



# The Physiologist

## Porter Physiology Development Program 1967-2001: A Retrospective Study

Marsha Lakes Matyas and Martin Frank

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### Porter Program History and Purpose

The American Physiological Society (APS) has been continuously involved in the support of career training of physiologists since the award of the first Porter Fellowship in 1920. The Fellowship was first established and maintained by Dr. William Townsend Porter through his personal generosity and that of the non-profit Harvard Apparatus Company, founded by Porter (1). Porter recognized the need to stimulate and recruit young scientists as career teachers and investigators. He later included in his legacy a means for perpetuation of the annually awarded Fellowship through the William Townsend Porter Foundation (formerly the Harvard Apparatus Foundation). Fellows were selected each year by a panel made up of APS members.

The current goal of the Porter Physiology Fellowship Program is to encourage diversity among students pursuing full-time studies toward the PhD in the physiological sciences and to encourage their participation in the APS. Fellowships are open to underrepresented ethnic minority applicants who are citizens or permanent residents of the United States or its territories (African Americans, Hispanics, Native Americans, Native Alaskans, or Native Pacific Islanders) and who have been accepted into or are currently enrolled in a graduate program in physiology. Fellowships are one-year awards, but, based on trainee progress, a second year of support is frequently awarded.

Between 1967 and 2001, Fellowships were awarded to 73 students. More

than two-thirds (67%) of the Fellows have been African-American students ( $n=49$ ), and 29% were Hispanic students ( $n=21$ ). Very few Native American (1%,  $n=1$ ) or Pacific-Islander (3%,  $n=2$ ) students received Porter Fellowships, and applications from these two groups have been very rare. In 2000, with support from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), the APS began a retrospective study to determine the impact of both the Porter Physiology Development Program and the NIDDK Minority Travel Fellows Program. Selected results from that study are presented here; the full study is forthcoming in March 2004.

### Survey Methodology

A brief survey questionnaire was developed to gather information on the career path of past Porter Fellows and on their perceptions of the impact their Fellowships had on their careers. The survey included multiple-choice, short-answer, and open-ended questions. The survey process utilized several methods proven to increase overall mailed survey response rates (2), including multiple mailings. The anticipated response rate for surveys using these methods is approximately 60% (1). Ultimately, surveys were completed and returned by 43 Fellows for an overall response rate of 59% of all past Porter Fellows ( $n=73$ ) and 66% of those for whom addresses could be found ( $n=65$ ). These percentages compare favorably with the expected response rate noted above.

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Published bimonthly and distributed by  
The American Physiological Society

9650 Rockville Pike  
Bethesda, Maryland 20814-3991  
ISSN 0031-9376

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**Subscriptions:** Distributed to members as part of their membership. Nonmembers in the USA: individuals \$60.00; institutions \$90.00. Nonmembers in Canada and Mexico: individuals \$65.00; institutions \$95.00. Nonmembers elsewhere: individuals \$70.00; institutions \$100.00. Single copies and back issues when available, \$20.00 each; single copies and back issues of Abstracts issues when available, \$30.00. Subscribers to *The Physiologist* also receive abstracts of the Conferences of the American Physiological Society.

The American Physiological Society assumes no responsibility for the statements and opinions advanced by contributors to *The Physiologist*.

Deadline for submission of material for publication: Jan. 10, February issue; March 10, April issue; May 10, June issue; July 10, August issue; Sept. 10, October issue; Nov. 10, December issue.

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Headquarters phone: 301-634-7118

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<http://www.the-aps.org>

Printed in the USA

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Additional data for non-respondents were extracted, where possible, from information found on the APS membership database, other society membership databases, and employers' websites. This brought the overall number of past Porter Fellows for whom some data were available to 57 (70%).

## Results

### Current Status of Past Porter Fellows

At the time of the survey, more than half (52%) of the past Porter Fellows were employed physiologists (Table 1). An additional 14% ( $n=10$ ) were postdoctoral students, and 11% ( $n=8$ ) were graduate students. The current status of the remaining 16 past Fellows could not be determined. The large majority (87%) of the Porter Fellows had either already completed or were in the process of completing studies leading to a doctoral (PhD) degree. Only one Porter Fellow could be identified as having not completed the doctoral degree. In addition to PhD degrees in physiology, several Fellows earned additional degrees, including an MBA, a Bachelor's degree in another field, a PhD in Biophysics, and MD/PhDs ( $n=3$ ).

The remainder of this article focuses on the career paths of past Porter Fellows who have completed their training. Information on the career paths and training of past Fellows who were still students (graduate and postdoctoral) at the time of the survey is available in the full study report, forthcoming in March 2004.

The career paths of past Fellows ( $n=38$ ) who were employed physiologists at the time of the survey were examined in greater detail, to gain a better understanding of where they were in terms of career development

and participation in the physiology community. Initially, the large majority (88%) of employed Fellows completed a postdoctoral fellowship before beginning their first professional position. Most Fellows held a single postdoctoral position (69%) while smaller percentages held two (12%) or three (8%) positions.

Respondents were asked to describe their first professional position (Table 2). About two-thirds of responding past Fellows (65%) held first professional positions as assistant professors in medical schools or universities.

When asked about their current position, the large majority of past Fellows indicated that they were employed by academic institutions (77%) (Table 3). Nearly half were in faculty positions, primarily in physiology or life sciences departments. Smaller percentages were in clinical (5%) or administrative (8%) positions. Less than 20% described their position as research assistant, lab assistant, or instructor. A number of Fellows were working in government positions, primarily as administrators of research programs, including an NIH Deputy Director and an Institute Director.

Only 10% of the past Fellows were identified as holding positions in industry. It should be noted that this may be an underestimate, since some information was gathered via web searches and it is harder to identify and locate scientists employed in industry via web searches than either those in academia or government. Unlike researchers in academia or government, industry scientists are unlikely to have individual web pages describing their research or work and most industries do not publish employee titles and contact information online.

Finally, respondents indicated how their work time is allocated (Table 4). On average, the employed past Fellows spent just under half of their work time engaged in research with the other half of their time divided between teaching and management/administration. This varied with specific job title, of course, with some Fellows ( $n=5$ ) indicating that they spent 100% of their time in

management or administrative tasks. Few Fellows ( $n=5$ ) spent more than half of their time in teaching and only two Fellows indicated that they engaged in patient care activities. Three Fellows indicated that they spend a portion of their time on committee work.

In summary, the past Porter Fellows who have completed their training are, in general, working in physiology-related positions commensurate with their doctoral training. They are found not only in academic positions in medical schools and universities, but also in industry and government positions. A number of the past Fellows hold significant positions as department chairs, senior managers in industry, or department/division heads in government agencies. Most of the past Fellows spent a significant portion of their time engaged in biomedical research and spend at least a portion of their time in teaching, management, and administration. Few of the past Fellows are engaged in patient care or clinical research as a physician.

### Porter Fellows and APS Membership

One of the goals of the Porter Physiology Development Program is to encourage participation of Fellows in the APS. As shown in Table 5, the large majority of graduate students and postdoctoral fellows in the program are student or regular members of the Society. More than 40% of the employed physiologists were regular members at the time of the survey. Among the employed physiologists, 34% also indicated that they had been student members of the APS during their training. Of those who were student members during their training, 62% are now active members in the APS. At the time of the survey, 29 of the 72 past Fellows (40%) were active regular or student members.

Past Porter Fellows have also made significant contributions to the APS through service on APS committees, sections, and task forces. They have played key roles in APS education programs such as the NIDDK Minority Travel Fellowships by serving as role models and mentors for minority students attending the APS annual meeting and fall conferences. Similarly, a

(continued on page 4)

**Table 1. Status of Past Porter Fellows at Time of the Survey**

Status at Time of Survey	Frequency	Percent
Graduate Students	8	11%
Postdoctoral Fellows	10	14%
Employed Physiologists	38	52%
Unknown Status	16	22%
Deceased	1	1%

(continued from page 3)

number of past Porter Fellows have served as Physiologists-in-Residence for the APS Frontiers in Physiology Summer Research Program for middle and high school science teachers.

### Impacts of the Fellowship

The impacts of the Porter Fellowship cannot be assessed simply by numbers of degrees, titles, and institutional descriptions. Graduate and postdoctoral fellowships have important impacts on trainees in terms of not only financial status, but perseverance to degree completion, self-image, and perceptions of others. The retrospective study of past Porter Fellows also explored their perceptions of how the Fellowship impacted their training, professional development, and self-image.

Fellows first were asked whether they felt that the Porter Fellowship had an impact on the quality of their training as biomedical researchers. Many respondents indicated that the Fellowship provided them with the freedom to make important professional choices. Because they had an independent fellowship they felt they could select a graduate advisor or postdoctoral position based on their own research interests, not on the availability of funds in the advisor's laboratory group. One Fellow stated:

*The Porter Fellowship allowed me to choose the university, the major advisor—with or without funds—and my specific research area. Otherwise, I would have chosen a professor with funds whether or not I liked their research area.*

A number of Fellows indicated that having a Fellowship allowed them to focus fully on their research work, contributing to the quality of their work and training. Comments included the following:

*The Fellowship allowed me to concentrate on my research and resulted in a higher quality PhD dissertation. As a result, my entire dissertation was published in quality peer-reviewed journals. This certainly helped me get a postdoctoral fellowship.*

*Academically, the Porter Fellowship has allowed me to be a*

**Table 2. First Professional Position of Employed Fellows**

Position Title	Number	% of Respondents*
Assistant Professor, university <sup>+</sup>	8	35
Assistant Professor, medical school	7	30
Research Assistant Professor	2	9
Research Physiologist in government or private industry	2	9
Research Instructor	1	4
Clinician	1	4
Government Funding Program Director	1	4
Manager, Technology licensing for medical school	1	4
No response	15	-----

\*Sum may not total 100% due to rounding.

<sup>+</sup>Includes one Fellow who indicated that the Assistant Professorship was non-tenure track.

**Table 3. Current Professional Position of Employed Fellows**

Position Title	Number	%*
Faculty Positions	17	45
Associate Professor (6)		
Assistant Professor (4)		
Professor (5)		
Faculty position-title unspecified (2)		
Clinical Positions	2	5
Clinical Assistant Professor (1)		
Chief Resident Neurosurgery (1)		
Other Academic Research & Teaching Positions	7	18
Research Assistant Professor (3)		
Research Associate (1)		
Lab Assistant (1)		
Research Instructor (1)		
Director, Multi-discipline Teaching Laboratory (1)		
Administrative Positions	3	8
Associate Dean (1)		
Associate Provost (1)		
Associate VP for Sponsored Research (1)		
Industrial Positions	4	10
Biological Systems Scientist (1)		
Senior Manager, Biomedical Licensing (1)		
Industry position-title unspecified (2)		
Government Positions	5	13
Government Office Directors (3)		
Deputy Director, NIH Div. of Extramural Activities (1)		
Director, NIH Institute (1)		

\*Sum may not total 100% due to rounding.

stronger and more focused researcher as the financial assistance afforded me time to concentrate 100% on research and my development as a researcher.

Fellows also commented on the Fellowships' impacts on their career commitment. They noted the positive impacts the Fellowship had on their financial security during their graduate studies and on their self-confidence as a researcher:

*It gave me more confidence in my ideas and career path. Science is often negative and critical and support (financial and emotional) are greatly needed and appreciated during graduate school.*

*The Fellowship was pivotal in my career. It offered the opportunity of doing a post-doc in a new area of research, Developmental Neurobiology, which became my principal research interest. I cannot imagine becoming a successful investigator without the training opportunity this Fellowship offered me.*

*Receiving the Porter Fellowship made my self-confidence as a researcher improve. I...was very thankful to receive the Porter Fellowship during my pre-doctoral training. It was a very significant honor for me.*

*The Porter Fellowship was available to me at a time when financial difficulties made it strenuous to maintain my commitment to biomedical research. In this regard, Porter was instrumental in helping me maintain focus throughout the graduate school experience.*

*This prestigious award played a critical role in defining my career path as a Physiologist, both as a teacher and a researcher. It increased my commitment and devotion to the physiological sciences because I became part of a selected and highly distinguished group of scientists that defined the knowledge and direction of what constitutes physiology today.*

Fellows were invited to add additional comments about the overall impact of the Fellowship—both positive and negative. Their comments indicate that the Fellowship, in many cases, provided important support and recognition at critical junctures in their career development:

*This Fellowship has helped me tremendously, economic and academically. I have been able to work long hours on my research project, and not to worry about part-time jobs. Also, being part of the Porter Physiology Fellowship [program]*

*assured me of the relevance of my research topic.*

*This Fellowship gave me the opportunity to pursue my graduate studies full time. As a single [parent] at the time, this really helped me out!*

*The Porter Fellowship is a wonderful program for graduating doctoral students to develop their grant writing "muscles" and develop independent research.*

*As a PhD candidate I have gained more support and recognition from my institution after receiving the Fellowship.*

*My colleagues consider the Porter Physiology Fellowship a prestigious award; therefore, it has helped my C.V.*

When asked for final comments about the program, Fellows wholeheartedly encouraged the continuation of the program. As one Fellow said:

*A superb model that should be emulated. One the country should be using in other areas of science and engineering.*

## Recent Program Enhancements

Fellows were asked for suggestions for enhancing or improving the Fellowship program. A number of their suggestions echoed the enhancements already being made to the Porter Fellowships and other APS minority programs, including the following:

Since 2002, an annual reception for all current and past Porter Fellows and NIDDK Travel Fellows has been held at the Experimental Biology meetings;

In 2003, the APS Education Office launched the APS Minority Physiologist Listserv. In addition to offering easy communication among minority physiology students, the Education Office sends a bi-weekly email with information on awards, Fellowships, grant opportunities, and postdoctoral and professional positions available;

Publicity for the Fellowship has been expanded via Internet and listserv announcements to numerous organizations and via exhibits at the annual meeting of the Society for the

*(continued on page 6)*

**Table 4. Current Allocation of Time to Key Work Activities**

Key Work Activity	Employed Physiologists		
	Mean % of time	Median % of time	Min/Max
Research	47.4	45	0/100%
Teaching	28.8	10	0/95%
Management/Administration	26.9	10	0/100%
Patient Care	6.7	0	0/80%
Other "Committee Service"	1.5	0	0/15%

**Table 5. Membership Status of Past Fellows by Career Level**

Membership Status	Graduate Students	Postdoctoral Fellows	Employed Physiologists
Regular Member	-----	40%	42%
Student Member	75%	30%	-----
Non-member	25%	30%	58%

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Advancement of Chicanos and Native Americans in Science (SACNAS) and the NIH-sponsored Annual Biomedical Research Conference for Minority Students (ABRCMS). As a result, in recent years applications to the Porter Fellowship have increased significantly;

The Fellowship stipend has been increased to be commensurate with NIH stipends; and

As part of the new APS Careers in Physiology website (<http://www.the-aps.org/careers/careers1/index.htm>), special resource pages for minority students and physiologists have been added at each educational level.

## Summary

The Porter Physiology Development Program Fellowships have supported the predoctoral and postdoctoral studies of numerous minority students. All of the Fellows responding to the current survey continue to be involved in life sciences-related work, primarily as physiologists-in-training or as physiologists working in academia, government, or industry. Following receipt of their degree, the large majority of Fellows completed a single postdoctoral fellowship and entered their first professional position. Most employed past-Fellows spent at least part of their time engaged in research

and were also involved in teaching, management, and administration.

Respondents felt strongly that the Porter Fellowship had contributed to the quality of their pre/postdoctoral training. They felt it gave them intellectual freedom to select research advisors and topics or postdoctoral positions. They also felt the financial freedom provided by the Fellowship allowed them to concentrate on their research, contributing both to the quality of their work and to their overall career commitment. Fellows strongly recommended continuation of the program and offered suggestions for expansion and increased communication.

Finally, one of the most powerful benefits of the program is in its longitudinal impact. Past Fellows now serve as role models for a new generation of minority students aspiring to careers in biomedical research. Some have their own graduate students who have received the Porter Fellowship. One such Fellow emphasized the importance of this aspect of the program:

*I was always told by my colleagues that I would be a good role model to minority students. Having Fellowships like the Porter Development Fellowship insures the training of minority profes-*

*sionals. Young minority students have hope of becoming scientists when they see those of us who have made it. I have graduate students who tell me that they want a laboratory and to do research like I am doing which makes me feel that I have accomplished something [important].*

As stated earlier, the goal of the Porter Physiology Fellowship Program is to encourage diversity among students pursuing full-time studies toward the PhD (or DSc) in the physiological sciences, and to encourage their participation in the APS. The findings of this retrospective study suggest that the program has been highly successful in both of these aspects. ❖

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## APS Elections!

The American Physiological Society 2004-2005 elections are coming in February. For the first time, the election of the APS President-elect and Councillors will occur electronically using a web-based election program. Regular members in good standing will receive their ballot notification electronically in February.

You will have the opportunity to vote for one of the following candidates for President-elect and for two of the following candidates for Councillor, as put forward by the Nominating Committee.

### **For President-Elect**

Kim E. Barrett  
Douglas C. Eaton

### **For Councillor:**

Robert G. Carroll  
Thomas R. Kleyman  
Carole M. Liedtke  
Thomas E. Lohmeier  
William T. Talman  
Irving H. Zucker

## APS Council Holds Fall Meeting in Virginia

The APS Council held its fall meeting at the Lansdowne Resort in Leesburg, VA, October 31–November 2, 2003. The Council approved increasing the size of the Finance Committee from four members to five members. The Council also approved a motion that will allow the nomination and election of Society officers by electronic ballot. Since these amendments will require a change to the APS Bylaws, these issues will be put before the membership for a vote at the APS Business Meeting. The Business Meeting will be held on Tuesday, April 20, at EB 2004. (For additional information, please see APS Bylaws Changes in the December issue of *The Physiologist* available at <http://www.the-aps.org/publications/tphys/index.htm>.)

Council was presented with reports from the Publications, Finance, Membership, Public Affairs, Education, and Careers Committees. APS staff members Linda Allen, Marsha Maytas, Robert Price, Alice Ra'anan, and Margaret Reich joined the meeting to assist with the committee report presentations.

The Publications Committee announced that, with the approval of the IUPS, the title of journal *News in Physiological Sciences (NIPS)* would be changed to *Physiology* beginning in 2004. The journal is being redesigned, and the new title and design will be implemented in August 2004. The main body of the journal will still contain short review-type articles. In addition, the redesigned journal will have several new features, such as culled abstracts from other important papers, short articles on emerging topics and on emerging technologies, and reviews of web sites and occasional historical perspectives.

The Publications Committee announced that **Michael M. Mueckler**, editor of *AJP-Endocrinology and Metabolism* was evaluated in October and has been reappointed for a second term as editor. The Committee also announced that four articles have been published in the *Annals of Internal Medicine*. A fifth article was scheduled for publication at the beginning of November. It was reported that 172 subscriptions to the *Legacy Project* have been sold, and

that the last phase should be online by the second quarter of 2004.

The Finance Committee presented Council with the final 2003 budget and the proposed 2004 budget, both of which were accepted and approved by Council. Both are essentially balanced budgets.

The Public Affairs Committee updated Council on the status of the NIH budget, The NIH Roadmap, and the "Bridging the Sciences" Coalition. In July 2003, the House voted for an NIH appropriation of \$27.66 billion in FY 2004, the same 2.5% increase as in the President's budget request, and in September 2003, the Senate approved a \$27.98 billion budget that would provide the NIH with a 3.7% increase. In the post-doubling era, NIH funding increases will be competing with health, education, and human services programs that were held back while the NIH budget was doubled. At the same time, perceived public health

priorities such as bioterror defenses and emerging diseases such as SARS and West Nile Virus may absorb most of the increases allocated to NIH. Also, NIH Director Zerhouni wants to spend \$2 billion over five years to the priorities identified in a strategic planning process he calls the NIH Roadmap. The major themes of the Roadmap are: new pathways to discovery; research teams of the future; and reengineering the clinical research enterprise.

The Public Affairs Committee reported that the "Bridging the Sciences" Coalition now proposes to work toward legislation that would create a new entity—the Center for Bridging the Sciences within National Institute of General Medical Sciences (NIGMS). The Coalition, which APS joined last year, is led by the Biophysical Society, and is comprised of basic-science physical and biomed-

### Council Action Items

Council approved the name change from *News in Physiological Sciences* to *Physiology* when the new journal design is implemented in August 2004.

Council approved the motion for an annual Editorial Board meeting for *NIPS (Physiology)* for the first four years.

Council approved a motion to allow APS members the option of receiving *Advances* either in print or online beginning with the 2005 dues renewal notice.

Council approved the revised "Conflict of Interest Disclosure Form."

Council unanimously approved the recommendations of the Finance Committee, accepted the 2003 estimated budget and approved the 2004 proposed budget.

Council unanimously approved a motion to transfer the following 10 regular members to emeritus membership status: **Ata Abdel-Latif, James C.M. Chan, Dwain L. Eckberg, Robert M. Epstein, Rex L. Jamison, Milton Landwone, Salvatore Leto, Irwin Singer, Gerard P. Smith, Maximo E. Valentinuzzi.**

Council unanimously approved the

requests of two regular members for reinstatement: **Sangeeta Mehendale, Karen E. Pemberton.**

Council unanimously approved the selection of **Alfred P. Fishman** as the 2004 Daggs Awardee.

Council accepted a motion to change Article IV, Officers of the APS bylaws to allow the nomination and election of officers by mail and/or electronic ballot.

Council accepted a motion to change Article V, Standing Committees of the APS bylaws to increase the membership of the Finance Committee from four to five members.

Council approved a motion to establish a liaison program between the Council and APS committees. The duties of the liaison are to communicate Council's wishes to the committee chair; serve as a resource to the committee; and communicate the committees' requests to Council at times other than the Summer Council meeting when the committees present their annual reports.

Council approved a motion naming **Caroline Sussman** as chair of the Trainee Advisory Committee for a two-year term. Her term will expire December 31, 2005.

ical research societies seeking major new federal support for research at the interface between the biomedical sciences and the physical/mathematical sciences. The Committee reported that a preliminary review of Zerhouni's Roadmap indicates that many elements of the Coalition's initiative are addressed in the Roadmap.

