champaign

Enhancing the Catalytic Promiscuity of Members of the Tautomerase Superfamily. Speaker: Christian Whitman, University of Texas, Austin

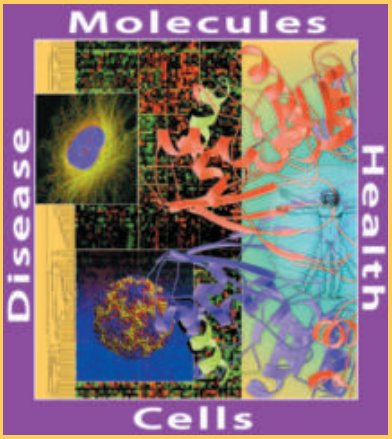
Directed Evolution of Enzyme Function. Chair: Frank M. Raushel, Texas A&M University

Nature does not necessarily provide catalysts for known reactions with unnatural substrates or new reactions. "Rational" design and combinatorial evolution provide strategies for obtaining novel enzymes. This symposium highlights recent advances in the in vitro evolution of enzymes to direct catalysis of "new" reactions.

Molecular Diversity and Catalysis. Speaker: Donald Hilvert, Swiss Federal Institute of Technology, Zurich

Altering the Substrate Specificity of Enzymes in the Amidohydrolase Superfamily. Speaker: Frank M. Raushel, Texas A&M University

Evolving Enzymes for Making Novel Sugars and Glycoproteins. Speaker: Chi Huey Wong, Scripps Research Institute.



Catalysis: Structure, Function and Evolution

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Directed Evolution of Enzyme Function

Altering the substrate specificity of enzymes in the amidohydrolase superfamily
Chair, Frank M. Raushel, Texas A&M Univ.

Molecular diversity and catalysis
Donald Hilvert, Swiss Federal Inst. of Technology, Zurich

Evolving enzymes for making novel sugars and glycoproteins
Chi-Huey Wong, Scripps Research Inst.

Natural Evolution of Enzyme Function

Discovering, designing, and evolving new enzymes
Chair, John Gerlt, Univ. of Illinois at Urbana-Champaign

Mechanistic diversity and the evolution of enzyme function
Richard Armstrong, Vanderbilt Univ.

Enhancing the catalytic promiscuity of tautomerase superfamily members
Christian Whitman, Univ. of Texas at Austin

Intermediates in Enzyme-Catalyzed Reactions

Reaction intermediates in enzyme catalysis
Chair, Debra Dunaway-Mariano, Univ. of New Mexico

The prenyltransferase superfamily. Evolution of new reactions in the isoprenoid biosynthetic pathway.
C. Dale Poulter, Univ. of Utah

Hold on loosely, but don't let go: catalysis in the phosphomannomutase/phosphoglucomutase reaction
Peter A. Tipton, Univ. of Missouri – Columbia

Radical Enzymes

Mechanistic studies on the reaction of lipoxygenase with arachidonic acids
Chair, Wilfred A. van der Donk, Univ. of Illinois at Urbana-Champaign

The anatomy of a radical enzyme
Catherine L. Drennan, MIT

Ribonucleotide reductases: regulation in S. cerevisiae
JoAnne Stubbe, MIT

Experimental Biology 2005

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See You Next Year in San Diego!

2005 ASBMB Annual Meeting

Held in conjunction with EB 2005

April 2-6, 2005

San Diego, CA

Meeting Organizers

Dennis R. Voelker, National Jewish Medical Research Center

Cecile Rochette-Egly, IGBMC, Strasbourg

and the 2005 ASBMB Program Planning Committee

Meeting Themes

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

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

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

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

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

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

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

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

Proteolysis and Disease
Chair: Charles Craik, Univ. of California, San Francisco

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

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

Genomes and Proteomes
Chair: Andrew J. Link, Vanderbilt Univ.

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

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William Dowhan Selected for ASBMB-Avanti Award

William Dowhan, John S. Dunn Professor of Biochemistry at the University of Texas Medical Center in Houston will receive the ASBMB-Avanti Award in Lipids. The Award which recognizes outstanding research contributions in the area of lipids alternates between ASBMB and the Biophysical Society. Previous recipients were Edward A. Dennis in 2000, Ronald N. McElhaney 2001, Christian R. H. Raetz 2002, Robert Bittman 2003, and in 2004 William L. Smith. The Award consists of a plaque, a stipend, and transportation and expenses to present a lecture at the ASBMB Annual Meeting, April 2-6 in San Diego.

In the 1970s. Dr. Dowhan was the first to purify to homogeneity several key integral membrane enzymes of lipid biosynthesis when that was still a very difficult thing to do. This work validated the Kennedy pathway in E. coli at the level of enzymology. He discovered that phosphatidylserine decarboxylase of E. coli contains an unusual pyruvate cofactor generated from a precursor protein by internal splicing. In the yeast system he was first to purify the phosphatidylcholine/phosphatidylinositol exchange protein to homogeneity. Analysis of its N-terminal sequence led to the remarkable conclusion that the SEC14 gene of yeast, which is involved in protein secretion, is the structural gene for this exchange protein.

