

Experimental
Biology
2001
Abstract
Deadline
November 6!



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Meeting**
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The Physiologist

Volume 43, Number 4

August 2000

EB 2001—Translating the Genome

On June 26th, President Clinton walked into the White House East Room and announced “the most wondrous map ever produced by humankind.” The efforts of a public consortium led by Francis Collins and the private efforts of Craig Venter, Celera Genomics, created a “Book of Letters,” a readout of the 3.1 billion biochemical “letters” of human DNA. These letters, which provide the coded instructions for a fully functional human, will remain undecipherable until they are combined into words and sentences with meaning.

Just as APS created a new journal, *Physiological Genomics*, to provide a forum for the dissemination of information about the translation of the “Book of Letters” arising from the multiple genome projects, the organizers of the Experimental Biology meeting hope to make the EB 2001 Meeting a forum for translating the genome. Based on the program offerings from the participating societies, it is clear that Experimental Biology 2001 will be one of the major venues for all the “omics” arising from the genome projects. Not only will it feature physiological genomics, as defined by APS, but it will also include scientific sessions defined as functional genomics, proteomics, pharmacogenomics, structural genomics, etc., by our sister societies. Just as the 90s was the “Decade of the Brain,” the societies participating in the Experimental Biology meeting consider this the decade for “Translating the Genome.” Once completed, the secrets within the “Book of Letters” will lead to a revolution in diagnosis and treatment of disease.

In the pages of *The Physiologist*, you will find a complete listing of the sessions being offered by your colleagues for presentation at the Experimental Biology meeting. A number of them will serve to translate the genome as evi-

denced by their titles. Others will include talks by leading scientists using genomics to define the physiological function of a cell or a tissue. However, the sessions listed are only those being offered by APS. In the future, *The Physiologist*, the Call for Abstracts (to be mailed in September), and the EB and APS Home Pages will provide a listing of the wide range of sessions related to the “omics” listed above.

However, as you are well aware, the APS portion of the Experimental Biology meeting is not just about “Translating the Genome.” It is about all of physiology from cellular and molecular to integrative and systems to translational and clinical application. It is also about professional development and social interactions. Consequently, I urge you to be part of the Experimental Biology meeting scheduled for March 31-April 4, 2001 in Orlando, Florida. Not only will it provide an opportunity for you to interact with other physiologists, it also represents the first meeting since 1991 at which members of the American Society for Biochemistry and Molecular Biology (ASBMB) will participate. ASBMB will be joining the traditional EB participants of APS, American Society for Pharmacology and Experimental Therapeutics, American Society for Investigative Pathology, American Society for Nutritional Sciences, American Association of Immunologists, and American Association of Anatomists at the 2001 meeting in Orlando.

The APS meeting within EB will start on Saturday with a refresher course on “Endocrinology in the Modern Medical Curricula,” a tutorial on “Experimental Gene Delivery and Therapy,” and a workshop on “Integrative Approaches for the Study of Physiological Function in Genetically Altered Mice.” That evening, Robert J. Lefkowitz will

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present the annual Walter B. Cannon Award Lecture, followed by the annual APS mixer, an opportunity to mingle and mix with your colleagues. During the remainder of the week, attendees will have the opportunity to attend the Henry Pickering Bowditch Award Lecture presented by Peter M. T. Deen, as well as the 12 Distinguished Lectureships sponsored by the 12 disciplinary sections of the Society. In addition, there will be numerous symposia and featured topic presentations on every aspect of the physiological sciences.

The meeting, however, is not about the lectures and symposia organized by the Society. The EB Meeting is about you, the individual investigator and the forum it provides for the presentation of your work as volunteered abstracts. Last year, APS members submitted over 2,500 abstracts to the meeting. This year, APS anticipates an equivalent number of submissions by the membership. All volunteered abstracts will be presented as posters, with some being selected for an additional presentation in an oral session.

This year, abstracts will **only** be accepted **electronically**. APS and the other EB societies have contracted with the MIRA Digital Publishing to develop an online abstract submission system for use by EB meeting participants. It is

designed to be more user friendly than the “LaTeX” version used the last several years. Please review the material included in the Call for Abstracts and on the EB and APS Home Pages to make your submission experience a pleasant one. After all, the abstract deadline of **November 6, 2000**, is rapidly approaching.

EB 2001 will also provide the Society with an opportunity to welcome the Association of Latin American Physiological Societies (ALACF) and the Sociedad Espanola Ciencias Fisiologicas (SECF) as guest societies at the meeting. Each society will be offering two symposia featuring research performed by members of their societies. In addition, it is anticipated that a large number of ALACF and SECF members will plan on attending the meeting in Orlando. The APS will also be welcoming The Microcirculatory Society, the Biomedical Engineering Society, the American Federation for Medical Research, and the Society for Experimental Biology and Medicine as guest societies for the meeting.

The Experimental Biology 2001 meeting is also about the students, post-doctoral fellows and junior faculty at our institutions. As always, APS will host a number of sessions designed to enhance their professional development. In addition, the Society will have

numerous opportunities for these individuals to be recognized for their work and for their contributions to our discipline. The Society will once again offer the Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Awards, the Procter and Gamble Professional Opportunity Awards, the NIDDK/NIGMS Minority Travel Awards, numerous section awards, as well as Young Investigator Awards such as the Giles F. Filley, Lazaro J. Mandel, Shih-Chun Wang, and Arthur C. Guyton Awards. Last year, APS used the Business Meeting to announce the names of over 150 individuals receiving awards totaling nearly \$250,000 as a result of their contributions to physiology. This year, you can be one of those awardees. Once again, check out the Call for Abstracts and the APS Home Page (<http://www.faseb.org/aps>) for information about the award programs available for the EB Meeting.

In order to make the EB 2001 meeting a success, we need your participation. Please consider attending this year's meeting in Orlando. It represents the start of a decade in which the EB participating societies will be striving to unravel the mysteries of the “Book of Letters.” EB 2001 will mark the start of the decade devoted to “Translating the Genome.” ❖

*Martin Frank
Executive Director*

Mark Your Calendars!

Experimental Biology 2001

Abstract Deadline

November 6, 2000

153rd Business Meeting

Time: 5:30 PM, Monday, April 17, 2000

Place: San Diego Convention Center, San Diego, CA

I. Call to Order

The meeting was called to order at 5:35 PM by **President Walter F. Boron**, who welcomed the members to the 153rd Business Meeting of the American Physiological Society. A booklet containing the agenda and a listing of all the APS award recipients was distributed. President Boron selected **Susan Barman** as parliamentarian.



APS President Walter F. Boron

II. Election of Officers

Executive Director **Martin Frank** announced the results of the election of officers that was conducted by mail ballot. The membership elected **John E. Hall**, University of Mississippi, as President-Elect (April 18, 2000-April 4, 2001). The two newly elected Councillors for three-year terms are **Douglas C. Eaton**, Emory University, and **Steven C. Hebert**, Vanderbilt University (April 18, 2000-April 16, 2004). They will assume office at the close of the Annual Meeting. They are replacing **Dale J. Benos** and **Richard J. Traystman**, who are completing three-year terms on Council.

III. State of the Society

Boron mentioned that each year the President of the Society has the opportunity to review the year and comment on the state of the Society at the annual Business Meeting. He pointed out that there were several major events that

occurred during his term as President: staff changes, E-Biomed, which led to PubMed Central, APS Central, *Physiological Genomics*, ISI agreeing to individual impact factors for the *American Journal of Physiology* journals, the upcoming APS-Scandinavian Physiological Society Meeting, and the Strategic Planning Meeting.

Major staff changes occurred this past year with the retirements of long-time employees Brenda Rauner, Publications Manager and Executive Editor; Laurie Chambers, Production Manager; and James Liakos, Business Manager. He introduced the people now responsible for those departments: Margaret Reich, Director of Publications; Anna Trudgett, Editorial Manager; and Robert Price, Director of Finance.

