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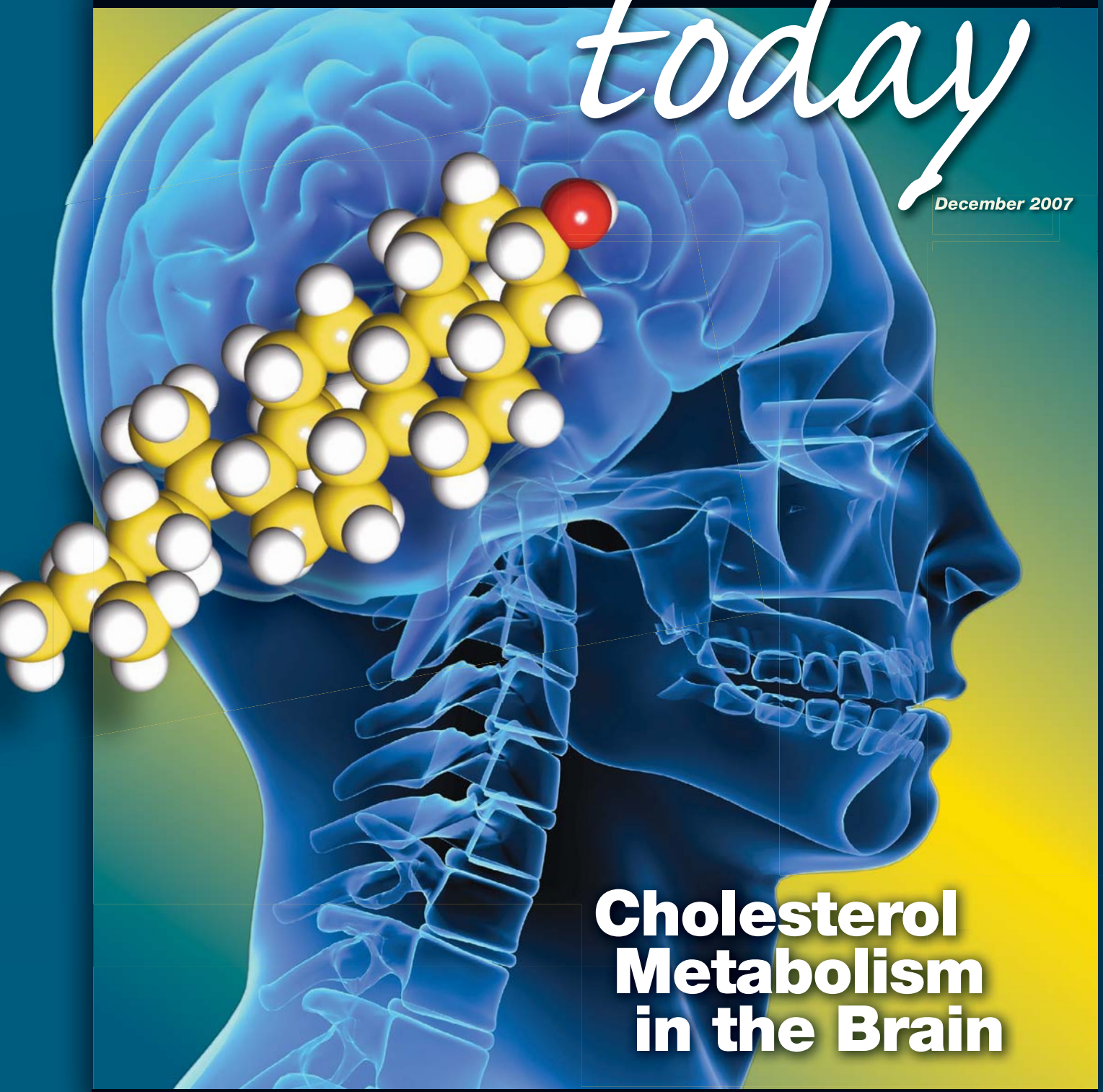
ASBMB today

December 2007



Cholesterol Metabolism in the Brain

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Late-breaking abstracts will be accepted beginning the week of December 10, 2007. The abstracts will be accepted for poster presentations only and will be scheduled on Wednesday, April 9, 2008.

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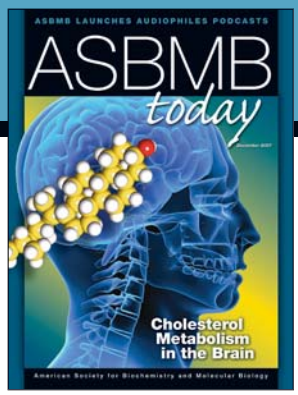
contents



DECEMBER 2007

ON THE COVER:
John Dietschy is studying cholesterol processing in the brain to find ways to prevent it from accumulating abnormally. 26

CHOLESTEROL IMAGE CREDIT: KEN BUTENHOF.

society news

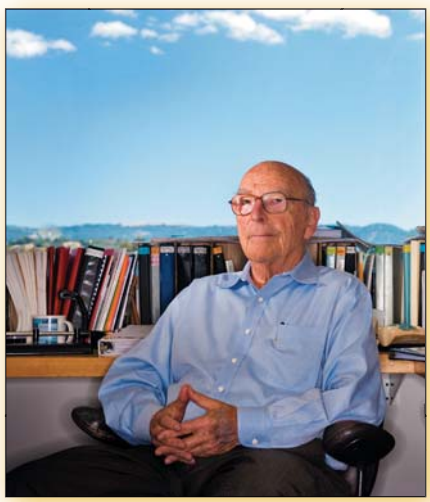
special interest

2008 meeting overview

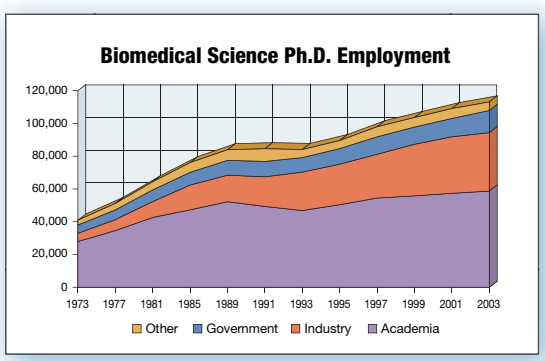
science focus

departments

resources



Retrospective: Arthur Kornberg (1918—2007) 12



Science Employment and Award Trends. 14

podcast summary

This month's ASBMB AudioPhiles Podcast looks at a line of "mighty mice" bred by Case Western Reserve University researchers as well as the classic work of protein chemist Frank W. Putnam.

Download the podcast at: http://www.faseb.org/asbmb/media/media.asp

ASBMB today

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www.asbmb.org

ASBMB's Ongoing Activities in Peer Review

BY HEIDI HAMM

ASBMB has taken a strong and active role in providing the National Institutes of Health (NIH) with advice during its year-long effort to review and (we hope) make improvements in its peer review system. Elsewhere in this issue of *ASBMB Today* is an article about ongoing peer review meetings under the aegis of a working group of the Advisory Committee to the director of NIH. These meetings, chaired by ASBMB members Keith Yamamoto and Lawrence Tabak, have been very well attended, and ASBMB has had representatives at all of them.

A parallel track of meetings is being organized by NIH's Center for Scientific Review. These "open houses" have been held regularly all year, and the goal is that when completed, all Initial Review Groups and the study sections grouped underneath them will have been reviewed for effectiveness.

ASBMB has joined the American Society for Cell Biology in an effort to generate data from a survey of some of our members on how the study sections are functioning, and many of you received a copy of the survey in late October.

So far, we have received almost 400 responses from people who have submitted grant applications to the study sections being reviewed in November and December and almost 200 responses from current or former members of these same study sections. We are reviewing the data and will share the results with you in more detail next month. For now, we are pleased to report that the peer review system, according to the feedback we have received, is in generally good shape. However, a few storm clouds are on the horizon.

Members of the study sections generally think the system is working well. Respondents thought the qualities of the reviews are mostly fair, the expertise on the sections is appropriate, and the Scientific Review Administrators (SRAs) for the study sections being looked at were generally competent and qualified. The major problem raised is that it is extremely difficult to discriminate between equally meritorious proposals when only a limited number can be funded. This of course is not a problem with the peer review system per se; rather, it is a problem of not enough money in the system (we hope you have contacted your member of Congress at some point this year about the importance of funding NIH adequately!).

As might be expected, the responses from applicants were somewhat more negative. Only about three-quarters of the respondents believed that their applications were assigned to the appropriate section, and only about half of the respondents thought that section members in the aggregate had the appropriate level of expertise to review their applications. More worrisome, almost half of the respondents to the survey whose sections were being reviewed at the November open house did not think the process was thorough

or fair. Complaints about reviewer bias or hidden agendas, contradictory reviews, slowness, and too much emphasis on preliminary data were common.

Finally, about 26% of applicants who submitted to the study sections being reviewed in November were funded (only applications with a priority score averaging less than 150 received funding).

These results are not necessarily surprising. However, as with most such surveys, the unsolicited comments, especially from the members of the study sections in question, are useful and interesting. I will have more results to report in my next column.

If you have experiences as a member or applicant before any study section, we'd like to hear from you. Please write to our public affairs officer, Pete Farnham, at pfarnham@asbmb.org. Provide Pete with the name of the study section, whether you were an applicant or a member (and when), and any comments you have, particularly if you have suggestions on how to improve the system. It is only by letting NIH know how the system is working (or not) that it will be improved.

Errata: An article in the November issue of *ASBMB Today* mistakenly said that David Allis identified the first HAT. This is incorrect. The first yeast HAT1 was identified by Rolf Sternglanz and colleagues in a paper published in the *JBC* (1995 **270,** 24674–24677).

FASEB Works to Educate Congress and the Public about NIH and Basic Research

BY CARRIE D. WOLINETZ

In the current era of fiscal constraint, conflicting priorities, and partisan politics, it becomes more important than ever to reach policymakers with the message that science and research funding are critically important. In light of this, FASEB's Office of Public Affairs is focusing on continuing efforts to develop tools and products that FASEB and society member scientists can use to communicate with policymakers as well as exploring new strategies to engage members of Congress. Two of these efforts are described below.

Breakthroughs in Bioscience Article on Asthma

FASEB recently announced the release of the publication "Breathtaking Discoveries: How Basic Research Led to Treatments for Asthma," the latest article in the *Breakthroughs in Bioscience* series. The *Breakthroughs in Bioscience* series is a collection of illustrated articles, published by FASEB, that explains recent developments in basic biomedical research and how they are important to society. FASEB distributes this series, free of charge, to members of Congress, patient advocacy groups, educational organizations, members of the press, and research advocacy partners. We highly encourage members of the FASEB societies to use these materials in their own advocacy and education activities. The entire series, which ranges from advances in cardiovascular treatment to diabetes therapies to antidepressants, is available online (opa.faseb.org/pages/Publications/breakthroughs.htm) or in hard copy form by contacting the FASEB Office of Public Affairs (opa.faseb.org). FASEB also welcomes suggestions for new topics that meet the objective of the series: basic research discoveries that have resulted in effective treatments or diagnostics for medical conditions.

While asthmatic attacks have been documented since ancient times, referenced in Egyptian papyri and Homer's *Iliad*, it is only fairly recently that scientists have come to understand that asthma is not a single disease, but rather a collection of syndromes leading to common symptoms of breathlessness, wheezing, and coughing. Researchers investigating the causes of asthma have identified a number of intersecting pathways, involving the nervous system, allergic response, and even inflammation, which have allowed for more targeted asthma therapies and relief for millions of asthma sufferers. The article also describes researchers' quest to answer questions like: why are incidences of asthma on the rise?; what triggers asthma attacks?; and why does a cold make asthma worse? Readers will come away with an understanding of what causes asthmatic symptoms, how asthma therapies work, and an appreciation for the decades of scientists and clinicians whose collective work now allows asthma patients to breathe easier.

Briefing for Freshman Members of Congress

While the National Institutes of Health (NIH) remains fortunate to have stalwart and active champions like Senators Tom Harkin (D-IA) and Arlen Specter (R-PA) or Representatives David Obey (D-WI), Edward Markey (D-MA), and Mike Castle (R-DE), it is also important to make sure new members of Congress gain an appreciation for the importance of federal funding of research. It is not unusual, particularly with freshman members of Congress, for policymakers to be unaware of the work the NIH funds or cognizant of the fact that the research funding flows back to scientists in their districts. To address this challenge, FASEB is organizing a briefing aimed at introducing freshmen members of the House of Representatives to NIH, featuring NIH Director Elias Zerhouni. FASEB staff have been working with the office of Congressional freshmen class president, Representative Tim Walz (D-MN), as well as patient advocacy groups, including the Alzheimer's Association and American Heart Association, to put together this event for the 54 new members of the House. Taking place on December 11, the briefing will not only foster an appreciation for the activities of NIH among freshmen Representatives but also may ultimately inspire the next generation of medical research champions.

Carrie D. Wolinetz is with the FASEB Office of Public Affairs.

NIH Review of Peer Review Continues

BY PETER FARNHAM, CAE, AND ANGELA HVITVED, ASBMB OFFICE OF PUBLIC AFFAIRS

The National Institutes of Health (NIH) peer review system continued to receive scrutiny at meetings in New York and Washington, DC, during October. The meetings were the third and fourth of a series of five held around the country to collect comments from the scientific community about how the system is working. The meetings are being held under the aegis of a Working Group on Peer Review of the NIH Director's Advisory Committee. The group is chaired by Lawrence Tabak, director of the National Institute of Dental and Craniofacial Research, and Keith Yamamoto, University of California at San Francisco (both are ASBMB members).

The most recent meeting, held October 22 in Washington, focused on concerns of individuals representing patient advocacy groups and gave them an opportunity to discuss their concerns and suggestions regarding the peer review system and possible changes.

Eight individuals representing various interests, including the Arthritis Foundation, the Parkinson's Action Network, and the National Breast Cancer Coalition, gave brief comments followed by discussion sessions. Although a wide range of concerns were discussed, several themes consistently emerged:

The funding climate is too conservative, and there is not enough support for "risky" research.

Greater participation is needed in study sections. The workload is becoming more and more burdensome. Younger investigators are not as well trained in how to perform as a study section member, and standards and practices are necessary. Members perform inconsistently, and expectations are also not consistently stated. It was also suggested that in some cases, exemptions from conflict-of-interest regulations were needed to broaden the scope of expertise.

Many commented that there appeared to be a bias in study sections toward basic research and that not enough importance was given to clinical and translational work. Many questioned whether the bulk of NIH's work is really aimed at the NIH mission of improving health.

Finally, it was noted repeatedly that many diseases are "under-funded" in proportion to the burden of illness they represent among the general population.

Suggestions for Improvement

A number of suggestions were offered, including the idea of funding basic and disease-oriented research separately, providing "milestone-driven" grants for risky work, grouping under-funded diseases together and giving research on those diseases a chance to "catch up" before requiring them to compete in the general pool of applicants, providing "pre-reviews" of grant proposals before submitting full grants to determine relevance to human health, providing incentives for serving on study sections such as extending the grants of members to compensate for time spent on study section business, better training for scientific review officers, self-assignment of study sections, improving the success rate for first time applicants through quotas and limiting who they have to compete with, and not requiring large amounts of preliminary data for some types of grants.

One member of the audience expressed concern about the apparent view that there was some kind of competition between basic and translational research and cautioned against the temptation to focus too much

on particular illnesses rather than broader, cross-cutting areas of research that impact many diseases. The top priority should be funding the best science, and working to increase funding broadly best served everyone's interest.

Working Group Co-chair Keith Yamamoto echoed these sentiments in his closing comments, noting that some of the changes proposed can also have unanticipated outcomes. For example, establishing an early layer of review to determine an application's relevance to human health would be quite problematic because it is often hard to assess relevance at first, although it later may become apparent that the work is extremely relevant.

Another Meeting, Other Ideas

Grant applicants should get a clear and concise summary of criticism of their grants. Reviewers should use a standard form. Grant applications should be shortened. On resubmissions, don't come up with new criticisms when all earlier ones have been addressed. Reviewers should be allowed to consider funding. Applicants should be able to submit a pre-proposal so they will know early if their grant applications have a chance of being funded.