He was also first to make strains of E. coli (and more recently of yeast) in which the content of major membrane phospholipids can be regulated in a systematic manner by placing the genes encoding key lipid biosynthetic enzymes behind appropriate promoters. This resulted in the demonstration of an acidic lipid requirement for the initiation of DNA replication (DnaA mediated) in E. coli. Acidic lipids also proved essential for the insertion of a subset of E. coli membrane proteins.

The characterization of Dr. Dowhan's E. coli mutants completely lacking the zwitterionic phospholipid phosphatidylethanolamine resulted in the unambiguous demonstration of a phosphatidylethanolamine requirement for LacY function in living bacterial cells. Dowhan traced this phenomenon to a very specific failure of the N- terminal half of the LacY protein to assemble properly in the absence of phosphatidylethanolamine. The normal topography of the first six transmembrane helices is actually reversed in the absence of phosphatidylethanolamine, even though normal amounts of LacY are made and inserted into the inner membrane. A subset of membrane proteins are affected in this manner, including several in the LacY class of permeases. LacY mis-folding is reversed by restoring phosphatidylethanolamine biosynthesis. These observations are consistent with the recent crystal structure of LacY, which reveals two somewhat autonomous domains, as would be expected based on Dowhan's studies.

Dr. William Dowhan

Dr. Dowhan' s research over 30 years has established and defined the molecular basis for new roles of lipids in a diverse number of cell processes. His observations have expanded the number of investigators who now consider lipids as important to their studies.

In summary, Dr. Dowhan' s science is of the highest quality, and it is of fundamental importance to membrane and lipid biochemistry. He is a wonderful role model for younger scientists, and he freely shares his results with everyone in the field. He is frequently invited to speak at national and international meetings, and serves on NIH study sections.

Regulation of Transcription continued ...

Continued from page 14

transcription by controlling the association/dissociation of co-regulators.

Integration of mRNA processing with transcription

mRNA processing reactions (capping, splicing and polyadenylation) occur co-transcriptionally. Though these reactions are biochemically distinct processes, they are interlinked and so influence one another's specificity and efficiency. During this session, David Bentley (University of Colorado Health Sciences Center) will discuss the link between mRNA processing and transcription. He will describe a dynamic complex, the "mRNA factory," which carries out the processing of transcripts and influences the function of both the processing and transcription machineries through a growing number of regulatory interactions. Then, Stephen Buratowski (Harvard Medical School) will describe RNA processing factors associated with transcription complexes and chromatin. Finally, Harold Martinson (University of California, Los Angeles) will show how poly(A)-dependent termination is coupled to transcription through the carboxyl-terminal repeat domain of the largest RNA polymerase II subunit.

Jack Dixon to Receive ASBMB-Merck Award

Jack E. Dixon, Professor and Dean of Scientific Affairs at the University of California, San Diego School of Medicine, has been selected to receive the 2005 ASBMB-Merck Award in recognition of his outstanding contributions to research in biochemistry and molecular biology. Recipients over the past five years have been Jack L. Strominger in 2004, Stephen Benkovic in 2003, Robert G. Roeder and Robert D. Kornberger who shared the Award in 2002, Avram Hershko and Alexander J. Varshavsky who shared the Award in 2001, and Robert L. Baldwin in 2000. Nominations must be originated by Society members, but the nominees need not be ASBMB members. The Award consists of a plaque, $5,000, and transportation and expenses of the recipient and spouse to the 2005 Annual Meeting to present a lecture.

Following undergraduate study at the University of California, Los Angeles, graduate study at UCSB with Dr. Thomas C. Bruice and postdoctoral training at UCSD with Dr. Nathan O. Kaplan, Dr. Dixon became a faculty member at Purdue University. In 1991 he was appointed Professor and Chair of the Department of Biological Chemistry at the University of Michigan, and a year ago he became Dean of Scientific Affairs and Professor of Pharmacology, Cellular and Molecular Medicine, Chemistry and Biochemistry at the University of California, San Diego. While pursuing his research interests with vigor, he has undertaken major administrative responsibilities with much success and is recognized nationally and internationally for his scientific leadership. His honors include election to the Institute of Medicine, State of Michigan Scientist of the Year Award, President of the American Society for Biochemistry and Molecular Biology, Fellow of the American Academy of Arts and Sciences, election to the National Academy of Sciences, and the William C. Rose Award.

Dr. Dixon has brought a strong chemical background and expertise in molecular biology and molecular genetics to his research investigations. Early in his career, he was a leader in research on the biosynthesis and post-translational processing of polypeptide hormones. He adopted the tools of molecular biology as they became available in the late 1970's, and his laboratory was among the first to use a synthetic oligonucleotide to identify and clone cDNAs encoding peptide hormones such as somatostatin, cholecystokinin, and neuropeptide Y. He subsequently became a pioneer and intellectual leader in the structure and function of the protein tyrosine phosphatases (PrPases).