The Education Committee reported that the APS/ACDP Professional Skills document had been distributed to the membership of both the APS and ACDP for comments. The document will undergo a final revision by the Education Committee and then be presented to both the APS and ACDP Council for final approval before distribution. The primary purpose of the document is to serve as a professional development tool for physiology trainees and their mentors.

Council endorsed efforts by the Education Committee to identify institutions with undergraduate physiology programs and to determine the course structure of these programs. Using this information, it was proposed that the APS work with the members of the ACDP to increase the number of undergraduate physiology degree programs and the teaching of physiology in the undergraduate curriculum. The Council also directed the Education Committee and Animal Care and Use Committee to work with the ACDP to examine the benefits of various teaching techniques, ranging from simulations, animal laboratories, models, etc., to students' acquisition of knowledge of physiology.

The Council also began planning for a Strategic Planning Retreat in the Fall 2005. The first step is to revise the Member Needs Survey distributed to a sampling of members prior to the 2000 Strategic Planning Meeting. The survey will be web-based and the entire membership will be asked to complete the document, helping to shape the future of the Society. The Survey should be available online in May 2004.

Additional details of the Council's fall meeting will be presented to the membership at the 2004 APS Business Meeting. The Business Meeting will be held at EB 2004 on Tuesday, April 20 at 5:45 PM in the Washington, DC Convention Center. All APS members are invited to attend. ❖



## Introducing Irving H. Zucker



On January 1, 2004 **Irving H. Zucker** succeeded **William Talman** as Chair of the Public Affairs Committee. Zucker is the Theodore F. Hubbard Professor of

Cardiovascular Research and Chairman of the Department of Physiology and Biophysics at The University of Nebraska Medical Center (UNMC) in Omaha, NE. A native of New York City he came to UNMC in 1972 following the receipt of his PhD from the Department of Physiology at New York Medical College. His PhD was directed by Gabor Kaley who remains Chairman of Physiology at New York Medical College. Zucker did his post-doctoral training under the direction of Joseph P. Gilmore, the then Chair of Physiology and Biophysics at UNMC. Zucker rose through the ranks to Professor by 1983. He was appointed Chair in 1989.

Zucker serves on the Editorial Boards of nine journals including *AJP: Heart and Circulatory Physiology*, *AJP: Regulatory Integrative Physiology*, *Hypertension* and *Circulation Research*. He is the Past President of the Association of Chairs of Departments of Physiology. He has served on the APS Animal Care and Experimentation Committee (1985-1988) and on the Public Affairs Committee (2000-present). He served on the Executive Council of the American Heart Association's Council on Basic Cardiovascular Sciences (2000-2003). He was a councilor for the Society for Experimental Biology

and Medicine (1998-2002). Zucker also served on the Clinical Physiology Committee of IUPS (2000-2002). Zucker was a member of the NIH Cardiovascular and Renal Study Section (2002-2003) and is now a member of the Clinical and Integrated Sciences Study Section (2004-2007). He currently serves as a member of the American Heart Association's national research committee.

Zucker has been an Established Investigator of the American Heart Association (1977-1982) and has received an NHLBI MERIT Award (1992-2002) for his research. In 1993 he was awarded the University of Nebraska's Outstanding Research and Creative Activity Award.

Zucker's research focuses on autonomic regulation in experimental heart failure. The roles played by various cardiovascular reflexes and alterations in central mediators of autonomic outflow are a major emphasis of investigation in his laboratory. Zucker and his group have evaluated and determined the mechanisms for alterations in sympathetic nerve activity in heart failure. Early on, these studies focused on cardiovascular sensory transduction. These included abnormalities in baroreflex, cardiopulmonary reflex, chemoreflex and cardiac sympathetic reflex function. Recently, the research has focused on major changes in central gene expression and production of nitric oxide synthase and angiotensin II receptors which have been implicated in alterations in resting sympathetic outflow and cardiovascular reflex function. Changes in these regulatory mechanisms following exercise training in

heart failure have also been elucidated from Zucker's research. Zucker's research has been funded for his entire career by NIH, AHA and other sources.

The Public Affairs Committee's primary responsibility is to monitor major issues that impact the discipline of physiology. The Committee is advisory to the APS council. The issues that have been addressed in the past and are likely to continue to be of primary importance are: NIH funding; biomedical research funding of various other agencies, including the NSF and the VA and peer review. The effects and implications of the NIH roadmap implementation on the constituency of the APS will be a major issue of discussion in the coming years. The nature of integrative physiology as it relates to the implementation of the roadmap and the impact on physiology departments will be an additional issue of scrutiny by the committee. Because the Chair of the PA Committee serves as an ex-officio member of the Animal Care and Experimentation Committee, issues relating to animal welfare and the animal rights movement have been and will continue to be important issues of discussion and advice to council. The PA committee will continue to monitor and advise the council on issues related to the interactions between other societies, the media and various national issues as they arise on an ad hoc basis. Finally, the Chair of the PA committee acts as the APS representative to the FASEB Science Policy Committee. ❖

### “Crossing Boundaries: Innovations in Undergraduate Research”

The Council on Undergraduate Research will hold its next national conference, “Crossing Boundaries: Innovations in Undergraduate Research,” at the University of Wisconsin, La Crosse on June 23-26, 2004. This conference will bring

together faculty, administrators, policy makers, representatives of funding agencies and others with an interest in doing and promoting undergraduate research. With over 100 workshops, presentations by representatives of funding agencies, disciplinary

sessions, informal roundtables on current topics, and social interactions, this promises to be an outstanding conference.

For information on program and registration, visit <http://www.cur.org/conferences.html>. ❖

## 2003 APS Conference Aldosterone and ENaC: From Genetics to Physiology September 10-14, Banff, Alberta, Canada

The 2004 APS Conference on Aldosterone and ENaC: From Genetics to Physiology was held at the Banff Centre for Conferences, located in the majestic Canadian Rockies within Banff National Park. Herds of Elk and deer grazed unconcerned outside the Max Bell Building—where the sessions were held—while inside an interdisciplinary group of researchers shared their knowledge about amiloride-sensitive sodium channels, their regulation and their involvement in normal and pathophysiological situations and the role of aldosterone in regulating these processes. Designated free time each afternoon found attendees utilizing the abundance of hiking trails or visiting nearby lakes including stunning Lake Louise. The Organizing Committee, chaired by **Daniela Rotin** of The Hospital for Sick Children, Toronto and **Douglas Eaton** of Emory University, selected the venue and arranged the scientific sessions.

There was an internationally recognized and interdisciplinary group of investigators present and interaction was enhanced by the presence of young scientists, students and established investigators. The conference attracted 133 total registrants: 26% of which represented young scientists including 18 students and 16 postdoctoral registrants. Twenty-three (17%) were APS members (including two

Emeritus members) and 29 (22%) were not members of APS. Forty-seven (35%) of the registrants represented invited speakers and session chairs. Of the 133 registrants, 45 (34%) were from outside The Americas; 13 (10%) were from Canada; four (3%) were from industry; and one was a researcher working in a US Government lab.

The outstanding program consisted of nine symposia sessions and 47 poster presentations scheduled into two separate poster sessions. The social program included an Opening Reception and Mixer on Wednesday evening and the Conference Banquet and Awards Presentation on Saturday evening. The organizers were able to leave time each afternoon for participants to enjoy the beauty of Banff National Park by scheduling evening symposium sessions after the dinner hour.

The awards presentation recognized three recipients of the Research Recognition Award for Outstanding Abstract Presentation by a Graduate Student or Postdoctoral Fellow. The following awardees were presented with a certificate and cash prize during the banquet: **Diego Alvarez de la Rosa**, “SGK and aldosterone increase ENaC activity through different mechanisms in A6 cells”; **Sandra Yukie Flores**, “Aldosterone stimulation of Na<sup>+</sup> transport and Nedd 4-2

**Table 1. Distribution by Department of Submitted Abstracts**

Department	Number of Abstracts (%)
Physiology	9 (19%)
Medicine	8 (17%)
Pharmacology	8 (17%)
Biology	3 (6%)

**Table 2. Registration Statistics**

Registrant Type	Number of Attendees (%)
APS Member	21 (16%)
Nonmember	29 (22%)
Postdoctoral	16 (12%)
Student	18 (14%)
Retired	2 (1%)
Invited Speaker	47 (35%)
Total	133

phosphorylation in mpkCCDc14 cells; and, **Satyanarayana R. Pondugula**, “Sodium absorption by semicircular canal duct epithelium via ENaC is stimulated by corticosteroids”.

Thanks to the generous financial support by the International Society of Nephrology, the following 14 students and postdoctoral fellows received travel awards to attend the conference: **Ditte Andreasen, Daniela Cucu, Anke Dahlmann, Christophe**



APS Conference attendees review one of the poster presentations and pose questions to the presenter.



The picturesque surroundings of Banff provided the backdrop for the APS Conference.

Debonneville, Silvana Maria del Mónaco, Panagiotis Fakitsas, Fatemeh Fouladkou, Elena Gonzalez Rodriguez, Danny Jans, Goran Kostoski, Cathy Le Moellic, Bao Lei,

Stephanie Michlig, and Yannis Sainte-Marie.

In addition, Rudy M. Ortiz, of Tulane University Health Sciences Center and Ollie Kelly, of Emory



APS Members Doug Eaton and Daniela Rotin presented Research Recognition Awards for Outstanding Abstract Presentation by a Graduate Student or Postdoctoral Fellow to three recipients, Sandra Yukie Flores, Satyanarayana R. Pondugula, and Diego Alvarez de la Rosa.

University were recipients of the Porter Physiology Development Committee's Minority Travel Fellowship Awards provided to encourage participation of under represented minority students. With support from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and the National Institute of General Medical Sciences (NIGMS) the fellowship provides reimbursement of all expenses associated

with travel to and participation in the conference. The recipient is matched with an APS member attending the conference who offers guidance and makes introductions to other scientists.

Of the 47 abstracts submitted for poster presentation, 45% (21) included a female first author; 30% (14) were from institutions outside The Americas and 19% (9) were from institutions in Canada. Table 1 provides a distribution of abstracts based on submitting department. Table 2 provides the breakdown of registration by type.

The Society and Organizing Committee gratefully acknowledge financial support provided through generous educational grants from NIH, NIDDK, The Canadian Institutes of Health Research, The Canadian Cystic Fibrosis Foundation and The International Society of Nephrology. ❖

## 2003 APS Physiological Genomics Conference Understanding Renal and Cardiovascular Function Through Physiological Genomics October 1-4, Augusta, Georgia

The Savannah River and Augusta Riverwalk served as the backdrop for the Society's 2nd annual Physiological Genomics conference entitled, "Understanding Renal and Cardiovascular Function Through Physiological Genomics" organized David M. Pollock (Chair), Richard A. McIndoe, Jennifer S. Pollock, Jin Xiong She, and R. Clinton Webb. The conference provided the opportunity for

researchers to learn how new technologies, tools and applications of genomics can be used by physiologists to discover how genetic and environmental factors influence renal and cardiac function.

There was an internationally recognized and interdisciplinary group of investigators present and interaction was enhanced by the presence of young scientists and students. The conference attracted 152 registrants, 41% of which represented young scientists, including 23% student and 18% postdoctoral registrants. Nineteen percent were members and 18% were not members of APS. Invited speakers and session moderators represented 20% of the registrants.

The outstanding program consisted of six symposia, 58 poster presentations and two "free communication" oral ses-

sions that included selected abstract presentations. The social program included the Wednesday evening Opening Reception and Friday evening banquet and awards presentation. Banquet attendees enjoyed the music of local band Friends.

**Table 1. Distribution by Department of Submitted Abstracts**

Department	Number of Abstracts (%)
Physiology or Physiol/Biophysics	20 (34%)
Cardio- or Vascular Biology	12 (21%)
Pediatrics	5 (9%)
Medicine	4 (7%)
Surgery	4 (7%)

**Table 2. Registration Statistics**

Registrant Type	Number of Attendees (%)
APS Member	29 (19%)
Nonmember	28 (18%)
Postdoctoral	34 (22%)
Student	28 (18%)
Invited Speaker	31 (20%)
Exhibitor	2 (1%)
Total	152

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In the non-scientific realm, first-time visitors to Augusta were surprised to discover a diverse and culturally rich Old South community with much to offer. The Morris Museum of Art, located one block from the hotel, includes antebellum portraits, Civil War illustrations, Southern impressionist paintings, landscapes, contemporary art and more. Additionally, The Best of Augusta Bash coincided with the conference and was held at Ft. Discovery National Science Center. The Bash featured tastings from area restaurants, live music and dancing.

The awards presentation recognized two postdoctoral fellows and two graduate students for outstanding abstract presentation. The postdoctoral awardees were: **Keith J. DiPetrillo**, "Genetic analysis of hypertension in SWR/J mice;" **Jennifer C. Sullivan**, "Microarray analysis of the influence of gender expression in mesenteric arteries from genetically Hypertensive rats."

The graduate student awardees were: **Alfred J. Casillan**, "Microvascular acclimatization to systemic hypoxia involves upregulation of inducible nitric oxide synthase and heme oxygenase-1;" and **Norman Taylor**, "Role of H<sub>2</sub>O<sub>2</sub> in the maintenance of salt-induced hypertension in the Dahl salt-sensitive rat."

Among the meeting attendees were nine recipients of the NIDDK Fellowship Award provided to encourage participation of under represented minority students. Supported by the National Institutes of Diabetes and Digestive and Kidney Diseases the fel-

lowship provides reimbursement of all expenses associated with travel to and participation in the conference. The recipient is matched with an APS member attending the conference who will offer guidance and make introductions to other scientists. The recipients were: **Anita Austin**, **Turner Coggins**, **Vallie Holloway**, **Ronald McMillon**, **Evangeline Motley**, **Phillip Palmer**, **Myla Patterson**, **Stephanie Richardson**, and **Elethia Woolfolk**.

A total of 58 abstracts were submitted to the conference for poster presentation. Table 1 provides a distribution of abstracts based on submitting department. Thirty-three percent (19) were by female first authors and 3% (2) were submitted by authors at institutions outside The Americas. A total of 152 registrants attended the conference. Table 2 provides the breakdown

of registration by type. Thirty-three percent (50) of the registrants were female; 4% (6) were from outside The Americas and; 5% (7) were from industry. 45% (69) of the registrants represented physiologists working at the Medical College of Georgia.

The Society and Organizing Committee gratefully acknowledge financial support provided through generous educational grants from: AstraZeneca, Bio-Rad Laboratories, Fisher Scientific, Medical College of Georgia and Merck & Company, Inc.



APS Member David Pollock presented awards to several attendees, including nine recipients of the NIDDK Fellowship Award, two postdoctoral fellows, and two graduate students.



APS Conference attendees review one of the poster presentations and pose questions to the presenter.



David Pollock presents awards to Keith DiPetrillo, Norman Taylor, and Alfred Casillan.

## New Regular Members

### \*transferred from Student Membership

- Gilman Baker Allen**  
Univ. of Vermont
- Joseph K. Angleson**  
Univ. of Denver, CO
- Laurent Maurice Arsac**  
Univ. of Bordeaux, France
- Hiroshi Ashikaga**  
Univ. of California, San Diego
- Edward Michael Balog**  
Univ. of Minnesota
- Matthew D. Beekley\***  
US Military Acad. at West Point, NY
- Karim Bendjelid**  
Univ. Hospital of Geneva, Switzerland
- Joshua R. Berlin**  
UMDNJ-New Jersey Med. Sch.
- Andrew Paul Binks**  
Harvard School of Public Health, MA
- Galina S. Bogatkevich**  
Medical Univ. of South Carolina
- Sasha Bogdanovich**  
Univ. of Pennsylvania Sch. of Med.
- Marvin O. Boluyt\***  
Univ. of Michigan
- Phillip Dalton Bowman**  
US Army Inst. of Surgical Research, TX
- Vladimir Brezina**  
Mt. Sinai Sch. of Med., NY
- Tess L. Briones**  
Univ. of Illinois
- Carol A. Britson**  
Univ. of Mississippi
- Claudio Busettini**  
Univ. of Alabama, Birmingham
- Michael B. Butterworth**  
Univ. of Pittsburgh, PA
- Iain T. Campbell**  
South Manchester Univ., UK
- Jason Robert Carter\***  
Michigan Technological Univ.
- Shelton D. Caruthers\***  
Washington Univ., St. Louis, MO
- Nancy Louise Chamberlin**  
Beth Israel Deaconess Med. Ctr., MA
- Giuliano Ciarimboli**  
Univ. of Munster, Germany
- Gerard David D'Angelo\***  
Medical College of Georgia
- Scott Lee Davis\***  
Presbyterian Hosp., Dallas, TX
- Rona J. DeLay**  
Univ. of Vermont
- Vincent Gerard DeMarco**  
Univ. of Missouri
- Kate M. Denton**  
Monash Univ., Australia
- David M. Devilbiss\***  
Univ. of Wisconsin
- Joseph Gerald Duman \***  
Univ. of Washington Med. Ctr.
- Gabriela A. Eppel**  
Monash Univ., Australia
- Janet Lynn Fisher**  
Univ. of South Carolina
- Amanda Jane Flood**  
Griffith Univ., Australia
- Andrew Stanton French**  
Dalhousie Univ., Canada
- Masahiko Fujita**  
Hosei Univ., Japan
- Dana M. Garcia**  
Texas St. Univ., San Marcos
- Smita Garde\***  
Respironics Inc., Murrysville, PA
- William T. Gerthoffer**  
Univ. of Nevada Sch. of Med.
- Martin Joseph Gibala\***  
McMaster Univ., Canada
- Gary Hugh Gibbons**  
Morehouse School of Med., GA
- Adriana Castello Girardi\***  
Yale Univ. Sch. of Med., CT
- Linda C. Giudice**  
Stanford Univ., CA
- Angela Jean Grippo\***  
Loyola Univ., Chicago, IL
- Colin K. Grissom**  
LDS Hospital, Salt Lake City, UT
- R. Scott Harris**  
Massachusetts General Hosp., MA
- Qing He**  
St. Luke's Roosevelt Hosp. Ctr., NY
- Jennifer Marie Hughes**  
Univ. of New Mexico
- Charles David Ianuzzo**  
Wheaton College, IL
- Kenichi Isibashi**  
Jichi Medical Sch., Japan
- Lori L. Isom**  
Univ. of Michigan
- Masahiko Izumizaki**  
Showa Univ. School of Med., Japan
- Ying Jin**  
Univ. of Kentucky Med. Ctr.
- Terry Ellen Jones**  
East Carolina Univ., NC
- Alie Kanu**  
Univ. of Tennessee
- Joseph P. Y. Kao**  
Univ. of Maryland, Baltimore
- Mahendra Kavdia**  
Univ. of Arkansas
- Mirajul H. Kazi\***  
Yale Univ. Sch. of Med., CT
- Ollie Kelly\***  
Emory Univ., GA
- Jonathan D. Kelty**  
Central Michigan Univ.
- Nazareth Khodiguian**  
California State Univ., Los Angeles
- Tejvir Singh Khurana**  
Univ. of Pennsylvania
- Laurie E. Kilpatrick**  
Children's Hospital, Philadelphia, PA
- Steven J. Kleene**  
Univ. of Cincinnati
- Robert John Kolb**  
Case Western Reserve Univ., OH
- Chakradhar Kotaru**  
Univ. of Colorado
- Terry B. J. Kuo**  
Tzu Chi Univ., Taiwan
- Rahul P. Kuver**  
Univ. of Washington
- Paul Milward Lea\***  
Georgetown University, DC
- Shi-Yan Li**  
Univ. of Wyoming
- Richard Michael Lovering\***  
Univ. of Maryland
- Scott Lozanoff**  
Univ. of Hawaii Sch. of Med.
- Thomas A. Lutz**  
Univ. of Zurich, Switzerland
- Thomas Y. Ma**  
Univ. of New Mexico
- Paul B. Manis**  
Univ. of North Carolina, Chapel Hill
- Andrew R. Marks**  
Columbia Univ., NY
- Shizue Masuki**  
Mayo Clinic, MN
- Todd Jason McWhorter\***  
Univ. of Wisconsin, Madison
- Akio Mizutani**  
Oita Medical Univ., Japan
- Ali Mobasher**  
Univ. of Liverpool, UK
- Caurnel Morgan**  
Weill Med. College, Cornell Univ., NY
- Jeff I. Myers\***  
Tulane Univ. Med. Sch., LA
- Susan Nadi**  
Naval Med. Res. Inst, MD
- Ana Navarro**  
Univ. De Cadiz, Spain
- Joseph F. Ndisang**  
Univ. of Saskatchewan, Canada
- Raoul D. Nelson**  
Univ. of Uath
- Brian Noga**  
Univ. of Miami Sch. of Med., FL
- Carrie Annalice Northcott\***  
Michigan State Univ.