E-Biomed in its original incarnation would have made the NIH the sole biomedical publisher in the world (or at least the USA). This would have meant that NIH would have been responsible for reviewing and all editorial decisions, would have eliminated the printed page immediately, and would have provided content free to readers (although it was not clear at the beginning who would finance E-Biomed). In a later incarnation, it was revealed that authors would be financing the venture through payment of page charges. It was possible, had E-Biomed come to fruition, that physiology as an identifiable published discipline would disappear. The new version is called PubMed Central. Under this version, present journals would continue to exist and be responsible for the reviewing, editing, and publishing of scientific literature. Once printed, the material would be transferred to PubMed Central. It would be up to the individual publisher to decide when to make content available for free access on PubMed Central (e.g., after three months, six months, one year, etc.). PubMed Central allows for seamless, full-text search capability across all participating journals. It would also offer superior electronic archiving of

papers. Boron announced that APS is currently negotiating with PubMed Central to give them APS journal content 12 months after publication and yet allow users to search APS content immediately, linking to the present fee-based HighWire system during that first year.

Boron described APS Central, the APS online system for submission and review of manuscripts. He noted that it has already been implemented for *JAP*, *AJP: Lung, Cellular, and Molecular Physiology* and *Physiological Genomics*, and *Journal of Neurophysiology* and *AJP: Cell Physiology*. Plans include implementing APS Central for all APS journals within 12 months. One of the reasons for the push to get all the Society's journals online during the next year is that plans are being made to electronically publish accepted manuscripts on the web on the day of acceptance, with approval of the author.

The new APS journal *Physiological Genomics* had its first online release July 1999 plus two other online releases in 1999. The first print publication of the journal was in December 1999. For 2000, there have been three online releases to date and the first print issue for 2000 is scheduled for May. The goal for the journal is to have a monthly online release and publication schedule at some point in the future.

Boron reminded the membership that ISI had finally agreed to calculate Impact Factors for all the individual *American Journal of Physiology* journals instead of just the consolidated journal. Each journal will now compete on its own merits rather than relying on the overall impact factor of *AJP*. Boron explained that the Impact Factor is a two-year index. Where APS journals do extremely well is in the 10-year index, sometimes improving four-fold compared with competing journals.

A joint APS-Scandinavian Physiological Society Meeting has been planned for August 16-19, 2000 in Stockholm, Sweden. The program has

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been finalized and is available on the APS Web site. Travel grants are available for the meeting, with a June 1 deadline.

Boron announced that the Society had held a Strategic Planning Meeting in November 1999. The Section Advisory Committee, the Long-Range Planning Committee, and the APS Council were involved. Boron noted that it was the 1992 Strategic Plan that shaped the current Society so successfully. At the 1999 meeting, a long-range plan was established for the future of APS. Among the major initiatives discussed were publications, meetings, and member benefits (see April issue of *The Physiologist* for details).

In closing, Boron thanked the membership for the opportunity to serve the Society.

IV. Report on Membership

A. Summary of the Membership Status

President-Elect **Gerald F. DiBona** reported on the status of the Society membership. As of March 21, 2000, the current membership of the Society is 9,612, of which 6,775 are regular members, 39 are honorary members, 1,066 are emeritus members, 70 are affiliate members, and 1,662 are student members. During this Experimental Biology meeting, Council approved the election of 244 people to regular membership. In addition, at this meeting, one physiologist was elected by Council to honorary

membership: **Heini Murer** of the University of Fribourg, Switzerland. This month, Martin Frank, APS Executive Director approved 100 student and four affiliate members. With the addition of these candidates, the Society's membership stands at 9,961.

B. Deaths Reported Since the Last Meeting

DiBona read the names of those members whose deaths had been reported since the last meeting. The membership stood and observed a moment of silence in tribute to their deceased colleagues.

V. Awards and Presentations

A. Giles F. Filley Memorial Awards

As a result of a bequest from the family of Giles F. Filley, a memorial fund was established in 1993 to recognize excellence in respiratory physiology and medicine. Two annual awards are made to investigators who hold an academic rank no higher than assistant professor and are pursuing research in respiratory physiology and medicine. Awards are made to APS members working in the United States, who have demonstrated outstanding promise based on their research program.

President Boron presented the 2000 awards to **Edward D. Chan**, National Jewish Medical and Research Center, Denver, and **Judy Marie Hickman-Davis**, University of Alabama, Birmingham.

Chan is studying the responses to protective immunity against *Mycobacterium tuberculosis*, including the formation of TNF α -dependent granulomas and the immunomodulators that mediate the regulation of TNF. Hickman-Davis' current research is on the importance of nitric oxide for mycoplasmal killing in vitro and in vivo in mice, demonstrating the complexity of interactions between reactive oxygen-nitrogen species and proteins during inflammation.

Each recipient received a \$25,000 check for use in his/her respective research program, a plaque, and reimbursement of expenses to attend the Experimental Biology meeting.

B. Arthur C. Guyton Award for Excellence in Integrative Physiology

A donation to the Society in honor of Arthur C. Guyton led to the establishment in 1997 of an award to recognize excellence in integrative physiology. One award is made annually to a regular APS member who demonstrates outstanding promise based on his/her research program in feedback, mathematical modeling, and integrative physiology.

President Boron presented the 2000 Arthur C. Guyton Award in Integrative Physiology to **Jeffrey M. Hausdorff**, Beth Israel Deaconess Hospital, Boston.

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President Walter F. Boron presenting Giles Filley Award to Edward D. Chan.



President Walter F. Boron presenting Giles Filley Award to Judy-Marie Hickman-Davis.



President Walter F. Boron presenting Arthur C. Guyton Award to Jeffrey M. Hausdorff.

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(continued from page 169)

Hausdorff is using his background in biomedical engineering to improve understanding of the regulation of physiological systems, to study the factors that contribute to change in these systems with aging and disease, and to generate new means for investigation, diagnosis, and intervention. His research to date has focused on gait and heart rate dynamics, as well as their interactions, by simultaneously monitoring electrocardiogram and walking step rate to study the relationship between ECG changes and physical activity on a beat-to-beat and step-by-step basis.

Hausdorff received a \$12,000 check for use in his research program, a plaque, and reimbursement of expenses to attend the Experimental Biology meeting.

C. Shih-Chun Wang

Young Investigator Award

As a result of a bequest from the wife of Shih-Chun Wang, a memorial fund was established in 1998 to recognize excellence in physiology. Shih-Chun Wang was the Pfeiffer Professor of Pharmacology at Columbia University and a long-standing member of the APS. He was internationally recognized

for his research contributions in the areas of neurophysiology and neuropharmacology with an emphasis on brainstem control mechanisms. An award is made to an APS member working in the United States who has demonstrated outstanding promise based on his/her research program. Boron presented the 2000 Wang Award to **Peter J. Havel**, University of California, Davis.

Havel is investigating the interactions of the nervous and endocrine systems in regulating metabolic homeostasis and energy balance. His research falls into two main areas: 1) understanding how the nervous system communicates with the endocrine pancreas to maintain glucose homeostasis and how this interaction is altered in individuals with diabetes, and 2) how the peripheral signals from adipose tissue (leptin) and the endocrine pancreas (insulin) participate in the long-term regulation of energy intake, energy expenditure, and body fat stores; what the biochemical and molecular mechanisms are that regulate leptin production; and what effects the dietary factors have on this system.