Dr. Jack E. Dixon

Two recent studies from the Dixon laboratory illustrate the breadth of Dr. Dixon's scientific contributions. Since the discovery of the PTPase in the pathogen bacteria responsible for the plague, his laboratory has continued its interest in the molecular aspects of bacterial pathogenesis. His laboratory has recently demonstrated that a Yersinia effector protein (YopJ) is a protease that degrades ubiquitin-like proteins. YopJ homologs are found in bacteria pathogenic to animals, plants, and plant symbionts, suggesting that this mechanism of proteolysis is used to modulate a wide variety of signaling pathways present in the animal and plant kingdoms. Finally, in collaboration with Larry Zipursky at UCLA, the Dixon laboratory identified a novel receptor that is required for axonal guidance in the fly. Remarkably, the gene encoding this receptor can undergo alternative splicing to generate more than 38,000 different receptor isoforms. This molecular diversity is likely to contribute to the specificity of neuronal connectivity

Dr. Dixon's laboratory has also played an important role in methods development. Early in his career, he was a leader in research on the biosynthesis and post-translational processing of polypeptide hormones. He adopted the tools of molecular biology as they became available in the late 1970s, and his laboratory was among the first to use a synthetic oligonucleotides to isolate a cDNA encoding peptide hormones that were expressed at low levels. In addition his laboratory used the tools of protein chemistry and mass spectrometry to demonstrate previously unknown modifications of peptide hormones such as hydroxylation and a-linked glycosylation. He also pioneered in the use of mass spectrometry to make disulfide bonds assignments in proteins. The Dixon laboratory also developed glutathione S-transferase expression vectors which were easily cleaved by proteases. These vectors have proven to be of great utility in recombinant protein expression. The original publication describing these vectors has been cited 1,274 times. Dr. Dixon was also the first person to develop tools that allowed the silencing of genes in Drosophila cell lines using RNA interference. This simple direct method has been widely used by others to map metabolic pathways and to carry out genetic screens to identify novel effector proteins alternating signal transduction pathways.

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ARC-232	Inositol, myo, [^{14}C(U)]	5 μCi	$479
ART-261	Inositol, myo, [1,2-^{3}H(N)]	1mCi	$729
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ART-171	Inositol-1-phosphate, D-[inositol-2-^{3}H] (1-IP)	5 μCi	$299
ARC-233	Inositol-1-phosphate, D-[inositol-2-^{14}C(U)]	5 μCi	$299
ART-268	Inositol-3-phosphate, D-[inositol-2-^{3}H]	5 μCi	$359
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ART-872	Inositol 1,3,4,5 tetrakisphosphate D-[inositol-1-^{3}H(N)]	5 μCi	$629
ARCD-108	Inositol, myo D-1,4,5 triphosphate, “Cold”	1 mg	$209
ARCD-109	Inositol, myo L-1,4,5 triphosphate, “Cold”	1 mg	$199
ART-270	Inositol, 1,4,5-triphosphate, D-[inositol-2-^{3}H(N)] (1,4,5-IP3)	5 μCi	$579
ART-487	Phorbol-12,13-diacetate, [20-^{3}H(N)]	50 μCi	$309
ART-485	Phorbol-12,13-dibutyrate, [20-^{3}H(N)]	50 μCi	$299
ART-486	Phorbol-12-myristate-13-acetate [20-^{3}H(N)]	50 μCi	$319
ART-184	Phosphatidylinositol, L-α-[myo-inositol-2-^{3}H(N)] PI [^{3}H]	10 μCi	$599
ART-183	Phosphatidylinositol 4,5-biphosphate [myo-inositol-2-^{3}H(N)] PIP_2[^{3}H]	5 μCi	$559
ARCD-131	Phosphatidylinositol 4,5-biphosphate (PIP_2), “Cold”	1 mg	$209
ARE-100	Phosphatidylinositol specific phospholipase C (PI-PLC)	5 units	$339
ART-185	Phosphatidylinositol 4-phosphate, [myo-inositol-2-^{3}H]	5 μCi	$649
ART-1297	Prostatin [20-^{3}H] [dPAC]	50μCi	$999

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Jan-Åke Gustafsson Wins Bristol-Myers Squibb/Mead Johnson Award

Jan-Åke Gustafsson is the winner of the twenty-fourth annual Bristol-Myers Squibb/Mead Johnson Nutritionals Freedom to Discover Award for Distinguished Achievement in Nutrition Research, recognizing his efforts in pioneering the field of molecular nutrition, where he has played a pivotal role in discoveries of how nuclear receptors in the cell mediate actions of nutrients and hormones to regulate metabolism. Dr. Gustafsson is Professor of Medical Nutrition and Chairman of the Department of Medical Nutrition as well as Director of the Center for Biotechnology of Novum, Karolinska University Hospital at the Karolinska Institutet in Stockholm, Sweden.

He helped establish a new field of nutrition research and quickly became a leader in that field. In the process, Dr. Gustafsson and his colleagues have made critical contributions to our knowledge of the mechanisms whereby certain nutrients and hormones, among them fatty acids and vitamins A and D, regulate a variety of metabolic responses through their interactions with nuclear receptors. These interactions are fundamental to their regulation of growth and metabolism and to their contributions to the pathophysiology of diabetes and obesity. In addition, Dr. Gustafsson first described the three-domain structure of nuclear receptors, defined the function of these domains, and ascertained how the DNA-binding mechanism mediates certain activities in the cell including cellular communication. He also was the first to discover that fatty acids are natural activators of the peroxisomal proliferators activated nuclear receptors (PPAR), thus stimulating the investigation of the role of PPARs in lipid metabolism. And Dr. Gustafsson discovered a second type of estrogen receptor as well as a nuclear receptor that is important in cholesterol metabolism.