These and many other suggestions were aired at the third regional consultation meeting on peer review on October 8 in New York. Unlike the October 22 meeting, this one did not focus on the concerns of patient advocacy groups alone but rather took comments from a broader sampling of the scientific community. As at other meetings, individuals were given five minutes to make comments on ways they believe the peer review system could be improved.

Among the suggestions:

- **Concise summary of criticisms.** Reviewer comments are often vague and not very well stated. Reviewers should specify which comments must be addressed in a revised application and which are merely "thinking out loud." Negative comments should be aired publicly.
- **Pre-proposals.** This would be akin to an abstract of a scientific paper. Grant applications take many hours to fill out, and many are routinely triaged (*i.e.* not reviewed). Being able to submit a pre-proposal would allow an applicant to learn quickly whether it would be worthwhile to bother to submit a full grant application.
- **Funding levels.** Reviewers should be allowed to consider funding requests in grant applications; a study might not be worth the money involved. It might also motivate applicants to be more frugal in their requests.
- **Indirect costs.** Facilities and administrative costs should be slashed and the money saved devoted to funding grant applications.
- **Meeting formats.** In study section meetings, group dynamics are important; thus face-to-face meetings are essential. Phone or videoconferencing participation is not nearly as effective.
- **New vs. experienced principal investigators (PIs).** Grant applications from new PIs, who tend to be younger, should be considered in separate study sections without having to compete against applications from older, more experienced PIs.
- **Length of applications.** The current 25-page application is too long, although there was no consensus on how much it should be shortened.
- **Reviewer training.** New members of study sections should receive training, and section chairs should wield the gavel more decisively to cut down on irrelevant and off point discussion.
- **Incentives to serve.** Prospective members of study sections should be given some incentives to serve, such as grant extensions to make up for time spent on study section business.
- **Capping funding.** In these difficult times, the amount of money to any one lab should be capped.
- **Discretionary funds.** Program directors should have discretionary funds available to fund innovative and interesting proposals.
- **Member selection.** Section chairs should be senior scientists who no longer are receiving NIH funding. In addition, foreign scientists should be section members.
- **Democracy in the system.** "The peer review system is more akin to a military tribunal," said one commenter. The rebuttal system needs to be made more effective.
- **Choice of study sections.** Applicants should have some say in what study sections their applications go to. Also, grant applications from small or cross-disciplinary specialties often are sent to inappropriate sections without the necessary expertise.
- **Fund automatically to the 20th percentile.** Even if grants in the 11-20th percentile have to get partial funding, some money is better than none. And funding more small grants is better than funding fewer large ones.

The bottom line for some commenters, however, was that there is simply not enough money in the system. "If Congress were funding NIH adequately," one said, "none of us would be here."

A biomedical research lobbyist at the meeting noted that scientists need to make it clear to their members of Congress that NIH needs more funding. With an election coming up next year, scientists can ask candidates for public office what their stance is on NIH funding. They should be attending candidate forums and asking questions, writing to their Congressmen and Senators, and working to elect candidates (regardless of party) that support NIH.

2008 NIH Funding set at $30 Billion—If President Doesn't Veto It

BY PETER FARNHAM, CAE, ASBMB PUBLIC AFFAIRS OFFICER

On November 1, House-Senate conferees resolved all differences between their respective House and Senate-passed Labor, Health and Human Services (L/HHS) bills, and the conference report was sent to the floors of both House and Senate where it was considered during the week of November 5. If all goes well, the bill is to be sent to the President on or around Veteran's Day.

This timing is not a coincidence. The Democratic leadership attached the Military Construction–Veteran's Affairs Appropriations Bill to the L/HHS bill, which, combined with mandatory Medicare, Medicaid, and other entitlement spending that grows automatically and is not part of any dispute, makes up the largest portion of the spending measure. Democrats hope the President will not veto the measure because it includes so much uncontroversial spending. But the L/HHS portion of the bill exceeds his proposed spending levels by about $10 billion. Furthermore, House Republican leaders claim they have the votes to sustain a presidential veto, and Office of Management and Budget (OMB) Director Jim Nussle reiterated the President's intent to veto the measure in a letter to the Congressional leadership sent the last week of October.

If the President does veto the bill, this will be very unfortunate news for NIH, which for the first time in five years has grown at a level close to biomedical inflation. Conferees agreed to support a fiscal year (FY) 2008 funding level for NIH of $30 billion. The Senate had proposed to increase NIH funding in FY 2008 to $29.9 billion, whereas the House proposed to increase the agency's funding in FY 2008 to $29.65 billion. Therefore, the conferees actually added an additional $100 million beyond the higher Senate figure—a very rare occurrence. House Appropriations Chairman David Obey (D-WI) explained that had Congress agreed with the President's FY 2008 proposal for NIH, 1,100 research grants (over two years) would have to be cut.

"This development clearly is a big victory for those supporting biomedical research," notes FASEB Director of Legislative Affairs Jon Retzlaff. "Our community owes a great deal of gratitude to Senators Tom Harkin (D-IA) and Arlen Specter (R-PA) and Representatives David Obey (D-WI) and James Walsh (R-NY)."

The decision to add the Military Construction–Veteran's Affairs Bill to the L/HHS bill is being criticized by Republicans and will complicate matters once the bill goes to the House and Senate for final passage. Republican conferees expressed concern that funding for veterans will be delayed because of the President's plan to veto the L/HHS bill.

Obey responded to these criticisms by stating that he compromised by agreeing not to attach the Defense Appropriations bill to the L/HHS bill, and he asked Republicans to exhibit the same kind of willingness to compromise by being open to combining the L/HHS and Veteran's Affairs bills (the Democratic leadership had initially intended to include defense spending in the measure but decided not to at the last minute because of opposition from within its own ranks over the idea). Nevertheless, Republican Senators are threatening to raise a point of order, allowed under the Democrats' new ethics rules, requiring 60 votes to keep the combined package intact.

asbmb member spotlight

Que to Receive 2008 Alfred Bader Award

The American Chemical Society announced at its national meeting in Boston that University of Minnesota Professor of Chemistry Lawrence Que will receive the 2008 Alfred Bader Award in Bioinorganic or Bioorganic Chemistry. The Bader Award recognizes significant accomplishments that are at the interface between biology and organic or inorganic chemistry. The award is given to scientists at the top of their fields; among the previous 20 recipients are 17 members of the National Academy of Sciences.

Que has made outstanding contributions to the field of bioinorganic chemistry that have profoundly impacted the understanding of the structure and function of metal ions in biology. He has played a pioneering role in understanding the function that nonheme iron centers play in dioxygen activation in biology. Using a multidisciplinary approach, he has successfully combined biochemical/biophysical studies of the metalloproteins themselves and synthetic approaches to develop structural and functional models for these systems.

Theil Is Garvan-Olin Medal Awardee

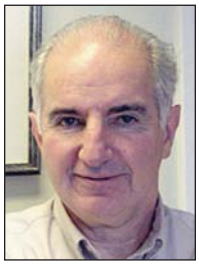
Elizabeth Theil, senior scientist at CHORI, the Children's Hospital & Research Center in Oakland, California, has been awarded the American Chemical Society's (ACS's) 2008 Francis P. Garvan-John M. Olin Medal for her research on the chemistry of iron in biology and for her advocacy of biochemistry studies in the education of all chemists.

The Garvan-Olin Medal recognizes distinguished research and service achieved by women chemists and is the third oldest ACS award and first award established to honor women chemists.

Theil was honored for her research on the structure, function and genetic control of ferritin. She was also recognized for her commitment to new areas in chemical education, where she was an early advocate for the requirement of biochemistry in ACS-approved curricula.

Theil is one of the 35 principle investigators at CHORI and is currently the leader of the Council of BioIron at the research institute. In addition she is an adjunct professor in the Department of Nutrition, Science, and Toxicology at the University of California, Berkeley, and in the Department of Molecular Structural Biology at North Carolina State University.

Goldberg Honored with Ernst Knobil Award

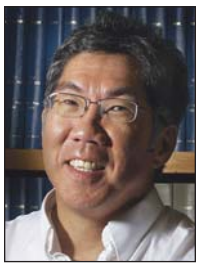


Alfred Goldberg of Harvard Medical School (HMS) was chosen to receive the 2007 Ernst Knobil Award from the University of Texas Medical Center in Houston. This annual award is given in honor of Ernst Knobil, the third dean of University of Texas Medical School and one of the world's leading neuroendocrinologists.

Goldberg received the award in recognition of his many fundamental contributions to our understanding of the mechanisms and regulation of intracellular protein degradation.

Goldberg, HMS professor of cell biology, gave the Ernst Knobil Distinguished Lecture at the University of Texas Health Science Center in Houston this past October. The lecture series is the university's premier scientific presentation and attracts an audience with diverse research interests. The honor is given each year to an internationally recognized researcher and includes a $10,000 award. This prize has been previously award to Eric Kandel, Joseph Goldstein, Stan Prusiner, and Jeffrey Friedman.

Shaw Named HHMI Investigator



Andrey Shaw, the Emil R. Unanue Professor of Immunobiology in the Department of Pathology and Immunology at Washington University School of Medicine in St. Louis, has been named an investigator of the Howard Hughes Medical Institute (HHMI).

Shaw was one of 15 researchers selected nationwide. More than 200 physician-scientists applied for this year's competition, which was focused on researchers who probe basic biomedical questions in innovative ways that help rapidly improve patient diagnosis and care.

As an investigator, Shaw will remain at Washington University where his laboratory will be supported by HHMI. The initial term of the new appointment is five years and is renewable after review. HHMI has committed $150 million to support the 15 new investigators during their initial term.

HHMI selected Shaw for his work with podocytes, cells that are found in the kidney's glomerulus. In 1999, Shaw found a gene that was essential for normal podocyte function. Now his lab is involved in a search for other genes that are essential to podocyte function and may as a result also be linked to kidney failure.

PHOTO: SARAH CONARD/PR NEWSWIRE, ©HHMI

Five ASBMB Members Elected to IOM

This past October, the Institute of Medicine (IOM) announced the names of 65 new members, five of whom are members of ASBMB. These include:

BRUCE J. BAUM, chief, gene transfer section, National Institute of Dental and Craniofacial Research, National Institutes of Health, Bethesda, Maryland.

JEFFREY V. RAVETCH, Theresa and Eugene M. Lang Professor and head, Leonard Wagner Laboratory of Molecular Genetics and Immunology, Rockefeller University, New York City.

MATTHEW P. SCOTT, investigator, Howard Hughes Medical Institute; and professor of developmental biology, genetics, and bioengineering, Stanford University School of Medicine, Stanford, California.

ARNOLD W. STRAUSS, B. K. Rachford Professor and chair of pediatrics, University of Cincinnati College of Medicine; and medical director, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio.

THOMAS C. SÜDHOF, investigator, Howard Hughes Medical Institute; and chair, Department of Neuroscience, University of Texas Southwestern Medical Center, Dallas, Texas.

The new members raise the total active membership of the IOM to 1,538. Current active IOM members elect new members from among candidates nominated for their professional achievement and commitment to service. An unusual diversity of talent is assured by the institute's charter, which stipulates that at least one-quarter of the membership be selected from outside the health professions, from such fields as the natural, social, and behavioral sciences as well as law, administration, engineering, and the humanities.

ASBMB Members Elected as AAAS Fellows

Several ASBMB members have been awarded the distinction of AAAS Fellow, an honor bestowed upon American Association for the Advancement of Science (AAAS) members by their peers. This year, 471 AAAS members have been awarded this honor in recognition of their contributions to science and technology. The new Fellows will be inducted at the Fellows Forum in February during the 2008 AAAS Annual Meeting in Boston. We congratulate the following ASBMB members for this achievement:

SUSAN G. AMARA, University of Pittsburgh School of Medicine

MARK A. BATZER, Louisiana State University

MARLENE BELFORT, University at Albany, State University of New York

STEPHEN M. BEVERLEY, Washington University School of Medicine

MORRIS J. BIRNBAUM, University of Pennsylvania

JOAN S. BRUGGE, Harvard Medical School

ELIZABETH A. CRAIG, University of Wisconsin-Madison

BENJAMIN F. CRAVATT, III, Scripps Research Institute

SALIL K. DAS, Meharry Medical College

TERENCE S. DERMODY, Vanderbilt University School of Medicine

RAYMOND J. DESHAIES, California Institute of Technology

WILLIAM L. DUAX, Hauptman-Woodward Medical Research Institute

ANINDYA DUTTA, University of Virginia School of Medicine

HOWARD J. EDENBERG, Indiana University School of Medicine

ELLEN H. FANNING, Vanderbilt University

ROBERT L. FISCHER, University of California, Berkeley

ERROL C. FRIEDBERG, University of Texas Southwestern Medical School

ELAINE FUCHS, Rockefeller University

SANKAR GHOSH, Yale University School of Medicine

JONATHAN D. GITLIN, Washington University School of Medicine

GARY D. GLICK, University of Michigan

STEPHEN P. GOFF, Columbia University

BARBARA J. GRAVES, University of Utah

NIG D. F. GRINDLEY, Yale University

JEROME E. GROOPMAN, Beth Israel Deaconess Medical Center

THOMAS J. GUILFOYLE, University of Missouri-Columbia

GERALD L. HAZELBAUER, University of Missouri-Columbia

STANLEY L. HAZEN, Cleveland Clinic Foundation

STEVEN C. HUBER, University of Illinois at Urbana-Champaign

SAMUEL KAPLAN, University of Texas-Houston Medical School

JUDITH KLINMAN, University of California, Berkeley

RICHARD J. KUHN, Purdue University

IRA MICHAEL LEFFAK, Wright State University School of Medicine

STANLEY M. LEMON, University of Texas Medical Branch at Galveston

JOHN D. LIPSCOMB, University of Minnesota

ROBERT P. MECHAM, Washington University School of Medicine

JAN A. MIERNYK, U. S. Department of Agriculture

SHAHRIAR MOBASHERY, University of Notre Dame

TOM W. MUIR, Rockefeller University

FRED R. NAIDER, College of Staten Island

MARIT NILSEN-HAMILTON, Iowa State University

LESLIE V. PARISE, University of North Carolina at Chapel Hill

ANNA M. PYLE, Yale University

JAMES E. ROTHMAN, Columbia University College of Physicians and Surgeons

LEONA D. SAMSON, Massachusetts Institute of Technology

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ROY L. SILVERSTEIN, Cleveland Clinic Foundation

JANET L. SMITH, University of Michigan

THOMAS A. STEITZ, Yale University

F. WILLIAM STUDIER, Brookhaven National Laboratory

PALMER TAYLOR, University of California, San Diego

PAULA TRAKTMAN, Medical College of Wisconsin

GEORGE C. TSOKOS, Beth Israel Deaconess Medical Center

New Skin Lipids Series in *JLR*

This month, the *Journal of Lipid Research* (*JLR*) is starting a new thematic review series on skin lipids. The series consists of six articles, the first of which appears in the December issue of the journal along with an editorial on skin lipids by Kenneth R. Feingold of the University of California, San Francisco. Feingold is an associate editor for *JLR* and also is a coordinator for the review series. The remaining articles will appear in subsequent issues of *JLR*.

The series starts off with an editorial by Feingold in which he provides an overview of the upcoming thematic reviews. The December *JLR* also contains a review article by Feingold in which he discusses the role of epidermal lipids in permeability barrier function. This barrier, which prevents the loss of water and electrolytes, is comprised of extracellular lipid-enriched membranes that contain ceramides, cholesterol, and free fatty acids.

Next, Diane Thiboutot and colleagues will discuss lipid metabolism in sebaceous glands, which secrete a variety of lipids onto the surface of the skin. They will also review the role of sebaceous gland lipids in skin hydration.

The third article in the series will be by Phillip Wertz and colleagues. They will review the role of skin lipids in preventing infections and show that these lipids, produced by both the epidermis and sebaceous glands, are active participants in the innate immune system.

Peter Elias and colleagues will then review the role of lipids in regulating desquamation, or the shedding of the outer layers of the skin. A number of genetic abnormalities in lipid metabolism have been linked to faulty desquamation and have thus provided useful insights into the role of lipids in regulating cohesion and desquamation in normal skin.