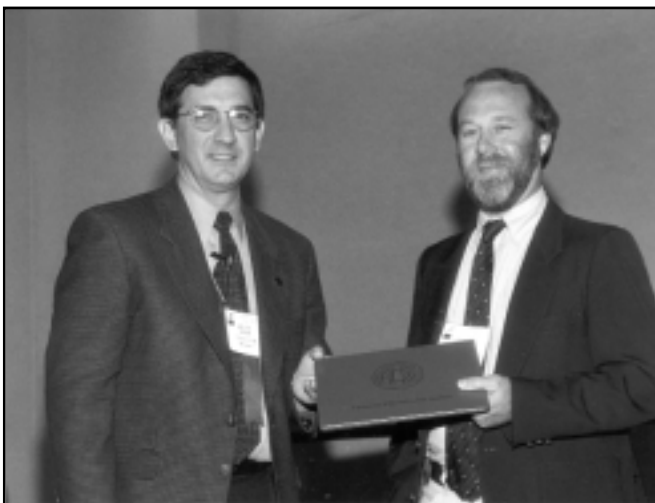
Havel received a \$12,000 check for use in his research program, a plaque, and reimbursement of expenses to attend the Experimental Biology meeting.

D. Lazaro J. Mandel

Young Investigator Award

As a result of a bequest from the wife of Lazaro J. Mandel, a memorial fund was established in 1999 to recognize excellence in epithelial or renal physiology. An annual award is made to an investigator who holds an academic rank no higher than assistant professor and is pursuing research in epithelial or renal physiology. An award is made to an APS member working in the United States who has demonstrated outstanding promise based on his or her research program. Each award is for \$12,000 and is designated for the use of the awardee in his/her research program. Boron introduced **Mrs. Muriel Mandel**, who presented the 2000 Mandel Award to **Iskander I. Ismailov**, University of Alabama, Birmingham.

Ismailov is investigating the regulation of recently cloned epithelial Na⁺ channels (ENaCs) in airway epithelia, specifically in relation to cystic fibrosis, a genetic disease that results because of severely disordered transport function of several epithelia. He seeks to determine the CFTR-interacting domain in the C-terminal cytoplasmic tail of the a-subunit and in the N-terminal cytoplasmic tails of b- and/or g-rENaC subunits. Ismailov received a \$12,000 check for



President Walter F. Boron presenting Shih-Chun Wang Award to Peter J. Havel.



President Walter F. Boron and Mrs. Muriel Mandel presenting Lazaro J. Mandel Award to Iskander I. Ismailov.

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use in his research program, a plaque, and reimbursement of expenses to attend the EB meeting.

E. Liaison With Industry Awards

The Liaison With Industry Awards are given to the graduate student and the postdoctoral fellow submitting the best abstract describing a novel disease model. Boron and **Terry Opgenorth**, Chair of the Liaison With Industry Committee, presented the 2000 Liaison With Industry Awards to Postdoctoral Fellow **Marc Egli** from the CHUV, Lausanne, and Graduate Student **Shayn M. Peirce** from the University of Virginia.

Egli is investigating impaired alveolar fluid clearance and augmented susceptibility to lung edema in mice with defective amiloride-sensitive sodium transport. Peirce is studying the attenuation of I/R injury in skin using a selective A_{2A} adenosine receptor agonist.

F. Caroline tum Suden/Frances Hellebrandt Professional Opportunity Awards

Thirty-six awards were made possible by the bequests of Caroline tum Suden and Frances Hellebrandt, who were long-time members of the Society.

Awards are open to graduate students or postdoctoral fellows who present papers at the spring meeting. Recipients receive a \$500 check for travel to the Experimental Biology meeting, paid registration, and have access to the FASEB Placement Service. **Susan Barman**, Chair of the Women in Physiology Committee, presented the awards. (see p. 175)

G. Procter & Gamble Professional Opportunity Awards

The Procter and Gamble Company, a multinational, technically based consumer products corporation, provides support for the APS Professional Opportunities Awards. The APS sections selected 17 predoctoral students who are within 12-18 months of receiving a PhD degree and are presenting a paper as first author at the spring meeting. Paid registration and \$500 checks were given to the awardees. (see p. 176)

H. Minority Travel Fellowships

Frank announced that 43 Minority Travel Fellowship awards, funded by NIDDK and NIGMS, were presented to minority students to help them attend the Experimental Biology 2000 meeting. (see p. 176)

I. Recognition of Outgoing Section Chairs

Eileen M. Hasser, outgoing Chair of the Neural Control and Autonomic Regulation Section, and **Ronald H. Freeman**, outgoing Chair of the Water and Electrolyte Homeostasis Section, complete their terms at the close of this meeting. Boron expressed pleasure in having had the opportunity to serve in a leadership capacity with them and recognized their dedication and guidance to their individual sections as well as the Society, presenting each with a plaque.

J. Recognition of Outgoing Councillors

Councillors **Dale J. Benos** and **Richard J. Traystman** complete their terms at the close of this meeting. Boron expressed pleasure in having had the opportunity to serve on Council with them and recognized their dedication and guidance to the Society, presenting each with a plaque.

Announcing that this is **L. Gabriel Navar's** last meeting as an officer of the Society, Boron noted that it was a special pleasure to recognize Navar for his

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President Walter F. Boron and Terry Opgenorth presenting Marc Egli and Shayn Peirce with Liaison With Industry Award.



President Walter F. Boron presents a plaque to Eileen Hasser, outgoing chair of the Neural Control and Autonomic Regulation Section.



President Walter F. Boron presents plaque to Ron Freeman, outgoing chair of the Water and Electrolyte Homeostasis Section.

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strong and effective leadership and true service to the Society. A plaque honoring his presidency was given to Navar.

Navar thanked the Council and Society membership for the opportunity to serve as President. He noted that he has "tried to serve the constituency, not only of the Society, but the whole constituency of physiology, whether members or not." He remarked that he had been witness to an incredible transformation occurring in APS: reaching the goal of 10,000 members by the year 2000; finishing the Core Learning Objectives in conjunction with the ACDP and APS, particularly **Rob Carroll** and the Teaching of Physiology

Section and Education Office of APS; and the change in membership status to recognize colleagues throughout the world as Regular members of the Society. However, he noted that with the Society having more of an international status, this brings additional responsibility. He pointed out that both in The Americas and overseas, there are many programs, schools, and societies that are in need of help. APS should stretch out its hand to those individuals, societies, and departments who could use some assistance. He urged those emerging leaders present to take charge and move the Society forward into the next century.



President-elect Gerald DiBona.



President Walter F. Boron presents plaque to Richard Traystman, outgoing Councillor.

VI. New Business International Union of Physiological Sciences

Boron introduced special international guest Anthony Macknight, Organizer of the 2001 IUPS Congress to be held in Christchurch, New Zealand.

Macknight gave an update on the status of the upcoming meeting. He announced that everyone should look for an article in *News in Physiological Sciences* detailing the superb scientific program. In addition, there will be outstanding non-scientific activities that promise to be fun for all attendees. He urged everyone to come and enjoy the 2001 IUPS Congress and New Zealand.

VII. Passing of the Gavel

Boron then turned the gavel over to **Gerald F. DiBona**, University of Iowa, the incoming President of the American Physiological Society. DiBona thanked Boron for leading the Society throughout the past year, and especially for his efforts on developing the 2000 APS Strategic Plan, which will serve to guide the Society over the next several years. He thanked the membership for the opportunity to serve as President of the Society.

There being no other business, the meeting was adjourned at 6:37 PM, April 18, 2000. ❖

Gerald F. DiBona
President-Elect



President Walter F. Boron presents plaque to L. Gabriel Navar, outgoing Past President.



President-elect Gerald DiBona receives the gavel from President Walter F. Boron.

Ray Daggs Award

Ray G. Daggs was the APS Executive Secretary-Treasurer from 1956 until his retirement in 1972. In tribute to his devotion to the Society, the Ray G. Daggs Award was established and is given annually to a physiologist for distinguished service to the Society and to the science of physiology. Boron was pleased to announce that the recipient of the 2000 Ray G. Daggs Award is **Heinz Valtin**. Valtin was born in Hamburg, Germany in 1926. His family immigrated to the United States when he was still a youngster, and he became a naturalized US citizen in 1945. He graduated from Swarthmore College in 1949 and from Cornell University Medical College in 1953. He obtained postgraduate training at the University of Rochester Medical School and St. Andrews University Medical School in Scotland.