Dr. Gustafsson received his Bachelor of Medicine degree in 1964, his Ph.D. in chemistry in 1968 and his M.D. degree in 1971, all from the Karolinska Institutet. He was named a professor of chemistry at the Institute in 1976, and to his current posts in 1979. In 1987, he founded KaroBio AB, a biotechnology company based at the Karolinska Institutet and initially supported by pension and government funds.

The author of more than 1,100 peer-reviewed publications in scientific journals, Dr. Gustafsson also has served or currently serves on the editorial boards of a number of distinguished journals including the *Journal of Molecular Medicine*, *Molecular Endocrinology, Molecular Pharmacology, Cancer Research, Cell Metabolism* and the *International Journal of Oncology*. He is also a member of the International Advisory Board of the World Health Organization Center in Oulu, Finland.

Among the many honors he has received during his career are: the Svedberg Prize in chemistry in 1982, the Fernström Prize of the Karolinska Institutet in 1983, the Anders Jahre Prize in 1992, the Gregory Pincus Medal and Award of the Worcester Foundation in 1994, the Söderberg Prize in Medicine in 1998, the European Medal of the British Society for Endocrinology in 2000, and the Fred Conrad Koch Award from the Endocrine Society in the U.S. in 2002. He has served as an adjunct member of the Nobel Committee of the Karolinska Institutet, and was chairman of the Nobel Assembly of the Institute in 2002. Dr. Gustafsson was elected to the Swedish Academy of Sciences in 1997, to the Swedish Academy of Engineering Sciences in 1998, became a foreign honorary member of the American Academy of Arts and Sciences in 2000 and a foreign honorary member of the U.S. National Academy of Sciences in 2002.

Jan-Åke Gustafsson

Current Research Interests

The current research interests of the Gustafsson Group fall mainly into the following two categories. They are, says Dr. Gustafsson:

1. Continued studies on the physiological role of ERß and its pharmaceutical applications.

Very excitingly, ERß agonists seem to be promising potential drugs against rheumatoid arthritis, inflammatory bowel disease (Wyeth-Ayerst), prostate disease including prostate cancer (Eli Lilly), postmenopausal symptoms (Schering Germany), as well as depression. Since all these applications were predictable on the basis of our research (published in *MCB*, *PNAS* and elsewhere), we now want to continue to study molecular mechanisms involved, utilizing the pharamaceutical tools (ERß agonists) now becoming available. We also want to contribute to widening the pharmaceutical potential of ERß based on our continuing characterization of novel phenotypes of ERß KO mice, i.e. in the lung, bladder and other tissues. Furthermore, we are involved in identifying, if possible, human mutations of the ERß

Continued on next page

The Journal of Biological Chemistry Launches Papers of the Week

This past July, *The Journal of Biological Chemistry* (*JBC*) launched Papers of the Week, a new *JBC* Online feature that is intended to recognize the top one percent of submissions received by the journal. "This new feature was initiated to highlight and promote the remarkable contributions that our authors make to the advancement of biochemistry and molecular biology," explained Dr. Robert Simoni, Stanford University and deputy editor of *JBC*.

The Papers of the Week are nominated by *JBC* reviewers, Editorial Board Members and Associate Editors, who are asked to identify papers of unusual interest and importance. "Our criterion for selection as a Paper of the Week is only that each reviewer judge the paper to be among the top one or two papers that he or she will review for *JBC* in a year," noted Dr. Simoni. "This is a very high standard and we expect it will yield 50 to 100 papers each year."

Once selected, the paper is highlighted in the Table of Contents of the issue of *JBC* Online in which it appears. There is a link from the Table of Contents to a summary of the paper that explains why the work was selected for this honor. The paper is also included in a cumulative collection of *JBC* Papers of the Week that can be accessed directly from the home page of *JBC* Online.

Recent Papers of the Week have included a report by Dr. Kevin Chen and colleagues on their generation of an MAO A/B knockout mouse line; a paper in which Dr. Xingzhi Xu discussed how he and his colleagues established a link between a congenital neurological disorder and DNA repair; and a report by Drs. Chulee Yompakdee and Joel A. Huberman on their discovery of a DNA sequence involved in controlling the timing of DNA replication.

Gustafsson continued...

Continued from previous page

gene involved in disease. Finally, we are continuously exploring new molecular mechanisms behind ERß action.

2. Continued studies on the physiology and pathophysiology of LXRß.

We have observed several novel phenotypes (unpublished) of LXRß KO mice, indicating as yet undescribed physiological roles of this nuclear receptor. These phenotypes are now being characterized in detail, including underlying mechanisms. Our hope is that results from these studies will help in developing pharamaceutical use of the LXRB targeted drugs currently developed in many pharmaceutical industries for use in treating, for example, cardiovascular disease.