**Sarah C. Nuding**  
Univ. of South Florida

**Shigehiko Ogo**  
Univ. of North Texas

**William E. O'Neill**  
Univ. of Rochester, MN

**Alejandro Ortiz-Acevedo\***  
Univ. of Puerto Rico

**Tian Qing Peng**  
Univ. of Western Ontario, Canada

**John K. Petrella\***  
Univ. of Alabama, Birmingham

**Charles G. Plopper**  
Univ. of California, Davis

**Tomas Prolla**  
Univ. of Wisconsin

**Stacie Marie Propst\***  
Research America, VA

**Venkatesh Rajapurohitam**  
Univ. of Western Ontario, Canada

**Matthew R. Ricci**  
Research Diets Inc., New Brunswick, NJ

**Michael G. Roth**  
Univ. of Texas

**Irit Rubinstein**  
Technion Sch. of Medicine, Israel

**Takuya Sakaguchi**  
Univ. of California, San Francisco

**B. Singh Salh**  
Univ. of British Columbia, Canada

**Emilio Salinas**  
Wake Forest Univ., NC

**Claudio Sartori**  
Univ. Hospital, Switzerland

**Liaette Arnaud**  
CIBO IMSS, Guadalajara, Mexico

**Rashad J. Belin**  
Univ. of Illinois, Chicago

**Katharina Brennecke**  
Univ. of New England, ME

**Daniel Bromberg**  
Reed College, Portland, OR

**Lorenzo Cangiano**  
Karolinska Inst., Stockholm, Sweden

**Sylvain Chauvette**  
Laval Univ., Quebec Canada

**Jonathan A. Cohen**  
North Carolina Univ.

**Alfredo Durazzo**  
Indiana Univ.

**Carlos G. Fonseca**  
CIBO IMSS CMNO, Guadalajara, Mexico

**Raffaele A. Gdovin**  
Univ. of Texas, San Antonio

**Amanda L. Begora**  
McMaster Univ., Canada

**Douglas B. Sawyer**  
Boston Univ. Medical Center, MA

**John G. Semmler**  
Deakin Univ., Australia

**Lauren E. Sergio**  
York Univ., Canada

**Federico Sesti**  
UMDNJ-R.W. Johnson Med. Sch., NJ

**Amany Shweta**  
Monash Univ., Australia

**Erik Pierre Silldorff\***  
Towson Univ., MD

**Jose L. Soengas**  
Univ. De Vigo, Spain

**Ian B. Stewart\***  
Queensland Univ. of Tech., Australia

**Masao Takata**  
Imperial College London, UK

**Xiao-Qing Tang**  
Univ. of Kentucky

**Katsumi Tashiro**  
Kanazawa University, Japan

**Maria Isabel Tejero\***  
George Washington Univ., DC

**Jay Ram Thiagarajah**  
Heather of California, San Francisco

**Heather S. Thompson\***  
Smith College, MA

**Rong Tian**  
Brigham and Women's Hosp., MA

**Houng-Wei Tsai\***  
Univ. of Virginia

**Yoshiyuki Ueno**  
Tohoku Univ., Japan

## New Student Members

**Avram D. Heilman**  
Hebrew Univ., Jerusalem

**Krishna A. Jhaveri**  
Southern Illinois Univ.

**Umme Zehra Laiwalla**  
Univ. of Calgary

**Alice Peiyu Liou**  
Univ. of California, Davis

**Ghada Sza Mahmoud**  
Marshall Univ., Huntington, WV

**Bernard Jeffrey Mason**  
Univ. of California, Davis

**Aliyu Mohammed**  
Ahmadu Bello Univ., Zaria, Nigeria

**Sunil G. Nair**  
Univ. of Cincinnati

**Vaibhav T. Pai**  
Univ. of Cincinnati, OH

**E. S. Prakash**  
Jawaharlal Inst., India

## New Affiliate Members

**Teri Kleine**  
Univ. of Texas

**Bert J.E. Vanheel**  
Ghent Univ., Belgium

**Susan J. Vannucci**  
Columbia Univ., NY

**Michael James Wacker\***  
Univ. of Kansas

**Kristen Lee W. Walton**  
Univ. of North Carolina, Chapel Hill

**Bin Wang**  
National Inst. on Drug Abuse, MD

**Dajun Wang**  
Univ. of Alabama, Birmingham

**Jong-Shyan Wang**  
Ghang Gung Univ., Taiwan

**Rui Wang**  
Univ. of Saskatchewan, Canada

**Yingda Wang**  
Vanderbilt Univ., TN

**Julie M. Wenninger**  
Univ. of Wisconsin

**Matthew D. White**  
Simon Fraser Univ., Canada

**Sarah A. Wilcox-Adelman\***  
Massachusetts General Hospital

**Yidi Wu**  
Indiana Univ.

**Baoxue Yang**  
Univ. of California, San Francisco

**Sanghee Yoo**  
Vertex Pharmaceutical Inc., CA

**David P. Zenisek**  
Yale Univ., CT

**Sergey Ivan Zharikov**  
Univ. of Florida Coll. of Med.

**Mary Elizabeth Zimmer\***  
Wayne State Univ., MI

**Kristyn M. Ringgold**  
Univ. of California, Davis

**Amber Rowe**  
Univ. of Redlands, CA

**Ali Marie Samek**  
Univ. of Colorado, Boulder

**Tracy J. Staton**  
Univ. of Cincinnati, OH

**Molly Sue Stitt**  
Univ. of Pittsburgh, PA

**Rujia Sun**  
Univ. of Utah

**Gerald Tuffin**  
Inselspital, Berne, Switzerland

**Christopher N. Vlangos**  
Michigan State Univ.

**Ying Zou**  
Univ. of Texas

**William J Kutschke**  
Univ. of Iowa

## Association of Chairs of Departments of Physiology Meets in St. Kitts, British West Indies

The Association of Chairs of Departments of Physiology (ACDP) held their annual fall retreat at the St. Kitts Marriott Resort December 4-7, 2003. Approximately 70 Chairs were in attendance. The opening session of the meeting on Friday, December 5 began with an introduction of new Chairs. The meeting was highlighted by a program that included presentations by **David Korn**, Assistant Vice President for Research at the American Association of Medical Colleges (AAMC). Korn provided a comprehensive overview of research funding in medical schools. This included an assessment of the current situation and the likelihood of major changes in the sources of research revenue in the subsequent two years. While Korn touched upon some of the legislative issues concerning NIH funding, this was dealt with in more detail by Francis Patrick White, the Director of Legislative Relations for FASEB. These two presentations dovetailed extremely well and led to a picture of NIH funding that will most likely be below the FASEB recommended levels. An estimate of the number of new grants funded in FY05 was 9,588, down from FY04 of 10,509.

The afternoon session was devoted to a workshop on the Responsible Conduct of Research (RCR). This was

the first time an effort such as this was attempted at the ACDP meeting. ACDP was awarded a \$5,000 grant from the AAMC and the Office of Research Integrity (ORI) to conduct this workshop. The workshop was organized by **Michael D. Mann**, Professor of Physiology and Biophysics at The University of Nebraska Medical Center. Three mini-lectures were followed by breakout sessions. The lectures and breakout sessions were conducted by Mann, **Francis Macrina** of Virginia Commonwealth University and **Michael Kalichmann** of the University of California, San Diego. Topics covered included, "Promoting RCR," "Why Teach RCR?," and "Creative Pedagogy: Different Methods of Presenting Materials." The breakout sessions included discussions of authorship, handling allegations of misconduct, and data acquisition. Post-workshop evaluations indicated that this was a worthwhile and informative exercise.

Day two of the retreat opened with a discussion of experiences associated with the merging of physiology departments at Wright State University School of Medicine and at the North Eastern Ohio University College of Medicine. **Peter K. Lauf** and **Michael B. Maron** described condi-

tions at their institutions that led to the consolidation and merger of their departments with others in their respective institutions. While this is not happening on a large scale, it remains an area of concern to Chairpersons and to APS.

Two scientific talks were delivered by new Chairs and members of ACDP. **William M. Chilian** of Louisiana State University Health Sciences Center in New Orleans spoke on "Adaptations of the Coronary Circulation to Myocardial Ischemia" and **Gary C. Sieck** of the Mayo Clinic Medical School spoke on "Exploring the Basis of Muscle Weakness." Both talks described state of the art physiology.

For the first time, ACDP initiated a liaison with a local medical school. The Windsor University School of Medicine is a young institution located on the island of St. Kitts. The administration of Windsor University initially offered the suggestion of having the retreat in St. Kitts. The Dean of Windsor University, Brijinder Gupta, addressed the attendees at a lunch on Friday, December 5. He described the origin of the medical school, the curriculum and the student demographics. In association with the Vice President Of Continuing Medical  
*(continued on page 16)*



The ACDP Distinguished Service Award is presented to L. Gabriel Navar by Aubrey Taylor, Professor Emeritus at South Alabama University School of Medicine and Irving H. Zucker, President of ACDP.



A banquet was hosted by Windsor University School of Medicine in St. Kitts. From left to right are: Brijinder Gupta, Dean; Irving H. Zucker, President ACDP; the honorable Sam Condor, Deputy Prime Minister of St. Kitts-Nevis; Martin Frank, Executive Director of APS; L. Gabriel Navar, recipient of the distinguished service award and Chair at Tulane University School of Medicine.

(continued from page 15)

Education, Surendra Parmar, several Chairs provided talks for the Inaugural Research Day of Windsor University on Thursday, December 4. This symposium allowed several Chairs to meet with the administration and students at Windsor University.

The business portion of the retreat was divided into two sessions on Friday and Saturday. Important aspects of the business meeting included an update on the APS by **Martin Frank**, ratification of the Professional Skills Document assembled by ACDP and the APS Education Committee, and election of new offi-

cers of ACDP. The President-Elect is **Richard N. Bergman** of the University of Southern California School of Medicine. Because of a combined meeting with basic science chairs at the AAMC sponsored meeting in 2005, Bergman's term will start following the 2005 meeting. New councilors elected are **Joseph C. Dunbar** of Wayne State University and **William G. Spielman** of Michigan State University. Finally, **Peter Cala** provided an update on the plans for the 2004 retreat which will take place in Maui, HI.

The meeting concluded with a banquet on Saturday evening, December 6, hosted by Windsor University School of Medicine. Present at the

banquet was the Deputy Prime Minister of St. Kitts-Nevis, the Honorable Sam Condor who addressed the group. A highlight of the banquet was the presentation of the ACDP's Distinguished Service Award to **L. Gabriel Navar**, Chairman of the Department of Physiology at Tulane University School of Medicine. Navar, a past president of APS has contributed enormously to ACDP, APS and the discipline of physiology over his illustrious career. **Aubrey Taylor**, Professor emeritus and past Chair at The University of South Alabama School of Medicine presented the award to Navar. ❖

## Education



### APS Archive of Teaching Resources Reaches 300 Items

The APS Archive of Teaching Resources (<http://www.apsarchive.org>) continues to grow with the recruitment of a variety of new learning objects from educators all over the country. To date, there are over 300 items catalogued in the Archive from various sources.

However, more material is still needed. Please consider submitting material that you have developed to use to make your teaching more effective. These can be:

- lecture or course outlines or PowerPoint slides from a lecture that is particularly effective with your students;

- problems or cases you've written for your classes;

- diagram(s) that you've created to

- illustrate a specific pathway or process that seems to clarify it for your students;

- simulations or videos you have developed;

- web sites you have discovered that have valuable information for your teaching;

- teaching tools/materials that you are developing that would benefit from feedback from your colleagues;

- anything educational related to physiology, pathophysiology, or clinical physiology.

By submitting learning objects that you have developed, you can help your colleagues in their efforts to find the best tools for introducing their students to the exciting discipline of physiology.

Here are some new items in the Archive. Take a moment and check out those that are most relevant to your teaching. Don't forget that you can comment on any of these items through the comment section attached to each item, which can be found on its Fact Sheet.

*Acid-Base Balance—Faculty and Student Versions*

*Body Fluids—Faculty and Student Versions*

*Fluid & Electrolytes—Faculty and Student Versions*

*Renal Clearance—Faculty and Student Versions*

*Urinary Dilution & Concentration—Faculty and Student Versions*

**Bruce Koeppen** ❖





PHYSIOLOGY IN PERSPECTIVE:  
THE WALTER B. CANNON  
AWARD LECTURE (SUPPORTED  
BY THE GRASS FOUNDATION)

**Christine Seidman**  
Harvard Medical School

*"Human Genetics:  
New Clues For Physiology  
and Pathology"*

SATURDAY, APRIL 17, 5:45 PM



HENRY PICKERING BOWDITCH  
AWARD LECTURE

**Robin L. Davisson**  
Univ. of Iowa

*"Unraveling Cardiovascular  
Disease Through  
Physiological Genomics"*

SUNDAY, APRIL 18, 5:45 PM

## Distinguished Lectureships



CARL W. GOTTSCHALK  
DISTINGUISHED LECTURESHIP  
OF THE RENAL SECTION

**Thomas Jentsch**  
Hamburg Univ., Germany

*"Chloride Transport in the  
Kidney: Insights From  
Mouse Models and Human  
Disease"*

SUNDAY, APRIL 18, 8:00 AM



JULIUS H. COMROE, JR.  
DISTINGUISHED LECTURESHIP  
OF THE RESPIRATION SECTION

**Jerome Dempsey**  
Univ. of Wisconsin, Madison

*"Crossing the Apneic  
Threshold: Causes and  
Consequences"*

SUNDAY, APRIL 18, 10:30 AM



CARL LUDWIG  
DISTINGUISHED LECTURESHIP  
OF THE NEURAL CONTROL AND  
AUTONOMIC REGULATION  
SECTION

**Cliff Saper**  
Harvard Medical School

*"A Hypothalamic  
Integrator for Circadian  
Regulation"*

SUNDAY, APRIL 18, 2:00 PM

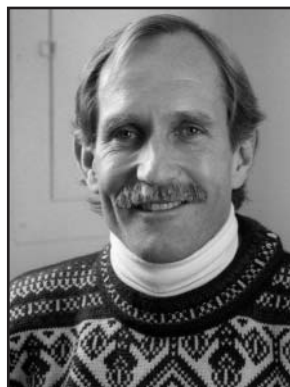


CLAUDE BERNARD  
DISTINGUISHED LECTURESHIP  
OF THE TEACHING OF  
PHYSIOLOGY SECTION

**Harold Modell**  
Physiology Education  
Research Consortium,  
Seattle, WA

*"Evolution of an Educator:  
Lessons Learned and  
Challenges Ahead"*

SUNDAY, APRIL 18, 3:15 PM



HUGH DAVSON  
DISTINGUISHED LECTURESHIP  
OF THE CELL AND MOLECULAR  
PHYSIOLOGY SECTION

**Peter Agre**  
Johns Hopkins Univ.

*"Aquaporin Water Channels  
at the Convergence of  
Physiology and Medicine"*

MONDAY, APRIL 19, 8:00 AM



ROBERT M. BERNE  
DISTINGUISHED LECTURESHIP  
OF THE CARDIOVASCULAR  
SECTION

**Gary Owens**  
Univ. of Virginia

*"Molecular Regulation of  
Smooth Muscle  
Differentiation in  
Development and Disease"*

MONDAY, APRIL 19, 10:30 AM



AUGUST KROGH  
DISTINGUISHED LECTURESHIP  
OF THE COMPARATIVE  
PHYSIOLOGY SECTION

**William Dantzer**  
Univ. of Arizona

*"A Vertebrate Renal  
Odyssey—Organic Solute  
Excretion and Water  
Conservation in Reptiles,  
Birds and Mammals"*

MONDAY APRIL 19, 2:00 PM



SOLOMON A. BERSON  
DISTINGUISHED LECTURESHIP  
OF THE ENDOCRINOLOGY AND  
METABOLISM SECTION

**Bert O'Malley**  
Baylor College of Medicine

*"Signalling Through the  
Steroid Receptor  
Coactivators"*

MONDAY, APRIL 19, 2:00 PM

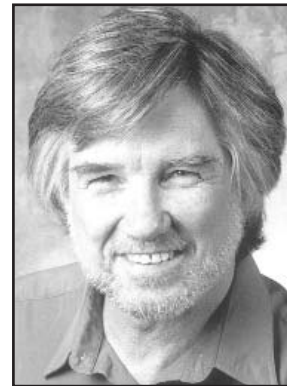


HORACE W. DAVENPORT  
DISTINGUISHED LECTURESHIP  
OF THE GASTROINTESTINAL  
SECTION

**John Forte**  
Univ. of California, Berkeley

*"The Gastric Hydrogen Ion  
Cycle"*

MONDAY, APRIL 19, 3:15 PM



EDWARD F. ADOLPH  
DISTINGUISHED LECTURESHIP OF  
THE ENVIRONMENTAL  
AND EXERCISE PHYSIOLOGY  
SECTION

**Reggie Edgerton**  
Univ. of California, Los Angeles

*"Learning and Memory in  
the Spinal Cord"*

TUESDAY, APRIL 20, 8:00 AM



JOSEPH ERLANGER  
DISTINGUISHED LECTURESHIP  
OF THE CENTRAL NERVOUS  
SYSTEM SECTION

**Paul Greengard**  
Rockefeller Univ., NY

*"Signal Integration in the  
Central Nervous System"*

TUESDAY, APRIL 20, 10:30 AM



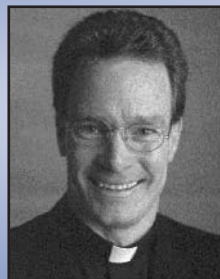
ERNEST H. STARLING  
DISTINGUISHED LECTURESHIP  
OF THE WATER AND  
ELECTROLYTE HOMEOSTASIS  
SECTION

**Christopher Wilcox**  
Georgetown Univ.

*"Oxidative Stress and  
Functional NO Deficiency in  
the Kidney: A Critical Link  
to Hypertension?"*

TUESDAY, APRIL 20, 2:00 PM

## Sixth Annual Walter C. Randall Lecture in Biomedical



**Kevin Fitzgerald, SJ, PhD**

*"Crossing Species Boundaries:  
Promethean, Pandoran or  
Just Plain Science?"*

Tuesday, April 20, 2:00 PM

Saturday April 17, 2004

Ballroom B	5:45-6:45 PM Physiology in Perspective—The Walter B. Cannon Memorial Award Lecture <b>Seideman</b>		
Room146 A	12:00-3:00 PM Workshop: Microarrays, Proteomics and Mass Spectrometry <b>Old</b>	3:15-5:15 PM Workshop: The Promised Land or Fatal Attraction? A Practical Overview of the Present and Future of Genetically Engineered Mice <b>Kohan</b>	
Room146 C	8:00 AM-12:00 NOON Refresher Course: Cellular Homeostasis <b>Romero and Freeman</b>	3:15-5:15 PM MCS President's Symposium: Molecular Genetics Approaches to Microvascular Research <b>Schmid-Schonbein</b>	5:30-7:00 PM MCS Business Meeting
Room146 B	11:00 am - 3:00 pm IACUC 101 for Scientists <b>Stallone</b>		
Room140 A	2:00-5:00 PM Communications Committee: Making Science News: A Journalist's Roundtable <b>Gwosdow</b>		

## APS Undergraduate Research Poster Session

**You're invited...**

Come and see the research that tomorrow's  
graduate students are doing today!

*NEW APS Undergraduate Research Poster Session*

Washington Convention Center  
Level 3, Lobby  
Sunday, April 18, 2004  
4:30-6:00 PM

The David S. Bruce Awards for Excellence in  
Undergraduate Research will be presented at this  
session.

(sponsored by the APS Education Committee)

## Sunday April 18, 2004

	8:00-10:00 AM	10:30 AM - 12:30 PM	3:15-5:15 PM
Ballroom B	Symp: Use of Mouse Models to Understand the Pathophysiology of Diabetes: Implications for Preventing Complications <b>LeRoith &amp; Kahn</b>	Physiology InFocus: Large Scale Systems Biology: High Through-put Genomics: Cosponsored by <i>Physiological Genomics</i> Journal <b>Cowley &amp; Nickerson</b>	Symp: A Bioninformatics How-to-for the Wet-Lab Physiologist <b>Jacob</b>
Room146 A	BMES Symp: Mechanical Cell Signaling Explored at the Nanoscale <b>Vogal &amp; Helmke</b>	AFMR Symp: Strategies for the Prevention of Alcohol-mediated Tissue Injury <b>Hart and Guidot</b>	5:45-6:45 PM Henry Pickering Bowditch Award <b>Davisson</b> FT: Wigger's Award Featured Topic <b>Cooper</b>
Room146 C	FT: Rho and Rho Associate Kinase Pathways <b>Paul</b>	10:30-11:30 AM MCS Landis Award Lecture <b>McCuskey</b> Education Refresher Course: Cellular Homeostasis <b>Romero and Freedman</b>	Symp: Mechanisms of Hyperglycemia in Diabetes II <b>Radzuik and Rizza</b>
Room146 B	8:00-9:00 AM Carl W. Gottschalk Distinguished Lectureship <b>Jentsch</b>	Julius H. Comroe, Jr. Distinguished Lectureship <b>Dempsey</b>	2:00-3:00 PM Carl Ludwig Distinguished Lectureship <b>Saper</b> Symp: Neural Control of Venous Capacitance Function in Health and Disease <b>Fink and Galligan</b>
Room145 A	FT: Action of Steroids on Neuroprotection and neuroendocrine regulation <b>Brann</b>	Symp: Signaling Mechanisms Regulating Metabolism in Skeletal Muscle <b>Goodyear &amp; Nosek</b>	Symp: Intracellular Trafficking of Membrane Proteins in Renal Epithelia <b>Welling and Caplan</b>
Room145 B	FT: Global Gene Expression to Function <b>Verbalis</b>	FT: Capacitative Calcium Entry <b>Bounelis and Marchase</b>	FT: Spectrum of Ion Channels in Alveolar Epithelial Cells: Implications in Alveolar Fluid Balance and Cell Volume Regulation <b>Kim and Kemp</b>
Room147 A	Symp: A. Clifford Barger Symposium: Control of Blood Flow in the 21st Century-More Questions Than Answers <b>Chilian &amp; Gutterman</b>	FT: Stress, Mood and Autonomic Function <b>Johnson and Grippo</b>	FT: Control of Muscle Blood Flow During Exercise <b>Joyner and Sinoway</b>
Room147 B	FT: Hypertensive Mechanisms: Insights from Genetic Models <b>Roman</b>	Symp: "Physiological Cross-Talk"-Non-hemostatic Physiological Effects of Hemostasis-related Components <b>Schwartz</b>	1:00-2:30 PM Symp: The New CSR Review Process: An NIH Review <b>R. Dowell</b> 3:15-4:15 PM Claude Bernard Distinguished Lectureship <b>Modell</b>
Room140 A	FT: Writing Higher Level Cognitive Questions in Physiology <b>Seeley</b>	Symp: Collaboration: The Cornerstone of Science, Learning and Change <b>Schlegel</b>	Symp: Do Baroreflexes Play a Role in Long-Term Control of Arterial Pressure? <b>Lohmeier and Brooks</b>
Room140 B	FT: Oxygen Sensing by Neural Tissues <b>Dean</b>	FT: Regulation of Intestinal Transporters During Development <b>Rao</b>	FT: Molecular Physiology of Oxygen Homeostasis: Oxygen-Dependent Hydroxylation <b>Lahiri</b>