Valtin's early training at St. Andrews University resulted in several publications in the *Scottish Medical Journal*, and these were his first scholarly contributions to the medical and scientific literature. Following completion of his postgraduate training, Valtin joined the faculty of Dartmouth Medical School in 1957 as Instructor in the Department of Physiology. He has remained at Dartmouth throughout the intervening forty-some years, serving as Chair of the Department of Physiology from 1977 to 1989. Presently, he is the Andrew C. Vail Professor Emeritus and Constantine and Joyce Hampers Professor Emeritus of Physiology at Dartmouth.

Valtin has a strong interest in the neurohypophyseal hormones, especially vasopressin and its renal actions for water reabsorption and concentration of the urine. He has made many contributions to our understanding of vasopressin biology through his research efforts in normal animals and in animals with hereditary diabetes insipidus. He played a major role in the development of genetic animal models with hereditary diabetes insipidus. In addition to



APS President Walter Boron presenting the Ray G. Daggs Award to Heinz Valtin.

his scientific research papers, Valtin has contributed substantially to the discipline of physiology through his popular textbook, *Renal Function: Mechanisms Preserving Fluid and Solute Balance in Health*, now in its third edition.

Valtin has received many honors and awards during his illustrious career, including the Purkinje Medal from the Czechoslovak Physiological Society, the I.P. Pavlov Medal from the Physiological Society of the USSR, and the Arthur C. Guyton Award for Distinguished Teaching from the American Physiological Society. His service to the APS has been exemplary; for example, he served on Council and on the Editorial Boards of the *American Journal of Physiology* and *News in Physiological Sciences*. He also served as Chair of the Scientific Program Committee of APS. Additionally, Valtin served as treasurer of the International Union of Physiological Sciences from 1984 to 1989. He also has been actively involved with other scientific societies, including the National Kidney Foundation and the American Heart Association.

It is abundantly clear that Heinz Valtin has contributed to the advancement of physiological science through his many research contributions, through his educational contributions, and through his exemplary service given over many years to the APS and

its members. He is the embodiment of those characteristics that are considered necessary for those honored with the Ray G. Daggs Award of the APS.

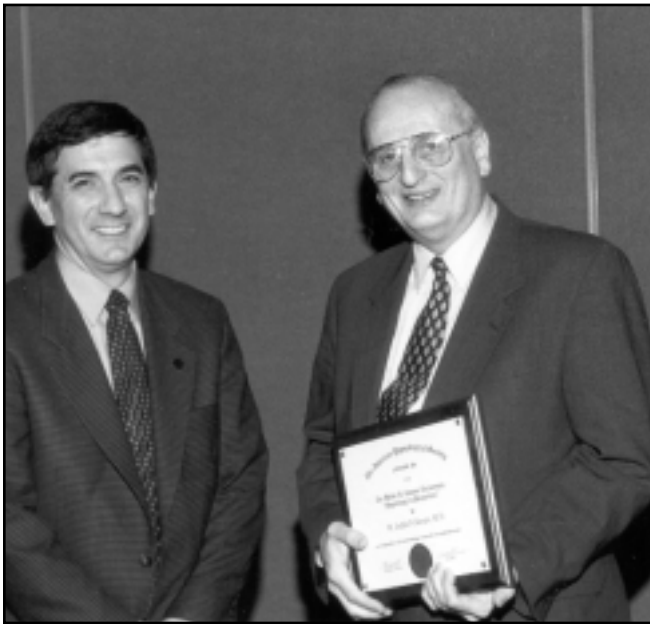
In accepting the Daggs Award, Valtin expressed his "heartfelt thanks to the Daggs Award Committee and to the Council for giving me this honor. The fact is, my service to the Society has been so enjoyable and satisfying that no recognition through an award was necessary. Anyone who has served on APS committees or on Council—and there are many in this room—can testify to the thoughtful preparation and support that is brought to each meeting by Marty Frank and his superb and friendly staff—a fitting tribute, indeed, to the Society's first Executive Secretary-Treasurer, Ray G. Daggs. The result is a friendly and trusting atmosphere in which our deliberations are conducted—always with serious intent, but also, invariably, with that sense of humor that is so essential to tolerating long meetings. What's more, through a combination of sound fiscal management (plus, of course, the spectacular market), the Society has the resources for implementing our many worthwhile programs, old and new. My service to the Society spanned a critical period for the discipline of physiology. My first meeting with the Council occurred in the early 1990s, a period when many physiologists were hanging their heads because it appeared (to some but not all) that physiology had been usurped by the exciting developments in cellular and molecular biology. It is truly exhilarating to contemplate, in retrospect, in what a short period of time physiology has recovered from that low point and risen to a new peak. The new essential role for physiology in the biomedical sciences was expressed by none other than the Director of the National Genome Research Institute, Francis Collins, when, in his introductory comments as chair of the first Physiology InFocus Symposium at these meetings, he pointed out that the next step after

Ray Daggs Award

defining the human genome, will be to elucidate the physiological function of each of our genes. This need was seen clearly by **Allen Cowley** when he made “functional genomics” the hallmark of his presidency of the APS. And the culmination of this effort—as you all

know—was the founding, in 1999, of the new journal, *Physiological Genomics*, published—of course, and proudly—by the American Physiological Society. This resurgence of physiology was illustrated clearly yesterday by **Curt Sigmund**’s beautiful Bowditch

Lecture. Thus, from discouragement in the late 1980s and early 1990s, we have blossomed into a vibrant present and a promising future! Thank you, once more, for this award.”



President Walter F. Boron presents the Walter B. Cannon Lecture Award to M. Judah Folkman.



Past President L. Gabriel Navar presents the Henry Pickering Bowditch Lecture Award to Curt Sigmund.



President-elect Gerald DiBona and Gene Rupp present the Walter C. Randall Lecture Award to Nigel Cameron.



Awards

Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Awards Presented to Graduate Students and Postdoctoral Fellows

Graduate students and postdoctoral fellows who were first authors on an abstract submitted to Experimental Biology 2000 in San Diego, CA were eligible to apply for the Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Award. The APS Women in Physiology Committee, chaired by **Susan Barman**, Michigan State University, selected 36 awardees from a pool of 123 applicants. Applicants were chosen based on two criteria: the quality of their abstracts; and the content of letters written by the applicants that explained their goals, research, and why they were particularly deserving of the award. Each awardee received \$500, a certificate of recognition, and complimentary registration for the EB 2000 meeting. Awards were presented during the APS Business Meeting at EB 2000.

Awardees were:

Christopher Agassandian, University of Iowa
Barbara T. Alexander, Univ. of Mississippi Medical Center
Laurent P. Audoly, Duke University Medical Center
Stacy Beske, Colorado State University
Robert W. Brock, University of Western Ontario
Scott H. Carlson, University of Alabama at Birmingham
Shampa Chatterjee, University of Pennsylvania
Nchan A. Chitale, University of Michigan
Inyeong Choi, Yale University School of Medicine
Brant DeFanti, University of California, Davis
Anne M. Dorrance, University of Michigan
Sharyn M. Fitzgerald, Univ. of Mississippi Medical Center
Melissa A. Fleegal, University of Florida
Patricia Ohliger Frerking, University of California, Davis
Annette M. Gabaldon, University of California, Davis
Josephine M. Garcia-Ferrer, Saint Louis University
Erik-Jan Kamsteeg, University of Nijmegen
Henry L. Keen, University of Iowa

Romulo Leite, University of Michigan Medical School
Pamela Lloyd, University of Missouri, Columbia
Robert D. Loberg, University of Michigan
Christopher J. Madden, University of Pittsburgh
Martin Mense, Yale University
Stephen E. Mercer, University of Texas at Arlington
Jauchia Wu, Yale University School of Medicine
Pablo A. Ortiz, Henry Ford Hospital
Rennolds Ostrom, University of California, San Diego
John Peever, University of Toronto
Tonous N. Silfani, Northeastern Ohio Univ. College of Med.
Sean D. Stocker, University of Pittsburgh
Douglas M. Swank, San Diego State University
Zoltan Ungvari, New York Medical College
Sara M. Vaplon, University of California, San Diego
David S. Weber, University of Michigan
Steven M. White, Tulane University School of Medicine
Yuan Clare Zhang, University of Florida



Caroline tum Suden/Frances Hellebrandt Professional Opportunity Awardees.