Lindquist Resigns As Whitehead President

Dr. Susan Lindquist resigned as President of the Whitehead Institute at MIT, effective November 1. The Board of Directors accepted the resignation "with extreme regret." Dr. Lindquist has headed the Whitehead since October 2001. According to the *Boston Globe*, during her tenure, Dr. Lindquist oversaw a "massive reduction in staff and budget to help create a separate science organization, the Broad Institute, whose headquarters is now under construction next door." The paper reports that the Whitehead's annual budget declined from $130 million to roughly $50 million.

The Whitehead Board stated that Dr. Lindquist has been an extraordinarily effective president during a period of transition unprecedented in the Institute's history. In the past three years, she successfully implemented the transition of the Whitehead/MIT Center for Genome Research to the newly established Broad Institute while preserving opportunities for joint scientific programs between Whitehead and the Broad. She also negotiated important improvements in the Whitehead/MIT affiliation.

Dr. Lindquist is a pioneer in the study of the stress response and protein folding. She concentrates on chaperones (proteins that help others to assume their proper shape) and prions (proteins with the property of causing others to assume an alternative shape). Focusing on bakers' yeast as a model organism, but also using fruit flies, the plant Arabidopsis and Mammalian systems, she employs a combination of genetics, molecular and cell biology analyses, and biophysical methods, to understand the mechanisms of prion propagation, generation of diversity and human disease.

Dr. Lindquist came to the Whitehead in 2001 from the University of Chicago where she was the Albert D. Lasker Professor of Medical Sciences in the Department of Molecular Genetics and Cell Biology, and an Investigator in the Howard Hughes Medical Institute. She received her PhD in Biology from Harvard University in 1976, going to the University of Chicago as an American Cancer Society Post-doctoral Fellow before joining the faculty there in 1977.

by John D. Thompson, Editor

'Magnificent Seven' Form Edinburgh Science Triangle

It's not that old western movie starring Yul Brenner, it is the new Edinburgh Science Triangle, described as a triangle of excellence for cutting edge science and technology that has the capability of shaping the future and a potential to contribute £750 million ($1,350 million U.S.) per year to Scotland's economy, that has been established in Scotland.

Already home to more than 3,300 world class researchers, the area has the potential to create 15,000 new high value research jobs, across a 500,000 square meter super-campus with a development investment of over £500 million ($900 million). Launched in late September, the new facility has the goal of ranking alongside Cambridge and London as a top UK research region recognized as one of the top 10 in European science and technology excellence.

Encompassing seven leading science parks, all within a 45 minute drive, the Edinburgh Science Triangle (EST) is expected to bring a new dimension to the promotion of Scotland's science excellence, according to Scottish Enterprise, Scotland's main economic development agency. The new alliance is intended to showcase Scotland as a leading center in the appliance of science and a world class location for companies and institutes seeking to benefit from the expertise within EST.

All in all, the last week of September was regarded as a good one for Scotland's life sciences sector last week, as in addition to EST the week saw two other developments that promise to turn innovation into financial gain. First, the Scottish Centre for Genomic Technology and Informatics (GTI) launched a £4.5 million project to support the commercialization of scientific breakthroughs, and then the Korea Health Industry Development Institute (KHIDI) established a Scottish office to manage a multimillion-pound investment in drug development research. South Korea's KHIDI plans to invest up to £18 million in Scottish drug development projects over the next 9 years. This makes Scotland the first country to take full advantage of South Korea's International Collaborative Program for Drug Development.

Vioxx Recall May Bring Flood of Suits

The decision by Merck to halt sales of Vioxx, its blockbuster painkiller, could lead to an onslaught of new lawsuits against the company according to The New York Times.

The Times reported that lawyers were predicting that hundreds and perhaps thousands of new Vioxx lawsuits are likely to be filed, many of them class actions that aim to represent large groups of Vioxx users who have taken the drug for extended periods. It said that radio advertisements seeking plaintiffs were being broadcast and some suits were filed almost immediately after Merck's recall announcement on September 30. The paper quoted Don S. Strong, an Oklahoma lawyer, who filed a suit against Merck on the day of the recall, as saying, "Our lawsuit was in the works but the filing was accelerated by the recall."

While he and other lawyers appear to think that the recall will help their lawsuits, other experienced product liability lawyers say a new wave of litigation may not necessarily be more distracting for Merck than the suits that are already working their way through the courts. Should the Vioxx cases follow the pattern of other major product liability battles, a surge in lawsuits could well encourage court-ordered consolidation of the litigation, hastening its resolution.

Austrian Funding Giant Emerges

Austria has created a new agency to coordinate the funding of applied research in fields such as biotechnology and nanotechnology, as well as to foster interaction between Austrian researchers and the international scientific community. The Austrian Research Promotion Agency (FFG), which was established by merging the Technology Promotion for Industry agency (FFF), the Austrian Space Agency (ASA), the Bureau for International Research and Technology Cooperation, and the Technology Impulse Society, is expected to be a giant in the country's research funding, with a budget that could be as high as 300 million euros a year, according to media reports.

The creation of the FFG is part of an ongoing reorganization of Austrian science funding bodies, which are being merged, scaled up, and streamlined as the country seeks to adapt to changes across Europe.