## Monday April 19, 2004

	8:00-10:00 AM	10:30 AM - 12:30 PM	3:15-5:15 PM
Ballroom B	8:00-9:00 AM Hugh Davson Distinguished Lectureship <b>Agre</b>	Physiol InFocus: Large Scale Systems Biology: Next Generation Technologies for Proteomics <b>Ping and Greene</b>	
Room146 A	Symp: Stem Cells and Progenitors Cells: Biology, Physiology, and Therapeutic Applications <b>March</b>	10:30-11:30 AM Robert M. Berne Distinguished Lectureship <b>Owens</b>	2:00-3:00 PM Solomon A. Berson Distinguished Lectureship <b>O'Malley</b> Workshop: High Content Biology: Multiplexing in Cell Physiology <b>Montrose-Refizadeh</b>
Room146 C	Symp: Sympathetic-Adrenergic and Baroreflex Function with Aging <b>Seals and Hasser</b>	Symp: Redox Control of Skeletal Muscle Adaptation to Exercise and Inactivity <b>Powers and Reid</b> 2:00-3:00 PM August Krogh Distinguished Lectureship <b>Dantzler</b>	3:15-4:15 PM Horace W. Davenport Distinguished Lectureship of the APS Gastrointestinal Section <b>Forte</b> 5:30-7:30 PM Poster Session: Graduate Student Highlights in Respiration Physiology <b>Bhattacharya, Fegosi and Stevens</b>
Room146 B	Symp: Integrated Control of Lung Fluid Balance <b>Mehta and Malik</b>	Symp: Biological Applications of Nanotechnology <b>Bhattacharya</b>	FT: AstraZeneca Young Investigator Session: Renal Hemodynamics <b>Imig</b>
Room145 A	Symp: Assembly of Tissues: Coordinating Cell Interactions in Large, Multicellular Systems <b>Skalak and Tranquillo</b>	Symp: Nutrient Sensing and the Metabolic Syndrome of Aging <b>Barzilai</b>	Symp: Remodeling of Adult Tissues: Beneficial Adaptation, Disease and the Engineering of Reparative Medicine <b>Peirce and Lauffenburger</b> 5:45-7:45 PM Symp: Planning a Successful Postdoctoral Experience: A Proactive Approach <b>Scheuer</b>
Room145 B	Symp: Polycystic Kidney Disease: From Bench to bedside <b>Chapman and Zhou</b>	Symp: Non-Invasive Body Composition Analysis in Small Animals <b>Nagy and Speakman</b>	FT: Dysautonomics: Clinical Disorders of the Autonomic Nervous System <b>Goldstein</b>
Room147 A	FT: Nitric Oxide: Oxygen Radicals and Lipid Mediators in the Control of Arterial Pressure <b>Wilcox</b>	Symp: The TRP Superfamily of Cation Channels: Emerging Roles in Epithelial Physiology <b>Smith</b>	FT: Mechanisms of Vascular Dysfunction in Insulin Resistance <b>Busija</b>
Room147 B	Symp: Mediators of Liver Inflammation <b>Lentsch</b>	Symp: The Maternal-Fetal Dialogue <b>Soares</b>	Symp: Functional Connections Among Ponto-medullary Respi- ratory Neurons <b>Duffin</b>
Room140 A	FT: Comparative Regulation of Renal and Intestinal Phospho- rus processing and Transport: From Molecules to Environment <b>Sugiura and Ferraris</b>	Symp: Peer-Review, Ethics, and New Features of APS Publications <b>Benos</b>	FT: Membrane Traffic in Epithelial Cells <b>Kirk</b>
Room140 B	FT: Young Investigator Session: Microvascular Function and Disease <b>Welsh</b>	FT: Non-traditional Arachidonic Acid Signaling in Arteries <b>Bryan</b>	FT: Muscle Fatigue <b>Renaud</b>

## Tuesday April 20, 2004

	8:00-10:00 AM	10:30 AM-12:30 PM	3:15-5:15 PM
Ballroom B		Physiol InFocus: Large Scale Systems Biology: New Approaches to Large Scales Systems Biology <b>Williams and Samuelson</b>	APS Special Session: Arthur C. Guyton: The Man and His Science <b>Granger and Granger</b> 5:45 PM <b>APS Business Meeting</b>
Room 146 A	Symp: The Role of Integrins in Vascular Cell Signaling and Regulation of Vascular Function <b>Davis and Meininger</b>	Joseph Erlanger Distinguished Lectureship <b>Greengard</b>	2-3:00 PM: Ernest H. Starling Distinguished Lectureship <b>Wilcox</b>  FT: Links Between Nitric Oxide and other Transmitters in Central Cardiovascular Control <b>Talman</b>
Room 146 C	One hour only: Edward F. Adolph Distinguished Lectureship <b>Edgerton</b>	Symp: Development of Arterial Oxygen Chemoreception in Mammals: Bench to Bedside <b>Carroll</b>	Symp: Physical Activity: A Drive for Central Neural Plasticity <b>Kramer and Waldrop</b>
Room 146 B	Symp: The Mechanisms and Impact of Fetal Physiological Programming <b>Schwartz</b>	Symp: Stem Cells of the Developing and Adult Lung <b>Borok and Stripp</b>	Symp: New Genomic Technologies for Systems Biology <b>Kwittek</b>
Room 145 A	Symp: Life after the PhD: Finding a Postdoctoral Fellowship <b>Liedtke, Berecek, and Lakoski</b>	Symp: Neuroendocrine Modulation and Adaptive Responses to Stress <b>Guevara-Guzman and Antunes-Rodriguez</b>	Symp: Cardiac Fibrosis-Good, Bad or Dead <b>Tyagi and Lucchesi</b>
Room 145 B	Symp: Biophysical Studies of Membrane Trafficking <b>Zenisek</b>	Symp: Store-Operated Calcium Channels and Control of Muscle Contraction <b>Ma and Putney</b>	FT: Hormone and Autocoids <b>Mulroney</b>
Room 147 A	Symp: Breathing and Walking Following Spinal Injury <b>Fuller and Golder</b>	Symp: Interaction of Physiological Mechanisms in Control of Muscle Glucose Uptake <b>Wasserman and Charron</b>	2:00-3:00 PM Walter C. Randall Lecture on Biomedical Ethics <b>Fitzgerald</b> FT: Molecular and Cellular Mechanisms of Cerebral Ischemia and Neuroprotection <b>Wyss and Traystman</b>
Room 147 B	FT: Vacuolar Type H <sup>+</sup> - ATPases: Structure and Cellular Function in Mammalian Cells <b>Martinez-Zaguilan and Sennoune</b>	FT: Berne Lecture Featured Topic <b>Owens</b>	FT: Intestinal, Renal and New Model Systems for the Study of Oligopeptide Transporters <b>Leibach</b>
Room 140 A	FT: Vascular Communication and Coordinated Blood Distribution <b>Rivers</b>	Symp: Effects of Aging on Vascular Function-Human to Cell <b>Muller-Delp and Wilson</b>	FT: Insect Models of Epithelial Tissue Transport <b>Karnaky</b>
Room 140 B	FT: Epithelial Na and K Channels <b>O'Grady and Stockand</b>	FT: Renal Epithelial Transport <b>Vallon and Garvin</b> 12:45-1:45 PM: Historical Lecture: Commemorating Pavlov and the 1904 Nobel Prize <b>Tipton</b>	FT: Novel Concepts in the Local Regulation of Vascular Tone <b>Hein and Heaps</b>

## Wednesday April 21, 2004

	8:00-10:00 AM	10:30 AM - 12:30 PM	2:45-4:45 PM
Ballroom B	Symp: The Heme-Heme Oxygenase-Carbon Monoxide System and the Control of Cardiovascular and Renal Function <b>Nasjletti and Abraham</b>	Physiol InFocus: Large Scale Systems Biology: Applications of Systems Biology to Function and Disease <b>Kwitek and Donowitz</b>	
Room 146 A		FT: Inflammatory Mediators and Cardio-Renal Pathophysiology <b>Pollock and Pollock</b>	
Room 146 C	Symp: The State of the Progenitor: A Comprehensive Stem Cell Research Update <b>Hawkins and Crook</b>	Symp: Cold Ischemic Injury of Organs for Transplantation: Devastation, Mechanisms and Prevention <b>Salahudeen and Storey</b>	
Room 146 B	Symp: Mitochondrial Function in Aging and Disease <b>Conley &amp; Harper</b>	FT: The Respiratory-Sympathetic Dance: Who Leads and Who Follows <b>Mifflin</b>	FT: Controversies in Cardia Preconditioning <b>Busija</b>
Room 145 A	Symp: Claudin Expression and Function in the Kidney <b>Harris</b>	Symp: Metalloprotenase and Diabetes <b>Tyagi and Joshua</b>	
Room 145 B	FT: Adaptation to Exercise Stresses: Mechanisms of Protection <b>Koh</b>	FT: Cell-Cell Contacts in Regulating Lung Function <b>Koval</b>	FT: Urinary Concentrating Mechanisms <b>Neilsen and Sands</b>
Room 147 A	FT: New Insights into Osmoregulation by the Brain <b>Sladek and Schreihofner</b>	FT: Protein & Amino Acid Metabolism <b>Jefferson</b>	
Room 147 B	FT: Gastro-Intestinal Pathophysiology <b>Appleyard</b>	FT: Cardiovascular and Respiratory Constraints on Exercise <b>Munns</b>	
Room 140 A	FT: Beneficial and Deleterious Effects of Estrogen on the Cardiovascular System <b>Stallone and White</b>	FT: Excitation-Contraction Coupling in Health and Disease <b>Williams</b>	2:45-4:45 PM: FT: Hot Topics in Lung Endothelial Biology <b>Bhattacharya</b>
Room 140 B	Symp: Physiology of the Intrinsic Lymph Pump <b>Zawieja and Gashev</b>	Symp: The SAGA of Fever <b>Blatteis</b>	FT: Heme Oxygenase/Vascular Control <b>Leffler and Drummond</b>

### “IACUC 101 for Scientists” at EB 2004

A half-day workshop on the Institutional Animal Care and Use Committees (IACUCs) will be offered at Experimental Biology 2004. “IACUC 101 for Scientists: Dealing with Problem Areas” will be presented from 11 am - 3 pm on Saturday, April 17, 2004 in Room 146B of the Washington Convention Center. There is no separate fee for this session, but you register for EB 2004 to participate, and seating is limited so you are also encouraged to contact the APS Public Affairs Office to reserve a spot. (See <http://www.the-aps.org/pa/IACUC/eb04.htm> for more information.)

“IACUC 101 for Scientists” has been adapted from the popular “IACUC 101” training series created by the Applied Research Ethics National Association (ARENA). This workshop will provide information useful both to IACUC members and to researchers whose protocols require IACUC review. The EB 2004 workshop will move beyond IACUC basics to address areas that require special attention from IACUCs. Topics will include the role of the IACUC as a facilitator of research; the semi-annual review; designated member vs. full committee reviews; comparing grants

to protocols; post-approval monitoring of protocols; institutional responsibilities; and creating a culture of compliance. Time is allotted within the program for participants to raise questions with representatives of USDA, OLAW, and AAALAC.

Participation of women, racial/ethnic minorities and persons with disabilities, and others who have been traditionally underrepresented in science is encouraged. If you have questions or need additional assistance, please contact Alice Ra’anan at (301) 634-7105 or [araan@the-aps.org](mailto:araan@the-aps.org). ❖

## Poster Sessions (12:45 pm - 3:00 pm)

### Sunday, April 18

Microvascular Permeability/Exchange  
Microvascular Pharmacology/Vascular Control  
Angiogenesis/Microvascular Remodeling  
Myocardial Ischemia I  
Cerebral Circulation I  
Coronary Circulation  
Hypertension and Diabetes-I  
Cardiac Electrophysiology  
Oxidized Lipids  
Vascular Smooth Muscle-I  
Renal Hemodynamics and GFR  
Central Mechanisms in Control of Blood Pressure  
and Arterial Pressure  
Mechanisms of End Organ Damage in Hypertension  
Capacitative Calcium Entry  
RHO & RHO Associated Kinase Pathways  
Caveolin at Membrane Domains  
Intracellular Signaling and Second Messengers  
Active Transport, Cotransporters and Exchangers  
in Epithelia  
Transporters Involved in Epithelial Acid/Base Homeostasis  
Epithelial Cl<sup>-</sup> Channels  
Protein: Protein and Protein Lipid Interaction  
in Epithelial Transport  
Lung Fluid Balance in Stress  
Lung Surfactant  
Lung Nitric Oxide and Vasoregulation  
Lung Endothelial Stress  
Control of Breathing: Central Connectivity  
and Neurotransmission  
Control of Breathing: Rhythm Generation  
Control of Breathing: Development  
Neurotransmission in the Brain  
Neurotransmitters in the Brain: Systems Neurobiology  
Aging and Muscle Function  
Development & Adaptation  
Pancreas  
Motility  
Regulatory Peptides  
Regulation of Intestinal Transport During Development  
Genetic Analysis and Model Organisms, Transgenic  
and Knockouts  
Genetic Models  
Contractile and Regulatory Proteins  
Exercise Metabolism and Locomotion  
Muscle Plasticity and Gene Regulation/Expression  
Hypertensive Mechanisms: Insights From Genetic Models  
Vasopressin—Aldosterone and Fluid Volume Control  
Scholander Award Competition  
Osmotic and Ionic Regulation  
Temperature Adaptation and Energetics  
Physiological Ecology & Evolutionary Physiology  
Physiology in Extreme Environments  
Vascular System and Biofluid Mechanics

### Monday, April 19

Microvascular Cell Interactions  
Ischemia/Reperfusion  
Microvascular Pathophysiology  
Cell-Cell Communication and Conducted Responses  
Flow Regulation; Oxygen Delivery  
Microvascular Mechanics and Hemodynamics  
Vascular Pathology  
Endothelial Cell Biology I  
Hypertension and Diabetes-II  
Vascular Communication and Coordinated Blood Distribution  
Cardiac Function and Dynamics I  
Blood Pressure Regulation-I  
Microcirculation  
Liver physiology & Pathophysiology  
Dysautonomias: Clinical Disorders of the Autonomic  
Nervous System  
Neural Control of Cardiovascular Function I:  
Brainstem Mechanisms  
Neural Control of Cardiovascular Function II: Hypothalamic  
Mechanisms  
Central Autonomic Regulation I: Sensory and Spinal  
Mechanisms  
Neural Mechanisms in Hypertension and Heart Failure:  
Angiotensin  
Stress, Mood and Autonomic Function  
Blood Brain Barrier  
Behavior and the Brain  
Neuroprotection, Neuroendocrinology, Hypothalamus,  
Pituitary and Reproduction  
Mammary Gland, Gestational, Fetal and Neonatal Biology  
Immunoendocrinology  
Renin-Angiotensin-Aldosterone  
Lipids, Lipoprotein and Cholesterol Metabolism  
Connective Tissue, Bone and Stress Induced Metabolism  
Epithelial Channels, Pumps and Transporters  
Transporters: Ions, Nutrients, Metabolites and Drugs  
Epithelial Transport and its Regulation  
Intracellular Calcium, Calcium stores and Calcium Signaling  
Multivalent Ion Transport Including Trp and PKD Channels  
Epithelial Transport and Organic Solutes and Drugs  
Water Channels: Structure, Function and Regulation  
Tight Junctions and Gap Junctions in Epithelia  
Regulation of Epithelial Cell Volume  
Epithelial Cell Polarity and Membrane Traffic  
Lung Development  
Lung Endothelial Signaling  
Control of Breathing: Integrated Responses  
Spectrum of Ion Channels in Alveolar Epithelial Cells  
Hypoxia: Intermittent Hypoxia  
Hypoxia: Gene Regulation  
Gene Regulation  
Renal Hormones/Autocoids  
Renin Angiotensin System in Volume and Pressure Regulation  
Gender differences in body fluid and CV regulation  
Skeletal muscle physiology  
Exercise and Training responses I  
Gravitational and Space  
Tissue Engineering, Biomaterials, and Biotransport  
Electrophysiology of Muscle: Systems Design and Analysis



## Tuesday, April 20

Endothelial Cell Biology II  
Myocardial Ischemia II  
Cerebral Circulation II  
Angiogenesis I  
Renal Transport: H<sub>2</sub>O, Urea, Ions, and Acid-Base Regulation  
Intracellular pH and Acid-Base Transport  
Vacuolar H<sup>+</sup>-ATPases  
ATPase Ion Pumps  
Cytoskeleton, Cell Mechanics and Intracellular Trafficking  
Trafficking of Membrane Proteins  
Oxidative Stress Biology  
NO, Oxygen Radicals and Lipid Mediator in Arterial Pressure and Fluid Volume Control  
Epithelial Na<sup>+</sup> and K<sup>+</sup> Channels  
Growth Factors  
Secretion and Absorption  
Biology of the Alveolar Epithelial Barrier  
Signaling Mechanisms in Airway Cells  
Cell-cell Contacts in Regulating Lung Function  
Airway Epithelial Cell Biology  
Pulmonary Hypertension  
Oxygen Sensing by Neural Tissues  
Control of Breathing: Chemoreception  
Hypoxia: Transmitters and Ion Channels  
Growth Factors and Brain Plasticity  
Stroke and Neuroprotection  
Neural Control of Cardiovascular Function III:  
Baroreceptor Reflexes and Responses to Hemorrhage  
Neural Control of Cardiovascular Function IV:  
Cardiac Regulation  
Neural Control of Cardiovascular Function V:  
Gender Differences, Pregnancy and Development  
Central Autonomic Regulation II: Patterns and Mechanisms of Sympathetic Activity  
Central Autonomic Regulation III: Obesity and Metabolic Regulation  
Smooth Muscle Physiology/Pharmacology  
Cardiac Muscle Physiology  
Heat Shock Proteins and Muscle Function  
Muscle Fatigue  
Fever and Hypothermia  
Temperature Regulation and Fluid Balance  
Circadian and Biological Time Keeping  
Diving and Hyperbaria  
Altitude and Hypoxia  
History of Physiology  
Robert M. Berne Featured Topic Poster Session

## Wednesday, April 21

Novel Concepts in the Local Regulation of Vascular Tone  
Free Radical Injury  
Blood Pressure Regulation-II  
Beneficial and Deleterious Effects of Estrogen on the Cardiovascular System  
Peripheral Circulation  
Gene Expression  
Microarrays, Proteomics and Bioinformatics  
Gene Transfer and Therapy  
Insulin, Glucagon and other Pancreatic Hormones  
Carbohydrate Metabolism  
Obesity and Satiety  
Protein and Amino Acid Metabolism  
Angiogenesis II  
Vascular Smooth Muscle-II  
Shock  
Cardiac Function and Dynamics II  
Renal Organic Solute Transport/Pathology and Toxicology  
Osmoregulation and Neuro Endocrine Control by the Brain  
Neural Control of Cardiovascular Function VI: Reactive Oxygen Species and Oxidative Stress  
Neural Control of Cardiovascular Function VII:  
Other Neuroactive Messengers  
Neural Control of Cardiovascular Function VIII:  
Exercise and Conditioning  
Links Between Nitric Oxide and Other Transmitters in Central Cardiovascular Control  
Gastrointestinal Pathophysiology  
Molecular Biology, Physiology and Pathophysiology of Epithelial Transporters and Pumps  
Epithelial Genomics and Proteomics  
Model Systems  
Physiology Genomics of the Respiratory System  
Lung Ventilation and Gas Exchange  
Respiratory-Sympathetic Interactions  
Hypoxia: Adaptations High Altitude  
Ion Channels  
Cell Volume, Osmoregulation and Water Transport  
Stem Cell and Cell Development  
Cell-Cell Interactions and Communication  
Excitation-Contraction Coupling in Health and Disease  
Exercise Responses and Training II  
Cardiovascular and Respiratory Constraints on Exercise  
Respiration and Acid Base  
Muscle and Locomotor Adaptation  
Heart, Blood and Circulation  
Insect Models of Epithelial Tissue Transport  
Comparative Regulation of Renal and Intestinal Phosphorus Processing and Transport: From Molecules to Environment  
Heme Oxygenase/CO  
Nitric Oxide/Carbon Dioxide  
Inflammatory Mediators and Cardiorenal Integration

## Sections Special Functions

### Cardiovascular

#### Section Program Committee

Friday, April 16, 1:00 PM  
Convention Center, Room 208B

#### Steering Committee

Monday, April 19, 7:00 AM  
Convention Center, Room 302

#### Banquet

Monday, April 19, 7:00 PM  
Old Ebbitt Grill  
675 15th Street, NW, Washington, DC

### Cell and Molecular Physiology

#### Steering Committee

Friday, April 16, 9:00 AM  
Convention Center, Room 303

#### Section Reception for the

#### Distinguished Lecturer

Monday, April 19, 9:00 AM  
Convention Center, Ballroom B

#### Banquet

Monday, April 19, 6:30 PM  
Tony Chang Seafood Restaurant  
621 H Street, NW, Washington, DC  
Advanced-purchased tickets  
required. For more information,  
contact Carole Leidtke, Tel. 216-368-  
4629, Fax: 530-752-5423; Email:  
cx17@cwru.edu.