Moving?

If you have moved or changed your phone, fax, or email address,

please notify the APS Membership Office at
301-530-7171 or fax to 301-571-8313.

Awards

Predocctoral Students Receive Procter & Gamble Professional Opportunity Awards at EB 2000

Each year, the Procter & Gamble Company provides a generous contribution to the APS to allow the recognition of valuable contributions of predoctoral students to the science of physiology. Students apply for the Procter & Gamble Professional Opportunity Award through one of the 12 Sections of the Society. Each Section participates in the selection of awardees, and the number of awards each Section makes is based on the number of applications submitted. Seventeen awardees were selected to attend Experimental Biology 2000 in San Diego, CA. Each awardee received \$500, a certificate of recognition, and complimentary registration for the Experimental Biology meeting. Awards were presented at the APS Business Meeting at EB 2000.

Awardees were:

Mir Haroon Ali, University of Chicago
Kenneth D. Cohen, University of Rochester
Monica L. Gardon, University of Florida
Alok Pachori, University of Florida
Brian M. Button, University of Texas Medical Branch
Michael Christensen, Vanderbilt Univ. School of Medicine
Alex Zambon, University of California, San Diego
John R. Kapoor, Finch Univ. of Health Sci./Chicago Med. School
Deborah Kristan, University of California, Riverside

Michelle Z. Tucker, University of Southern California
Erwin A. Bautista, University of California, Davis
Harry B. Rossiter, St. George Hospital Medical School
Andrew N. Alexander, University of Wisconsin
Erin J. Whalen, University of Iowa
Matthew Walker, III, Tulane University
Natalie R. Norwood, University of South Alabama
Regina R. Randolph, University of Missouri, Columbia



Procter & Gamble Professional Opportunity Awardees.

APS Members Serve as Mentors to EB 2000 NIDDK/NIGMS Minority Travel Fellows

The APS has awarded Travel Fellowships to underrepresented minorities to attend the APS/Experimental Biology meeting each spring since 1987. These travel awards are supported by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and the National Institute of General Medical Sciences (NIGMS). Awardees are provided with funds for transportation, meals, lodging, and complimentary meeting registration. The APS Porter Committee reviews and selects applicants for

this award. This year, 43 minority students were selected from 61 applications to receive fellowships, enabling them to attend EB 2000 in San Diego, CA.



NIDDK/NIGMS Minority Travel Fellows.

Awards



NIDDK/NIGMS Minority Travel Fellows.

One of the most important components of the Minority Travel Fellowship is the pairing of Fellows with APS member volunteers who serve as mentors to Fellows during a meeting. Mentors provide guidance on sessions to attend, introduce Fellows to other scientists, and offer career advice. This component allowed Fellows to more fully experience all aspects of EB 2000, as evidenced in the follow-up evaluation surveys. One student made the following comment: "...the mentoring component is one of the most attractive components of the fellowship. The excitement that is expressed by the mentor was wonderful." Another student wrote: "...the mentoring was beneficial—I appreciated getting an outside opinion and advice about my academic development." Other Fellows expressed their appreciation that the program provides "not only financial assistance, but also professional guidance." Several students focused on the value of networking at scientific meetings, including one who wrote: "...I think the mentoring component is the most significant and useful part of the program. I have made several important contacts; without the mentoring, I doubt I would have had those contacts." The mentors are much appreciated for their time and expertise.

Fellows and their mentors also attended a closing luncheon at EB held in conjunction with the APS Women in Physiology Committee's *Women in Physiology Mentoring Program*. **Walter Boron**, APS President, and **Martin Frank**, Executive



NIDDK/NIGMS Minority Travel Fellows.

Director, presented certificates to each Fellow. During the luncheon, program participants compared their scientific activities of the week, and heard statements from APS member **Alice Villalobos** of the University of Connecticut. Villalobos focused on the value of having several mentors during her career in physiology and in her personal life.

The travel awards are open to graduate students,

postdoctoral students, and advanced undergraduate students from minority groups underrepresented in science (i.e., African Americans, Hispanics, Native Americans, and Pacific Islanders). Students must be US citizens or permanent residents. The specific intent of this award is to increase participation of pre- and postdoctoral minority students in the physiological sciences. For more information, contact the APS Education Office at 301-530-7132, educatio@aps.faseb.org, or <http://www.faseb.org/aps/Education.html>.

EB 2000 Awardees were:

Diane S. Allen-Gipson, Florida A&M University
Erwin A. Bautista, University of California, Davis
Richard A. Beswick, Univ. of Michigan Medical School
Wendy R. Burns, Western Michigan University
Antonio J. Carrasco, Mayo Clinic/Mayo Foundation
Christie R. Claxton, Jackson State University
Ana Y. Estevez, Vanderbilt University
Ricardo Falcon, University of New Mexico
Martin Farias, Univ. of North Texas Health Science Center
Karen Feng, University of Arizona
Carmina A. Flores, Meharry Medical College
Gerald Frank, Vanderbilt University Medical Center
Annette M. Gabaldon, University of California, Davis
Terri Gomez, University of Wisconsin, Madison
Rayna J. Gonzales, University of New Mexico
Orlando Gonzalez, Univ. of Puerto Rico School of Medicine
Monica Grafals, Univ. of Puerto Rico School of Medicine
Gerald M. Herrera, University of Vermont
Keith Jackson, Univ. of North Texas Health Science Center
Nikki L. Jernigan, University of New Mexico
Elmond J. Johnson, Meharry Medical College
Dorian Jones, University of Missouri, Columbia
Ollie Kelly-Appleberry, Emory University
Keri Kles, University of Illinois, Urbana-Champaign
Rafael A. Leos, New Mexico State University

Awards

Jurandir J. Dalle Lucca, University of Louisville
Cina M. Mack, North Carolina State University
Ronald K. McMillon, University of South Alabama
Delphine F. Medicine Horse, Dull Knife Memorial College
Stephania T. Miller, Univ. of Arkansas for Medical Sciences
Donna A. Ortiz, New Mexico Highlands University
Rudy M. Ortiz, University of California, Santa Cruz
Jewel R. Payne, Montana State University
Cassandra V. Reyes, Univ. of Illinois, Urbana-Champaign
Tiffany T. Robinson, Meharry Medical College
Raudel Sandoval, University of Illinois at Chicago
Oscar Kenneth Serrano, University of Arizona
LaTonia Stiner, Wright State University
George D. Thorne, University of Cincinnati
Patricia Turner, National Institutes of Health/NHLBI
John Walker, University of Louisville
Matthew Walker, III, Tulane Medical School
Letha Woods, Meharry Medical College

EB 2000 Mentors:

James Amend, Texas A&M University
Mouhamed Awayda, Tulane University Medical Center
Susan Barman, Michigan State University
Siribhinya Benyajati, Univ. of Okla. Health Science Center
Kathleen Berecek, University of Alabama at Birmingham
Cesar Blanco, University of Southern California
Clark Blatteis, University of Tennessee, Memphis
Eldon Braun, University of Arizona Health Sciences Center
Steven Britton, Medical College of Ohio
Robert Carroll, East Carolina Univ. School of Medicine
William Chilian, Medical College of Wisconsin