Next, Walter Holleran and colleagues will discuss sphingolipid metabolism in the epidermis. These sphingolipids not only play key roles in the formation of the extracellular lamellar membranes in the stratum corneum that account for the permeability barrier, but they also play an essential role in the formation of the cornified lipid envelope that links the corneocyte with the extracellular lamellar membranes.

In the last article in the series, Matthias Schmuth and colleagues will review the role of peroxisome proliferator-activated receptors (PPARs) and liver X receptors (LXRs) in skin biology. These lipid-activated nuclear hormone receptors are present in the skin and regulate a wide variety of skin functions.

"Together, this series of articles should provide an up-to-date review of cutaneous lipid metabolism," says Feingold. "I am hopeful that the readers will develop a greater appreciation for the key role of lipids in skin biology, and perhaps they will be attracted to applying their expertise to further elucidate the key roles of lipid metabolism in skin biology and disease."

ASBMB Launches AudioPhiles Podcasts

This past November, ASBMB launched AudioPhiles, a monthly podcast featuring research highlights from ASBMB journals. The first podcast contained highlights from the *Journal of Biological Chemistry*, including a spotlight on the breeding of a "Mighty Mouse" by Richard Hanson of Case Western Reserve University Medical School and excerpts from a *JBC* Classic paper by protein chemist Frank W. Putnam. These *JBC* News podcasts will be posted every month and will contain summaries of research appearing in the journal that month.

Future podcasts will also include research highlights from the *Journal of Lipid Research* and *Molecular and Cellular Proteomics*, interviews with prominent biochemists, and Society news items.

The podcasts are intended to present a new way for ASBMB members and journal subscribers to stay informed about research in their fields of study. They can be found on ASBMB's new multimedia Web page at www.faseb.org/asbmb/media/media.asp.

ASBMB will also be posting supplementary video footage on the new multimedia page. These videos will be on subjects that are of interest to researchers in the fields of biochemistry and molecular biology and will complement journal articles and podcasts.

Women in Science Is Focus of Hill Hearings, Legislation

BY ANGELA HVITVED

Issues of women in science and engineering were in the Capitol Hill spotlight this fall, with legislation introduced and a hearing held. September saw the introduction of the "Gender Bias Elimination Act of 2007" (H.R. 3514) by Representative Eddie Bernice Johnson's (D-TX), authorizing $4.4 million to establish workshops aimed at eliminating gender biases in the sciences.

The bill would apply to all of the major federal agencies that fund scientific research, including the National Institutes of Health, Department of Energy, Department of Defense, National Science Foundation, and NASA. A sign-on letter supporting Johnson's initiative is being circulated, and ASBMB has added its name to the list of supporters for this legislation. Stay tuned for more information as the legislative process progresses.

In October, the House Committee on Science and Technology's Subcommittee on Research and Science Education held a hearing entitled "Women in Academic Science and Engineering" to discuss barriers to women seeking science and engineering faculty positions. Committee members heard testimony from Donna Shalala, president, University of Miami; Kathie Olsen, deputy director, National Science Foundation; Freeman Hrabowski, president, University of Maryland, Baltimore County; Myron Campbell, chair of Physics, University of Michigan; and Gretchen Ritter, professor of Government, University of Texas at Austin.

A large focus of the testimony was the 2006 National Academies report "Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering" that was commissioned to bring together information and current statistics on the status of women in science and engineering in academia. Shalala chaired the committee that produced the report and gave a brief summary of the findings. Several on the panel stressed the need for sweeping organizational reforms to tackle the multiple factors that feed into the higher rate of attrition for women in academia; however, all participants agreed that in dealing with issues of subtle biases and climate, there are no quick fixes. A concerted and persistent effort must be made to address the complicated factors, including subconscious gender biases and issues of work and family balance.

Following the House hearing, the Society of Women Engineers (SWE) hosted a luncheon to discuss "The Leaky Science and Engineering Pipeline: How can we retain more women in academia and industry?" Shalala discussed the National Academies report and answered audience questions. Lisa Frehill, the executive director of the Commission on Professionals in Science and Technology, presented an analysis of SWE's national survey of women in engineering, "Retention of Women Engineers in Industry," which gathered information on women's participation in and satisfaction with engineering careers in industry.

In dealing with issues of subtle biases and climate, there are no quick fixes.

Outside the world of policy, a study was published in EMBO Reports, conducted by the Second Task Force on the Status of the National Institutes of Health (NIH) Intramural Women Scientists, summarizing the responses of more than 1,300 intramural postdoctoral fellows at the NIH to a Web-based survey on attitudes and expectations regarding future careers in academic research. The results provided insights into the factors and forces that result in the significant loss of women in the transition from postdoctoral fellow to faculty position.

Researchers posed a variety of questions aimed at better understanding the concerns and priorities of postdoctoral fellows, both women and men. The general issues of work-family balance were prioritized differently between men and women, confirming observations from previous studies. Additionally, gender differences in self-confidence and self-evaluation could provide further avenues of inquiry and potential intervention. However, it remains clear that narrowing the gender gap in academic research will require attention to multiple details, and no single solution will be able to address such a complicated issue.

RESOURCES

To view the text of the "Gender Bias Elimination Act of 2007" go to thomas.loc.gov/ and enter "H.R. 3514" in the search box.

To download the executive summary of the National Academies Report "Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering," go to books.nap.edu/catalog.php?record_id=11741. A full version of the report can also be purchased.

Testimony presented at the House subcommittee hearing can be found on their Web site: science.house.gov/subcommittee/research.aspx.

The report of the survey of intramural NIH postdoctoral fellows can be downloaded from the EMBO Reports Web site (November 2007, **8,**11): www.nature.com/embor/journal/v8/n11/index_ss.html.

Retrospective: **Arthur Kornberg**

Arthur Kornberg, former ASBMB president and Nobel Laureate, passed away on October 26, 2007, at 89 years of age. He was a longtime professor at Stanford University and continued to work in his laboratory until a few days before his death.

Kornberg was born in Brooklyn, New York, in 1918. He received his undergraduate degree from the City College of New York in 1937 and his M.D. from the University of Rochester in 1941. After a year-long internship in internal medicine at Strong Memorial Hospital in Rochester, New York, Kornberg served as a commissioned officer in the U.S. Public Health Service during World War II. He was first assigned to the Navy as a ship's doctor and then as a research scientist in the Nutrition Section of the National Institutes of Health (NIH).

At NIH Kornberg studied vitamin deficiency diseases and established an enzyme research laboratory. He eventually became chief of the Enzyme and Metabolism Section. He resigned from this position in 1953 to assume the chairmanship of the Department of Microbiology of Washington University School of Medicine in St. Louis, Missouri. In 1959, Kornberg moved to California, where he organized the Department of Biochemistry of the Stanford University School of Medicine, serving as its chairman until 1969 and thereafter as professor. He accepted the title of professor emeritus in 1988.

Kornberg's early studies on the mechanisms of the enzymatic synthesis of coenzymes and inorganic pyrophosphate led to his interest in the biosynthesis of nucleic acids, particularly DNA. He elucidated the key steps in the pathways of pyrimidine and purine nucleotide synthesis, including the discovery of 5'-phosphoribosyl-1-pyrophospate (PRPP) as an intermediate. Continuing with experiments on the enzymes that create DNA, Kornberg eventually isolated DNA polymerase I.

Kornberg submitted two papers concerning this seminal discovery to the *Journal of Biological Chemistry* (*JBC*). The first was a description of the purification of DNA polymerase from *Escherichia coli,* and the second was a description of the components necessary for DNA synthesis to occur. These two papers were initially declined by the reviewing editors. Fortunately John Edsall, who had just assumed the position of editor-in-chief of the journal, intervened, and the two papers were accepted. In 1959, one year after the papers were published, Kornberg was awarded the Nobel Prize in Physiology or Medicine with Severo Ochoa "for their discovery of the mechanisms in the biological synthesis of ribonucleic acid and deoxyribonucleic acid"[1].

Since then, Kornberg enjoyed a close relationship with the *JBC* and was even asked to write the first *JBC* Reflection in 2001[2].

In 2006, Kornberg's son Roger was awarded the Nobel Prize in Chemistry for solving the three-dimensional structure of RNA polymerase and creating a detailed picture of transcription in eukaryotes. The Kornbergs are the sixth father and son to both win Nobel Prizes.

In 1967, Kornberg and his colleagues became the first to produce the active inner core of a virus in a laboratory. President Lyndon B. Johnson hailed the report of the feat as "one of the most important stories you ever read" because it "opens a wide door to new discoveries in fighting disease and building healthier lives."

In his academic career, Kornberg served as departmental chairman, on the committees of the Stanford Medical School and Stanford University, and on the advisory boards and councils of numerous universities, governmental, and industrial research institutes. He was a founder of the DNAX Research Institute of Molecular and Cellular Biology (a division of Schering-Plough, Inc.) and a member of its Policy and Scientific Advisory Boards. He served on the Scientific Advisory Boards of Regeneron Pharmaceuticals, Inc., Maxygen, and the XOMA Corp. and was also a member of the Board of Directors of XOMA Corp.

Kornberg was devoted to encouraging the government to support scientists to study science for intellectual progress rather than for potential financial benefits. "Invest in science," he said in an interview with ASBMB. "It is as sound, practical, and essential for our nation's health and industry as the investment we make in the rearing and education of our children."

Among Kornberg's honors are memberships in the National Academy of Sciences, the Royal Society, and the American Philosophical Society; a number of honorary degrees; the Nobel Prize in Physiology or Medicine (1959); the National Medal of Science (1979); the Cosmos Club Award (1995); and the Gairdner Award.

We extend our sympathy and thoughts to Kornberg's friends and family. To the right, as a tribute, we offer thoughts and reflections from several of Kornberg's friends and former colleagues:

(1918–2007)

PHOTO CREDIT: JAMIE KRIPKE PHOTOGRAPHY

Although we were graduate students with Bob Lehman and Roger Kornberg, since our time at Stanford Arthur has been a generous mentor and a friend. He helped to shape our scientific careers, first by adding his encouragement to Roger's to begin and work together on the RNA polymerase II transcription project we collaborate on to this day and then by convincing DNAX to provide us lab space in which to do so. From him, and further amplified by Bob and Roger, came the belief that there is no such thing as a boring enzyme and that ultimately the best and most elegant route to understanding biological mechanisms is through fractionation, resolution, and purification of the enzymes and proteins involved and reconstitution and analysis of the process in a test tube. We are deeply grateful to have had the chance to have Arthur as a friend and a mentor, and we will cherish his memory always.

— Ron and Joan Conaway, *investigators, Stowers Institute for Medical Research*

I view the days I spent in the mid-1950s working with Kornberg in the Department of Microbiology on the fourth floor of the old Clinic Building at Washington University to be among the most thrilling and enjoyable of my scientific career. There were new and unexpected findings being made virtually every day, and all of us in our small group shared in the joy and excitement of those discoveries. I feel terribly fortunate to have been part of that extraordinary moment in time.

— I. Robert Lehman, *William Hume Professor Emeritus, Stanford University School of Medicine*

Arthur's loss is so painful to me; it is difficult to cope with. I had known Arthur for more than 50 years. He was partially responsible for my accepting a position in the Biological Sciences Department at Stanford. While I was considering this invitation I learned that Arthur was moving his department to Stanford Medical School, and this convinced me that Stanford desired to become an outstanding research institution. Arthur was an exceptional scientist. He had very high personal standards and believed that basic research was extremely important and that it would lead to many medical applications. He was a thorough believer in enzymology. He recognized that other areas of research were important but, for him, understanding how specific enzymes act was his major goal. Arthur was my idol; I will always miss him.

— Charley Yanofsky, *professor emeritus, Stanford University*

I came to Stanford as an assistant professor in the Biology Department in 1971, and I met Arthur then but only briefly. A few years later, I learned that he had nominated me for membership in the American Society of Biological Chemists. This was an important advance in my young career, to be recognized by one of the legends of biochemistry as having some promise. More importantly, it is the small things that are the measure of the person, and Arthur went out of his way to do this small thing for me. He was a tireless and unrelenting advocate for basic biomedical science and the important role that the NIH plays.

— Robert D. Simoni, *professor and chairman, Department of Biological Sciences, Stanford University*

Arthur was not only a great scientist but also a terrific colleague and a close friend to so many of us. My own association with him began 64 years ago when we worked together at NIH and has continued over the intervening years. While his scientific contributions are legendary, he had a tremendous influence on all of his associates, including me, as well as on all of his students. Indeed, he did much to shape the course of biochemistry over the past six decades, in part by insisting on the importance of careful laboratory research and basic enzymology in solving biological problems. We will all miss him.

— Herbert Tabor, *Pharmacology Section, chief, Laboratory of Biochemistry and Genetics, NIDDK, National Institutes of Health*

FOOTNOTE

More information on Kornberg's research can be found in his *Journal of Biological Chemistry* Classics article (1), and video interview with Kornberg in honor of ASBMB's Centennial Celebration can be seen at http://www.faseb.org/asbmb/media/media2.asp.

REFERENCES

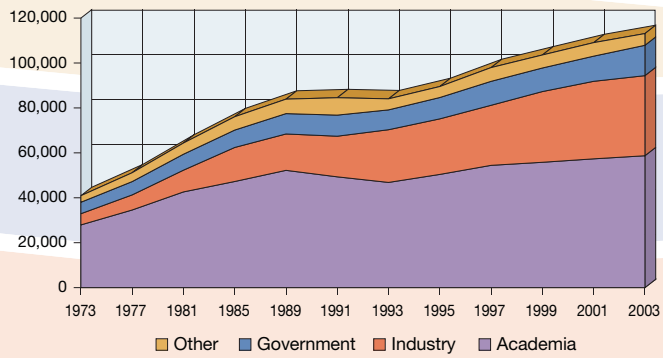
1 Kresge, N., Simoni, R. D., and Hill, R. L. (2005) Arthur Kornberg's Discovery of DNA Polymerase I. *J. Biol. Chem.* **280,** e46.

2 Kornberg, A. (2001) Remembering Our Teachers. *J. Biol. Chem.* **276,** 3-11.

Trends in Employment & Awards

These graphs complete our feature on the data compiled by Howard Garrison and Kimberly McGuire of FASEB's Office of Public Affairs. The graphs represent trends in Ph.D. employment and grant awards. The full set of data from FASEB's Office of Public Affairs can be found at opa.faseb.org/pages/PolicyIssues/training_datappt.htm.

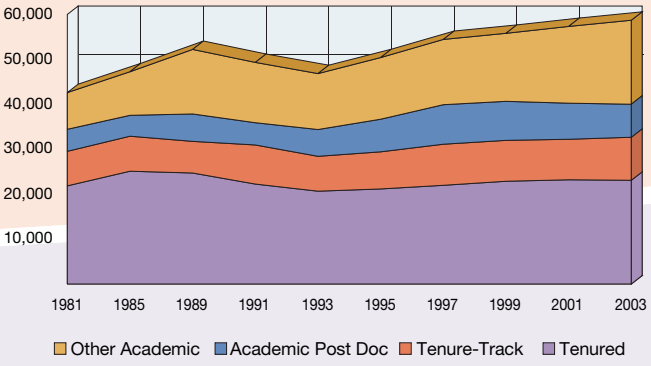
Biomedical Science Ph.D. Employment



Since 1973, the majority of scientists who earned biomedical Ph.D.s have gone into academia. However, over the years, the number of Ph.D.s entering non-academic careers has increased dramatically and is now almost equal to those employed on academia.

SOURCE: THE NATIONAL SCIENCE FOUNDATION (WWW.NSF.GOV/STATISTICS/SESTAT/).

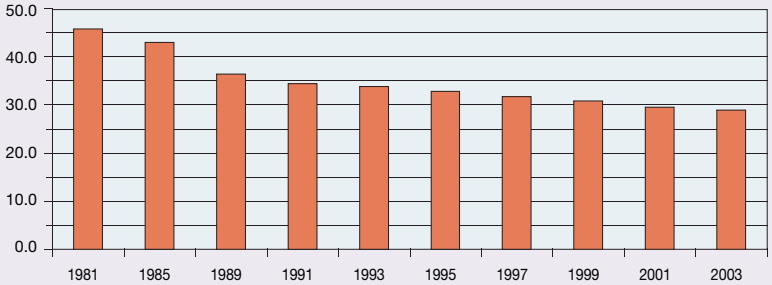
Academically Employed Biomedical Ph.D.s by Tenure Status



Since 1981, the percentage of Ph.D.s in tenured, tenure track, and academic post-doctoral positions has remained somewhat constant. However, over the same period, the number of Ph.D.s employed in other academic positions has doubled.