Tularik Acquisition Enhances Amgen's Research Organization

Amgen Inc., the world's largest biotechnology company, has completed the acquisition of Tularik Inc., a pioneer in drug discovery related to cell signaling and the control of gene expression. Final regulatory approvals were received in June and Tularik stockholders approved Amgen's acquisition of the company during a special meeting held yesterday.

"The completion of this acquisition underscores our commitment to scientific excellence and innovation through the expansion of our internal drug discovery research capabilities," said Roger M. Perlmutter, M.D., Ph.D., executive vice president research and development of Amgen. "We welcome the Tularik staff into our organization and are confident that our combined research capacity will help patients by advancing important treatments for serious diseases."

Pursuant to the merger agreement announced on March 29, 2004, Amgen will exchange Tularik common stock for Amgen common stock in a tax-free transaction. Tularik stockholders will be entitled to 0.451 shares of Amgen common stock for each share of Tularik common stock held. Any fractional shares will be paid in cash. A total of approximately 24 million Amgen shares will be issued as consideration.

"We are truly looking forward to being a part of Amgen," said Tularik founder and CEO David V. Goeddel, who recently received *The Economists'* Annual Innovation Prize Award in Bioscience for gene cloning and the expression of human proteins.

"Tularik's research engine is a rare asset and a great strategic fit. Tularik has a strong team of scientists who share our desire to develop important new therapeutics in inflammation, metabolic diseases, and oncology. Amgen and Tularik have complementary chemistry expertise and compound libraries that together strengthen and broaden our discovery capabilities," said Dr. Perlmutter, who along with Dr. Goeddel is an ASBMB member.

Strategies to Support the Bio/Pharma Value Chain

The need to overcome the pharmaceutical industry's pipeline productivity crisis is forcing the genomics innovators and their partners to reshape their portfolio management, according to DataMonitor, a consulting firm that specializes in market research. In a report released in early October, the company states that new asset allocation strategies and valuation methodologies are needed to support the evolution to a new business model emphasizing investment in technological diversification. A new wave of innovation is focusing on gene functionalities, population genomics, and pharmacogenomics. Drug developers should continue integrating well-defined genomics assets into their supply chains, work to maximize successful target validation and optimize alliance networks to ensure asset co-evolution and diversification.

FDA Eases Rules on Drug Manufacturing

Drug makers will not need regulatory approval for every change in their manufacturing processes under new guidelines designed to prevent supply disruptions, U.S. health officials said September 30. Companies can skip the prior approval requirement if they have developed adequate tests and procedures to show certain changes will not affect product safety or effectiveness, the Food and Drug Administration said in a report.

The modification is part of a just-completed, two-year effort to overhaul regulation of pharmaceutical manufacturing, a major issue for drug makers. In the past, Schering-Plough Corp., Eli Lilly and Co. and other companies had trouble meeting federal production standards and faced delays in the approval of new medicines.

Some critics said the changes amounted to decreased regulation that could harm patients if problems were not uncovered before medicines were released to the public. Dr. Sidney Wolfe, head of Public Citizen's Health Research Group, a consumer group, was quoted by Reuters as saying, "I don't think it's a good idea. From a patient perspective, it is questionable and intermittently dangerous."

Health and Human Services Secretary Tommy Thompson, however, said in a statement that the FDA's plan would ensure "consistently high quality" for the U.S. drug supply. The FDA said the new measures would help drugs get on the market quicker and prevent supply shortages or disruptions.

Steven McKnight Among Winners of NIH Director's New Pioneer Award Recipients

Steven McKnight,* Professor and Chairman, Department of Biochemistry, University of Texas Southwestern Medical Center, Dallas, is one of the first five researchers selected to receive the NIH Director's Pioneer Award, a program designed to support individual scientists and thinkers with highly innovative ideas and approaches to contemporary challenges in biomedical research. A central component of the NIH Roadmap for Medical Research, the Director's Pioneer Award was established in January 2004 to encourage exceptional researchers and thinkers from multiple disciplines to conduct high-risk, high-impact research related to the improvement of human health.

The McKnight laboratory seeks to understand the regulation of transcription factors, the regulatory proteins that switch genes on and off, at a biochemical level with keen attention to biological relevance. He is a member of the National Academy of Sciences and serves on the Scientific Advisory Board of the Howard Hughes Medical Institute and the Board of Trustees of the Carnegie Institution of Washington.

To inaugurate this new program, the NIH will provide $500,000 in direct costs per year for five years to each Pioneer Award recipient, allowing them the time and resources to test far-ranging ideas with the potential to make extraordinary contributions to medical research.

The other recipents of the award are: Larry Abbott, Brandeis University; George Daley, Children's Hospital Boston, Boston; Homme Hellinga, Duke University Medical Center; Joseph McCune, J. David Gladstone Institutes, San Francisco; Chad Mirkin, Northwestern University; Rob Phillips and Steven Quake, both of the California Institute of Technology; and Sunney Xie, Harvard University.

Dr. Steven McKnight

The nine recipients represent a broad spectrum of scientific disciplines including quantitative and mathematical biology, pathogenesis, epidemiology and translational clinical research, molecular and cellular biology, integrative physiology, instrumentation and bioengineering.

*ASBMB member.