Parimal Chowdhury, Univ. of Arkansas for Med. Sciences
George Cooper, Medical University of South Carolina
James Covell, University of California-San Diego
John Cuppoletti, Univ. of Cincinnati College of Medicine
Margarita Curras-Collazo, Univ. of California-Riverside
Maria Florez-Duquet, Cal-Polytech State Univ.
Ernest Greene, New Mexico Highlands University
Robert Gunn, Emory University School of Medicine
Pamela Gunter-Smith, Spelman College
Alan Hargens, University of California-San Diego
Lisa Harrison-Bernard, Tulane Univ. School of Medicine
Peter Horvath, SUNY at Buffalo
Joyce Jones, University of Missouri-Columbia
Irving Joshua, University of Louisville
Jonathan Kaunitz, UCLA School of Medicine
Ulla Kopp, University of Iowa College of Medicine
Evangeline Motley, Meharry Medical College
C. Subah Packer, Indiana University School of Medicine
Nancy Pelaez, California State University-Fullerton
Jane Reckelhoff, University of Mississippi Medical Center
Joyce Richey, University of Southern California
Roy Russ, Mercer University School of Medicine
Celia Sladek, Finch Univ. of Health Sci./Chicago Med. Sch.
John Stallone, Texas A&M University
Bruce Stanton, Dartmouth Medical School
Colleen Talbot, California State University-San Bernardino
Richard Vari, Univ. of North Dakota School of Medicine
Alice Villalobos, University of Connecticut
Mark Weiss, Kansas State University
John Wood, University of Kansas Medical Center
Stephen C. Wood, Summa Health Systems

APS Sustaining Associate Members

The Society gratefully acknowledges the contributions received from Sustaining Members in support of the Society's goals and objectives.

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Awards

2000 APS Postdoctoral Fellowship Recipients

Council approved the APS Awards Committee request to award three APS Postdoctoral Fellowships in Physiological Genomics for 2000 because of the high quality of the three applications.

A total of 27 applications were received for the fellowship. After reviewing all the applications, the Awards Committee selected Bradley J. Merrill, Biao B. Sun, and Frank van Breukelen as the 2000 APS Postdoctoral Fellows. As awardees, each will receive a yearly stipend allowance of \$30,000 and a mini-grant of \$3,500 for laboratory expenses. The length of the award is two years.

Merrill, currently a postdoctoral fellow in the laboratory of Elaine Fuchs at the University of Chicago, proposes to use the hair follicle to investigate the functions of proteins that contribute to signaling mechanisms. While the stages of the hair cycle are morphologically and temporally well defined, the signals that are responsible for directing the cell proliferation and differentiation through these stages remain poorly

understood. With the proposed research, he will focus on the Wnt/Wingless signaling pathways in the hair follicle and specifically on one gene, Tcf3, which is likely to play an instrumental role in coordinating the proliferation and differentiation of follicular stem cells in the adults.

Sun is currently a postdoctoral fellow with Constance L. Cepko at the Harvard Medical School. He plans to use the award to undertake research designed to understand cone cell development in the vertebrate retina. The thrust of the proposal is to identify genes that influence cell fate choices and differentiation processes leading to mature cones. An understanding of cone photoreceptor development will shed light on how diverse cell types are generated in the central nervous system. Moreover, such an understanding will provide insights into human retinal diseases, such as cone-rod dystrophies and age-related macular degeneration.

van Breukelen is a postdoctoral fellow in the laboratory of Sandra L. Martin at the University of Colorado

Health Science Center. He proposes to use a combination of hypothesis and discovery-driven approaches to assess the transcriptional machinery of hibernating golden-mantled ground squirrels (*Spermophilus lateralis*). He hypothesizes that there will be significant changes in transcription both quantitatively and qualitatively during torpor. Due to the severe metabolic depression that characterizes hibernation and the estimation that transcription may account for as much as 10% of a cell's standard metabolic rate, he hypothesizes that there will be a general reduction of transcriptional activity in torpid squirrels. This reduction is likely to be achieved, at least in part, by passive temperature effects on both initiation and elongation. Further experimental data will determine if there is also an active mechanism to suppress transcription during hibernation.

The deadline for applications for the 2001 APS Postdoctoral Fellowships in Physiological Genomics is January 15, 2001. ❖



Biao Sun plans to use his fellowship award in Constance Cepko's lab to undertake research designed to understand cone cell development in the vertebrate retina.



Frank van Breukelen and Sandra L. Martin at the University of Colorado Health Science Center where van Breukelen will apply his fellowship.

APS Awards

The following APS Awards are available to the membership. For more information and applications, please see the APS web site (<http://www.faseb.org/aps/Awards.htm>.)

Ray G. Dags Award

This annual award is presented to a physiologist who is judged to have provided distinguished service to the science of physiology and APS. Selection is made by Dags Award Committee.

The recipient receives an honorarium of \$500, a plaque, and expenses to participate in the EB meeting. The Award is presented at the Society Business Meeting.

Orr E. Reynolds History Award

Deadline: December 1

The Orr E. Reynolds History Award is given annually by APS for the best historical article submitted by a member of the Society.

Articles may deal with any aspect of the history of physiology, including the development of physiological ideas and their application, instrumentation, individual and collective biography, departmental and institutional history, history of societies including APS, and physiology in its public context. Manuscripts should represent original research and be adequately documented. Articles published in APS journals or books during the prior calendar year are also eligible for the award upon request by the author(s). The award is open to all APS members except those holding advanced degrees in the history of science and medicine. A member may receive the award only once.

The awardee will receive \$500 plus expenses to attend the annual spring EB meeting. If the awardee wishes, and there is a suitable place on the program, an oral presentation will be made at the EB meeting or a subsequent conference at the beginning or an appropriate scientific session. It is hoped that, after appropriate peer review, the article will be published in one of the APS journals.

Manuscripts will be evaluated by a Society Awards committee consisting of three members of APS appointed annually by Council in consultation with the chair of the History of Physiology Group. At least one member will be a professional historian.

Manuscripts should conform to the style used in APS journals. Manuscripts should be sent to the Orr E. Reynolds Award, American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991, by December 1. The award will be presented at the Society Business Meeting.

G. Edgar Folk, Jr., Senior Physiologist Award

The G. Edgar Folk, Jr., Senior Physiologist Fund has been set up through the generosity of family and former graduate students and postdoctoral fellows to provide assistance to senior physiologists, 70 years or older, who no longer have grant funds available to them. The awards, in the amount of \$500, might be used for such purposes as attending an APS meeting to present a paper, engaging in a series of modest experiments, or completing a manuscript. Recipients will be selected with the assistance of the Senior Physiologists Committee. Names of awardees will not be made public. When the award was established, it was for the Senior Physiologists Committee "to have fun assisting colleagues and for Emeritus APS members to keep in closer touch with APS."

Research Career Enhancement Awards

Deadlines: April 15 and October 15

The APS Career Enhancement Awards are designed to enhance the career potential of APS members. The awards provide up to \$4,000 for individuals in the early phases of their careers to obtain special training and in the later phases of their careers to develop new skills and to retrain in areas of developing interests.

The awards can be used to support short-term visits to other laboratories to acquire new skills and to support attendance at courses devoted primarily to methodologies appropriate for both new investigators and more senior investigators entering a new field of research.

Members in good standing interested in applying should submit an application including a curriculum vitae, justification for an award, description of enhancement activity and current research program, and anticipated budget for the proposed program of enhancement. The applicant must also include a letter of support either from his/her department chair, laboratory host, or other appropriate individual.

Teaching Career Enhancement Awards

Deadlines: April 15 and October 15

The Teaching Career Enhancement Awards are designed to enhance the career potential of regular members. The awards provide up to \$4,000 to develop innovative and potentially widely applicable programs for teaching and learning physiology.

The awards can be used to support short-term visits to other schools to consult with experts who can assist with the project or attendance to courses on methodologies appropriate for the educational development project.

Regular members in good standing may submit an application form including: 1) a 2-page description of the proposed project, including the aim, the educational problem that the project is designed to ameliorate, identification of the innovative aspects, a plan to evaluate the educational outcomes, and the kinds and sources of expertise needed by the to carry out the project; 2) an anticipated budget with justification for fund requests; 3) a letter of support from the applicant's department chair or other appropriate individual; 4) letters of agreement from individual or departmental hosts of schools to be visited; 5) description or outline of courses to be

APS Awards

attended; and 6) a brief curriculum vitae focused on activities and achievements related to education.