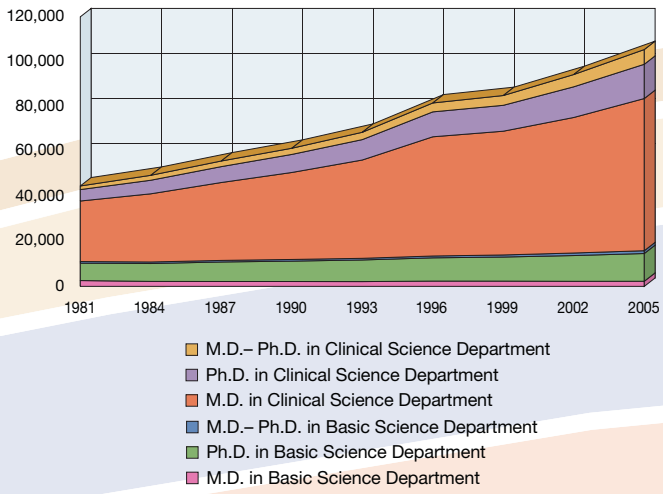
SOURCE: THE NATIONAL SCIENCE FOUNDATION (WWW.NSF.GOV/STATISTICS/SESTAT/).

Percentage of U.S. Biomedical Science Ph.D.s Holding Tenured or Tenure-Track Positions



The percentage of biomedical science Ph.D.s holding tenure or tenure-track positions has declined steadily since 1981. In 1981, 45.8% of Ph.D.s held these positions. By 2003 the number decreased to 28.9%.

Medical School Faculty Members by Degree and Department Type



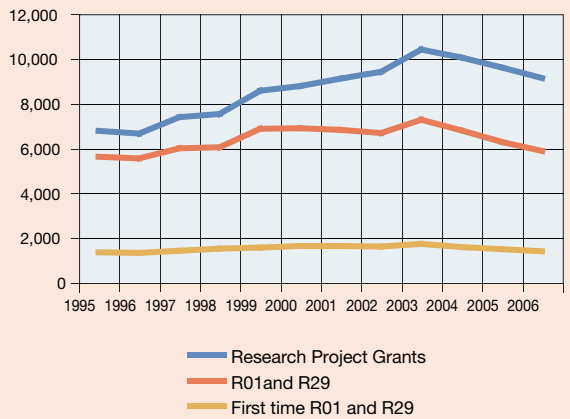
The overall number of M.D.s and Ph.D.s employed in medical schools has more than doubled in the past 20 years. The majority of these continue to be M.D.s employed in clinical departments. However, the number of Ph.D.s and M.D.-Ph.D.s in clinical departments has also seen a significant increase.

SOURCE: ASSOCIATION OF AMERICAN MEDICAL COLLEGES (WWW.AAMC.ORG/DATA/FACULTYROSTER/REPORTS.HTM).

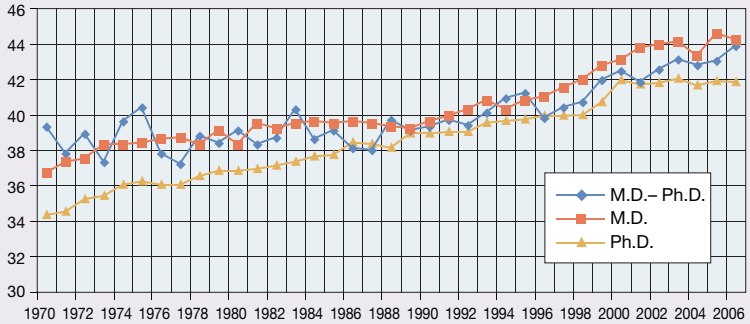
Number of NIH Research Project Awards Granted

Although the number of National Institutes of Health (NIH) research project grants awarded has increased since 1995, the number of R01 and R29 grants awarded has remained the same.

SOURCE: NATIONAL INSTITUTES OF HEALTH (GRANTS1.NIH.GOV/GRANTS/AWARD/AWARD.HTM).



Average Age of First Time R01/R29 Awardees



For Ph.D.s, the average age of first time R01 awardees has increased from 34.3 years in 1970 to 41.8 years in 2006. Similarly, the average age has increased from 36.7 to 44.2 years for M.D.s and 39.3 to 43.9 years for M.D.-Ph.D.s.

SOURCE: NATIONAL INSTITUTES OF HEALTH (GRANTS1.NIH.GOV/GRANTS/AWARD/AWARD.HTM).

The 2008 FASEB Excellence in Science Award: **Mina J. Bissell**


Bissell

Mina J. Bissell, distinguished scientist, Life Sciences Division, Lawrence Berkeley National Laboratory, has been selected to receive the FASEB Excellence in Science Award at the 2008 ASBMB Annual Meeting. Bissell is a world-renowned leader in the role of extracellular matrix and microenvironment in regulation of tissue-specific function with special emphasis in breast cancer, an area in which she has changed some established paradigms. She will present her award lecture in San Diego, California, on Tuesday, April 8, at 8:30 am.

Bissell grew up in Iran and was ranked among the top of the country's high school students when she graduated from high school. She won a scholarship to attend an American college and chose Bryn Mawr College. After her sophomore year, she transferred to Harvard/Radcliffe College and earned an A.B. with honors in chemistry in 1963. She then went on to earn a Ph.D. in bacterial genetics at Harvard University, where she was one of only three women in a class of 200. Her doctoral thesis proposed the unconventional idea that enzymes fold into their final form only after they are secreted by the cell—a model that has since been proven correct.

Bissell graduated in 1969 and was a Milton Fellow at Harvard for the next year. In 1970, she left Harvard and became an American Cancer Society Fellow in the Department of Molecular Biology at the University of California, Berkeley. There, she started studying the cells of higher organisms. She joined the Lawrence Berkeley National Laboratory in 1972 and has remained there since. Bissell became a senior scientist in 1977, the director of Cell & Molecular Biology in 1988, and was appointed director of all of Life Sciences in 1992.

It was at the Lawrence Berkeley National Laboratory that Bissell began her groundbreaking work on cancer. At that time, cancer was thought to arise when one or two genes in a cell acquire mutations that trigger uncontrollable proliferation. The meshwork of proteins and other molecules surrounding the cells, known as the extracellular matrix, were thought to serve as a passive scaffold.

Bissell began to question the role of the extracellular matrix in cancer. Using breast cells, she and her collaborators showed that normal and cancerous breast cells were indistinguishable when grown in culture without extracellular matrix, but when extracellular matrix was added, both cell types changed their behavior. The normal cells became organized, stopped growing, and differentiated, while the cancerous cells grew rapidly into a tumorous mass.

These experiments convinced Bissell that the extracellular matrix sends signals to breast cells that alter their gene activity and led her to propose a new model of breast tumorigenesis. She suggested that a normal cell becomes cancerous through a multistep process, involving both genetic changes within the cell and signals from the extracellular matrix.

When Bissell went public with the idea that the tissue surrounding a cancer cell is just as important in shaping its behavior as the genes inside it, she met with serious opposition from the cancer research community. A quarter-century later, that view has changed. Thanks to studies in Bissell's lab and others, the extracellular matrix is now widely recognized as an important source of signals that regulate the changes in gene expression and cell division, survival, shape, and movement that control tumor progression.

Bissell's long-term goal is to develop a more realistic three-dimensional model of breast cancer that mimics its normal situation and can be used to study cancer pathogenesis and test anticancer drugs.

Bissell was selected to receive the FASEB Excellence in Science Award for her scientific leadership at the intersection among the cellular microenvironmental, the extracellular matrix, and the three-dimensional tissue structure in differentiation and cancer. The selection committee was particularly struck by the fact that at first Bissell's ideas were not well accepted but that she bravely persevered and that ultimately her work resulted in a special initiative from the National Cancer Institute, with a new study section established to focus on this bold new paradigm.

The FASEB Excellence in Science Award is sponsored by Eli Lilly and Company and recognizes outstanding achievement by women in the biological sciences. The award is open to members of all the societies of FASEB; Bissell is a member of ASBMB. Past winners include Frances Arnold, Marilyn Farquhar, and Elaine Fuchs.

The 2008 Avanti Award in Lipids: **Alexandra C. Newton**


Newton

Alexandra C. Newton, professor of pharmacology at the University of California in San Diego (UCSD), will be presented with the Avanti Award in Lipids at the 2008 ASBMB Annual Meeting. Newton has worked for over two decades on molecular aspects of lipid signaling and as a result has been able to elucidate the molecular controls that regulate the function of protein kinase C (PKC). She will present her award lecture in San Diego, California, on Monday, April 7, at 8:30 am.

"Alexandra's work can be characterized as elegant and meticulously designed experiments which provide novel insights into difficult and important biological questions. Her most significant contributions focus on discoveries which have led to a greater understanding of the role protein kinase C plays in lipid research," says Jack E. Dixon, dean of Scientific Affairs at UCSD and vice president and chief scientific officer at the Howard Hughes Medical Institute.

Newton entered the field of protein kinase C (PKC) research in the late 1980s as a postdoctoral fellow at the University of California, Berkeley, with Daniel Koshland, Jr. There, Newton studied how lipids control the activity of PKC and discovered that the enzyme phosphorylates itself.

In 1988, after setting up her own laboratory at Indiana University in Bloomington, Newton began to investigate PKC activation. She showed that when calcium ions are released in the cell they bind to PKC and allow it to tether to the cell membrane. The membrane-bound PKC then moves along the membrane and binds to diacylglycerol. This induces a change in PKC's internal conformation that releases a pseudosubstrate, freeing the active site and allowing PKC to phosphorylate other proteins.

By the mid 1990s, when Newton joined the faculty of UCSD, she and her colleagues had shown that PKC needs to be sequentially phosphorylated on three different sites before it can bind to the cell membrane. Consequently, she was one of the first investigators to recognize that phosphorylation of PKC by phosphoinositide-dependent protein kinase 1 (PDK1) triggers PKC autophosphorylation at the two remaining sites. This led to a series of prominent papers that defined molecular components of the PKC activation pathway.

Newton performed several follow up studies that utilized live cell imaging of PKC activity with novel reporters to more precisely define the PKC activation pathway in a cellular context. This work showed when, where, and for how long PKC is active in the cell and revealed for the first time where PKC's activity was sustained and where it was rapidly turned off.

More recently, Newton has focused on the cellular mechanisms that terminate PKC signaling. She has discovered two novel proteins: a Pleckstrin homology (PH) domain-containing phosphatase called PHLPP that dephosphorylates a key site in the enzyme and an E3 ligase named RINCK that targets PKC for down regulation via proteosomal degradation. Newton later found that PHLPP appears to function as a tumor suppressor in the same manner as the lipid phosphatase PTEN, by terminating Akt signaling.

"As a contemporary of Alexandra's, I can state categorically that, from my perspective, Alexandra has contributed more than any other single investigator to the advancement of our understanding of how protein kinase C is processed from a newly synthesized polypeptide into a functionally competent, calcium-dependent, lipid-regulated protein kinase, how PKC interacts with specific lipid co-factors at bilayer membranes to become activated, and how catalytic activity and processing is regulated by lipids and by autophosphorylation and phosphorylation by upstream kinases," says Alan P. Fields, professor and chair of the Department of Cancer Biology and director of Cancer Basic Science at the Mayo Clinic Comprehensive Cancer Center. "Any one of the contributions mentioned above would make for a respectable and productive career, but to have all of these areas of PKC research led and so heavily influenced by one investigator is truly impressive. In reflecting on Alexandra's work over the past 15 years, perhaps what is most distinctive is the breadth of approaches, growth in conceptual design and sophistication over time, and the unwavering high quality of her scientific contributions."

Newton is also committed to biomedical service and education. She is director of the Biomedical Sciences Graduate program at UCSD and a former member of the ASBMB council. She has organized several scientific meetings and has been co-chair of two past ASBMB meetings.

The Future of Minority-targeted Programs and Groups

BY THOMAS LANDEFELD

The establishment of Minority Affairs Committees (MACs) within organizations (such as national scientific societies like ASBMB) and as part of agencies, institutions, and other groups is designed to address the under-representation of minorities within each entity. Similarly, federal agencies, for example, have established programs that provide funds specifically to address this problem faced by academia as well as general society. Many of these were initially referred to as Affirmative Action Programs and, although there was certainly resistance to the existence of these programs, they were generally accepted and did work to address the problem. In fact, non-minority women made significant gains as a result of these programs.

Much of the resistance to these programs related to the fact that the issue of "race" was being addressed (and I hate using that term since it is totally a social construct that has no biological basis!). Despite the challenges, the programs have continued for many years and, although they certainly have not solved the problem, they have been effective in at least addressing it. Interestingly, at the same time these programs were challenged, one did not see challenges in academia to other preferential programs such as the legacy rule or preferences afforded athletes, musicians, and individuals representing other talented specialties. In fact, even today very few challenges exist against these preferential programs.

Conversely, in recent years, groups such as the Center for Equal Opportunity, the American Civil Rights Coalition, and the Center for Individual Rights have led a national assault on "race-based programs" at all levels, including specific institutions, federal agencies and, most importantly, state initiatives. Examples of the latter include Proposition 209 in California in 1996, similar efforts in Washington State and, most recently, Proposition 2 in Michigan. As a result of the passage of these initiatives, ethnicity cannot be considered in decisions on admissions and hiring. These efforts and other similar efforts such as the Hopwood decision in Texas have had devastating effects on minority enrollment, particularly in the professional schools in California and Texas, two states where "the minority is now the majority." Similarly, they severely hamper efforts to diversify the faculty ranks because institutions are afraid to challenge them legally. As these efforts continue nationwide, with the groups now identifying five more states, and when coupled with blatant racist actions such as the display of nooses nationwide, we, as academicians, scientists, and members of society in general should be concerned about the future of the United States, especially considering the changing demographics of the country.

...efforts can indeed generate results when the commitment to address the problem is there.

What does this have to do with ASBMB? As mentioned, the MACs of the various scientific societies were established to address the under-representation of minorities in the sciences, and in particular, the individual scientific societies, ASBMB of course, being one of those. Although it is a tough issue to address as an organization, these scientific societies do represent a significant gathering of the professionals in science from around the world and, in particular, in the United States. Thus, efforts can indeed generate results when the commitment to address the problem is there. Also, at this point, the groups attacking these programs have not yet identified scientific societies as targets, perhaps because monies for the societies are not tied the same way as they are to institutions and agencies. Regardless of the reason, MACs, such as the ASBMB MAC, must play a proactive role with its membership, with its legislative liaisons, and with any other networks to offset the actions by these groups. Despite what these groups are saying, the playing field is far from level in this arena, based on any of the statistics. As a result,

the workforce in 2050 cannot truly represent the "face of society" and cannot adequately address the issues that will be most important to science and society. An excellent example of such a critically important issue is that of minority health disparities. In fact, this issue represents a national crisis when one considers such diseases/disorders as diabetes, HIV/AIDS, breast and prostate cancer, hypertension, infant mortality that are disproportionately higher in minority populations.

For these reasons and others, the ASBMB MAC, with support of both the constituency and the governing body of ASBMB, must prioritize the role that the organization plays in making a difference in educating, providing positive exposure for, and supporting minority scientists. How can this be accomplished? It can be a simple as providing information about the activities and the data through magazine articles such as this one to much more complicated efforts, often spearheaded by MAC but with support of the ASBMB governance, such as increasing efforts to increase minority membership; increasing the numbers of minorities speaking, and chairing sessions at national meetings; electing minorities in leadership roles within the society; and proactively advocating to legislators about these issues. Currently, MAC is accomplishing some of this in that: 1) there are now four sessions sponsored by MAC at the ASBMB annual meeting, including one dealing with "minority issues" but also three others addressing scientific aspects related to health disparities, 2) ASBMB exhibits and recruits at several minority conferences each year, 3) the ASBMB MAC is participating with the MACs of other societies as part of a "SuperMac" group that will be more visible and more vocal than the MACs from individuals societies, and 4) ASBMB provides minority student presentation awards at the annual meeting as well as at a major minority conference. There are other ways that ASBMB can effect a change, including outreach efforts in grades K-12 including programs for teachers and mentoring of students, but this can only happen with continued and expanded support from the ASBMB leadership.