### Central Nervous System

#### Section Program Committee

Saturday, April 17, 12:00 PM  
Convention Center, Room 305

#### Steering Committee

Monday, April 19, 12:00 PM  
Convention Center, Room 305

#### Reception

Tuesday, April 20, 5:30 PM  
Hyatt, Roosevelt Room

### Comparative Physiology

#### Steering Committee

Saturday, April 17, 12:00 PM  
Convention Center, Room 208A

#### Business Meeting and Social

Tuesday, April 20, 11:30 AM  
Hyatt, Farragut Square Room

### Endocrinology and Metabolism

#### Steering Committee

Sunday, April 18, 12:00 PM  
Convention Center, Room 305

#### Business Meeting and Awards

#### Reception

Monday, April 19, 6:30 PM  
Hyatt, Constitution C

### Environmental and Exercise Physiology

#### Section Program Committee

Friday, April 16, 2:00 PM  
Convention Center, Room 208A

#### Steering Committee

Sunday, April 18, 7:00 AM  
Convention Center, Room 305

#### Business Meeting

Monday, April 19, 6:00 PM  
Hyatt, McPherson Square Room

### Epithelial Transport Group

#### Steering Committee

Sunday, April 18, 12:00 PM  
Convention Center, Room 208B

### Gastrointestinal

#### Section Program Committee

Friday, April 16, 4:00 PM  
Hyatt, Washington Boardroom

#### Steering Committee

Monday, April 19, 7:00 AM  
Convention Center, Room 305

#### Reception and Business Meeting

Monday, April 19, 5:30 PM  
Hyatt, Cabin John Room

### History of Physiology Group

#### Business Meeting

Monday, April 19, 12:00 PM  
Convention Center, Room 306

### Neural Control and Autonomic Regulation

#### Section Steering Committee

Friday, April 16, 12:00 PM  
Convention Center, Room 305

#### Reception for the Distinguished

#### Lecturer

Monday, April 19, 6:30 PM  
Hyatt, Franklin Square Room

### Parietal Cell Club

Sunday, April 18, 5:00 PM  
Hyatt, Constitution C

### Renal

#### Section Steering Committee

Saturday, April 17, 12:00 PM  
Convention Center, Room 301

#### Section Program Committee

Tuesday, April 20, 7:00 AM  
Convention Center, Room 303

#### Reception

Sunday, April 18, 6:00 PM  
Hyatt, Constitution D

#### Dinner

Tuesday, April 20, 6:30 PM  
Old Ebbitt Grill, 675 15th Street,

NW Washington, DC. For more  
information, contact: Jeffrey L.  
Garvin, Treasurer, Renal Section,  
tel: 313-916-2048; fax: 313-916-1479;  
email: jgarvinl@hfh.org

### Respiration

#### Section Program Committee

Sunday, April 18, 7:00 AM  
Convention Center, Room 208B

#### Steering Committee

Tuesday, April 20, 7:00 AM  
Convention Center, Room 301

#### Business Meeting

Tuesday, April 20, 12:00 PM  
Convention Center, Room 303

#### Banquet

Monday April 19, 6:00 PM  
Location: Hyatt, Independence C/D/E  
For more information contact: Kurt  
Albertine, kurt.albertine@hsc.utah.edu

### Teaching of Physiology

#### Section Program Committee

Friday, April 16, 1:00 PM  
Convention Center, Room 306

#### Steering Committee

Saturday, April 17, 5:00 PM  
Hyatt, Washington Boardroom

#### Luncheon

Sunday, April 18, 12:30 PM  
Hyatt, Cabin John Room

#### APS/IUPS Education Workshop

**Planning Meeting**  
Monday, April 19, 10:00 AM  
Convention Center, Room 208A

#### Business Meeting

Monday, April 19, 5:30 PM  
Hyatt, Constitution D

#### Banquet

Monday, April 19, 7:00 PM  
Location: offsite, TBD

### Water and Electrolyte Homeostasis

#### Joint Steering/Awards/Section Program Committees

Saturday, April 17, 12:00 PM  
Convention Center, Room 208B

#### Luncheon and Business Meeting

Sunday, April 18, 12:00 PM  
Tony Chang Seafood Restaurant  
621 H Street, NW, Washington, DC  
Advanced-purchased tickets  
required. For more information,  
contact Jane F. Reckelhoff,  
Secretary/Treasurer of the Water  
and Electrolyte Homeostasis  
Section, Tel: 601-984-1819; Fax: 601-  
984-1817; Email: jreckelhoff@physi-  
ology.umsm.edu

## Committee Meetings

### Animal Care and Experimentation

Saturday, April 17, 7:00 AM  
Convention Center, Room 306

### Career Opportunities in Physiology

Monday, April 19, 7:00 AM  
Convention Center, Room 303

### Committee on Committees

Saturday, April 17, 8:00 AM  
Hyatt, Washington Boardroom

### Communications Committee

Sunday, April 18, 12:00 PM  
Convention Center, Room 301

### Education

Tuesday, April 20, 7:00 AM  
Convention Center, Room 306

### International Physiology

Saturday, April 17, 12:00 PM  
Convention Center, Room 306

### Joint Program

Saturday, April 17, 8:00 AM  
Hyatt, Constitution B

### Industry Members Mixer

Monday, April 19, 5:30 PM  
Hyatt, Constitution E

### Liaison With Industry

Tuesday, April 20, 12:00 PM  
Convention Center, Room 208B

### Long-Range Planning

Sunday, April 18, 12:00 PM  
Convention Center, Room 303

### Membership

Monday, April 19, 7:00 AM  
Convention Center, Room 208A

### Perkins Memorial Fellowship

Tuesday, April 20, 7:00 AM  
Convention Center, Room 305

### Porter Physiology Development

Sunday, April 18, 12:00 PM  
Convention Center, Room 306

### Public Affairs

Sunday, April 18, 7:00 AM  
Public Affairs, Room 302

### Section Advisory

Friday, April 16, 3:00 PM  
Hyatt, Renwick Room

### Joint Section Advisory Committee With Council

Friday, April 16, 7:00 PM  
Hyatt, Latrobe Room

### Trainee Advisory Committee

Sunday, April 18, 7:00 AM  
Convention Center, Room 208A

### Women in Physiology

Monday, April 19, 12:00 PM  
Convention Center, Room 303

## Publications Special Functions

### Journal Editorial Boards Group Meeting

Saturday, April 17, 3:00 PM  
Hyatt, Constitution C

### Advances in Physiology Education

Editor and Associate Editors  
Monday, April 19, 7:00 AM  
Convention Center, Room 301

### AJP: Cell Physiology

Editor and Associate Editors  
Monday, April 19, 12:00 PM  
Convention Center, Room 208B

### AJP: Endocrinology and Metabolism

Editor and Associate Editors  
Sunday, April 18, 7:00 AM  
Convention Center, Room 306

### AJP: Gastrointestinal and Liver Physiology

Editor and Associate Editors  
Monday, April 19, 7:00 AM  
Convention Center, Room 306

### AJP: Heart and Circulatory Physiology

Editor and Associate Editors  
Sunday, April 18, 12:00 PM  
Convention Center, Room 302

### AJP: Lung Cellular and Molecular Physiology

Editor and Associate Editors  
Sunday, April 18, 7:00 AM  
Convention Center, Room 303

### AJP: Renal Physiology

Editor and Associate Editors  
Tuesday, April 20, 12:00 PM  
Convention Center, Room 305

### AJP: Regulatory, Integrative and Comparative Physiology

Editor and Associate Editors  
Tuesday, April 20, 12:00 PM  
Convention Center, Room 302

### Journal of Applied Physiology

Editor and Associate Editors  
Monday, April 19, 12:00 PM  
Convention Center, Room 302

### Journal of Neurophysiology

No meeting

### News in Physiological Sciences

Editor and Associate Editors  
Monday, April 19, 7:00 AM  
Convention Center, Room 208B

### Physiological Genomics

Editor and Associate Editors  
Tuesday, April 20, 12:00 PM  
Convention Center, Room 208A

### Physiological Reviews

Editor and Associate Editors  
Tuesday, April 20, 7:00 AM  
Convention Center, Room 208B

### Book Advisory Committee

Sunday, April 18, 12:00 PM  
Convention Center, Room 208A

### History of Physiology Book Committee

Monday, April 19, 12:00 PM  
Convention Center, Room 301

### APS Classic Articles Meeting

Sunday, April 18, 7:00 AM  
Convention Center, Room 301

## Getting the Right Result: Fine-Tuning Your Search with a Single Click

Since the HighWire Library of the Sciences and Medicine opened its new portal site, *The Physiologist* begun providing you with these brief evaluations of the site's useful features that may speed up and facilitate your access to the newest research in physiology and other areas of interest. Stanford's HighWire Press aggregates and hosts the online editions of the APS journals as well as many other outstanding biomedical publications; the new site is at <http://highwire.stanford.edu>.

The HighWire Portal contains over a million full-text articles from hundreds of the world's best journals; that's good news, but even better, it also includes over 12 million article abstracts from MEDLINE in its searching and alerting facilities. But a search across all this content can bring back so many results that you may feel you are facing the proverbial "needle in the haystack" problem.

With a single click on the search result page you can easily try variations of your search if you see too many—or too few—results.

Let's suppose you were looking for a single full-text article about recent research on insulin resistance, for assignment to students in a course you are teaching. You type the words "insulin resistance" in the Quick Search box; the system searches for these words in the full text of several hundred HighWire-hosted journals, plus all MEDLINE's abstracts. In a few seconds, HighWire tells you there are over 37,000 articles and shows you the first page of 10 citations.

Let's refine this search one click at a time (see Figure 1):

Click on "phrase" to reduce your search result to only those articles in which the words "insulin resistance" occur together as a phrase. You are left with 23,000 results; too many to assign to a class!

Click on review articles to further reduce your result to only those articles that are reviews. Still over 4,000!

Click on HighWire-hosted journals to further reduce the result to journals whose recent full-text is online. The search result will allow you to see easily which articles are accessible to you and your students online (no need for a course reader or putting the article on reserve!). Now "only" about 500 articles.

Figure 1.

The screenshot shows the HighWire search interface. At the top, the HighWire logo is displayed with the text 'LIBRARY OF THE SCIENCES AND MEDICINE'. A green box on the right says 'Thank you for trying our new, experimental Search & Browse Tool. Please give us feedback!'. Below the logo is a navigation bar with links: Home, Search, My Email Alerts, For Institutions, For Publishers, About, Contact. A sign-in prompt reads 'Sign in or register for access to all HighWire customization features'. The search area includes a 'Quick search' button with a link to 'advanced', an 'Author' field (with example 'e.g., Smith, JS'), a 'Keyword(s)' field containing 'insulin resistance', and a 'go' button. Radio buttons allow filtering by 'In My Favorite Journals (what's this?)', 'In HighWire-hosted journals', and 'In HighWire-hosted journals + Medline'. The search results section shows 'Search Results 1 to 10 of 25 found' with a 'Next 10' link. The first result is for 'insulin resistance', searched as 'all words | any words | phrase'. It lists 'Full Text' availability, 'Journals: My Favorite Journals, HighWire-hosted journals, HighWire + MEDLINE', and 'Jan 2001'. It offers options to 'review articles | all articles' and 'within last 1 | 2 | 5 | 10 years'. A 'Rephrase...' and 'Search History...' link are also present. Below the search results, there are buttons for 'For checked items', 'View abstracts', and 'Download to citation manager'. Two specific articles are highlighted with 'REVIEW' labels and 'this article is FREE to you why?' icons. The first is from 'JBC Online' (Journal of Biological Chemistry) titled 'Immunologic and Genetic Factors in Type 1 Diabetes' by Abner Louis Notkins, published in J. Biol. Chem., Nov 2002; 277: 43545 - 43548. The second is from 'JOURNAL OF LIPID RESEARCH' titled 'Hormone-sensitive lipase: control of intracellular tri-(di-)acylglycerol cholesteryl ester hydrolysis' by Fredric B. Kraemer and Wen-Jun Shen, published in J. Lipid Res., Oct 2002; 43: 1585 - 1594.

At this point it is probably most efficient to scan the first 10 results and see if any of these are just the right article to assign. Why might you get lucky in the first 10 of 500 articles? Because the HighWire portal's search engine offers "relevance-ranked" results as well as the "most-recent-articles first" option (PubMed offers only the latter). So, if your search term is found in the title of a document, the document will be closer to the first page in your search result than if the term were found in the abstract but not the title; and if the term were found in the abstract, the document would be ranked higher than if the term were found only in the full text body of the article.

Since you were interested in recent research, you might next click on with-

in last two years to be sure you are looking only at the most recent research. But there are still over 250 such articles!

You now want to limit the results to the set of journals you are most familiar and comfortable with for your own searching. Click "My Favorite Journals." Depending on the set of journals you've selected, you might have only a dozen results, or perhaps a hundred.

You can now force the system to drop relevance ranking and simply present the results so that the most recent articles are first. Click newest first. While this doesn't reduce the number of articles in the result, it might make something particularly recent jump to the top, such as the *JBC* and *Journal of Lipid Research* articles shown in our example page.

You know you can assign these articles because you can see the indication that this article is FREE to you.

As a check to see whether you have missed anything, you note that the top right of the page shows Topics best matching my search, which indicates some subject-based collections of articles that are about the topic you want to assign. You click on the topic name and see that the first article, while it is from 1997, is about molecular mechanisms and signaling pathways of inherited insulin resistance and is freely available without a subscription. So you note that as a background article for your students, and put it on your growing reading pile. Task accomplished! ❖

## European Welfare Standards May Affect US Research

The Institute for Laboratory Animal Research (ILAR) held a workshop in November 2003 on "Development of Science-Based Guidelines for Laboratory Animal Care." The event was intended to provide a forum for laboratory animal veterinarians, regulators, and researchers from around the world to discuss proposed revisions to European animal welfare standards. Most participants were from the US, Western Europe, and Canada, with a few representatives of Asian and African nations. The US sponsors of the conference included the Office of Laboratory Animal Welfare and National Center for Research Resources (both at the NIH) as well as AAALAC, International.

Information about the program, plus some of the speakers' PowerPoint presentations, is available at the ILAR website at [http://dels.nas.edu/ilar/SBG\\_agenda3.asp](http://dels.nas.edu/ilar/SBG_agenda3.asp).

An expert working group assembled by the Council of Europe (COE) is currently developing proposals to revise the animal welfare standards contained in Appendix A of the "European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes." This document is commonly referred to as European Treaty Series (ETS) 123 and is one of the framework treaties for the Council of Europe (COE). ETS 123 grew out of a 1971 debate in the European Parliament. However, the consultation process was lengthy, and the original treaty was not finalized until 1986 and only took effect in 1991 after ratification by the requisite number of COE members.

The elements of the proposed revisions to Appendix A completed thus far would require significant enhancements to animal facilities and would mandate that environmental enrichment be provided for most lab animals. The ILAR workshop was intended to provide a forum for representatives of the scientific and laboratory animal medicine communities in the US to discuss with their European

counterparts the extent to which the ETS 123 proposals reflect current scientific understanding of the needs of lab animals, as well as the proposals' potential impact on science.

The COE is an international organization founded in 1949 to help standardize social and legal practices across post-War Europe. COE recommendations are advisory in nature, meaning that its treaties or conventions are not binding on its 45 member nations. The COE is a broad umbrella organization, and its conventions provide a non-binding social consensus. However, the international organization known as the European Union (EU) does have authority over its members' internal affairs.

The EU, formerly known as the European Economic Community or Common Market, is a political and economic union with the authority to set standards to be applied within member nations. The goal of the EU is to promote free flow of trade and create a "level playing field" in economic interactions among its select group of 15 member states. EU members are obliged to incorporate its Directives into their national laws, a process known as harmonization.

In 1986 the EU approved Directive 86-609 based upon COE's animal welfare standards, and this made it necessary for EU members to pass laws implementing these standards. Thus, the current draft of COE recommendations would have the force of law if the EU adopts them.

The current draft revisions to Appendix A have been under development for several years by a working group of experts from international organizations representing groups ranging from scientists, lab animal veterinarians, the pharmaceutical industry, and animal breeders to animal activists. The diversity of its members makes it seem likely that the working group was dealing with political as well as animal welfare concerns. It was scheduled to complete its draft by fall 2003 but it is unclear when the recommendations will be finished. The proposed revisions will be submitted to COE member governments for review and then will go to the European Parliament for approval before being submitted to the member

states for ratification. Certain elements of the draft have already provoked concern because of the proposed requirements that would be complex and expensive to implement and do not seem to be justified by current scientific knowledge about animal welfare.

The draft proposals would require animals to be housed in enriched environments that permit the expression of normal behaviors. More cage space would be allocated per animal, and most would have to be housed in compatible social groups. Enhanced mechanical systems such as ventilation may also be required. AAALAC International has provided an overview of some of these proposed changes at [http://www.aaalac.org/connection\\_3sp2003.htm](http://www.aaalac.org/connection_3sp2003.htm).

Topics discussed at the ILAR conference included the draft proposals themselves; the process involved in developing them; scientific findings with a bearing upon the draft proposals; differences in animal welfare systems among the nations represented; and the extent to which efforts should be made to seek international "harmonization" of animal welfare requirements.

Advocates of the changes argue that they will improve the welfare of laboratory animals. However, some of those present at the ILAR workshop asserted that there is insufficient evidence that animals would benefit from them. In addition, some of the changes may affect the baseline of variables being studied. For example, there is some evidence that cage environments may influence physiological parameters. Although this evidence has not yet been well documented or characterized, if this does prove to be the case, the implementation of new standards in Europe may make it difficult to compare European data with data generated elsewhere. This could have an impact on the ability of scientists to compare their findings or to collaborate internationally.

One frequent topic of discussion was how regulators should proceed in the absence of sufficient scientific data. When adequate scientific data are lacking, other kinds of "evidence" were suggested as possible guidance, including scientific principles, expert

opinion, and daily experience with proven methods and practices. The term "good practices" was generally seen as preferable to "best practices," which tend to become a de facto standard. John Miller, Executive Director of the Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC), said that when standards adequate to meet animal welfare needs are already in place, the burden of proof to justify new requirements is on the regulator. In such cases, proposed changes should be of clear benefit to animals, should not interfere unnecessarily with research, and should be science based.

There is also an animal welfare paradox inherent in the proposed changes. Timo Nevalainen of the University of Kuopio Finland, told the conference that there is sometimes an "either-or" choice to be made in terms of refining a procedure or reducing animal numbers since refined procedures may require larger numbers of animals to produce valid results. Speaker Gilles Demers of the International Council for Laboratory Animal Science said that in the area of testing, reduction of pain and distress is considered a higher priority than reduction of animal numbers. Nevertheless, the public is mainly concerned seeing a reduction in animal numbers and may not appreciate the fact that higher animal numbers may be one of the "costs" of reducing pain and distress.

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## Controversial VA Research Chief Resigns

Chief of the DVA Office of Research Development (ORD) Nelda Wray resigned December 4, 2003. Wray's 11-month tenure was marked by controversy over cancellations of previously approved grants and an effort to institute a mathematical formula to measure researcher productivity. Wray cited health concerns in her resignation.

Previously associated with the Houston VA Medical Center where she was in charge of the health outcomes research unit, Wray came to Washington with ambitious plans to

redirect VA medical research. She sought to shift the DVA research portfolio away from basic research in favor of outcomes research.

Wray made her mark on April 1, 2003, when 18 VA researchers received word that funds for their work would not be forthcoming despite the fact that they had previously been told that their merit review scores placed them in the fundable range. Wray justified this "de-funding" on the basis of a secondary review of researcher productivity using a new mathematical model she had devised. In a June 6, 2003 interview with *The Washington Fax*, ORD Deputy Director Mindy Aisen defended Wray's action. Aisen said it was ORD staffers who were at fault because they had assured investigators that their grants would be funded at a time when the agency was operating under a continuing resolution and did not yet know what its FY 2003 budget would be.

Wray's "de-funding" action set off a firestorm of protest within the scientific community. The American Society for Biochemistry and Molecular Biology called it "nothing less than an assault on the principle of peer review." Wray quickly reversed course, restoring at least one grant and providing bridge funding for the remaining investigators. Nevertheless, she continued to court controversy by proposing to require merit reviewers to use a mathematical formula to determine research quality. The formula weighed the number and quality of publications as well as other grant funding from both VA and non-VA sources.

APS President **John Williams** urged Wray "not to implement this new numerical scoring system but rather to provide appropriate guidance" to peer reviewers. He emphasized that the "proposed performance criteria are not reflective of productivity across disciplines and in different types of research projects" and they "have not been validated as predictors of performance."

The controversy also came to the attention of the Congress. Senate Veterans' Affairs Chairman Arlen Specter (R-PA) and Ranking Member Bob Graham (D-FL) raised the issue in a letter to Veterans Affairs

Secretary Anthony Principi. "Peer reviewed research is a well-established process conducted consistently throughout the federal research community," Specter and Graham wrote. "Any changes to this clearly understood and congressional supported mechanism must be well justified."

Jonathan Perlin, formerly the Veterans Health Administration's chief quality and performance officer, has been appointed as Acting Chief Research and Development Officer.

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## FY 04 Funds Await Final Nod; FY 05 Prospects Are Grim

Congress was scheduled to return on January 20, 2004, to begin the second session of the 108th Congress. One of the first items on the Senate's agenda was expected to be final approval of fiscal year (FY) 2004 funding for the NIH. The House passed an omnibus funding measure on December 8, 2003 to provide funds for the NIH and numerous other agencies. However, because a key Senate Democrat refused to allow the measure to go through on a voice vote it was held over until the new session began.

The omnibus bill would theoretically give the NIH \$27.98 billion, an increase of 3.7% or \$1.0 billion over last year's funding. This sum will be subject to an across-the-board cut of .59% to bring about a reduction in total government spending. In addition, the NIH budget will again be subject to administrative transfers of funds for program evaluation and the global HIV/AIDS fund. Once these reductions are taken, the NIH program level is expected to be \$27.05 billion, providing an effective increase of some \$736 million or 2.8% over the FY 2003 funding level of \$26.98. The APS advocated \$30.06 billion for the NIH in FY 2004.

The FY 2004 omnibus also contains \$5.6 billion for the National Science Foundation (NSF). This represents an increase of \$300 million over its FY 2003 level and includes a total of \$4.3 billion for research, \$156 million for

*(continued on page 34)*

(continued from page 33)

equipment and \$945 million for education. The APS advocated \$6.39 billion for the NSF to make it possible for its budget to double by FY 2007.

Even while final action on FY 2004 funding was still pending, grim news began to leak out about prospects for FY 2005 funding. The *New York Times* reported on January 2, 2004 that President Bush would request an increase of 3% or less for NIH in FY 2005. Unnamed administration officials told the paper they were concerned about the ability of the agency to manage another large infusion of funds. Some in the research community were expecting the administration's proposed increase for the NIH to be as low as 2.5%.