Successful applicants are expected to report, in print or at a physiology conference, a description of the project and its evaluation. Awardees are encouraged to submit reports for publication in *Advances in Physiology Education*.

Giles F. Filley Memorial Awards for Excellence in Respiratory Physiology and Medicine

Deadline: November 1

The Giles F. Filley Memorial Fund was established to recognize excellence in respiratory physiology and medicine. The awards are made to investigators holding an academic rank no higher than assistant professor and are pursuing research in respiratory physiology and medicine. Each award is for approximately \$25,000 and is designated for awardee's use in his/her research program. Awards do not include any indirect cost reimbursement.

Awards will be made annually to individuals demonstrating outstanding promise based on his/her research program in respiratory physiology and medicine. Applications will be accepted from members of APS working within the US, reflecting Giles F. Filley's contributions to the national research community through his membership in APS. Because of Filley's long association with the University of Colorado, Denver, preference for one award, on a competitive basis, will be given to individuals affiliated with that institution.

The awards will be announced during the APS Business Meeting held at the EB meeting and at the Respiration Section dinner. The recipients receive reimbursement for their expenses to attend the meeting and a plaque recognizing their designation at Giles F. Filley Awardees. The awardees are selected by a committee composed of members of the APS Respiration Section.

Arthur C. Guyton Awards for Excellence in Integrative Physiology

Deadline: November 1

The Arthur C. Guyton Fund was established in to recognize Guyton's contributions and interests in feedback, modeling, and integrative physiology. The awards are made to independent investigators, who hold an academic rank no higher than assistant professor, and are pursuing research that utilizes integrative approaches to the study of physiological function and explores the role of feedback regulation in physiological function.

An unrestricted \$15,000 award is designated for the use of the awardees in their research programs. Awards do not include any indirect cost reimbursement. Applications are accepted from regular members of APS.

The awards will be announced during the APS Business Meeting held at the Experimental Biology meeting. The recipients receive reimbursement for their expenses to attend the meeting and a certificates recognizing their designation as Arthur C. Guyton Awardees.

Shih-Chun Wang Young Investigator Award

Deadline: November 1

The Shih-Chun Wang Memorial Fund was established in 1998 in memory of Shih-Chun Wang, the Pfeiffer Professor of Pharmacology at Columbia University and a long-standing member of The American Physiological Society. Wang was internationally recognized for his research contributions in the areas of neurophysiology and neuropharmacology with an emphasis on brain stem control mechanisms. The Award will be made annually to an individual demonstrating outstanding promise based on his/her research program in the physiological sciences. Applications will be accepted from APS members working within the United States and holding an academic rank no

higher than assistant professor. The award is \$12,000 and is for the use of the awardee in his/her research program. The award does not include any indirect cost reimbursement.

Lazaro J. Mandel Young Investigator Award

Deadline: November 1

The Lazaro J. Mandel Young Investigator Award was established in 1999 in memory of Lazaro J. Mandel, professor of physiology at Duke University and long-standing APS member. The Mandel Young Investigator Award will be made annually to an individual demonstrating outstanding promise based on his/her research program in epithelial or renal physiology. Applications will be accepted from members of APS working within the United States and holding an academic rank no higher than assistant professor. The award is for \$12,000 and is designated for the use of the awardee in his/her research program. The award does not include any indirect cost reimbursement. The first Mandel Award will be presented at the EB 2000 meeting.

John F. Perkins, Jr., Memorial Fellowships

Deadlines: May 15 and November 15

APS invites applications for the John F. Perkins, Jr., Memorial Fellowships. The Perkins Fellowships are designed primarily to provide supplementary support to foreign physiologists who have already arranged for fellowships or sabbatical leave to carry on scientific work in the United States.

The supplementary support is intended to help foreign scientists bring their families to the United States and thus enable them to take fullest advantage of other cultural benefits inherent in international exchange. Preference will be given to physiologists working in the fields of respiratory physiology, neurophysiology, and temperature regulation. Applications from scientists in

(continued on page 182)

APS Awards

(continued from page 181)

developing countries will also be given special attention.

Application should be made by both the visiting scientist and his/her host. To qualify, the host must be a member of the APS. The application should contain an account of these arrangements with a brief description of the proposed scientific work and an account of how visitors and their families intend to make use of cultural opportunities during their stay. Deadlines for receipt of applications are May 1 and November 1. Applications are available from the Executive Director, American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991, USA.

APS Postdoctoral Fellowship in Physiological Genomics

Deadline: January 15

The APS, initially in collaboration with Genentech, Inc., designed a postdoctoral fellowship program to promote careers in mammalian organ system physiology. In 1993, the APS-Genentech Postdoctoral Fellowship was established in recognition of the fact that many advances in cell and molecular will ultimately require an understanding in the context of the organism, and special training will be needed to conduct this type of research. A central criterion is that the postdoctoral project uses the tools of cellular and molecular biology in the setting of the whole animal. In 1996, APS made the commitment to continue supporting the Fellowship without the support of Genentech.

Candidates must identify a laboratory and sponsor under whose supervision a project in mammalian organ system physiology and molecular biology can be combined. The award is for a two-year period and includes an annual stipend (\$30,000) and a trainee allowance of \$3,500.

Two awards are made per year.

William T. Porter Fellowship Awards

Deadlines: January 15 and July 15

This award is designed to support the training of talented students entering a career in physiology and to provide predoctoral fellowships for minority students, postdoctoral fellowships, and limited sabbatical leave aid for faculty members of predominantly black schools who wish to update their expertise in physiology. In addition, funds have been made available to lectureships and laboratory equipment to develop teaching consortia linking predominantly black colleges with medical schools in the same area. Summer research fellowships are also awarded for minority undergraduate opportunities for physiological research.

The recipients receive stipends, and an allowance is given to the training department or laboratory where the recipient will work.

Minority Travel Fellowship Awards

Deadline: November 13

NIDDK Travel Fellowships for Minority Physiologists are open to under-represented minorities who are advanced undergraduate, predoctoral, and postdoctoral scientists, including students, who have obtained their undergraduate education in Minority Biomedical Research Programs and MARC-eligible institutions, as well as students in the APS Porter Development Program. Applications may also be submitted by minority faculty members at the above institutions. Funds will provide transportation, meals, and lodging to attend the annual spring Experimental Biology meeting. The specific intent of this award is to increase participation of the pre- and postdoctoral minority students in physiological sciences. Applicants need not be members of the APS but should be US citizens or hold permanent resident visas. With the application form, candidates should include 1) a brief curriculum vitae; 2) a letter of recommendation from the applicant's advisor; and 3) an estimate of required travel and per

diem expenses. Faculty applicants should also include a statement of current and pending support.

Caroline tum Suden/ Frances A. Hellebrandt Professional Opportunity Awards

Deadline: November 6

The APS Caroline tum Suden Professional Opportunity Awards (\$500, complimentary registration, and placement service fees) are granted to as many as 30 graduate students or postdoctoral fellows who present a contributed paper at the EB meeting. Candidates must be the first author of an abstract submitted to APS. An accompanying letter, signed by the sponsor of the abstract, must contain 1) certification that the author is a student or postdoctoral fellow and 2) the approximate date the nominee will be available for employment. Applicants must also submit a one-page letter stating his/her research goals, role in their research, and reasons why he/she is deserving of the award. Awardees are notified by the Womens Committee prior to March 1 and presented with their awards during the APS Business Meeting.

Liaison With Industry Awards

Deadline: November 6

Liaison With Industry Awards will be made to the graduate student and postdoctoral fellow submitting the best abstract describing a novel disease model. The awards provide \$500 to the graduate student and \$800 to the postdoctoral fellow.

Awards are announced during the APS Business Meeting held at the Experimental Biology meeting.