Although ASBMB has not assumed a leadership role in this area among the scientific societies, it is now time to become the leader, especially in light of the direction that the country, and therefore the scientific community, is headed in the future. Being the leading scientific society in the area of biochemistry and molecular biology can only be made better by becoming also a leader in efforts towards increasing the diversity of our profession.

How I Got into Fundraising

BY SARA ROCKWELL MUNRO

It never fails. When someone finds out that I am now the director of Development and Community Relations for the YMCA but was once a molecular biologist he or she asks, "How did you get into fundraising?" Even now, I find it hard to believe until the follow-up question is asked, "How did you leave science behind?" The answer is, "I haven't entirely."

I have always been captivated by science. From the time I could walk (and my parents would let me), I explored tide pools... and I still do. I remember the glorious day my older sister gave me her mini-microscope. I immediately covered slides with salt, sand, grass, and anything else that was flat enough to squeeze under the lens.

Leaving science was the most difficult professional decision I have ever made. My plan since junior high school was to grow up to be a developmental geneticist. I doubled up math courses in high school so that I would have a head start in college. As an undergraduate, I chose technique courses and a senior research project to prepare for graduate school.

I worked as a research assistant for three years while I considered graduate programs. My favorite part of this work was testing new protocols, troubleshooting problems, and teaching graduate students. I was disheartened to see how little time my bosses spent at the bench. I was also frustrated by repeating experiments for several weeks or months. I knew I did not have the discipline to continue through grad school and postdoc years. I discovered that I wanted to work with scientists but not necessarily be one.

With a new career plan in hand, I changed my grad school search to public health and public administration programs to earn credentials for medical or research management. I chose public administration for two reasons: most research facilities were public entities; and the courses were far more diverse and applicable to managing people and policies.

After a detour at a public policy center, I found my way into health care administration in a most peculiar way. I volunteered to plan an event for our local community health center. A position in the fundraising and public relations department was open, and the department head thought I would be perfect for the job despite my limited fundraising experience. She was right. This was a perfect combination of my past experience and surrounded me with science-oriented people.

At first, I was intimidated by the fundraising aspects of the work. Like most people I thought, "I could never ask people for money," until I realized the essential truth of fundraising: it gives people a chance to make a difference. Donors connect to an organization for a variety of reasons, of which the greatest is belief in the mission and purpose. Most cannot do the work themselves; however they show their support in ways such as volunteering on a board, organizing an event, or writing a check. In other words, things the benefiting organization can't do themselves. This is summed up in an old fundraising saying: "giving time, talent, or treasure." As an active volunteer and modest donor, this philosophy resonates with me and sustains my work.

Sara Munro

Sara Munro received her B.S. in Zoology and Master of Public Administration from The University of Vermont. She spent three years in cell and molecular biology research at the Veterans Administration Hospital in White River Junction, Vermont, and Dartmouth Medical School before graduate school. She was the program director for The Vermont Leadership Institute and community building and policy programs at The Snelling Center for Government. She returned to medicine via the Community Relations and Development Department at The Community Health Center of Burlington, Vermont. She is now the director of Development and Community Relations at the Greater Burlington YMCA and an active volunteer in her community.

That said, it is not always easy. However I am very selective about my workplace. First and foremost, I only work for organizations that I donate

to myself and that I am passionate about. With community health, I am personally offended that people do not have access to quality care. At the YMCA I believe that everyone deserves a place to grow, learn, and play. My job is to share this passion with others and give them the opportunity to contribute as well.

Grant writing is a time where I use my science background a great deal. Researching, program planning, and outcome measures are part of any grant, whether it is a National Institutes of Health (NIH) research grant or small foundation support for a child care program. My experience organizing figures, writing captions, and citing sources allows me to move through the process more quickly than my peers. Making the leap to a YMCA seems like a move away from my goal of working with scientists, yet this is an exciting time as child care and fitness initiatives gain national attention. Many opportunities are available to work with Centers for Disease Control and state grants that demand more research and medical applications than private donors and foundations.

I often overlook how much I use my knowledge of science in the community relations aspects of my work. I am responsible for ensuring that the average client understands the technical aspects of a program. For example I have translated technical terms for dental procedures, medical tests, and even fitness equipment. My ability to "talk science" often comes up when I am preparing a reporter for a story, speaking to a donor about new health topics, questioning statistics in a report, and even explaining why a household refrigerator fails for proper vaccine storage. When someone finds out how I know these things, they then ask, "How did you get into fundraising?"

I miss the thrill of discovery and challenge of unraveling an experiment gone awry—un-jamming a copier just doesn't have the same rush. I still subscribe to NIH alerts and Medscape newsletters. I keep my science career on my resume along with my publications and presentations, which are now outnumbered by other topics. Science will always be part of who I am and will support what I do. It is the foundation of my career that has enabled me to make bold choices to discover a wonderful world of possibility beyond the bench.

Recommended Departmental Practices: Giving Postdocs Order

BY J. MICHAEL AUTRY

Postdoctoral scholars are essential contributors to research by academic departments. The National Institutes of Health and the National Science Foundation define the postdoctoral appointment as a "temporary and defined period of mentored advanced training to enhance the professional skills and research independence"[1]. Unfortunately, there are few published guidelines for departmental practices on postdoctoral training. The recent Sigma Xi postdoc survey found that a structured training environment increases the rate of postdoc publication. This article recommends that academic departments play a larger role in postdoctoral oversight and proposes new programs for postdoctoral training at the department level.

The Sigma Xi Postdoc Survey: Key Insights on Research Productivity

In 2004, the Sigma Xi Research Society conducted a survey of 7,600 postdocs at 46 research institutions, covering about 15% of the postdoc population in the U.S. (postdoc.sigmaxi.org/). The Sigma Xi survey included questions on many factors of the postdoctoral experience, including training practices, postdoc demographics, institutional benefits, and research productivity. The survey report, "*Doctors Without Orders: Highlights of the Sigma Xi Postdoc Survey*," identified a strong positive correlation between postdoctoral oversight and research productivity; that is, postdocs who report a highly structured training environment publish 40% more papers on average than postdocs who report a lack of structure[2]. Thus, the postdoc survey data suggest that academic departments are in a unique position to increase postdoctoral research productivity by providing additional department oversight. For instance, departments could increase efforts at promoting faculty mentoring, offering advanced training workshops, and efficiently managing postdoctoral appointments.

What Is the Department Role in Postdoctoral Training?

There are few, if any, recommendations on department practices in postdoctoral training reports from the Association of American Universities[3], the National Research Council[4], and the National Postdoctoral Association[5]. Clearly, academic departments are effective agents at facilitating institutional research, and postdocs benefit greatly from department resources, including faculty experience, staff support, and administrative leadership. The most important departmental link is the principal investigator (PI), who supervises postdoc activities with support from administrative staff and lab personnel. Other faculty members in the department add scientific guidance to supplement PI leadership, whereas other postdocs in the department constitute a scholarly network of research colleagues. Department chairs further enhance the postdoctoral experience by setting policies, both written and unwritten, that positively influence department culture and mentor mindset. Institution-wide postdoctoral offices, on the other hand, lack the means to offer discipline-specific training but play a large role in providing professional development resources for the varied postdoc population. Thus, academic departments should collaborate with central postdoctoral offices to provide specialized training and professional skills for postdocs.

One Potential Model for Departmental Practices

In 2002, the Department of Biochemistry, Molecular Biology, and Biophysics (BMBB) at the University of Minnesota appointed a director of Postdoctoral Affairs to coordinate the training of 50+ department "postdocs," which include postdoctoral fellows, research associates, and research assistant professors. The BMBB postdoc director and department head work together with postdocs to provide training programs aimed at research productivity and career development. The BMBB postdoc director is responsible for tracking postdoc progress, serving as faculty liaison, and helping with the annual postdoc retreat. In addition, the BMBB department head provides dedicated career resources for department postdocs, such as faculty mentored teaching opportunities, lunch/evaluation of faculty candidates, and a weekly newsletter with external job listings. To promote scientific productivity, BMBB offers postdoctoral research prizes, including Barnum Travel Awards, the Jenness Award for Metabolic/Microbial Research, and the Boyer-Peter Award for Research Excellence, which includes an invitation to speak in the department seminar series. As such, the BMBB postdoc

director and department head work together to provide structured oversight aimed at enhancing postdoc productivity and career development.

Expanded Avenues of Department Oversight and Formal Training

At institutions lacking a postdoctoral office with central policies, departments should consider implementing a postdoc training curriculum that includes a standardized appointment letter, individual development plan, annual performance review, and mandatory exit survey. Home departments should also consider offering postdocs the following training resources: 1) orientation guide with department facilities and faculty expertise, 2) annual recruiting day and training retreat, 3) postdoc discussion club and research-in-progress series, 4) instructional workshops on research skills and lab management, 5) social occasions to foster interdisciplinary collaboration between internal divisions and associated departments, 6) postdoc alumni network to aid with disciplinary advice and job placement, 7) guest speakers on alternative career options, 8) practice chalk talks and formal seminars to prepare postdocs for job interviews, and 9) mentoring resources to educate faculty advisors. Addition of these departmental resources will act to enhance postdoctoral training, productivity, and satisfaction.

Positive Outcomes Justify Improved Benefits for Postdocs

The Sigma Xi postdoc survey, "*Doctors Without Orders*," indicates a driving incentive for national research reform: enhancing the postdoctoral experience will increase the productivity of academic research departments and the U.S. scientific enterprise. Additional data on training programs may provide new insights into postdoc productivity and department efficiency. Objective measures for individual departments might include postdoc-based metrics on publishing rates, sponsored funding, and training participation, correlated over time with career outcomes from postdoc exit surveys. Positive measures of success will enable host institutions and funding organizations to further improve the postdoctoral experience.

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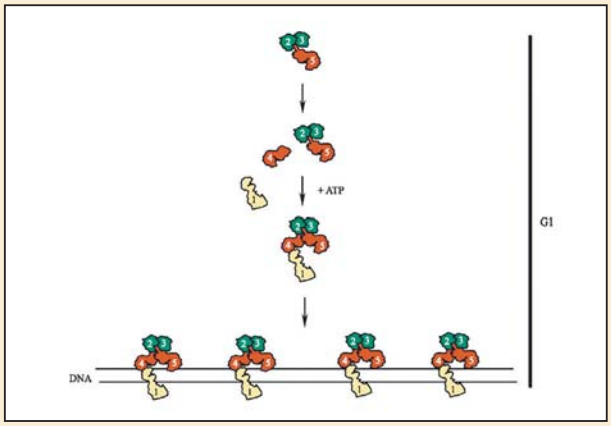
The Biochemistry of Eukaryotic DNA Replication

The origin recognition complex (ORC) was initially discovered in budding yeast extracts as a protein complex that binds to the autonomously replicating sequence (ARS) to initiate DNA replication. Human homologues of the six ORC subunits have been identified and have been shown to play an important role in eukaryotic DNA replication as well. In this *JBC* paper, the authors examined the biochemical reactions required for the formation of this complex in eukaryotes. They reconstituted the human ORC using a baculovirus expression system and showed that ATP is essential for human ORC assembly *in vitro*. They also examined complex formation, the role of ATP binding in complex assembly, and the association of the subunits across the cell cycle. From their results, they suggest that the assembly and disassembly of ORC in human cells is uniquely regulated and may contribute to restricting DNA replication to once in every cell division cycle.



The ORC complex is assembled in an ATP-dependent manner during G1

ATP-dependent Assembly of the Human Origin Recognition Complex

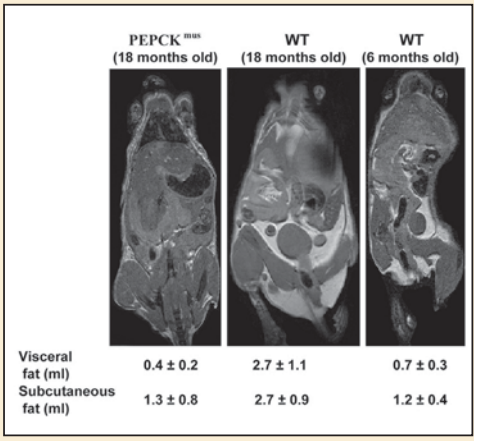
Khalid Siddiqui and Bruce Stillman

J. Biol. Chem. 2007 **282,** 32370-32383

jbc

Mighty Mouse

Phosphoenolpyruvate carboxykinase (PEPCK-C) is an enzyme that is involved in gluconeogenesis in the liver and kidney cortex and in glyceroneogenesis in the liver and white and brown adipose tissue. The enzyme is also present in a wide variety of other tissues however, its function in these tissues remains unclear. In this *JBC* paper, the authors overexpressed the gene for PEPCK-C in the skeletal muscle of mice and found that the transgenic mice were 7 times more active than control mice. This greatly enhanced exercise capacity was accompanied by a large increase in mitochondria and triglyceride content in the skeletal muscle. The transgenics were long-lived and retained their enhanced exercise capacity, as well as their fecundity, into murine old age. The mice overexpressing the gene for PEPCK-C also had very little body fat, despite eating 60% more than control mice. The authors conclude that overexpression of PEPCK-C repatterns energy metabolism and leads to greater longevity.



PEPCK-C^{mus} mice contain less body fat than wild-type mice

Overexpression of the Cytosolic Form of Phosphoenolpyruvate Carboxykinase (GTP) in Skeletal Muscle Repatterns Energy Metabolism in the Mouse

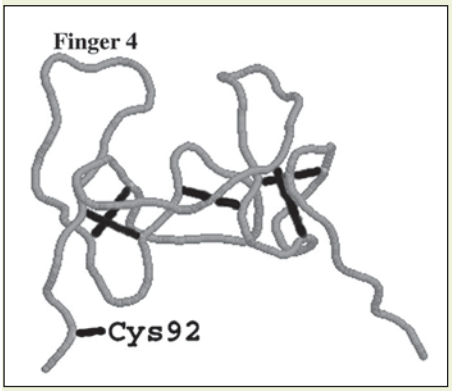
Parvin Hakimi, Jianqi Yang, Gemma Casadesus, Duna Massillon, Fatima Tolentino-Silva, Colleen K. Nye, Marco E. Cabrera, David R. Hagen, Christopher B. Utter, Yacoub Baghdy, David H. Johnson, David L. Wilson, John P. Kirwan, Satish C. Kalhan, and Richard W. Hanson

J. Biol. Chem. 2007 **282,** 32844-32855

jbc

A Diabetes Polymorphism

Pancreatic colipase plays a central role in dietary fat digestion. Recent studies have shown that a polymorphism resulting in a cysteine for arginine substitution at position 92 in the gene encoding procolipase is associated with type 2 diabetes. The authors of this *JLR* paper hypothesized that this polymorphism might affect lipid metabolism through alterations in the function or stability of the protein. To test their hypothesis, they expressed recombinant cysteine 92 (Cys92) procolipase in yeast and compared the function and stability of purified Cys92 with that of the more common arginine 92 (Arg92) procolipase. Cys92 fully restored the activity of bile-salt inhibited lipase with short- and medium-chain triglycerides but only had 50% of Arg92 function with long-chain triglycerides. After storage at 4°C, Cys92 lost the ability to restore pancreatic triglyceride lipase activity with medium- and long-chain triglycerides. The loss of function correlated with the inability of Cys92 to anchor lipase on an emulsion surface and oxidation of the cysteine. These findings demonstrate that the Arg92Cys polymorphism decreases the function of Cys92 colipase.



Schematic representation of the structure of human colipase.