$216 Million To Math, Science Education Improvement

The National Science Foundation has announced the award of $216.3 million in funding for the second year of its innovative Math and Science Partnerships to improve mathematics and science education in United States and Puerto Rico schools.

Math and Science Partnerships grants unite elementary and secondary teachers and administrators with collegiate science, technology, engineering and mathematics faculty and representatives from stakeholder institutions. The partnerships focus on enhancing the quality, quantity and diversity of science and mathematics teachers, raising student achievement and offering challenging curricula at all grade levels.

"The Math and Science Partnerships are about reinvigorating mathematics and science instruction and strengthening curriculum across the United States," said Dr. Judith A. Ramaley, who leads NSF's Directorate for Education and Human Resources. "These awards are an investment in the talent pool of the nation's future scientists, engineers and mathematicians."

The awards will directly impact at least 2.85 million students nationwide and in Puerto Rico who learn in urban, rural, suburban and tribal nation schools.

This year's MSP funding comes in four forms: comprehensive awards; targeted awards; research, evaluation and technical assistance awards; and a Prototype Institute Partnership award.

The comprehensive awards specifically marry institutions of higher education and stakeholder organizations with elementary and secondary schools to continuously improve student achievement from the earliest grades through 12th grade.

This year's MSP participants and FY2003 awards can be found at: http://www.nsf.gov/od/lpa/news/03/pr03112.htm#attachment

Career Opportunities

Three Molecular Biology Postdoctoral Positions at National Renewable Energy Lab, Golden, CO.

The candidates will be involved in projects related to the development of H2-photoproducing algae. The first project is developing molecular engineering techniques to enhance the O2 tolerance of hydrogenases in algal platforms (see www.eere.energy.gov/hydrogenandfuelcells for more information).

The two other projects are related to, respectively, the investigation of global gene expression of algal cultures under H2-producing conditions, and the identification of factors that specifically regulate expression of the algal hydrogenase (see Posewitz et al., Plant Cell 16, 2151-2163, 2004 and Posewitz et al., J. Biol. Chem. 279, 25711-25720, 2004). The candidates should have molecular biology experience and preference will be given to those who have worked with the green alga, Chlamydomonas reinhardtii. Experience with hydrogenase systems in other organisms is a plus. The candidates are also required to have good communication skills in English. Research will be in collaboration with Mike Seibert and Maria Ghirardi. Send a cover letter stating your research interests, a CV and the contact information for three professional references to Beverly Maestas beverly_maestas@nrel.gov

Req.# 5900-5094. Salaries are highly competitive,

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Clinical Research Director and Nutrition Director for NIH-supported non-profit organization in Washington, DC. The Clinical Research Director will oversee nutrition-related human clinical trials and literature reviews and must have research interest and experience. The Nutrition Director will supervise nutrition education, advocacy, and outreach and must have experience with vegetarian nutrition and program supervision. A doctoral-level degree, interpersonal skills, and writing skills are essential. Send letter of interest and CV to Physicians Committee for Responsible Medicine pcrm@pcrm.org, 5100 Wisconsin Avenue, Suite 400, Washington, DC 20016, fax: 202-686-2216. EOE.

Research Associate

The Section of Pulmonary and Critical Care Medicine at the University of Chicago is seeking a dynamic highly-motivated Research Associate (Instructor/Assistant Professor) to be part of a successful research team studying the role of costimulatory molecules in Th2 responses in both mice and humans. These studies include many aspects of immunological regulation, cell function, and animal physiology and pathophysiology using various genetically altered mouse models. Further, the successful candidate will supervise technical staff in the recruitment and evaluation of volunteers for translational studies.

The position offers a unique opportunity to a motivated individual to participate technically and intellectually in cutting edge biomedical research. The successful candidate will design and conduct experiments, present his/her work at national meetings, prepare scientific manuscripts, and obtain research funding.

Applicants should have Ph.D. or M.D. and a strong background in molecular and cellular biology and mouse research. Applicants should also have strong organizational skills, excellent communication skills and ability to work independently.

Interested applicants should send their curriculum vitae, a letter of interest with specific research goals, and names of three references to:

Elneda Boyd
Section of Pulmonary & Critical Care
The University of Chicago
5841 S. Maryland Ave., MC 6076
Chicago, IL. 60637
eboyd@medicine.bsd.uchicago.edu

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Calendar of Scientific Meetings

NOVEMBER 2004

4th International Congress on Autoimmunity

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

American Association of Pharmaceutical Scientists AAPS Annual Meeting and Exposition

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

First Latin-American Protein Society Meeting

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

Second National Meeting of the American Society for Matrix Biology

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

DECEMBER 2004

American Society for Cell Biology, 44th Annual Meeting

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

MARCH 2005

CSBMCB Sponsored Meeting on Cellular Dynamics

March 16-20 2005 • Banff Centre, Banff Alberta
This meeting, set in Banff National Park, will feature cutting-edge sessions on Nuclear structure, Organelle Inheritance, Imaging Technologies, Protein Folding, mRNA localization, Organelles of the secretory pathway and Systems approaches to Cell Biology. Keynote Speaker is Günter Blobel.
Email: rick.wozniak@ualberta.ca
Website:http://www.csbmcb.ca/2004Meeting/index.ht