## Sustain NIH Increases, Nobelists Tell White House

On November 20, 2003, three Nobel Laureates met with Bush administration officials to make the case for sustaining the nation's commitment to biomedical research in the coming years. Nobel Laureates Thomas Cech, Sidney Altman, and Sherwood Rowland participated in the meetings with Vice President Dick Cheney, Office of Management and Budget Director Joshua Bolten, and senior White House staffers. FASEB President Robert Wells accompanied the delegation.

FASEB sought these meetings to explain to top administration officials the critical importance of sustaining the investment made during the five-year doubling of the NIH budget. The Nobel Laureates explained the danger to research efforts from rapid budget growth followed by sharp funding reductions. They urged that a significant increase be recommended for the NIH in the FY 2005 budget, which is scheduled for release in early February.

"The legacy of the [NIH] budget doubling is at stake now," the Nobel Laureates told the White House officials. The group also discussed the interrelatedness of all scientific disciplines and the importance of a bal-

anced funding portfolio. They urged that support for the life sciences be complemented by investments in the physical sciences and mathematics.

FASEB President Robert Wells told reporters afterwards that the message the group tried to convey was the importance of scientific research, and that the discussions were "engaging." In addition to the meetings with Cheney and Bolten, the group met with White House Deputy Chief of Staff for Domestic Policy Harriet Miers and White House Office of Science and Technology Policy Director John Marburger.

## NIH Issues Conflicts of Interest Rules

On January 5, 2004, NIH unveiled new rules to address issues relating to conflicts of interests among scientists serving as peer reviewers. The new rules were scheduled to go into effect on February 4, 2004.

The rules, published in the *Federal Register* on January 5, state that scientists on peer review panels must recuse themselves from reviewing grants in which they have a financial interest totaling more than \$10,000. This is an annual total that includes consulting fees, honoraria, and ownership of corporate stock. However, the rule provides that the NIH Director may still allow the scientists to participate in reviews if they are deemed to have unique expertise and the conflict is not substantial enough to bias the review.

The rule would also require that scrutiny be given to any peer reviewer with ties that might constitute an apparent conflict of interest. In those instances, NIH peer review staff would estimate the risk of bias, but the NIH Director could provide a waiver.

The new rules were published at a time when financial conflicts of interest involving NIH staff have come under intense scrutiny. In a December 7, 2003 article, the *Los Angeles Times* reported that some senior NIH officials received thousands of dollars in consulting fees from pharmaceutical companies whose products were being

used in NIH clinical trials. Anthony Demsey, a senior advisor for policy at the NIH's Office of Extramural Research, said the timing was coincidental because work to develop the new rules began in 1996. The new rules provide an update and clarification of 1982 rules.

These latest incidents have also drawn the attention of Congress.

In a December 8, 2003 letter, House Energy & Commerce Committee Chairman W.J. (Billy) Tauzin (R-LA) and Oversight & Investigations Subcommittee Chairman James Greenwood (R-PA) asked NIH for information about the incidents reported in the *Los Angeles Times*. The items requested included NIH memos and letters relating to the approval of NIH scientists to serve as paid consultants for drug companies receiving NIH funding, as well as a list of approved consulting agreements and other records.

"The receipt of outside payments, even though approved, raises concerns about whether the integrity of NIH clinical research has been affected and whether the honor system used by NIH to enforce recusals signed by NIH scientists and other conflict-of-interest rules [have] been violated," Tauzin and Greenwood wrote in their letter. The Energy and Commerce Committee is expected to hold hearings on this issue.

In response to the congressional inquiry, NIH Director Elias Zerhouni has ordered a review of outside consulting arrangements made within the past five years. He has also set up a blue ribbon commission to look at solutions to this problem.

## AAAS Launches Science and Security Web Site

In December 2003, the American Association for the Advancement of Science (AAAS) launched a web site dedicated to the topic of science and security in the post-September 11th world. The site can be accessed at: <http://www.aaas.org/spp/post911>.

Visitors to this web page can find issue briefs and resource pages on various topics involving the intersection



of science and national security since the World Trade Center attacks. Topics addressed include visa restrictions for foreign students; new rules for working with select biological agents; handling sensitive and classified information; and scientific publication policies. For each of these topic areas there is a background brief with hyperlinked citations to related publications as well as a resource page with links to additional sources of information.

The site also features AAAS articles and publications, such as the AAAS News article, "Fear of Foreigners May Slow Scientific Progress," and the AAAS Special Report, "Science & Technology in a Vulnerable World." In addition, the site offers an area where scientists can share their experiences with post-September 11th security policies.

## "Making Science News" Symposium Returns at EB 2004

The obesity epidemic...SARS...

heart disease—the list of recent news stories written on science-based issues goes on and on. These articles are part of a growing niche in the media for science and health news. Journalists are eager to report on new research in the life sciences. Many reporters have a moderate knowledge of the sciences and some even have subscriptions to scientific journals. They are becoming more receptive to scientific information, especially that which affects human health and personal quality of life. A growing number of reporters have become proactive in their approach, contacting scientists to explore new research on the horizon.

What does this mean to APS members? This ever-expanding interest in scientific news is an opportunity to assist in public understanding of and garner public support for scientific and biomedical research. Not only are there many more occasions to publicize scientific studies, but there is also a higher probability that scientists will be called upon by the media to explain these studies. Helping scientists to take advantage of these opportunities is the aim of the "Making Science News" symposium, sponsored

for the second consecutive year by the APS Communications Committee.

"Making Science News" will feature a panel of three journalists (from TV, newspaper and radio) who will offer their insight into what makes science news and the best practices for getting scientific research covered. The symposium will also feature a hands-on session with medical publicist Donna Krupa about how scientists can work with the media. This will take the form of a mini-workshop where participants can engage in practical exercises. Those interested in participating in the workshop portion of the symposium are asked to register by April 2, 2004 at <http://www.the-aps.org/press/conference/eb04/sciencenews.htm> or email Stacy Brooks (sbrooks@the-aps.org) for more information.

The goal of this symposium is to familiarize scientists with how the media works. By preparing scientists to sculpt clear, media-ready messages, the scientific community assists in bringing accurate information to the public. The symposium is open to all and will be held in the Washington Convention Center Room 140A on Saturday, April 17, 2004 from 2-5 pm. ❖

## The American Physiological Society Medical Physiology Curriculum Objectives

<http://www.the-aps.org/education/MedPhysObj/medcor.htm>

Download in HTML or PDF format

A systematic presentation of core physiological concepts focused primarily on normal body function. The Objectives provide guidelines for the breadth and depth of knowledge in the physiological principle and concepts in understanding mechanisms of disease and body defenses in pharmacology, pathology, pathophysiology, and medicine.

- ◆ Cardiovascular
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- ◆ Renal, Fluid Balance, and Acid-Base

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The **Medical Physiology Curriculum Objectives** is a joint project of The American Physiological Society and the Association of Chairs of Departments of Physiology.

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## Experimental Biology '04 Public Affairs Workshops and Symposia

Open to all EB Registrants

**Saturday, April 17**

### **Human Research Protections 1a: How to Navigate Human Research Protection Regulations**

<http://www.asip.org/mtgs/EB04/hrtp.htm>

9:00 AM-11:00 AM

Convention Center, Room 101

This workshop will provide an introduction to principles of bioethics and current US federal regulations for protecting human subjects involved in research. The workshop will describe a comprehensive program of protections that an institution can provide to protect human subjects and conduct good scientific research. Emphasis will be on the roles of Institutional Review Boards (IRBs) and investigators in protecting research subjects and will include a comparison of the "Common Rule" with HIPAA concerning the use of human biological materials. There is no charge, but seating is limited so you must register to attend. Contact: Tara Zeitner at 301-634-7950.

### **IACUC 101 for Scientists: Dealing With Problem Areas**

<http://www.the-aps.org/pa/IACUC/eb04.htm>

11:00 AM-3:00 PM

Convention Center, Room 146B

This presentation moves beyond the basics of IACUC to address issues that may require special attention from the IACUC, including the role of IACUC as facilitator or research, conducting semi-annual program review and facility inspection, protocol approval monitoring and more. Participants will be able to pose questions to representatives of USDA, OLAW, and AAALAC. There is no charge for this session, but seating is limited so pre-registration is encouraged. Contact: Alice Ra'anani at 301-634-7105 or [araanani@the-aps.org](mailto:araanani@the-aps.org).

### **Making Science News**

<http://www.the-aps.org/press/conference/eb04/sciencenews.htm>

2:00 PM-5:00 PM

Convention Center, Room 140A

The goal of this symposium is to familiarize scientists with how the

media works. The ever-expanding interest in scientific news is an opportunity to assist in public understanding of and public support for biomedical research. Helping scientists to take advantage of these opportunities is the aim of this symposium. A panel of three journalists will offer insight into what makes science news and the best practices for getting scientific research covered. Contact: Stacy Brooks at 301-634-7253 or [sbrooks@the-aps.org](mailto:sbrooks@the-aps.org).

**Sunday, April 18**

### **The New CSR Review Process: An NIH Review**

1:00 PM-2:30 PM

Convention Center, Room 147A

This session will present an overview of the changes to Initial Review Groups at NIH's Center for Scientific Review that are being implemented as a result of the recommendations of the Panel on Scientific Boundaries of Review.

**Monday, April 19**

### **Scientific and Regulatory Challenges Involving Dietary Supplements and Botanical Products**

12:30 PM-2:00 PM

Convention Center, Room 143/AB

Confirmed Speakers:

Marc McClellan, Commissioner, Food and Drug Administration

Paul Coates, Director, Office of Dietary Supplements, NIH

Stephen Straus, Director, National Center for Complementary & Alternative Medicine, NIH.

Topics to be addressed include: how to promote a stronger scientific foundation at the FDA and the need to promote better health through better research; how new collaborations with NIH will help to improve our understanding of the underlying mechanisms of action and help to improve safety and efficacy of these products; research opportunities for the extramural community; and regulatory perspectives on the Dietary Supplement Health & Education Act of 1994 (DSHEA).

### **Will You Still Fund Me Tomorrow? The Deficit, Bioterror, and the NIH Roadmap**

3:00 PM-4:30 PM

Washington Convention Center, Room 207B

Join NIH Director Elias Zerhouni, MD, and several NIH institute directors in a panel discussion to address how a radically changing environment will impact NIH grantees in the coming years. Zerhouni and the other speakers will discuss the prospects for NIH funding in light of increasing federal budget deficits, the need for biodefense spending, and the NIH Roadmap. They will also address how the roadmap initiatives will complement or compete with investigator-initiated research and how the various institutes and centers will implement and plan for future Roadmap projects.

**Tuesday, April 20**

### **Sustaining Integrative & Organ Systems Sciences: Problems, Opportunities, Solutions**

12:30 PM-2:00 PM

Convention Center, Room 143C

Confirmed Speakers: Jerry Buccafusco, Medical College of Georgia; Gerald Schaefer, Wil Research Laboratories, Inc.; Steve Zeisel, University of North Carolina; Irv Zucker, University of Nebraska; Stanley J. Wiegand, Regeneron Pharmaceuticals, Inc. Other speakers to be announced.

The advent of molecular biology has produced a vast wealth of information on human health and disease. However, there has been a diminishment in the number and ability of trained investigators and students pursuing training and research in the integrative and organ systems sciences. Science cannot effectively study disease or treatments for a disease simply by using isolated molecules, cells, or organs. Speakers will give their perspectives on the challenges and opportunities for enhancing the integrative & organ systems sciences by addressing its impact on both academic and industrial concerns. ❖

## Textbook of Work Physiology: Physiological Bases of Exercise, 4th Edition.

Per-Olof Astrand, Kaare Rodahl, Hans A. Dahl and Sigmund B. Strome. Champaign, IL: 2003, 650 pp., illus., \$79.00, ISBN: 0-7360-0140-9.

In 1970, Astrand and Rodahl introduced their textbook to the exercise science community and subsequently observed its emergence during the latter portions of the 20th century as one of the most cited textbooks by teachers and researchers for exercise and work physiology information. However, with the fourth edition, the Astrand influence has been confined to his previous concepts and research findings with Rodahl and colleagues at The Norwegian University of Sport and Physical Education assuming the authorship.

The text consists of 18 chapters whose titles are our biological heritage; the cell and its regulatory mechanisms; the muscle and its contraction; motor functions; body fluids, blood and circulation; respiration; skeletal system; physical performance; evaluation of physical performance on the basis of tests; body dimensions and muscular exercise; physical training; nutrition and physical performances; temperature regulation; factors perfecting performance; fatigue; applied sport physiology; applied work physiology, and physical

activity and health. In addition, there are four appendices that are devoted to the definition of units, prefixes for unit abbreviations, conversion tables and symbols plus a section devoted to a glossary of terms. The text is well illustrated with two color figures, essentially 19 per chapter, and contains more than 1,600 citations with approximately 50% being published within a decade ago and 10% since the turn of the century (the third edition was published in 1986). New citation figures that enrich the chapters are the identification of classical studies and the listing of additional readings. However, the authors could have provided more information on the nature of the experiments and on their significance in advancing physiological understandings and concepts.

Single or multi topical chapters devoted to one's biological heritage, muscle and motor functions, the skeletal system, respiration, physical performance, physical training, applied sport physiology, and applied work physiology are comprehensive and noteworthy. Also deserving of comment is the information pertaining to environmental influences with special attention being devoted to the effects of elevated temperatures. "Hot topics" related to molecular biology, gene expression, metabolic signaling, aging, pregnancy, and the female athletic triad are discussed and interspersed throughout the chapters. Exercise physiology instructors should realize this text is likely the only one that

extensively details the physiological effects of specific activities, e.g. walking, running, skiing, swimming, skating, rowing, soccer, etc., as well as occupations pertaining to house work, farming, mining, fishing, fire fighters and the like. With an intended focus on performance, it was surprising that the physiological responses in a microgravity environment were not mentioned within its contents.

Because of the uncertainty in the scientific background of its readers, this edition, like most exercise physiology textbooks contains background information found in basic physiology texts. With exercise genomics becoming the topical area of the future, the text would have been enhanced by a specific section on the subject. In addition, more attention being directed on the immune and endocrine contributions to exercise and training would have helped increase the comprehensive component of the text.

In the preface, the authors note that "an attempt has been made to meet the contemporary needs of the physical education student at both the graduate and postgraduate levels." Even with the caveats of the preceding paragraph, the authors have accomplished this purpose and can look forward to its continued acceptance at the national and international level.



Charles M. Tipton  
University of Arizona

## APS Sustaining Associate Members

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## The Biology of Human Survival.

C.A. Piantadosi.  
New York: Oxford Univ. Press, 2003,  
280 pp., illus, index, \$35.00.  
ISBN: 0-19-516501-2.

Because the broad sweep of human physiology encompasses many specialized disciplines whose subject matter ranges from atoms to populations, most of us are highly focused in our research. Occasionally, a work of intellectual synthesis provides an elevated view that allows us to appreciate how the big and the small fit into the integrated system that is the human organism. *The Biology of Human Survival* by C.A. Piantadosi affords just such a prospect. Using human responses to environmental extremes as its organizing principle, the book begins with concise surveys of the characteristics of the human environment and of the history of environmental physiology and proceeds to an overview of the mechanisms of adaptation, acclimatization and acclimation.

In the laboratory, we may be able to limit the number of experimental variables under study, but in the real world this is an impossibility. Therefore, in the third chapter of this book the author introduces the important concept of cross-acclimation, the complex ways the body responds to multiple stressors. For example, pre-adaptation to cold may protect against subsequent exposure to ionizing radiation (positive acclimation), but may increase vulnerability to hypoxia (negative acclimation). This integrative and multivariate approach is carried forward through the remaining chapters which deal, in turn, with nutrition, water and salt balance, thermal homeostasis, defenses against both the deficiency and excess of oxygen, effects of ionizing radiation, as well as

the consequences of microgravity and hypergravity. The author illustrates the interaction of these factors in human attempts—both doomed and triumphant—to cross deserts and salt seas, to penetrate the Arctic and Antarctic, to delve the oceans, to reach into the upper regions of the atmosphere and beyond, into space. The human ability to escape the physiological envelope by means of behavioral adaptation, including the use of technology, is a theme that further unifies the book and includes the concept of double failure, in which an earlier oversight combined with a subsequent adverse event leads to catastrophe. This important idea is vividly demonstrated by the author's account of Robert Falcon Scott's second, and fatal, attempt to attain the South Pole during the British Terra Nova Expedition of 1910-1913. The ponies they had brought to transport their vital supplies were unequal to the task and died or had to be euthanized early in the expedition, after which the men themselves had to be their own beasts of burden, pulling heavy sledges laden with their necessities. Why did Scott and his companions die after completing over 90% of their planned trip and but one-day's-walk from a re-supply cache? Scott himself blamed bad weather and bad luck; others subsequently attributed the failure to the death of the ponies and discouragement of the men. These factors were, of course, important; but the author of *The Biology of Human Survival* demonstrates convincingly that the explorers perished from inadequate nutrition. Scott had allowed for 4,500 calories per man per day, but a straight-forward calculation and a compelling graphical display of available data show that after the ponies were gone the exhausted men needed far more than this and endured a daily deficit of 1200 to 1600 calories.

Therefore, the double failure began with the planning, before the expedition began: not enough extra food was allowed for adverse circumstances—the inevitable “bad luck.”

The next-to-last chapter is a sobering assessment of the futility of humanity's attempt to adapt to the ultimate stressor: its own power of self-annihilation, through weapons of mass destruction. The final chapter is a hopeful, but realistic consideration of the physiological possibilities for long-term space travel, even on multi-generational voyages, as well as extra-terrestrial colonization. There is an intriguing discussion of how the morphology of the human body might change in a permanent state of microgravity. The principles of population biology are used to estimate what would be the minimum required size for a sustainable population on such an adventure.

This book rests on a foundation of broad and solid scholarship and is written in a highly accessible style. It could serve as a textbook in a variety of courses at either the undergraduate or graduate levels. It can be read with great profit by practicing physiologists who want a broad view of the field. And it should be required reading for other professionals whose work has consequences for human survival: engineers, equipment designers, expedition planners, or military officers, to name a few. It will also be of considerable interest to weekend warriors who climb mountains, trek the wilderness, go to sea in small boats or dive beneath it using scuba. Or, you might just read it for pleasure if you have any interest in the marvelous ways humanity adapts to its environment.

❖

Barry W. Allen  
Duke University Medical Center

## Moving?

If you have moved or changed your phone, fax or Email address, please notify the APS Membership Office at 301-634-7171 or Fax to 301-634-7241. Your membership

information can also be changed by visiting the Members Only portion of the APS Website at <http://www.the-aps.org>.

**Tomohiko Ai**, Research Fellow, recently joined the Cardiac Electrophysiology Research Laboratory, Texas Heart Institute, Houston, TX. Prior to his current position, Ai was associated with the Department of Physiology, Dalton Cardiovascular Research Center, University of Missouri, Columbia, MO.

**James F. Amend** is currently Professor and Chairman, Western University of Health Sciences, College of Veterinary Medicine, Pomona, CA. Amend was previously associated with the Department of Physiology and Pharmacology, Texas A&M University, College Station, TX.

**Esther M. Brooks-Asplund** is presently a Scientist with Cato Research, Rockville, MD. Brooks-Asplund was formerly a Scientist with Clinical Development, Cato Research Ltd., Lake Villa, IL.

**Anthony C. Chao** has affiliated with Amphora Discovery Corporation as Senior Scientist, Mt. View, CA. Chao was formerly associated with Eli Lilly & Co., as a Research Scientist, Division of BioPharmaceutics and Drug Delivery, Indianapolis, IN.

**William H. Cooke** is presently with the US Army Institute of Surgical Research, San Antonio, TX. Cooke was previously an Associate Professor of Physiology, Department of Biomedical Engineering, Michigan Technological University, Houghton, MI.

**Brian Cummings** recently moved to Pharmaceutical and Biomedical Sciences, University of Georgia, Athens, GA. Cummings was previously associated with the Department of Pharmaceutical Sciences, Medical University of South Carolina Charleston, SC.

**Frank A. Dinunno** has joined the Department of Health and Exercise Science, Colorado State University, Fort Collins, CO. Prior to his new affiliation, Dinunno was with the Department of Anesthesiology, Mayo Clinic and Foundation, Rochester, MN.

**Tasmia Duza** is currently with The Burnham Institute, San Diego, CA. Previously, Duza was associated with the Department of Biomedical Engineering, University of Rochester, Rochester, NY.

**Beverley Greenwood-Van Meerveld** recently became Director, Oklahoma Center for Neuroscience and Presbyterian Health Foundation Chair in Neuroscience, Oklahoma University Health Sciences Center, Oklahoma City, OK. Greenwood-Van Meerveld was previously Scientific Director, Oklahoma Foundation for Digestive Research, Oklahoma City, OK.

**Omar D. Hottenstein** recently moved to the Division of Cardiovascular Devices, US FDA-Center Devices and Radiological Health, Gettysburg, PA. Hottenstein was previously affiliated with the US Army Medical Research and Materiel Command as Program Project Officer, Combat Casualty Care Research Program, Frederick, MD.

**Daniel B. Ornt** has affiliated with Case Western Reserve University, School of Medicine, Cleveland, OH as Professor, Dean's Office. Prior to his new position, Ornt was associated with the Department of Medicine and Pediatrics, University of Rochester School of Medicine and Dentistry, Rochester, NY.

**Bo Skaaning Jensen** is presently Chief Scientific Director, Department of Molecular Anatomy and Physiology, Frederiksberg, Denmark. Jensen was formerly with the Department of Molecular Anatomy and Physiology, NeuroSearch, Ballerup, Denmark.

**Sandrine V. Pierre** is currently with the Department of Pharmacology, Medical College of Ohio, Toledo, OH, as Research Assistant Professor. Pierre was formerly with the Department of Physiology, Texas Tech University Health Sciences Center, Lubbock, TX.

**Peipei Ping** presently holds the position of Professor, Department of Physiology and Biophysics, UCLA School of Medicine, Los Angeles, CA. Ping was previously affiliated with the Department of Physiology and Biophysics, University of Louisville Health Sciences Center, Louisville, KY.