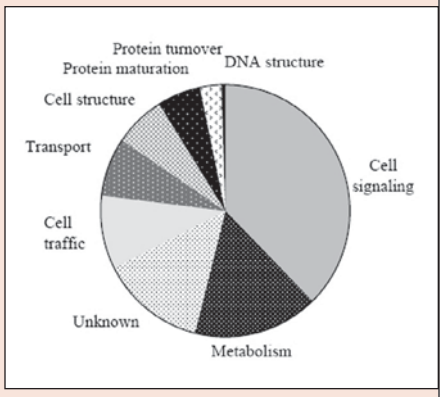
A Polymorphism in the Gene Encoding Procolipase Produces a Colipase, Arg92Cys, with Decreased Function Against Long-chain Triglycerides

Sheryl D'Silva, Xunjun Xiao, and Mark E. Lowe

J. Lipid Res. 2007 **48,** 2478-2484

The Plasma Membrane Proteome

The plasma membrane is a semipermeable lipid bilayer that surrounds all cells. Because it is in direct contact with the extracellular environment, it serves a variety of functions and thus contains a wide variety of biological molecules including transport proteins, receptor proteins and also proteins involved in signaling or cellular traffic. In this *MCP* paper, the authors report on their investigation of the plant plasma membrane proteome of *Arabidopsis thaliana.* They washed a highly purified plasma membrane fraction with NaCl and Na_2CO_3 salts and analyzed the insoluble fractions by nanoLC-MS/MS. They were able to identify 450 proteins, 65% of which had never been reported in other plant plasma membrane proteomics investigations. Half of the identified proteins were predicted to display transmembrane domains and/or to be anchored to the membrane. A fine analysis showed that the majority of proteins were signaling proteins and that 16% were lipid-modified.



Functional categories in the whole plasma membrane proteome.

A High Content in Lipid-modified Peripheral Proteins and Integral Receptor Kinases Features the Arabidopsis Plasma Membrane Proteome

Anne Marmagne, Myriam Ferro, Thierry Meinnel, Christophe Bruley, Lauriane Kuhn, Jérome Garin, Hélène Barbier-Brygoo, and Geneviève Ephritikhine

Mol. Cell. Proteomics 2007 **6,** 1980-1996

John Dietschy: Understanding Cholesterol Metabolism

BY PAT PAGES

Understanding how cholesterol works in the body has been the subject of intense research over the past century. Scientists have painstakingly studied how cholesterol is metabolized in both cultured cells and various animals and showed that this fat-like substance is produced not only by the liver—as originally thought—but by every organ. These studies have also shown that cholesterol is part of an intricate set of biochemical pathways that define a cycle among the organs.

One of the scientists who is at the forefront of these discoveries is John Dietschy, The H. Ben and Isabelle T. Decherd Chair in Internal Medicine in Honor of Henry M. Winans, Sr., M.D., at the University of Texas (UT) Southwestern Medical Center at Dallas. He was among the first scientists who made precise measurements of the amount of cholesterol entering and leaving the body; then he and his colleagues elucidated how cholesterol was made in various organs and later provided a comprehensive description of how cholesterol is regulated among these organs.

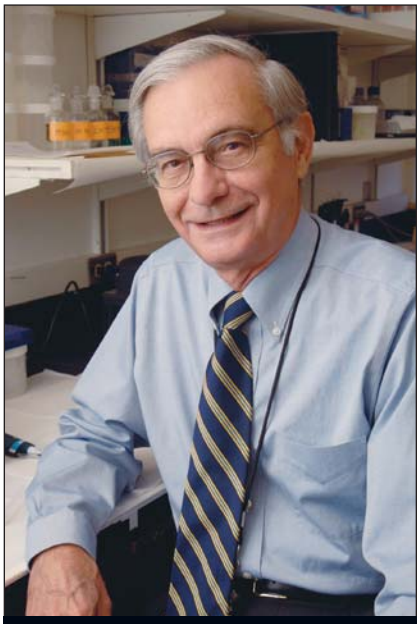
"Cholesterol is now a household name, but this was not the case 50 years ago," Dietschy says. "Back then, we knew only very little about cholesterol, but then scientists started developing techniques to measure how sterol was made, absorbed, and degraded in animals, which provided the first details of what was happening at the organ level and later at the cellular level. Today, research on cholesterol is providing so many results that even experts in this area can barely keep up with all of them."

During his 45-year career, Dietschy has not only provided insights into the cellular mechanisms of cholesterol regulation, but he also sought to use this knowledge in the treatment of diseases, including cardiovascular and brain diseases. He has recently provided new insights into cholesterol metabolism in the brain, which may help find new ways of treating metabolic disorders, such as Niemann-Pick C disease, and neurodegenerative diseases, such as Alzheimer disease.

Early Interest in Biology and Medicine

Dietschy grew up in Alton, Illinois, a small town near St. Louis, Missouri. During his childhood, he enjoyed school and felt supported by his parents and teachers. "My parents and teachers had a strong sense of education, and the teachers were particularly good in physics, chemistry, and biology, which probably helped me enjoy these topics," Dietschy says.

After high school, Dietschy went to Washington University, St. Louis. "The undergraduate courses in physics, chemistry, and biology were all taught by senior, distinguished professors, such as Arthur Holly Compton, who won the Nobel Prize in Physics in 1927, Florence E. Moog, known for her research on how lungs mature in embryos and premature babies, and Viktor Hamburger, who pioneered studies of brain development in embryos," Dietschy says. "Because of the quality of their teaching, the undergraduate education that I received was superb."



John Dietschy

Although Dietschy was interested in doing research in biology, he decided to pursue medical studies in his junior year. "I enjoyed biology in general, but I realized that I was more interested in using it for a practical purpose, which is why I decided to go to medical school instead of doing a Ph.D."

After earning his B.A. in Biology, Dietschy went to Washington University School of Medicine. He remembers being a little put off during the first year by all the anatomy courses that required him to learn countless names of the various parts of the body. And although he considered following the Ph.D. track instead of medical school during the first year, the following years provided material that piqued his interest in medicine.

A Passion for Medicine and Mountain Climbing

During his undergraduate and medical school years, Dietschy spent his summers hiking and climbing mountains in Wyoming and Canada. He loved it so much that he decided

that after finishing medical school, he would practice medicine in Colorado to be able to continue mountain climbing. So in 1958, he went to Denver, Colorado, where he completed his internship and residency training.

But during his second year of residency, Tom Witten, then head of the VA Hospital's Gastroenterology Department, noticed Dietschy's interest in not only practicing medicine but also pursuing teaching and research. So he suggested to Dietschy that he work with one of his colleagues, the late Franz J. Ingelfinger, who was the leading academic gastroenterologist in the country at that time and was pursuing patient-oriented research on esophageal diseases at Boston City Hospital and the Massachusetts Memorial Hospital, Boston.

Although the suggestion was appealing, Dietschy hesitated because he would have to leave his passion for mountain climbing behind. After thinking hard about it, he decided to join Ingelfinger's laboratory, a move that would rekindle his interest in scientific research and determine the rest of his career.

Early Work on Cholesterol Metabolism

From 1961 to 1963, through a two-year grant supported by the U.S. National Institutes of Health (NIH), Dietschy worked as a trainee in gastroenterology with Ingelfinger on understanding how structures called micelles, which are made of bile acids, form in the intestine and how they are involved in fat absorption.

In 1963, Dietschy felt that he needed more training in biochemistry, so he applied for—and was granted—another two-year NIH fellowship to work with Marvin Siperstein, a renowned biochemist at the University of Texas Southwestern Medical Center at Dallas. At that time, Siperstein was trying, for the first time, to understand how the synthesis of cholesterol was regulated in the body.

In Siperstein's laboratory, Dietschy started some of the first studies on cholesterol metabolism. He showed for the first time that many organs other than the liver convert acetate into cholesterol. He also determined that, of all the cholesterol that was excreted from the body—through feces—about half of it was converted into bile acids before being excreted.

Cholesterol Metabolism at the Whole Body and Cellular Levels

In 1965, Dietschy was offered a job as an assistant professor of Internal Medicine at the University of Texas Southwestern Medical Center at Dallas, where he set up his research laboratory. "At that time, the Department of Internal Medicine was just being built," he says. "The chair of the department was Donald Seldin, a remarkable person who had a passion for combining basic science concepts with the practice of internal medicine. Also, he hired many young and brilliant scientists who are now major figures in medicine, such as Michael Brown and Joseph Goldstein, winners of the 1985 Nobel Prize in Physiology or Medicine."

Dietschy focused his research efforts on understanding how cholesterol was processed by various organs in the body. He and his team developed techniques to carefully measure the amount of cholesterol produced or ingested from the diet in different types of mammals—including mice, spider monkeys, rabbits, guinea pigs, and sheep—and how much cholesterol was excreted through various

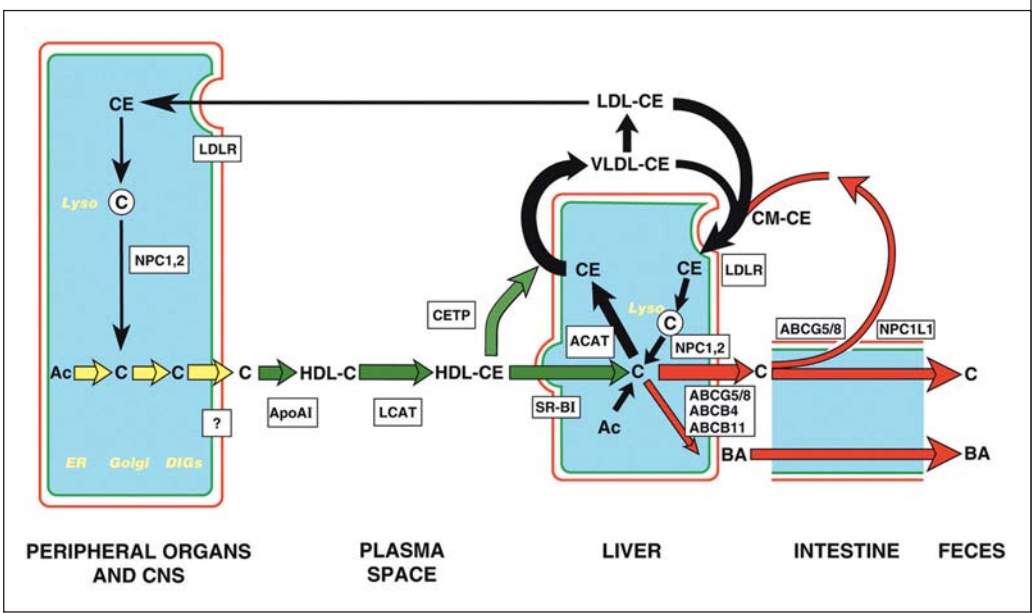


Fig. 1. Flow of cholesterol through the major organs of an animal or human.

CREDIT: DIETSCHY, J. M., AND TURLEY, S. D. (2004) CHOLESTEROL METABOLISM IN THE CENTRAL NERVOUS SYSTEM DURING EARLY DEVELOPMENT AND IN THE MATURE ANIMAL. *J. LIPID RES.* 45, 1375–1397.

pathways. The techniques consisted of administering radiolabeled water to the animals and then isolating the cholesterol that contained the radiolabeled water from every organ.

One of the scientists' main conclusions was that the liver was not the predominant source of cholesterol but that every organ makes cholesterol. "Our research showed that every cell in every organ makes cholesterol," Dietschy says. "Cholesterol is the main component of cell membranes, so this compound is critical to every cell."

Over the years, Dietschy, Stephen Turley, professor of Internal Medicine at UT Southwestern Medical Center, and colleagues showed that, overall, after cholesterol is first made in the peripheral organs, it is then carried through the blood to the liver and the intestine before being excreted from the body (Fig. 1). In the blood, cholesterol is carried by high density lipoprotein (HDL) particles to the liver, where part of the cholesterol is converted to bile acid, and the cholesterol and bile acid are then secreted into the bile and, ultimately, into the intestine by a variety of transport proteins.

Cholesterol is also internally recycled twice. In both the liver and intestine, some of the cholesterol is sent back to where it comes from, forming a cycle between the liver and the peripheral organs (*black arrows* in Fig. 1) and another cycle between the intestine and the liver (*red arrows* from the intestine to the liver in Fig. 1).

At the cellular level, Dietschy and his team described various signaling pathways that explained how cholesterol was either made within the cell or absorbed from outside the environment. The scientists made precise measurements of the amount of cholesterol entering a cell through different types of receptors (Fig. 1): the low density lipoprotein (LDL) receptor and the scavenger receptor class B type I (SR-BI), for example, which take up cholesterol from either LDL or HDL.

Cholesterol Turnover among Animals and within Organs

Dietschy and colleagues also showed that the flow of cholesterol from the peripheral organs to the liver and intestine is so tightly regulated that the concentration of cholesterol in cell membranes is kept remarkably constant. The amount of total cholesterol in every mammal is on average 2,200 milligrams per kilogram of body weight, but this concentration varies among different organs.

The scientists discovered that the rate of movement of cholesterol among organs varies significantly in animals with different basal metabolic rates---the amount of energy expended while at rest. For example, in the mouse, such a rate is about 170 kilocalories per day per kilogram, and the flow of cholesterol from all peripheral organs to the liver is greater than 100 milligrams per day per kilogram. In contrast, the basal metabolic rate in humans is only 25 kilocalories per day per kilogram, and the flow of cholesterol from peripheral organs to the liver is reduced to 10 milligrams per day per kilogram.

Also, each organ has a different basal metabolic rate that affects cholesterol turnover. When such a rate is high—as in the intestine—cholesterol flows faster, and vice versa when the rate is low—as in striated muscle. But the brain appears to be an exception. Although it has a higher basal metabolic rate than the average rate of the whole body, the brain's cholesterol turnover is only 0.03% per day compared to a whole body turnover of 0.7% per day. Understanding why this is the case has

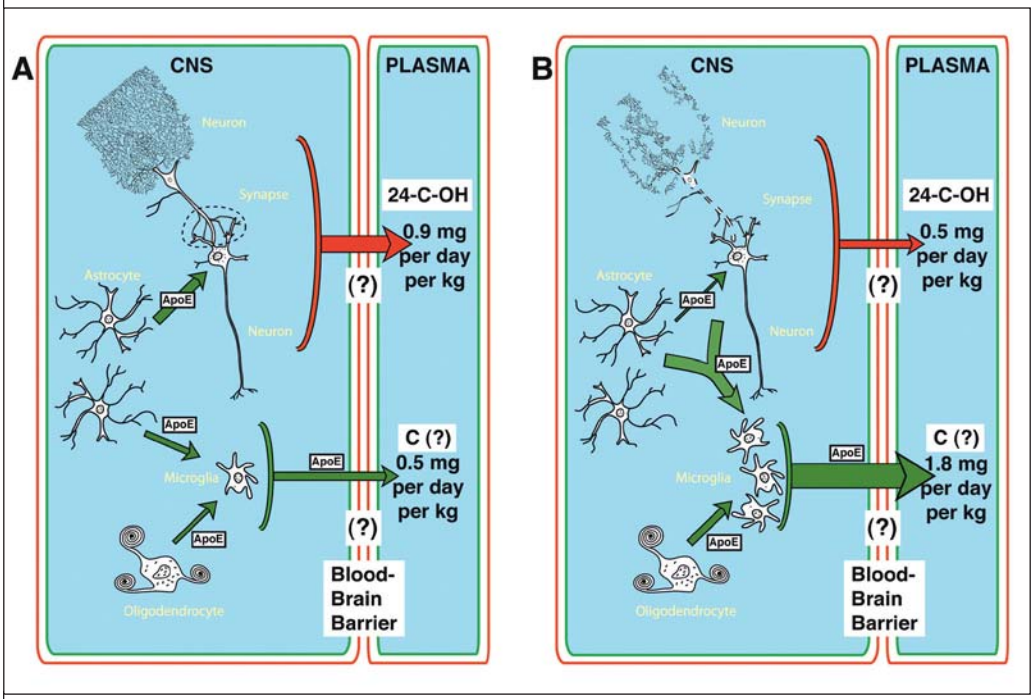


Fig. 2. Movement of cholesterol between different cellular compartments of the CNS and across the blood-brain barrier into the plasma.