APRIL 2005

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

April 2 – 6 • San Diego
Nobel Laureates Michael S. Brown and Joseph L. Goldstein will open the ASBMB Annual Meeting with the Herbert Tabor/Journal of Biological Chemistry Lecture.
Contact: ASBMB 2005, 9650 Rockville Pike, Bethesda, MD 20814-3008; Ph: 301-634-7145; Email: meetings@asbmb.org
Website: www.asbmb.org/meetings

The 46th ENC Experimental Nuclear Magnetic Resonance

April 10–15 • Rhode Island Convention Center, Providence, Rhode Island
Contact: ENC, 2019 Galisteo Street, Building I
Santa Fe, New Mexico 87505 (USA); Ph: 505-989-4573
Fx:(505-989-1073; E-mail: enc@enc-conference.org
Website: www.enc-conference.org

MAY 2005

From Gene to Genome: Heredity and Society

May 26 - 28 • Palais de Congrès, La Grande Motte, France
The half-century long success story of genetics and genomics has had and will continue to have a profound impact on society. It is time to recall how the science of genetics has evolved, and modified several fields of society such as medicine, law, ethics, behaviour. Taking advantage of the 40th anniversary of the Nobel prize awarded to a team from the Pasteur Institute, the French Society for Genetics has invited prominent geneticists, historians and philosophers to address these issues.
Contact: Christophe Schwob
Ph: +33 4 95 09 38 00; Fx : +33 4 95 09 38 01
Email : c.schwob@mcocongres.com
Website: www.genetogenome.org

JUNE 2005

7th Annual Plant Sciences Institute Symposium; Meristems 2005

June 2-5 • Iowa State University, Ames, Iowa
Abstracts due April 1, 2005; Registration Deadline May 2, 2005
Student Travel Grants: Applications due April 1, 2005
Contact: Plant Sciences Institute Symposia, Symposium Office, 3208 Molecular Biology Building, Iowa State University, Ames, Iowa 50011-3260; Ph: 515-294-7978; Fax: 515-294-2244
Email: pbmb@iastate.edu
Website: www.bb.iastate.edu/~gfst/phomepg.html

JULY 2005

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

July 2–5 • Budapest, Hungary
Contact: Ms. Franciska Morlin, Chemol Travel Congress Dept. H-1366 Budapest, P.O.Box 28, Hungary
Ph:+36-1-266-7032, Fx: +36-1-266-7033
Email: incoming@chemoltravel.hu; www.febs-iubmb-2005.com

BioScience2005 - From Genes to Systems

July 17-21 July • Glasgow, UK
Focus topics for the meeting: Cell architecture: from structure to function; The nucleus: chromatin, recombination and repair; Cellular information processing; Proteins in disease; Stem cells and development. Plenary speakers include: Robert J. Lefkowitz, Wolfgang Baumeister, P. Leslie Dutton, Walter Kolch, and David Stuart. Poster abstract deadline: April 15, 2005, Early registration deadline: May 23, 2005
For more information: BioScience2005, Biochemical Society, c/o Commerce Way, Colchester, Essex CO2 8HP
Ph: +44 (0)1206 796351; Fx : +44 (0)1206 798650
Email: info@BioScience2005.org; www.BioScience2005.org

SEPTEMBER 2005

Strategies for Engineered Negligible Senescence (SENS), 2nd Conference

September 7-11 • Queens' College, Cambridge, England
Conference organizer: Aubrey de Grey
Email: ag24@gen.cam.ac.uk)
Website: http://www.gen.cam.ac.uk/sens2/CSBMCB

Department Heads Take Note:

ASBMB Offers Free Membership to New Ph.D.s

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

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

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

Membership at ASBMB
American Society for Biochemistry
& Molecular Biology
9650 Rockville Pike
Bethesda, MD 20814
Email: membership@asbmb.org

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

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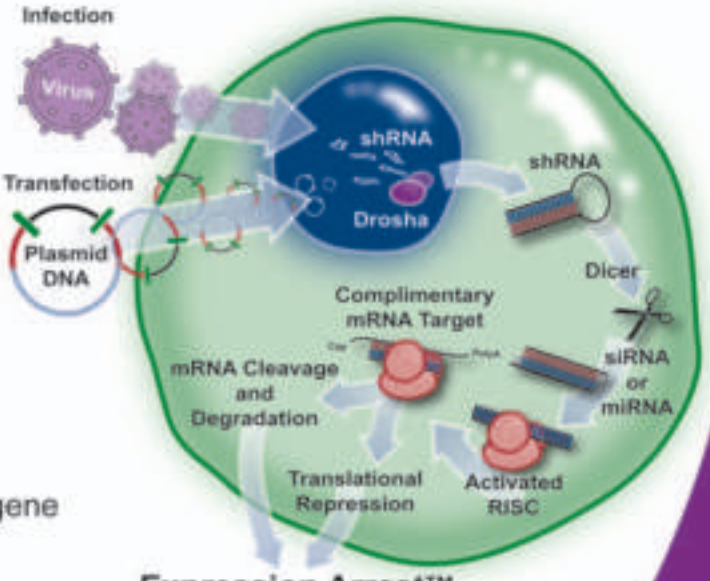

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