**Ilka Pinz** has recently affiliated with the Department of Pharmacology, University of New England, Biddeford, ME. Formerly, Pinz was associated with the NMR Lab for Physiological Chemistry, Brigham & Young Hospital, Harvard Medical School, Boston, MA.

**Jason E. Podrabsky** moved to the Biology Department, Portland State University, Portland, OR. Prior to his new position, Podrabsky was associated with the Stanford University Hopkins Marine Station, Pacific Grove, CA.

**Patangi K. Rangachari** has joined the O'Brien Center for the Bachelor Health Sciences Programme, University of Calgary, Calgary, Canada. Rangachari was formerly associated with the Department of Medicine-Intestinal Disease Research Program, McMaster University Health Science Center, Hamilton, Ontario, Canada.

**Qi Shi** recently affiliated with the Department of Neurosciences, Cleveland Clinic Foundation-Lerner Research Institute, Cleveland, OH. Formerly, Shi was associated with the Department of Genetics, Case Western Reserve University, Cleveland, OH.

**Craig S. Stump** has moved to the Department of Internal Medicine-Endocrinology, University of Missouri, Columbia, MO. Stump was previously affiliated with the Department of Endocrinology, Mayo Clinic, Rochester, MN.

**M.A. Hassan Talukder** is currently affiliated with the Davis Heart & Lung Research Institute, Ohio State University, Columbus, OH. Talukder was formerly associated with the Department of Cardiovascular Medicine, Kyushu University, Fukuoka, Japan.

**Yanggan Wang** is presently Assistant Professor with the Department of Internal Medicine, Division of Cardiology, UT Southwestern Medical Center, Dallas, TX. Prior to his new assignment, Wang was affiliated with the Department of Pediatrics, Emory University, Atlanta, GA.

**Ming Yu** currently has joined BMS Medical Imaging as a Research Investigator II, North Billerica, MA. Yu was previously with the Department of Physiology, Medical College of Wisconsin, Milwaukee, WI.

**Edward J. Zambraski** has been appointed Division Chief, Military Performance Division, US Army Research Institute of Environmental Medicine, Natick, MA. Zambraski had been affiliated with Rutgers University, Nelson Labs, Piscataway, NJ.

## Department Chairs

### Chair, Exercise and Nutrition

**Sciences:** The School of Public Health and Health Professions of the University at Buffalo, State University of New York, is seeking an energetic, visionary and experienced individual to Chair the Department of Exercise and Nutrition Sciences. Research in the department focuses on exercise physiology, nutrition and biomechanics as related to health and disease approached from basic, applied and clinical perspectives. The Department offers undergraduate and graduate programs in Exercise Science, Nutrition and Athletic Training. There are 24 Faculty in the programs. We are seeking a nationally recognized individual with a strong research background and administrative experience capable of working within the academic community and the community at large. Qualifications of a successful candidate include: 1) an earned doctorate in a field related to exercise or nutritional sciences; 2) a strong record of research with extramural and peer reviewed funding; 3) strong interpersonal and leadership skills. Excellent opportunities exist for successful interdisciplinary collaboration in both research and teaching within the School and with other units within the University, including Medicine and Biomedical Sciences, Dental Medicine, Pharmacy and Nursing and the Roswell Park Cancer Institute. The University at Buffalo is a major research-intensive institution, a member of the Association of American Universities, the largest and most comprehensive of the campuses of the State University of New York, offering more than 300 undergraduate and graduate degree programs. The School of Public Health and Health Professions was recently formed to promote research and train public health and health professionals through an integrated approach, with a public health and population perspective focusing on prevention, wellness, and evidence-based practice. Please send letter of application, curriculum vitae, and a list of three references who can address administrative, teaching and research expertise to: Dr.

Jo Freudenheim, Search Committee Chair, 270 Farber Hall, University at Buffalo, Buffalo, NY 14214; 716-829-2975 ext.612; Email: JFreuden@Buffalo.edu. Review of applications will begin January 19, 2004; applications will be received until the position is filled. [EEO/AA]

**Chairperson:** The Department of Biology at Central Michigan University invites applications for the position of Chair beginning August 2004. Applicants must have a PhD in the biological sciences, a proven record of externally funded research and teaching effectiveness commensurate with the rank of full professor, and experience overseeing the daily operations of an academic unit. Strong leadership and communication skills are required. A record of successful development activities is preferred. Duties include providing direction to facilitate teaching, research, curricular reform, and development, interfacing well with others on and off campus, and promoting excellence and diversity. The successful candidate will implement a shared vision for the department. CMU is a student-centered university committed to undergraduate education and select graduate programs. The main campus of 19,402 students is located in the central lower peninsula of Michigan near several metropolitan areas and surrounded by the state's splendid natural resources. The biology department includes over 30 faculty and staff, and offers both undergraduate and master's degree programs. Faculty research areas span the discipline from biological molecules to landscape ecology. Departmental programs benefit from an outstanding research/teaching field station on Beaver Island in northern Lake Michigan and modern instrumentation including an excellent microscope/imaging facility. Further information is available at <http://www.cst.cmich.edu/units/bio/>. Send a complete application including CV, separate statements of administrative and teaching philosophy, summary of research interests, and the names, addresses and phone numbers of five references to: Chair Search Committee, Department of Biology,

Central Michigan University, Mount Pleasant, MI 48859. Initial screening will begin on January 15, 2004. Applications will be accepted until the position is filled. CMU, an AA/EO institution, strongly and actively strives to increase diversity within its community (see <http://www.cmich.edu/aaeo/>).

### Professor and Chair, Department of Physiology.

The Faculty of Medicine and Dentistry, University of Alberta invites applications for a full-time academic tenured position as Professor and Chair, Department of Physiology. The position requires a candidate who has an international reputation as a scholar, has outstanding and innovative research accomplishments or recognition as an excellent emerging researcher, thereby contributing to the University's reputation as a leading research-intensive post-secondary institution. The Chair is responsible for a Department with 19 faculty. The successful candidate should have experience teaching and will be responsible for ensuring full participation of the Department in undergraduate education programs and for the continued development of a vigorous graduate research program. The opportunities in research are enhanced by the support of the Alberta Heritage Foundation for Medical Research, the newly-established Alberta Heritage Foundation for Science and Engineering Research and by the presence in Edmonton of the National Institute of Nanotechnology. The Faculty of Medicine and Dentistry and Capital Health represent one of Canada's leading academic health science centres in one of the largest integrated health delivery regions. With annual budgets of \$200 million and \$2.0 billion respectively, the two organizations are recognized nationally and internationally for their combined leadership in research, education and clinical service. Information about the Department of Physiology can be found at <http://www.physiology.ualberta.ca>. Details about the Faculty of Medicine and Dentistry, University of Alberta, and Edmonton can be found on the Faculty's website at <http://www.med>.

ualberta.ca. Interested candidates should submit an up-to-date curriculum vitae and a two-page document outlining their current research interests, leadership experience, educational philosophy, and thoughts about how to meet the challenges of academic leadership in an integrated health region. The names and addresses of three referees should be included. Interested individuals are asked to submit their material by **February 29, 2004** to: Dr. D. Lorne J. Tyrrell, Dean, Faculty of Medicine and Dentistry, University of Alberta, 2J2 WC Mackenzie Health Sciences Centre, 8440 – 112 Street, Edmonton, Alberta, Canada T6G 2R7. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority. If suitable Canadian citizens or permanent residents cannot be found, other individuals will be considered. The University of Alberta hires on the basis of merit. We are committed to the principle of equity in employment. We welcome diversity and encourage applications from all qualified women and men, including persons with disabilities, members of visible minorities, and Aboriginal persons.

## Research Positions

**Senior Scientist–Physiology Research \$100K+:** Be the point person for new product possibilities at an industry-leading medical device company located in California. This company is committed to organic growth and we are looking for a practical and inventive individual to design and develop new noninvasive medical monitoring technologies. Key focus is on the research and development of innovative, clinically-relevant medical devices (typically in anesthesia and hospital-based respiratory care) that improve patient safety and transform the practice of medicine. As the company's Senior Scientific representative, you will be in a highly visible position working with the Advanced Technology R&D leadership team investigating "What if we did this five years from now?" and presenting research and findings at industry con-

ferences. You will be asked to recommend and engage in clinical testing, market testing and technology assessment testing. You will be heavily relied on to advise on new clinical applications on the market horizon. Looking oximetry and anesthesiology. Must have the ability to establish credibility with clinical and medical for a PhD in physiology with extensive experience in respiratory function, researchers. Looking for exceptional speaking, presentation and teaching skills and the ability to travel up to 75% of the time. Solid working knowledge of quality and regulatory requirements, plus experience dealing with regulatory agencies or outside professional groups (e.g. FDA, ISO, ANSI, HIMA). For more information, please contact Rachael Stoddard rstoddard@influenzenetworks.com 1-888-882-0570.

**Research Associate:** Requisition #11872. A full-time Research Associate Position in the Department of Physiology and Biophysics at the University of Colorado Health Sciences Center, Denver, CO. This position requires a PhD in Physiology or Neuroscience. A Research Associate is needed for studies on the regulation of ion channel expression and function in embryonic spinal neurons. Both tissue culture and animal models are in use in the laboratory. Individuals will be required to design and carryout electrophysiological and molecular biology experiments, analyze data using appropriate statistical tests, present results at national and international meetings, as well as participate in the writing of manuscripts and grants. Expertise in electrophysiology, especially in whole-cell patch clamp recording for neurons in culture, is desired. Previous experience in molecular biological methods is essential. Salary: \$43,000-\$46,000 per year plus benefits. The University will accept applications starting January 1, 2004. The review of applications will begin on February 1, 2004 and continue until the position is filled. Send application and resume to: Dr. Angie Ribera, Department of Physiology and Biophysics, University of Colorado Health Sciences Center, 4200 East 9th Avenue, C240, Denver, CO 80262; Fax:

303-315-8110; Email: Angie.Ribera@uchsc.edu. The University of Colorado is committed to diversity and quality in education and employment.

## Faculty Positions

**Assistant Professor (Research) or Postdoctoral Fellow:** The School of Medicine, Department of Physiology (Obesity, Diabetes and Aging Animal Resource), is seeking an Assistant Professor, non-tenure track, to focus upon mechanisms of aging, disease of aging, and their mitigation by caloric restriction. Research program integrates in vivo in vitro studies. Send CV and names of three references to Director, ODRC, Department of Physiology, SOM, University of Maryland, 10 South Pine Street, MSTF #600, Baltimore, MD 21201; Fax: 410-706-7540; Email: mglow001@umaryland.edu. [EEO]

**Assistant Professor/Developmental Biologist:** The Department of Biology at New Mexico State University (<http://biology-web.nmsu.edu>, <http://biology-web.nmsu.edu/>) invites applications for a tenure-track assistant professor to develop a research program in animal developmental biology using innovative approaches and model systems to understand fundamental mechanisms at the molecular, cellular, and/or integrative/physiological levels. The ideal applicant will have a PhD or equivalent degree, at least two years of post-doctoral training, research productivity commensurate with experience, and a commitment to mentoring undergraduate and graduate students at a minority-serving institution. The successful candidate will be expected to develop an independent, externally funded research program, to direct MS and PhD students, to advise undergraduate and pre-professional students, to contribute to departmental teaching needs, to develop new courses in his/her area of expertise, to participate in the department's public service missions, and to interact with colleagues who work in a variety of sub-disciplines from microbiology to

evolution. Opportunities are available to participate in NIH-sponsored biomedical research programs (MARC, RISE, SCORE, MICPP, BRIN, and Bridges). University resources include extensive modern electron microscopy, fluorescence imaging, cell culture, and sequencing facilities. The Department provides competitive start-up packages. Applicants should submit by post or Fax (no Email attachments): curriculum vitae, statements of research goals and teaching interests, and three letters of reference to Developmental Biology Search Committee Chair, Biology Department MSC 3AF, Box 30001, NMSU, Las Cruces, NM 88003; Tel: 505-646-3611; Fax: 505-646-5665. Review of applications begins December 22, 2003 and continues until the position is filled. [EEO/AA]

**Assistant/Associate Professor of Pharmacology:** Drake University College of Pharmacy and Health Sciences invites applications for a tenure track faculty position in the Department of Pharmaceutical Sciences at the Assistant/Associate Professor level. Applicants must have a PhD and postdoctoral training in pharmacology or a closely related area. The College offers degree programs leading to a PhD and a bachelor of science in pharmaceutical sciences. Instructional responsibilities for the position will include pharmacology related courses in both programs. The successful candidate will be expected to develop innovative teaching and learning approaches for the classroom and to develop/maintain an ongoing, fundable research program. Drake University and the College of Pharmacy support an interdisciplinary environment for scholarly activity; collaborative research is encouraged. The candidate must demonstrate a strong commitment to teaching and research mentoring that meets college program needs. Appointment begins in August 2004. Applications will be reviewed until a successful applicant is identified. Applicants should send a letter of interest, curriculum vitae, a statement of teaching experience, a statement of research interests/activities and the

names, addresses and phone numbers of three references directly to: Ronald Torry, PhD, Chair, Pharmaceutical Sciences Search Committee, College of Pharmacy and Health Sciences, Drake University, 2507 University Avenue, Des Moines, IA 50311-4505; Email: ron.torry@drake.edu; Tel: 515-271-2750. [EEO]

**Assistant Professor in Applied Physiology:** The School of Applied Physiology at the Georgia Institute of Technology invites applications and nominations for a tenure-track position in the area of muscle physiology at the Assistant Professor level. Applicants for this position should have demonstrated strong research interests in muscle plasticity, regeneration, or related areas. Although all areas of interest will be considered, primary consideration will be given to applicants with experimental experience in the cellular mechanisms of skeletal muscle adaptation. Applicants must have an earned PhD and strong record of publication. The successful candidate will be expected to contribute to the development of a strong graduate program, to teach and mentor students, and to support the growth of the School. The School of Applied Physiology is in a rapid growth phase with strong support from upper levels of Institute administration. Current faculty members are active in the areas of biomechanics and the neural control of movement, motor control and motor behavior, prosthetics and orthotics, muscle physiology, and systems physiology as applied to exercise. Collaborations currently exist at Georgia Tech with the Center for Human Movement Studies, the Center for Assistive Technology and Environmental Access, the School of Psychology and the College of Engineering, and at Emory University School of Medicine with the departments of Physiology, Cell Biology, Neurology, Pharmacology and Rehabilitation Medicine as well as the Atlanta Veterans Administration Hospital. Interested individuals should send a letter of application, curriculum vitae, three recent publications and the names, addresses, Email addresses and phone numbers of at

least three individuals we would contact for letters of recommendation. Applications will be reviewed beginning immediately and continue until the position is filled, but all material must be received by April 1, 2004 to be assured of full consideration. Anticipated start date is August 2004, fall semester. For further information, please contact Thomas J. Burkholder, School of Applied Physiology, GA Institute of Technology, Weber Bldg 113, 281 Ferst Dr., Atlanta, Georgia 30332-0356; Tel: 404-894-1029; Email: thomas.burkholder@ap.gatech.edu. A Unit of The University System Of Georgia, an Equal Education and Employment Opportunity Institution.

**Assistant Professor:** The Department of Exercise Science at the University of Massachusetts, Amherst is seeking applicants for a tenure-track position (nine month) at the Assistant Professor level. Candidates must have a PhD or an equivalent terminal degree, and postdoctoral work is desirable. The successful candidate must have an established record of scholarship in one of the exercise science areas, such as, but not limited to, exercise physiology and metabolism, behavioral intervention, muscle biology and physiology, motor control, or biomechanics. Evidence of the ability to attract extramural funding is essential. The candidate must be able to integrate research and teaching efforts with other faculty in the department and support the department's mission to generate new knowledge and educate society as to the scientific principles that underlie human movement and the role of physical activity in attaining optimal health. Also desirable would be the ability to integrate research and teaching with other faculty in the School of Public Health and Health Sciences. Responsibilities will include development of an independent research program, training of graduate students and postdoctoral fellows, and teaching and advising undergraduate students. The Department of Exercise Science at the University of Massachusetts Amherst (<http://www.umass.edu/sphhs/exsci/index.html>) boasts a productive faculty that func-



tion in an integrative research atmosphere. Start date is September 1, 2004. Review of applications will begin January 15, 2004 and continue until the position is filled. Please send cover letter, curriculum vita, three representative publications and the names and contact information for three references to: Dr. Priscilla Clarkson, Search Committee Chair, Department of Exercise Science, University of Massachusetts, Amherst MA 01003. Members of underrepresented populations are encouraged to apply. [EEO/AA]

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**Assistant Professor:** The Department of Physiology and Biophysics at the University of Colorado Health Sciences Center, Denver, CO invites applications for a tenure-eligible faculty position at the Assistant Professor level in the area of renal and epithelial transport. Candidates whose research involves optical methods are especially encouraged to apply. The position is being filled with the Division of Renal Diseases and Hypertension. At least 80% of the successful candidate's time will be protected for research activities; the remainder will be devoted to clinical activities and medical and graduate teaching. Research strengths in the Department of Physiology and Biophysics include ion channel biology, synaptic function, sensory transduction, cell signaling, reproductive development, immune physiology, developmental neurobiology, neuroendocrinology, the role of acid-base transporters in epithelial cell physiology, and renal phosphate transport. Core facilities for molecular biology are available within the Department, and advanced imaging instrumentation is available at the UCHSC Light Microscopy Facility at <http://www.uchsc.edu/light-microscopy>. Opportunities exist for participation in interdepartmental programs in Biomolecular Structure, Cell & Developmental Biology, Immunology, Molecular Biology and Neuroscience. Visit our web site at <http://www.uchsc.edu/sm/physiol> to learn more. Candidates should have an MD or MD/PhD degree, and at least two years of laboratory-based Postdoctoral research experience.

Please send a Curriculum Vitae, a one to two-page statement of research interests, and the names and contact information of three references to: Administrator, Department of Physiology and Biophysics, University of Colorado Health Sciences Center, 4200 E. 9th. Ave., Box C240, Denver, CO 80262. Applications can also be submitted as PDF or Microsoft Word files by emailing them to [Becky.McGowan@uchsc.edu](mailto:Becky.McGowan@uchsc.edu). Review of applications will begin immediately and continue until the position is filled. To ensure full consideration, applications should be received before January 15, 2004. [EEO]

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**Associate Professor:** Associate Professor/Professor for Exercise Physiology Obstetrics and Gynecology, Research Track. Responsibilities: Director of Women's Pavilion Exercise Physiology and Clinical Applications Institute. Primary responsibilities include: develop a comprehensive women's exercise physiology wellness and clinical applications program. Design and conduct research program, supervise staff of exercise lab, perform VO<sub>2</sub> testing, stress testing, body composition assessment and develop wellness programs with other departments. Candidates should possess a Doctorate in Exercise Physiology or equivalent and have an established scholarly record in the area of women's health and exercise physiology. Evidence of successful research funding and extensive publications in peer-reviewed journals is required. Salary and faculty appointment will be commensurate with past experience and academic credentials. Send letter of application and CV in confidence to: Raul Artal, MD, Professor and Chairman, Saint Louis University, Department of Obstetrics, Gynecology and Women's Health, 6420 Clayton Road, Ste. 290, St. Louis, MO 63117; Email: [artalr@slucare1.sluh.edu](mailto:artalr@slucare1.sluh.edu). [EOE: M/F/VAH]

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**Assistant Professor:** The University of California, Berkeley, Department of Integrative Biology, Faculty Position in Physiology. The Department of Integrative Biology at the University

of California, Berkeley is seeking a scientist for a tenure-track position (Assistant Professor) in Physiology. We seek a colleague to join a department with a strong multidisciplinary emphasis, and to help the Berkeley campus develop its new Health Sciences Initiative. Applicants with a PhD and an exceptional research record in the area of mammalian (including human) physiology, using methods ranging from molecular to behavioral analyses, will be given serious consideration. Candidates must also have a strong interest in undergraduate and graduate teaching, and will be expected to contribute to instruction in human physiology as well as in their specific area of expertise. Please send a CV, bibliography, brief description of research accomplishments and objectives, statement of teaching interests, key reprints, and have three letters of reference sent to: Chair, Physiology Search Committee, Department of Integrative Biology, 3060 Valley Life Sciences Building, University of California, Berkeley, CA 94720-3140. Application deadline: **February 9, 2004**. [EEO/AA]

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**Tenure-Track Faculty Positions:** Molecular/Cellular Cardiovascular Physiology. The Virginia-Maryland Regional College of Veterinary Medicine (VMRCVM) seeks candidates for two tenure-track faculty positions in Cellular/Molecular Cardiovascular Physiology as part of a cluster hire in the Virginia Tech/Wake Forest University School of Biomedical Engineering and Sciences. Our objective is to attract a group of complementary researchers into a science and engineering team. Successful applicants will be expected to develop a strong research program, contribute to our educational goals, and serve the overall mission of the School. The appointments will be academic year. Salary and rank will be commensurate with the candidate's qualifications. This is an extension of a previous announcement. Applications will be reviewed as received and will continue until the positions are filled. Further information about the position, institutions, accommodations in the application process, etc. can be

obtained at <http://www.sbes.vt.edu>, or by email to [vamccoy@vt.edu](mailto:vamccoy@vt.edu). Virginia Tech has a strong commitment to the principle of diversity and, in that spirit, seeks a broad spectrum of candidates including women, minorities, and people with disabilities.

## Postdoctoral Positions

**Postdoctoral Fellow:** Opening for position as postdoctoral fellow in the Division of Research Hematology at The Children's Hospital of Philadelphia. We are a molecular hematology lab that studies the role of transcription factors in controlling cell survival, growth and differentiation during normal hematopoiesis and leukemogenesis. We use mutant mice, embryonic stem cells and tissue culture cells to perform our studies. Candidates with MD or PhD and 0-1 year of postdoctoral experience should apply. Requirements include a strong molecular biology and/or hematopoiesis background and the ability to work in a team. Contact: Mitchell Weiss, MD/PhD [weissmi@email.chop.edu](mailto:weissmi@email.chop.edu); Tel: 215 590-0565.