CREDIT: DIETSCHY, J. M., AND TURLEY, S. D. (2004) CHOLESTEROL METABOLISM IN THE CENTRAL NERVOUS SYSTEM DURING EARLY DEVELOPMENT AND IN THE MATURE ANIMAL. *J. LIPID RES.* 45, 1375–1397.

prompted Dietschy and his team to further examine cholesterol metabolism in the brain.

Cholesterol Metabolism in the Brain

In humans, the average concentration of cholesterol in the central nervous system (CNS)—brain and spinal cord—is higher than in any other tissue. Also, even though the CNS accounts for only 2.1% of body weight, it contains about a quarter of the cholesterol and other sterols present in the whole body. These observations make the brain a compelling organ to consider when studying cholesterol metabolism and turnover. But these mechanisms have not been investigated well so far, and cholesterol movement either into and out of the CNS or among CNS cells has been explored by scientists only recently.

Cholesterol can also accumulate abnormally in the brain, leading to diseases such as Niemann Pick C disease

Dietschy and colleagues have shown that the cholesterol found in the brain is probably made only there and is not provided by the blood plasma, as in most other organs. The main reason is the blood-brain barrier, a membrane made of endothelial cells that restricts passage of substances—including cholesterol—from the bloodstream to the brain.

The largest amount of cholesterol is used to form myelin, the fatty sheath coating the axons of neurons. The researchers found that more cholesterol is synthesized by the glial cells and neurons than is required for cell membrane and myelin formation so that the excess is released from the brain. The scientists suggest that this excess is probably released either directly through the blood-brain barrier or it is converted into another sterol called 24 (*S*)-hydroxycholesterol that is later released through the blood-brain barrier as well (Fig. 2).

Cholesterol can also accumulate abnormally in the brain, leading to diseases such as Niemann Pick C disease, an inherited metabolic disorder in which lipids accumulate in the spleen, liver, lungs, bone marrow, and the brain. Symptoms may include lack of muscle coordination, brain degeneration, learning problems, and an enlarged liver and spleen.

Dietschy and his team noticed that in mice with a mutation in the gene (NPC1) causing the disease, cholesterol excretion from the CNS is increased, whereas the excretion of 24 (*S*)-hydroxycholesterol is reduced. The scientists suggest that because many neurons die, cholesterol from these dead neurons make up the additional cholesterol. They also reason that microglia and a lipoprotein called apoE are involved in clearing the dead neurons from the brain. The researchers are now studying in detail how cholesterol is processed in the brain in the hope of finding ways to prevent it from accumulating abnormally.

Combining Basic Research with Medical Applications

Throughout the past 45 years, Dietschy has always tried to combine basic research with medical applications and felt fortunate that his efforts in doing so were supported by the Department of Internal Medicine. Such efforts have not only guided his research but also his teaching, which has proved more challenging.

"One of the current difficulties is how to teach scientific concepts to clinicians who are overwhelmed with many other considerations and have relatively little time left to devote to science," he says. "So every year, I have to decide what parts of the most recent knowledge need to be included in a medical student's curriculum. I hope that by doing so, these students will receive the information they need not only to be good physicians but also to understand some of the most important breakthroughs in genetics, biochemistry, and medicine."

For Dietschy, all the knowledge accumulated about cholesterol metabolism should help scientists better understand many physiological processes and could provide unprecedented insight into what can go wrong in human metabolism.

"I am very excited by the medical prospects of our work on cholesterol," Dietschy says. "I hope that all the advances that we and others have made in understanding cholesterol function will help us clarify what goes wrong in various metabolic diseases and may lead to drugs that cure devastating conditions resulting from abnormal cholesterol metabolism."

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career opportunities

National Center for Toxicological Research

DIRECTOR, DIVISION OF SYSTEMS TOXICOLOGY

The U. S. Department of Health and Human Services, Food and Drug Administration (FDA), National Center for Toxicological Research (NCTR), Office of Research is seeking to hire a highly qualified scientific leader for the position of Director, Division of Systems Toxicology (DST). The successful candidate will be expected to lead the DST scientists in multidisciplinary teams of six Centers of Excellence including Centers for Functional Genomics, Proteomics, Metabolomics, Hepatotoxicity, Toxicoinformatics, and Chemistry. The successful applicant will be expected to provide research leadership, technical expertise, and functional area mentorship for the inclusion of OMICs (genomic, transcriptomic, proteomic, and metabolomic), bio-imaging techniques, nanotechnology and informatic tools to support regulatory decisions including use in studies for the development of safe and effective drugs, veterinary medicines, medical devices and foods associated with the FDA's Critical Path Initiative.

The NCTR, located approximately 30 miles south of Little Rock, Arkansas, conducts FDA mission-related research that is of critical importance for the agency to develop a scientifically sound basis for regulatory decisions. For more information on NCTR research and training activities, visit www.fda.gov/NCTR.

In the Division Director-level position, the incumbent will be expected to be a visionary leader and to establish a nationally recognized research program in systems toxicology to support the agency's mission. The appointee will represent, manage, and provide leadership to DST multidisciplinary teams of toxicologists, biologists, chemists, molecular biologists, and toxicoinformatics scientists.

The position requires a Ph.D., M.D. or equivalent with demonstrated success in leading a multidisciplinary team, a strong publication record in peer reviewed journals, relevant administrative experience, and a strong independent research program. Preference will be given to individuals with a demonstrated record of accomplishments in proteomics, metabolomics, functional genomics, or toxicoinformatics. Evidence of effective planning, organization, and decision-making capabilities and excellent interpersonal and communication skills is required.

This is an excepted civil service position under Title 42 USC 209(f) with the salary negotiable and commensurate with experience and qualifications (range of $130,000–$190,000). The candidate must be a U. S. citizen or permanent resident. Benefits include health and life insurance options, retirement, and paid holidays, vacation, and sick leave. Relocation expenses may or may not be paid in accordance with FDA policy.

Interested individuals should send a letter of application with a curriculum vitae, statement of proposed and current research plans, copies of up to five peer reviewed publications, and names with complete contact information of three references to the attention of Mary Ann Hutchison, Office of Management Services, NCTR, 3900 NCTR Road, Jefferson, AR 72079.

Applications must be postmarked no later than January 10, 2008.

FDA is an Equal Opportunity Employer. FDA/NCTR is a smoke-free environment.

Oregon State University

FACULTY POSITION, NUTRIENT/GENE INTERACTIONS AND HEALTHY AGING

The Linus Pauling Institute at Oregon State University invites applications for a tenure-track or tenured full-time faculty position in its newly created Healthy Aging Program. The successful candidate will be expected to establish or maintain a competitive research program focused on studying the role of diet or micronutrients in influencing cellular, genetic, and physiological function during aging. Of particular interest is research on the interactive effects of nutritional factors on genetic or epigenetic imprinting that ultimately influence healthy aging. Though this position has a primary research focus, the successful candidate is also expected to contribute to undergraduate or graduate teaching and academic service appropriate with faculty rank.

See the full position announcement and application instructions at jobs.oregonstate.edu. For additional information, please contact Barbara McVicar, E-mail: barbara.mcvicar@oregonstate.edu. Linus Pauling Institute, Oregon State University, 571 Weniger Hall, Corvallis, OR 97331.

OSU is an Affirmative Action/Equal Opportunity Employer.

Genzyme Corporation

STAFF SCIENTIST (LIPIDS)

Genzyme Corporation, ranked as one of the foremost biotechnology companies in the world, is committed to providing an exceptional environment in which individuals can excel and achieve their professional and personal goals. Genzyme Corporation has been selected by FORTUNE magazine as one of the "100 Best Companies to Work For in 2006 in the United States." By applying for a position with Genzyme, you are taking the first step toward becoming a part of our dynamic and talented team, and sharing in our continued success.

Job Responsibilities:
We are seeking a Staff Scientist to work in an *In Vitro* Biology group to support Drug Discovery for targets in lipid biosynthetic pathways. You will develop, optimize, validate, and execute biochemical and cellular assays to support lipid-based projects as part of a growing small molecule drug discovery program. Primary responsibilities include assay development, automation and running of screening assays, and characterization of small molecule leads in support of structure activity relationship studies. You will be involved in all aspects of the screening process from compound management to reporting data. Additionally, you will participate in protein purification procedures in order to supply enzymes and substrates for screening.

Basic Qualifications:
A Ph.D. in Biochemistry, Cell Biology, or a related field and 1 year of experience with lipids is required. Also required is 1 year of experience in the design, validation, and execution of enzyme assays and in liquid handling methods, automation of assays, and rigorous data analysis methods.

Preferred Qualifications:
Industrial experience with lipids, including mass spectrometry analysis, is preferred; sphingolipid experience and experience in protein purification are also preferred. HTS lipid biochemistry experience is a plus. Candidates who possess the ability to work independently as well as in a group setting are encouraged to apply.

This position is located in Waltham, Massachusetts. Please apply online at www.Genzyme.com/careers, job number 10390.

Nucleonics Inc.

RESEARCH SCIENTIST, BIOLOGICAL CHEMISTRY

Nucleonics is a biotechnology company located in Horsham, Pennsylvania, a suburb of Philadelphia. Nucleonics is developing novel therapeutics for infectious diseases, cancer, and inflammatory conditions based on proprietary gene silencing technology known as expressed RNA interference.

A full-time opening is available for a self-driven individual to independently work on the strategic development, design, and implementation of novel methods for targeting DNA to cells of interest. Expertise in receptor cycling and intracellular vesicular trafficking and/or experience with ligand targeting is strongly desirable. DNA experience is a plus. A strong record demonstrating creative thinking is required. An individual with both chemistry and biology/biochemistry experience is strongly preferred.

The incumbent must be also able to evaluate the properties of experimental products (DNA complexes) using established procedures or create new analytical methods.

Education/Experience:
The position requires a Ph.D. in Biochemistry, Biological Chemistry, or related field. A minimum of at least 2-3 years of related work experience is required (which can include a post-doc) with an emphasis on biochemistry. Experience with DNA, polymers, emulsifiers, surfactants, dispersants, and/or a strong background in medicinal chemistry or cell physiology will be a plus.

CVs should be sent to:
E-mail: hr@nucleonicsinc.com.

Institute of Biochemical Sciences, National Taiwan University

ASSISTANT PROFESSOR

The Institute of Biochemical Sciences, National Taiwan University, invites applications for one full-time faculty position of Assistant Professor, starting from August 1, 2008.

Please go to homepage.ntu.edu.tw/~ibs/english/job.htm for details.

The University of Texas Health Science Center at San Antonio

POSTDOCTORAL POSITIONS AVAILABLE

Two postdoctoral fellowship positions are open immediately to pursue the specific aims of a **new** grant to examine the molecular and cellular effects of human mutations in NADPH-cytochrome P450 reductase. Candidates with training backgrounds in **molecular and/or cellular biology** are sought. Experience with primary cell culture, gene silencing, gene expression analysis, and/or cellular imaging techniques is strongly desired. We are also seeking candidates with **physical biochemistry** backgrounds to perform a wide array of protein characterization studies. The comprehensive nature of the project will incorporate these varied skills in a cross-training environment and will provide opportunities to pursue new experimental approaches. This laboratory encourages the development of independence and provides opportunities for the trainee to develop future career options. The salary is competitive and the environment is outstanding for the pursuit of this project. Please submit CV to:

Dr. Bettie Sue Masters, The Robert A. Welch Foundation Distinguished Professor in Chemistry, Department of Biochemistry, University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, Texas 78229-3900 masters@uthscsa.edu

The University of Texas Health Science Center at San Antonio is an Equal Opportunity/Affirmative Action Employer. All Postdoctoral appointments are designated as security sensitive positions.

Michigan Technological University

FACULTY POSITIONS

The Department of Biological Sciences at Michigan Technological University invites applications for *two or more positions* in the first round of an anticipated series of hires highlighting the integrative future of biology. One position will be in *Biochemistry/Molecular Biology;* the other position(s) will be in *Ecology* or *Health Sciences* complementing current departmental strengths and goals. Appointments are at the Assistant Professor level; however, exceptionally qualified applicants may be appointed at the Associate Professor level. Additional information is available at www.bio.mtu.edu.

University of Alabama

ASSISTANT PROFESSOR TOXICOLOGY/MOLECULAR AND CELLULAR BIOLOGY

The Department of Biological Sciences at the University of Alabama invites applications for a tenure-track position at the rank of Assistant Professor in Molecular and Cellular Biology to begin August 2008. Applicants must have a Ph.D. in the biological sciences, postdoctoral experience, and a strong publication record. The successful candidate will be expected to develop an active extramurally funded independent research program involving, but not limited to, research in molecular toxicology. Applicants using model organisms to investigate problems in molecular toxicology, including cellular stress response mechanisms, are particularly encouraged to apply. The successful applicant will be expected to interact with and enhance existing research groups in Molecular and Cellular Biology and will have an interest in developing quality instruction at the undergraduate and graduate levels, with course responsibilities within areas of expertise and departmental needs. The ideal candidate will demonstrate the potential to develop a multidisciplinary research program involving collaborative interactions with faculty in the Departments of Chemistry, Chemical Engineering, and/or Metallurgical & Materials Engineering.

To apply, mail hardcopies of curriculum vitae, a letter of application that includes your research interests and goals, a statement of teaching philosophy, a list of courses in your area of expertise, and have three letters of reference sent to:

Search Committee–Molecular Toxicologist, Department of Biological Sciences, Box 870344, The University of Alabama, Tuscaloosa, AL 35487.

Questions about the position may be addressed to Dr. Stevan Marcus, Chair of the Search Committee (E-mail: smarcus@bama.ua.edu, tel.: 205-348-8094). Review of applications will begin January 7, 2008, and continue until the position is filled.

For more information visit our Web site at www.as.ua.edu/biology.

The University of Alabama is an Equal Opportunity/Affirmative Action employer and welcomes applications from women and members of minority groups.

EISAI RESEARCH INSTITUTE
Research Biologist / Senior Research Biologist Life Sciences Department

Eisai's corporate philosophy focuses on meeting the diverse needs of patients and their families and increasing the benefits that health care provides. We express this philosophy with the phrase "human health care," and continue to concentrate efforts on its realization worldwide. Throughout the company's 63 years of operation, drug discovery has been an integral part of its mission to advance human health care for patients and their families, as well as a major contributor to Eisai's success. Today, Eisai is Japan's fourth largest pharmaceutical company, ranking in the top 25 worldwide. Eisai's global R & D efforts are focused in several therapeutic areas, including central nervous system, oncology, gastrointestinal, and inflammatory diseases. Eisai Research Institute (ERI) in Andover, MA, is the center for Eisai's U.S. research and development, with an emphasis on finding new treatments for immune disorders and cancer.

As a member of the Life Sciences department, your primary duties will include executing biochemical, cell-based and in vivo pharmacological experiments to evaluate drug candidates and explore their mechanism of action, mainly in the area of inflammation and autoimmune diseases. You will also analyze and calculate experimental results, work collaboratively with other members of a project group to accomplish team objectives, and communicate research results to supervisor in an appropriate, accurate and timely manner. Additional responsibilities include maintenance of an accurate and current record of experimental results, participation in research group and project meetings, and requisition and maintenance of laboratory equipment, chemicals and supplies.

Qualified candidates will have a BS/BA or MS/MA degree in an appropriate biological science such as biochemistry, immunology, pharmacology, molecular or cellular biology, as well as a minimum of 2+ years experience in the biotech or pharmaceutical industry or 4+ years postgraduate research in an academic setting. Technical skills required include experience with in vivo disease models and experimentation, proficiency in basic biomedical techniques such as ELISA, cell culture, and Western blotting; experience with FACS and/or luminex analysis would be a plus. Other basic requirements include excellent organizational and multi-tasking skills, flexibility to accommodate changing priorities and deadlines, good oral and written communication skills, and solid computer skills. A working knowledge of inflammation and allergic disease would be a plus.

Eisai offers an outstanding compensation package, including 401(k) match. Please fax or forward your CV (resume) to:
Human Resources, Eisai Research Institute,
4 Corporate Drive, Andover, MA 01810-2441.
Fax: (978) 681-8731 Email: hr_eri@eisai.com

For more information and other job postings, please visit the Eisai Research Institute web site at:
www.eisairesearchinstitute.com

Eisai Research Institute conducts background checks and pre-employment physicals. We are an equal opportunity employer M/F/D/V

Roanoke College
ASSISTANT PROFESSOR, TENURE TRACK CHEMISTRY OR BIOCHEMISTRY

Rated One of the "Best in the Southeast" By *The Princeton Review*

Roanoke College seeks applicants for a tenure track position starting August 2008. Ph.D. required. Research with undergraduates is expected and well supported. Excellent teaching is required. Teaching duties will include biochemistry plus other courses appropriate to the candidate's background. Research may be in any biologically related area of chemistry.