**Postdoctoral Position:** Opening available in Neurophysiology and Biomechanics of the Spine in the Department of Biomedical Engineering at SUNY Stony Brook. This NIH-funded position will begin October 1, 2004 and is funded for two years. The position will focus on investigating functional interactions between spine biomechanics and the nervous system with particular emphasis on mechanisms underlying the clinical effects of spinal manipulative therapy. The postdoc will work sequentially in two locations: SUNY Stony Brook and Palmer University, IA. Using an animal model, neural responses of single afferents innervating a facet joint capsule are recorded while simultaneously measuring capsular loading and deformation. The ideal candidate will have a background in neuroscience and/or biomechanics and be familiar with electrophysiological recordings techniques. A PhD or other relevant graduate degree is required. Salary is

commensurate with experience (includes standard university health benefits). Send summary of research interests, CV and contact information from three references to Dr. Partap S. Khalsa ([partap.khalsa@stonybrook.edu](mailto:partap.khalsa@stonybrook.edu)), SUNY at Stony Brook, Department of Biomedical Engineering, HSC-T18 Room 030, Stony Brook, NY 11794-8181. [AA/EOE]

**Postdoctoral Position:** The Departments of Internal Medicine and Physiology, Wayne State University School of Medicine have a postdoctoral position available in the area of respiratory physiology. The funded project is focused on the impact that exposure to episodic hypoxia has on central and peripheral chemoreflex function in humans. Doctorate in physiology is required. Start date is spring 2004. Email curriculum vitae, outline of research experience, and names, addresses and telephone numbers of three references to Jason H. Mateika PhD, (<http://www.med.wayne.edu/physiology/facultyprofile/mateika/jmateika.htm>), John D. Dingell VA Medical Center, 4646 John R, Research and Development, Room #4308, Detroit, MI, 48201, Tel: 313-576-4481; Fax: 313-576-4481; Email: [jmateika@med.wayne.edu](mailto:jmateika@med.wayne.edu).

**Postdoctoral Position:** The Obesity and Diabetes Research Center, Department of Physiology, University of Maryland School of Medicine has a postdoctoral position available in the areas of mechanisms of obesity, diabetes and aging. NIH and industry funded projects include the early physiological/molecular development of diabetes and aging; metabolic, enzymatic, and insulin signaling alterations in calorie restriction and aging; prevention of diabetes and its complications, retinopathy, nephropathy, and dyslipidemia; pancreatic islet culture and transplant; and molecular aspects of aging, diabetes and obesity. Doctorate in physiology, molecular or cell biology, or biochemistry with interest in integrating in vivo and in vitro studies required. Start date is open. Send curriculum vitae, outline of research experience and interests and

names, addresses and telephone numbers of three references to B.C. Hansen, Director, Obesity and Diabetes Research Center, Department of Physiology, University of Maryland, School of Medicine, 10 South Pine Street, #6-00 MSTF, Baltimore, MD 21201; Fax: 410-706-7450; Email: [bchansen@aol.com](mailto:bchansen@aol.com). [EEO]

**Postdoctoral Position:** The Department of Medical Physiology, Cardiovascular Research Institute (Drs. David C. Zawieja and Michael J. Davis) at The Texas A&M University System Health Science Center, College Station, TX, is seeking two postdoctoral research associates to join a cardiovascular research program studying the physiological basis of vascular contractility. One project involves the regulation of arterial, venous and lymphatic contraction in isolated vessels, with a particular emphasis on the influence of pressure and flow. The other project involves comparative muscle mechanics of arterioles, venules and lymphatics. Both projects include opportunities for the application of cellular and molecular biological techniques. Primary duties include design and performance of the experiments described above, analysis of data, and preparation of results for scientific publication and presentation. Requirements include a doctoral degree in a related scientific area. Experience in vascular/lymphatic biology or microcirculatory studies is strongly preferred. Also requires the ability to multi-task and work cooperatively with others. The positions are funded by a National Institutes of Health grant. Starting salaries for positions may be negotiable based on qualifications and experience. The positions are available immediately and may be funded for up to four years, depending on availability of funds. Applicants must apply for the positions online at <http://tamujobs.edu> and must include their resume, list of publications, and contact details of three references. Position number 040183. Staff can assist you at: Employment Office, Texas A&M University, 1475 TAMU, College Station, TX 77843-1475, [Emploffice@](mailto:Emploffice@)

tamu.edu. If you need additional information about the department or position, please contact: David C. Zawieja, PhD, Dept. of Medical Physiology, Cardiovascular Research Institute, Texas A&M University System Health Science Center, College Station, TX 77843; Fax: 979-847-8635; Tel: 979-845-7465; Email: dcz@tamu.edu. [EEO/AA]

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**Postdoctoral or Research Associate Positions:** Masonic Medical Research Laboratory, Department of Experimental Cardiology, Department of Molecular Biology, Department of Molecular Genetics. The Masonic Medical Research Laboratory (MMRL) is seeking qualified candidates for postdoctoral or research associate positions to conduct whole cell or perforated patch clamp experiments on native cardiac cells as well as WT and mutant channels (HERG and NaV) using a variety of expression systems. Primary emphasis is on genetic mutations that alter channel function (pri-

marily NaV and HERG channels, see *Circulation*. 2004;109:r151-r156). Opportunity to interact with molecular biology and molecular genetics programs. PhD, MD or equivalent degree required with voltage clamp experience. Position available immediately. Successful applicants will be considered for a staff position at the end of their training period. Please email CV and names of three references to: Dr. Charles Antzelevitch (ca@mmrl.edu), Masonic Medical Research Laboratory, 2150 Bleecker Street, Utica, NY 13501. [EEO/AA]

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**Pre- and Postdoctoral Training:**

The Department of Food Science and Human Nutrition at Colorado State University has research training opportunities available for qualified individuals interested in the role of dietary nutrients and endogenous lipids in the development of Type 2 diabetes. The department has just completed renovation of over 2,500 sq. ft. of laboratory space dedicated to cel-

lular/molecular nutrition, nutritional biochemistry, and in vivo metabolic physiology. These laboratories are under the direction of two new faculty members, Michael Pagliassotti, Professor and Lillian Fountain Smith Endowed Chair in Nutrition, and Michael Bizeau, Assistant Professor. Current areas of research focus include simple sugar regulation of hepatic gene expression, fructose regulation of hepatic insulin signaling, the role of the endoplasmic reticulum as a nutrient sensing organelle, mechanisms of lipid-mediated insulin resistance, and the role and regulation of sterol regulatory element binding proteins in skeletal muscle. Interested candidates should contact Drs. Pagliassotti or Bizeau via Email (pagliasm@cahs.colostate.edu; Michael.Bizeau@colostate.edu) to request application materials. Please provide a brief description of research background and interests. Additional information can also be obtained at the department web site: <http://www.cahs.colostate.edu/fshn/>. ❖

## Letters to G. Edgar Folk, Jr.

**Albert Hyman** writes: "How kind of you to remember me and my 80th birthday! It was exciting to hear from you!"

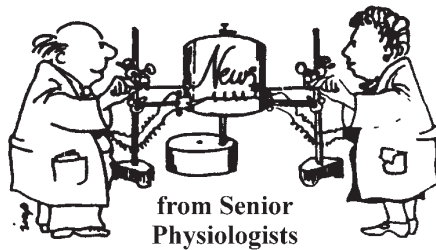
"I'm officially retired! Albeit, I still see cardiac consultations at the hospital four mornings a week and work on research projects related to the pulmonary circulation every afternoon with my 'younger' colleague, Phil Kadawitz. We're still turning out good MD-PhDs and PhDs in pharmacology—a work that keeps quite 'an courant' and excited. The email of NIH grant applications is always upon us.

"The cardiology section at Tulane where my primary appointment remains, erected a surprise wall poster for my birthday and it displayed much of the cardiac catheterization work I'd done since 1947(!). When I saw it, quite by accident, as I collected my mail and the announcements, I was truly overwhelmed. Then just before the usual Friday noon pharmacology seminars, the Chairman, Krishna Agawald, and Phil, surprised me with a birthday party and dedicated the seminar to me.

"Incidentally, several years ago, **Gabby Navar** honored me with giving the annual Hyman Mayerson Memorial Lecture. I talked about some of the work on stem cell transfer to the lung for pulmonary hypertensive states."

**Leonard B. Kirschner** writes: "Thanks for the letter with birthday greetings. Your 'Welcome to the ranks of more senior citizens' is late, but it's okay, because I received the welcome 10 years ago on my 70th. It might even have come from you.

"I'm well. The core (cardiovascular, respiratory, renal, etc.) functions as well as it did 40 or more years ago. Of course, all the peripherals either need a boost (i.e., vision, hearing, etc.) or have quite functioning altogether. But at 80, I can't complain, and in fact, am enjoying life. The only 'downer' is that I lost all three of my professional icons the past year or so; **Ladd Prosser**, who started me out; **Hans Using**, my postdoc mentor and **Herb Eastlick**, the chairman who hired me 50 years



ago. All lived into their 90s, and Prosser and Using were sentient to the end, so I guess complaints are not in order on that score, either.

"What am I doing? About what I've been doing for nearly 60 years. I was able to retain a lab and office, and so I still do research, although with no students or technicians, it goes pretty slowly. I gave up the grant business more than a decade ago. I had 34 years of generous support from NIH and NSF and hated every minute of it. I now support the lab out of pocket, and if this doesn't make me one of the dean's favorites, it's more relaxing and just as satisfying. I still work on epithelial ion transport in aquatic animals and was able to publish a paper in 2002 and one in 2003. A review has just been accepted by the *Journal of Experimental Biology*.

"Thanks to you and the APS for remembering me, even though it might be kinder not to remind one that he's 80 (sounds as old as dirt!)"

## Letter to Michael Barany

**Akira Arimura** writes, "When I graduated from the medical school in Nagoya, Japan, in 1951, I did not intend to become a physiologist. I wanted to be a clinician in Internal Medicine, hopefully a research oriented physician. Due to my poor health during my young age, I chose to specialize in Neurology which I could learn with less rigorous training than other subspecialties. Fortunately, the director of the Neurology Section was a very competent and farsighted mentor, and he advised me to study to establish a method for diagnosis of hypothalamic dysfunctions. Accordingly, I handled many patients with various neuroendocrine disorders, including diabetes insipidus. This seemed to have decided the direction of my life. I was immediately caught

with fascination of the intricate regulatory mechanisms of the hypothalamic control of the human body through the endocrine and the neural systems. A couple years before, du Vigneaud first isolated and identified oxytocin and then vasopressin, and the concept of neurosecretion had been firmly established. Before that period of time, the hypothalamic function in patients was judged only by the physical manifestation seen in various types of disorders caused by tumor or injury or other lesions in the hypothalamic region. The discovery of oxytocin and vasopressin opened a new page in modern neuroendocrinology. Humoral control of the anterior pituitary function by the hypothalamus through the hypophysial portal vessels was advocated by Jeffrey Harris, and several laboratories started to prove the existence of such chemical substances in the hypothalamus which regulate the secretion of the anterior pituitary hormones. With the permission of my mentor in the Department of Medicine, I started my graduate study in Physiology under Professor Yas Kuno, who established the systemic foundation of physiology of human perspiration, and under Dr. Shini Itoh, who was studying the effect of vasopressin in perspiration. I joined Itoh's laboratory to study the antidiuretic mechanism of vasopressin which was related to the treatment of my patients with diabetes insipidus. Then I learned that vasopressin also stimulates the anterior pituitary glands by altering ACTH secretion.

"My University in Nagoya, Japan, was completely destroyed by bombardments during World War II and we had to conduct research in temporarily built barracks. For the bioassay for ACTH, we had to hypophysectomize rats by ourselves. In the 1930's, Dr. Koyama established a simple method for hypophysectomy through the external auditory canal using a syringe with an 18-gauge needle. Since I heard that this method had been improved by Dr. Tanaka at the Shionogi Pharmaceutical Co's laboratory and routinely used for assaying ACTH there, I went to the company in Osaka to learn the technique. I was fascinated by seeing that a team of young female technicians removed the

hypophysis so easily and quickly through the ear, about one per minute. Although I could not do it as skillfully as these young female technicians, I did barely master this technique for hypophysectomy.

"In 1956, I completed my PhD study in Physiology. Through the advice of my mentor Itoh, who was then in the United States, I applied for postdoctoral positions at Harvard and Yale. I also wrote a letter explaining my work on the effect of vasopressin on ACTH secretion to the potential mentors, Dr. George Thorn, a famous endocrinologist at Harvard, and Dr. C. N. H. Long, a leading endocrine physiologist at Yale. Fortunately, I was offered a marvelous scholarship from Yale. In addition, with the generous aid of a travel grant from the Fulbright Commission, I could join the Department of Physiology at Yale as a postdoctoral fellow. The life of the United States in the 1950's was indeed like heaven compared to the still devastated Japan. My first article with Itoh submitted to *Nature* from Japan was accepted, but we, as well as our University in Nagoya, could not afford to subscribe to the journal or even order the reprints. I saw my published article in *Nature* for the first time at the library at Yale. The atmosphere of the Department of Physiology at Yale at that time looked rather like a British University. Many faculty members and fellows, including my predecessor, as well as the animal caretaker, were British. Professor Fulton still taught Medical History. Many scientists visited Yale to meet with Dr. Long and he showed them around the laboratories. One day, he brought Dr. Jeffrey Harris from Oxford University to my laboratory and asked me to show him the technique for hypophysectomy through the external auditory canal. Although I did not have much confidence in my technique, I barely managed to show the technique to Harris. He wanted to try the hypophysectomy by himself. I gave him the instrument. To my surprise, he removed the pituitary gland successfully in the first trial. It was marvelous. He commented his view on this technique very precisely, including its advantages and disadvantages. The second scientist whom Long brought

to my laboratory was a young physiologist, Dr. Roger Guillemin. After I showed him the technique, he also wanted to try the method by himself. He tried, tried and tried, but never succeeded with it. He finally gave up. The third visitor was a famous Swedish endocrinologist at Karolinska Institute, Dr. Rolf Luft. After I demonstrated the technique, he quietly asked me if the technique could be applied to humans. I said, 'no.' He nodded, and said, 'thank you.' And he left.

"After completing my postdoctoral study at Yale for two years, I joined Tulane University to be trained at the Endocrine Section of Department of Medicine, under a new mentor, Dr. Joseph Dingman, introduced by Dr. George Thorn. He was a former associate of Thorn and studied the regulation of vasopressin secretion in patients. After training under Dingman for three years, I returned to Japan to work in the Physiology Department of Hokkaido University with Itoh, who was then the Chairman of the Department. I returned to Tulane again in 1965, to work with Dr. Andrew V. Schally to isolate and identify the hypothalamic hormones as the chief physiologist. The primary target of our work was to isolate and identify gonadotropin releasing hormone (GnRH or LHRH). There was a hectic race between laboratories for the isolation of LHRH and other hypothalamic hormones. The discovery of TRH was first reported by Schally's group in 1969 just one week before the report by Guillemin's group appeared. In 1971, we won the race of LHRH. Then somatostatin was found by Guillemin's group. Then GHRH was isolated from the ectopic tumors by Vale and Guillemin's groups. CRH was then discovered by Vale's group. In 1977, Schally shared the Nobel Prize with Guillemin for the isolation and identification of the hypothalamic hormones. The humoral regulation of the pituitary gland by the chemical substances elaborated by the hypothalamus, the theory first proposed by Jeffrey Harris, was now firmly established. The chairman of the Nobel committee at that time was Dr. Rolf Luft. It was quite intriguing that I showed the transauditory hypophy-

sectomy technique to Drs. Harris, Guillemin and Luft, at Yale, and helped Schally with the isolation of LHRH. This may be called EN in Japanese.

"As a physiologist, I could not be satisfied with the notion that the regulation of the anterior pituitary function could be wholly explained by these 'classical' releasing and inhibiting hormones. Based on the fact that all classical releasing hormones activate adenylate cyclase in the pituitary cells, regardless of whether the signaling cascade is directly coupled to the secretion of the corresponding hormone, I proposed to screen for novel hypothalamic hormones based on their ability to stimulate adenylate cyclase in the pituitary cell cultures. I applied for a NIH grant and the application was turned down. They said that such a non-specific method would not reveal any novel peptide with a specific activity. I wondered if the Study Section knew that I worked with Schally as his chief physiologist for establishing the screening methods for various releasing hormones and screened various releasing activities for many years along with his purification work. Fortunately, due to the generous support from a Japanese pharmaceutical company, we could initiate the study and isolate the novel hypothalamic peptides based on their ability to stimulate adenylate cyclase. We named the first novel peptide Pituitary Adenylate Cyclase Activating Polypeptide (PACAP). It is a pleiotropic peptide. The peptide began to attract the interest of many investigators; now publications on this topic have exceeded 1,700. It was found to be an extremely potent neuroprotectant as tested in vitro and in vivo. We have just found an entirely novel function and the mode of action of this peptide in the testicular germ cells, and are about to ask all scientists who have an interest in this neuropeptide for the validity of the new concept about the neuropeptide physiology in germ cells. When we open a door, we always see fascinating scenes and also another door behind which more fascinations may wait for the curious scientists. Research is indeed a lot of fun." ♦

March 5-6

**The Third Gulf Coast Physiological Society Meeting, Mobile, AL.** *Information:* Internet: <http://www.physiology.usouthal.edu/gulfcoast/>.

March 7-12

**Molecular Mechanisms in Lymphatic Function and Disease Gordon Research Conference, Ventura, CA.** *Information:* Internet: <http://grc.org/programs/2004/lymphat.htm>.

March 25-27

**7th Scandinavian Congress of Medicine and Science in Sports, Stockholm.** *Information:* Internet: <http://www.svenskidrottsmedicin.se/scandinaviansportscongress>.

April 3-6

**BioVision Alexandria 2004 The New Life Sciences: Ethics, Patents and the Poor, Lyon, France.** *Information:* Internet: <http://www.bibalex.org/bioalex2004conf>.

April 22-23

**Cleveland Cell Biology Symposium: Regulation of Nuclear Function, Cleveland, OH.** *Information:* <http://www.cwru.edu/med/cellbiology>.

May 3-4

**Symposium on Cardiovascular Molecular Imaging, National Institutes of Health, Bethesda, MD.** *Information:* American Society of Nuclear Cardiology, 9111 Old Georgetown Road, Bethesda, MD 20814. Tel: 301-493-2360; Email: [CMISymposium@asn.org](mailto:CMISymposium@asn.org); Internet: <http://www.asnc.org/meetings/imaging.cfm>.

May 15-21

**Twelfth Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine, Kyoto, Japan.** *Information:* International Society for Magnetic Resonance in Medicine, 2118 Milvia Street, Suite 201, Berkeley, CA. Tel.: +1 510 841 1899; Fax: +1 510 841 2340; Email: [info@ismrm.org](mailto:info@ismrm.org); Internet: <http://www.ismrm.org>.

May 25-27

**Amino-Acid/Protein Metabolism in Health and Disease International Congress, Milano, Italy.** *Information:* Organising Secretariat, San Raffaele Congress Centre, Via Olgettina 58 - 20132 Milano - Italy. Tel: +39-02 2643 3700; Fax: +39 026 2643 3754.

May 28-31

**The XIV International Congress of Dietetics, Chicago, IL.** *Information:* Email: [congress@internationaldietetics.org](mailto:congress@internationaldietetics.org); Internet: <http://www.internationaldietetics.org> or <http://www.choosechicago.com>.

May 31-June 5

**31st Annual Meeting of the International Society for the Study of the Lumbar Spine, Porto, Portugal.** *Information:* Secretary, Dr. Scott Boden, Sunnybrook and Women's Health Science Center, Room MG 323, 2075 Bayview Avenue, Toronto, Canada, M4N 3M5. Internet: <http://www.issls.org>.

June 4-7

**33rd Annual Meeting of the American Aging Association, St. Petersburg, FL.** *Information:* American Aging Association, The Sally Balin Medical Center, 110 Chesley Drive Media, PA 19063. Fax: 610-565-9747; Internet: <https://www.americanaging.org/meetinginfo.htm>.

June 9-12

**CSPS 7th Annual Symposium on Pharmaceutical Sciences, Vancouver, British Columbia, Canada.** *Information:* Sandra Hutt, Administrator, Canadian Society for Pharmaceutical Sciences, Journal of Pharmacy & Pharmaceutical Sciences, 3118 Dentistry/Pharmacy Centre, University of Alberta Campus, Edmonton, Alberta, Canada T6G 2N8. Tel.: 780-492-0950; Fax: 780-492-0951; Internet: <http://www.ualberta.ca/~cpsps/symposium2004/home.htm>.

June 20-22

**9th International Workshop on Multiple Endocrine Neoplasias (MEN2004), Bethesda, MD.** *Information:* American Institutes for Research (AIR). Tel. 301-592-2115; Email: [men2004@air.org](mailto:men2004@air.org); Internet: <http://www.men2004.org>.

June 20-23

**8th International Symposium on Resistance Arteries (ISRA), Angers, France.** *Information:* 8th ISRA, laboratoire de Physiologie - UPRES EA 2170, faculté de médecine d'Angers, rue haute de reculée, 49045, Angers, France. Tel.: 0-33-(0)241 735 845; Fax: 0-33-(0)241 735 896; Email: [isra8th@med.univ-angers.fr](mailto:isra8th@med.univ-angers.fr); Internet: <http://www.isra2004.org>.

June 23-26

**The Council on Undergraduate Research's 10th Annual National Conference: Crossing Boundaries: Innovations in Undergraduate Research, University of Wisconsin, La Crosse.** *Information:* Internet: <http://www.cur.org/conferences.html>.

July 2-10

**4th International Congress of the African Association of Physiological Sciences, Tangier, Morocco.** *Information:* Email: [aapsmorocco04@yahoo.com](mailto:aapsmorocco04@yahoo.com).

August 15-20

**Macromolecular Organization and Cell Function, Oxford, UK.** *Information:* Gordon Research Conferences, P.O. Box 984, West Kingston, RI 02892-0984 USA. Email: [hardinc@missouri.edu](mailto:hardinc@missouri.edu); Internet: <http://www.missouri.edu/~psych/GRC/GRC2004>.