The teaching load at Roanoke is 9 contact hours per semester plus one May Term course every third year.

To learn about our excellent facilities and ACS-approved program, visit www.roanoke.edu/chemistry. Roanoke College is a nationally ranked residential liberal arts college affiliated with the Lutheran Church (ELCA), located in the beautiful Roanoke Valley of Virginia. A Phi Beta Kappa institution, Roanoke College is an equal opportunity employer and actively seeks diversity among its faculty, staff, and students; women and members of under-represented groups are especially encouraged to apply.

Review of completed applications begins December 1.

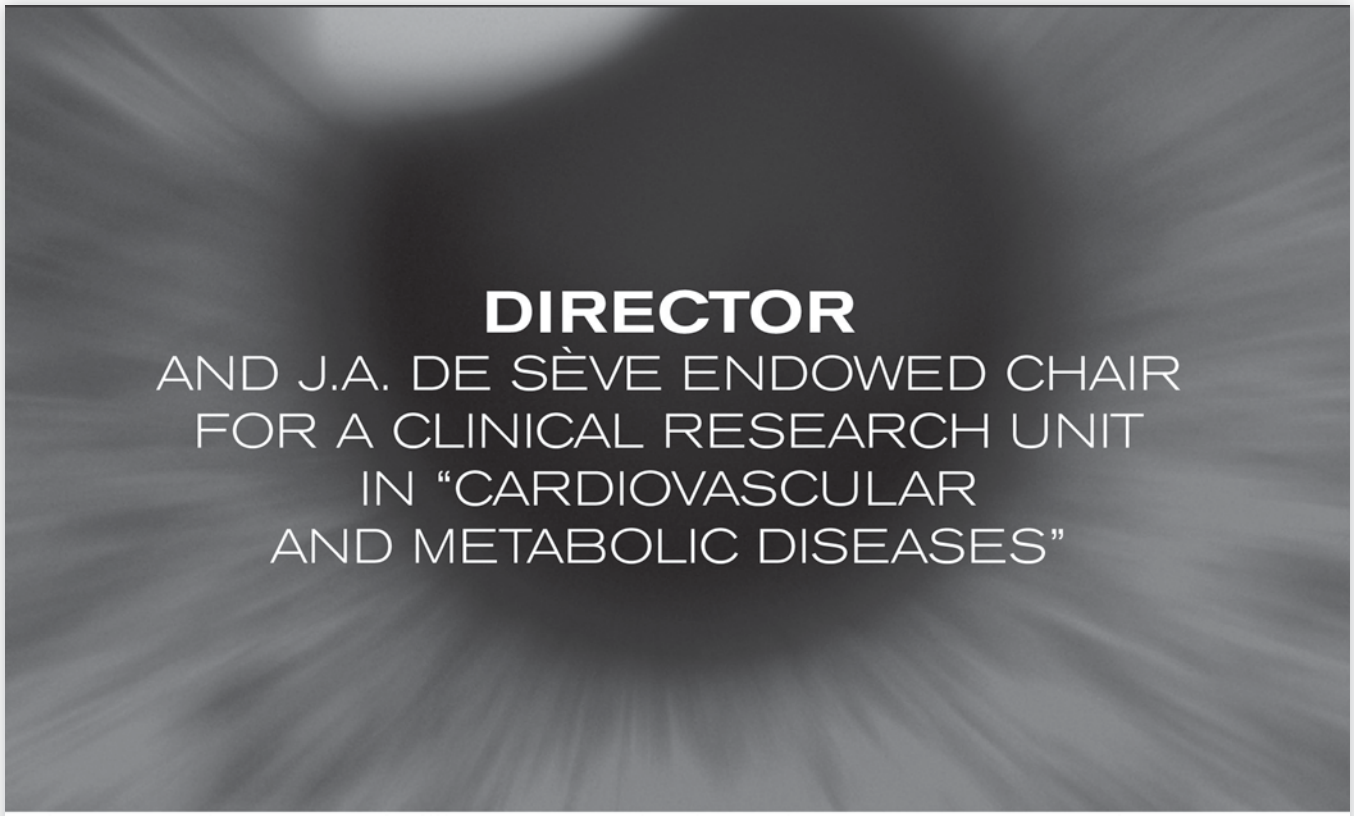
Send letter, vitae, graduate and undergraduate transcripts, teaching and research statements, and three reference letters to: Dr. Gail Steehler, Chair, Chemistry Dept., Roanoke College, 221 College Lane, Salem, VA 24153-3794. E-mail: gsteehle@roanoke.edu .

SUNY College at Plattsburgh
ASSISTANT PROFESSOR, BIOCHEMISTRY

The Chemistry Department at State University of New York College at Plattsburgh invites applications for an entry-level, tenure-track position at the Assistant Professor level in Biochemistry, commencing August 2008. The Biochemistry program is jointly administered by the Biology and Chemistry Departments, fostering collaborative research efforts and a greater range of research and educational opportunities for undergraduates. Preference will be given to applicants who have demonstrated ability to involve undergraduate students in research. A Ph.D. in biochemistry is required with a strong background in instrumental methods. Candidate must be committed to excellence in teaching at the undergraduate level and demonstrate a potential for long-term significant scholarly research. The candidate should have an understanding of and empathy for minority and gender concerns.

Review of applications began November 9, 2007, and will continue until the position is filled. Send resume, transcripts, three letters of reference, a one-page teaching philosophy, and description of research directions to: Chair, Search Committee, c/o Human Resource Services, SUNY Plattsburgh, (PJ# 4874-BMB), 101 Broad Street, Plattsburgh, NY 12901.

SUNY Plattsburgh is an equal opportunity employer committed to excellence through diversity.



DIRECTOR

AND J.A. DE SÈVE ENDOWED CHAIR FOR A CLINICAL RESEARCH UNIT IN "CARDIOVASCULAR AND METABOLIC DISEASES"

The Institut de Recherches Cliniques de Montréal (IRCM) is seeking to fill the position of the Director of a Clinical Research Unit in Cardiovascular and Metabolic Diseases. The successful candidate will be offered the prestigious J.A. De Sève Endowed Chair. The candidate should have a strong independently funded research program and a proven track record in this field. Ideally, the successful individual would have experience in directing a laboratory and in following patients in a clinical research program. The candidate's research is not limited to, but may include the areas of genetic predisposition, molecular mechanisms of atherosclerosis or plaque instability, obesity, lipidology, diabetes or the therapeutic potential of adult stem cells.

Qualifications include: an MD degree, preferably with a medical specialty and a PhD degree or equivalent scientific training. The successful candidate will direct his/her own research unit at the IRCM along with an appointment as a research professor at the University of Montreal or McGill. Proficiency in both English and French is required.

Please send your application including a CV, publication list and a summary of your most significant research contributions, a short description of your present and future research program and your clinical activities, as well as three references to candidature@ircm.qc.ca

For further information consult the IRCM website: **http://www.ircm.qc.ca.**

40 ans
1967-2007

IRCM
Institut de recherches cliniques de Montréal
La formation et la recherche pour la vie

The deadline for applications is January 15, 2008.

for your lab

The information in For Your Lab has been provided by manufacturers and suppliers of laboratory equipment. For further information about any of these products listed contacts are listed at the bottom of each panel. When contacting any of these companies, please mention that you saw their product in ***ASBMB Today***. *Please note that a listing in* ASBMB Today *does not imply an endorsement by the American Society for Biochemistry and Molecular Biology or by any of its members or staff.*

Manufacturers and suppliers, who would like to include products in For Your Lab can contact Molly at mbowen@faseb.org or 301-634-7157 (direct) or 1-800-433-2732 ext. 7157.

scientific meeting calendar

DECEMBER 2007

The 47th American Society for Cell Biology Annual Meeting
DECEMBER 1–5, 2007
WASHINGTON, DC
ascb.org/meetings/

2007 Congress of the Swiss Proteomics Society: Pushing the Limits
DECEMBER 3–5, 2007
LAUSANNE, SWITZERLAND
sps07.swissproteomicsociety.org

EuroTIDES
DECEMBER 3–6, 2007
BERLIN, GERMANY
www.iir-events.com/IIR-conf/SearchEvents.aspx

JANUARY 2008

Keystone Symposium—Frontiers of Structural Biology
JANUARY 6–11, 2008
STEAMBOAT SPRINGS, CO
www.keystonesymposia.org
E-mail: info@keystonesymposia.org

Keystone Symposium—Structural Genomics and Its Applications to Chemistry, Biology & Medicine
JANUARY 6–11, 2008
STEAMBOAT SPRINGS, CO
www.keystonesymposia.org
E-mail: info@keystonesymposia.org

Keystone Symposium—Eicosanoids and Other Mediators of Chronic Inflammation
JANUARY 7–12, 2008
BIG SKY, MT
http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=939

The Sanibel Conference: Ion Mobility and Related Emerging Areas
JANUARY 18–21, 2008
DAYTONA BEACH, FL
www.asms.org

Keystone Symposium—Diabetes Mellitus, Insulin Action and Resistance
JANUARY 22–27, 2008
BRECKENRIDGE, CO
http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=922

FEBRUARY 2008

Joint Meeting of the Biophysical Society 52nd Annual Meeting and 16th International Biophysics Congress
FEBRUARY 2–6, 2008
LONG BEACH, CA
http://www.biophysics.org/meetings/2008/

Regulatory RNA in Biology and Human Health
FEBRUARY 2–6, 2008
MIAMI BEACH, FL
http://www.med.miami.edu/mnbws/

Keystone Symposium—Biomarker Discovery, Validation and Applications
FEBRUARY 3–8, 2008
TAHOE CITY, CA
www.keystonesymposia.org

Drug Discovery for Neurodegeneration
FEBRUARY 4–5, 2008
WASHINGTON, DC
www.alzdiscovery.org/

International Conference on Neural Signaling: *Opportunities for Novel Diagnostic Approaches and Therapies*
FEBRUARY 16–20, 2008
PACIFIC GROVE, CA
medicine.ucsf.edu/conferences/asilomar2008/index.html
E-mail: robert.chan@ucsf.edu
Tel.: 415-476-9892

Peptides, Chemistry & Biology Gordon Research Conference
FEBRUARY 17–22, 2008
VENTURA BEACH, CA
www.gre.org

Keystone Symposium—Molecular Control of Adipogenesis and Obesity
FEBRUARY 19–24, 2008
BANFF, CANADA
http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=918

1st International Conference on Advanced Technologies & Treatments for Diabetes
FEBRUARY 28–MARCH 2, 2008
PRAGUE, CZECH REPUBLIC
http://www.kenes.com/attd

MARCH 2008

American Society for Neurochemistry 2008 Annual Meeting
MARCH 1—5, 2008
SAN ANTONIO, TX
asneurochem.org/

US HUPO 4th Annual Conference
MARCH 16–19, 2008
BETHESDA, MD
www.ushupo.org
E-mail: ushupo@ushupo.org
Tel.: 505-989-4876

Genomes to Systems 2008
MARCH 17–19, 2008
MANCHESTER, UK
www.genomestosystems.org/

42nd Annual Scientific Meeting of the European Society for Clinical Investigation (ESCI)
MARCH 26–29, 2008
GENEVA, SWITZERLAND
www.esci.eu.com/default.asp?page=meetings&file=future

Keystone Symposium—Nuclear Receptors: Orphan Brothers
MARCH 30–APRIL 4, 2008
WHISTLER, CANADA
www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=956

Keystone Symposium—Nuclear Receptors: Steroid Sisters
MARCH 30–APRIL 4, 2008
WHISTLER, CANADA
www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=957

APRIL 2008

ASBMB Annual Meeting *in conjunction with EB2008*
APRIL 5–9, 2008
SAN DIEGO, CA
Contact: ASBMB 2008, 9650 Rockville Pike, Bethesda, MD 20814-3008
www.asbmb.org/meetings
E-mail: meetings@asbmb.org
Tel.: 301-634-7145

Vascular Biology 2008 in conjunction with American Society for Investigative Pathology at Experimental Biology 2008
APRIL 5–9, 2008
SAN DIEGO, CA
www.navbo.org/vb08.htm

International Conference on Cellular and Molecular Biology: *A satellite meeting of the 4th World Congress on Cellular and Molecular Biology*
APRIL 6–8, 2008
INDORE, INDIA
Please submit your CV and proposal to:
E-mail: ak_sbt@yahoo.com

Arteriosclerosis, Thrombosis, and Vascular Biology Annual Conference 2008
APRIL 16–18, 2008
ATLANTA, GA
www.americanheart.org/presenter.jhtml?identifier=1201

MAY 2008

Keystone Symposium—G-Protein Coupled Receptors
MAY 18–23, 2008
KILLARNEY, IRELAND
www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=908

Gordon Research Conference on Thiol-based Redox Regulation and Signaling
MAY 25–30, 2008
IL CIOCCO, ITALY
Chair: Ruma Banerjee.
Vice Chair: Roberto Sitia
www.grc.org
E-mail: rbanerje@umich.edu

JUNE 2008

90th Annual Meeting of the Endocrine Society
JUNE 15–18, 2008
SAN FRANCISCO, CA
www.endo-society.org/apps/Events/Event.cfm?EventID=1253

33rd FEBS Congress & 11th IUBMB Conference
JUNE 28–JULY 3, 2008
ATHENS, GREECE
www.febs-iubmb-2008.org

AUGUST 2008

HUPO 7th Annual World Congress
AUGUST 16–21, 2008
AMSTERDAM, THE NETHERLANDS
www.hupo2008.com
E-mail: Wehbeh.Barghachie@mcgill.ca
Tel.: 514-398-5063

Glutathione and Related Thiols in Microorganisms
AUGUST 26–29, 2008
NANCY, FRANCE
Contacts: Jean-Pierre.jacquot@scbiol.uhp-nancy.fr, Pierre.Leroy@pharma.uhp-nancy.fr
https://matar.ciril.fr/THIOL/homephar.php

30th European Peptide Society Symposium
AUGUST 31–SEPTEMBER 5, 2008
HELSINKI, FINLAND
www.30eps.fi/
E-mail: 30eps@congrex.fi
Tel.: 358-(0)9-5607500

SEPTEMBER 2008

Workshop: Biology of Signaling in the Cardiovascular System
SEPTEMBER 11–14, 2008
HYANNIS, MA
www.navbo.org/BSCS08Workshop.html

International Conference on Structural Genomics
SEPTEMBER 20–24, 2008
OXFORD, UK
www.spine2.eu/ISGO

World Congress on the Insulin Resistance Syndrome
SEPTEMBER 25–27, 2008
LOS ANGELES, CA
www.insulinresistance.us

OCTOBER 2008

17th South East Lipid Research Conference
OCTOBER 3–5, 2008
PINE MOUNTAIN, GA
www.selrc.org

Translating Science into Health: Cytokines in Cancer and Infectious Diseases
OCTOBER 12–16, 2008
MONTREAL, CANADA
www.cytokines2008.org

Post Translational Modifications: Detection & Physiological Evaluation
OCTOBER 23–26, 2008
GRANLIBAKKEN, LAKE TAHOE
Organizers: Katalin F. Medzihradszky and Ralph A. Bradshaw, UCSF
www.asbmb.org/meetings

Transcriptional Regulation by Chromatin and RNA Polymerase II
OCTOBER 16–20, 2008
GRANLIBAKKEN, LAKE TAHOE
Organizer: Ali Shilatifard, Stowers Institute for Medical Research
Plenary Lecturer: Robert G. Roeder, The Rockefeller University
www.asbmb.org/meetings

APRIL 2009

3rd International Congress on Prediabetes and the Metabolic Syndrome—Epidemiology, Management, and Prevention of Diabetes and Cardiovascular Disease
APRIL 1–4, 2009
NICE, FRANCE
www.kenes.com/prediabetes

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