AAAS Mass Media Science and Engineering Fellowship

Deadline: January 15

APS will sponsor an AAAS Mass Media Science and Engineering fellow who will spend 10 weeks over the sum-

APS Awards

mer working for a newspaper, magazine, radio or television newsroom. The program includes a one-week orientation in Washington, DC to help fellows develop their ability to communicate

complex scientific issues to nonscientists. Applicants must be currently enrolled as a graduate or postgraduate student of physiology or a related discipline.

The fellowship will include expenses for traveling to sessions and the job site as well as a weekly stipend based on the local cost of living. ❖

Section Awards

Distinguished Lectureship Awards

The 12 Distinguished Lectureship Awards are named after outstanding contributors to the disciplinary areas of physiology. The recipient is chosen by the section as a representative of the best within the discipline. The annual lecture is presented at the EB meeting. Each recipient receives an honorarium of \$1,000 and up to \$2,000 to cover travel expenses.

The 12 named Lectureships are:

- Robert M. Berne Distinguished Lectureship of the Cardiovascular Section
- Hugh Davson Distinguished Lectureship of the Cell and Molecular Physiology Section
- Joseph Erlanger Distinguished Lectureship of the Central Nervous System Section
- August Krogh Distinguished Lectureship of the Comparative Physiology Section
- Solomon A. Berson Distinguished Lectureship of the Endocrinology and Metabolism Section
- Edward F. Adolph Distinguished Lectureship of the Environmental and Exercise Physiology Section
- Horace W. Davenport Distinguished Lectureship of the Gastrointestinal Section
- Carl Ludwig Distinguished Lectureship of the Neural Control and Autonomic Regulation Section
- Carl W. Gottschalk Distinguished Lectureship of the Renal Section
- Julius H. Comroe, Jr., Distinguished Lectureship of the Respiration Section
- Claude Bernard Distinguished

Lectureship of the Teaching of Physiology Section

- Ernest H. Starling Distinguished Lectureship of the Water and Electrolyte Homeostasis Section.

Procter & Gamble Professional Opportunity Awards

Deadline: November 6

The Procter & Gamble Professional Opportunity Awards (providing \$500 and complimentary registration for the EB meeting) are granted to at least 17 predoctoral students who present a contributed paper at the meeting. Candidates must be the first author of an abstract submitted to APS and within 12-18 months of completing his/her PhD degree. All recipients must be US citizens or hold a permanent resident visa. An accompanying form, signed by the sponsor of the abstract, must contain 1) certification that the author is a predoctoral student and 2) the approximate date of degree completion.

Awardees are selected by the following sections of APS: Cardiovascular, Cell & Molecular Physiology, Central Nervous System, Comparative Physiology, Endocrinology & Metabolism, Environmental & Exercise Physiology, Gastrointestinal, Neural Control & Autonomic Regulation, Renal, Respiration, Teaching of Physiology, and Water & Electrolyte Homeostasis.

Cardiovascular

The **Cardiovascular Section Young Investigator Award** (\$500) is designed to entice submission of abstracts to the

Experimental Biology meetings from junior investigators and to aid them in their travel expenses. To be eligible, the investigator must be within 10 years of receiving his/her PhD or MD degree and have submitted a first-authored abstract to a Cardiovascular Section topic category. Abstracts from eligible individuals will be judged by the Cardiovascular Section Awards Committee and a total of up to nine each year which are judged to be the most meritorious will be awarded. Eligible individuals are requested to email a copy of their submitted abstract to the Chair of the Cardiovascular Section Awards Committee: George Cooper, cooperge@musc.edu, to arrive by **November 30, 2000**.

The Cardiovascular Section presents two annual awards: the Lamport Award and the Carl J. Wiggers Award.

The Lamport Award is presented to a young investigator under the age of 36 showing outstanding promise in his/her field of cardiovascular research. The recipient, who receives a certificate and a \$500 check, is selected by an awards committee. The Carl J. Wiggers Award honors a founder of the section and is presented to a scientist who has made outstanding and lasting contributions to cardiovascular research. The selection is made by the Steering Committee. The recipient receives a plaque and presents a lecture on their research at the annual EB meeting.

Central Nervous System

The **Central Nervous System (CNS) Section** of the APS will provide at least

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Section Awards

(continued from page 183)

two awards (\$500 each) for recognition of meritorious research by young investigators who participate in the annual Experimental Biology Meeting. To qualify for this award, the applicant must have received a PhD or other professional degree within the past 10 years and must present a poster or talk at the EB meeting. The subject matter of this presentation can be any topic related to the central or peripheral nervous system. Applications will be reviewed and rated by the CNS Section Awards Committee. To apply for this award, please submit four copies of the submitted abstract (or a paragraph describing your research if it is to be presented in a symposium) and a note indicating the year you received your degree, your current position, and whether you are a member of the APS. Membership in the APS is not required but is highly recommended. Mail these items by January 31, 2001 to the Chair of the CNS Section Steering Committee: Susan Barman, Department of Pharmacology & Toxicology, Michigan State University, East Lansing, MI 48824-1317.

Comparative Physiology

The **Comparative Physiology Section Scholander Award** (provides \$200 and a certificate) will be presented to an outstanding young investigator presenting a paper in the "Scholander Award" session. Applicants must submit their abstract to the "Scholander Award Session" topic category, be first author on the abstract and not more than five years past the highest degree. Mail a copy of your abstract submission and the completed *APS Award Certification Form* to Linda Allen, Membership Services, APS, 9650 Rockville Pike, Bethesda, MD 20814-3991. **Deadline for applications is November 6, 2000.**

Environmental and Exercise Physiology

The Environmental and Exercise

Physiology Section (EEP) presents the following awards at its Business Meeting or Awards Banquet during the Experimental Biology Convention.

The EEP Honor Award is presented to a current or retired primary member of the Section whose research has made significant contributions to the advancement of environmental, exercise, or thermal physiology. Recognition includes members whose teaching, mentoring, and service endeavors have enhanced the functions of the Section while promoting the Society's objectives. The recipient will receive a plaque, a check for \$1100, reimbursement of their registration fee, and the opportunity to be the featured speaker at the Awards Banquet of the Section.

The **Gatorade Beginning Investigator Award** is presented to a post-doctoral fellow or its equivalent whose investigation in either environmental, exercise, or thermal physiology has been designated by the Steering Committee as an outstanding example of experimental research. The recipient must be first author on a submitted abstract to the EEP Section, answer a questionnaire from the Steering Committee, have received their advanced degree within four years of the date of the abstract deadline, and be present at the Awards Banquet. The awardee will receive a certificate, a check for \$700, and reimbursement of the registration fee.

The **Gatorade Young Investigator Award** is presented to a pre-doctoral graduate student whose investigation in either environmental, exercise, or thermal physiology has been designated by the Steering Committee as an outstanding example of experimental research. The recipient must be first author on a submitted abstract to the EEP Section, certified by his/her advisor as being eligible for such an award, answer a questionnaire from the Steering Committee, one who has not received an advanced degree at the date of the abstract deadline, and be present at the Awards

Banquet. The awardee will receive a certificate, a check for \$600, and reimbursement of the registration fee.

The **EEP Recognition Award** is presented to one or more pre-doctoral graduate students whose investigations in either environmental, exercise, or thermal physiology has been designated by the Steering Committee as being an example of meritorious experimental research. The recipient must be first author on a submitted abstract to the EEP Section, and be certified by his/her advisor as being eligible for such an award. The awardee will receive a certificate and a check for \$500.

Gastrointestinal

The **Gastrointestinal Physiology Section Student Prize** (\$500) is designed to challenge and reward trainees who are engaged in gastrointestinal research. Two awards will be made at the Experimental Biology Meeting. One will be given for work done while enrolled as a doctoral or medical student. A second award will be given for work performed during the first through third postdoctoral years or during a medical residency. In order to be considered, the applicant must be first author on an abstract submitted for the meeting and either the applicant or sponsor must be a member of APS. A copy of the abstract, accompanied by the signed and completed *APS Award Certification Form* should be sent to: Linda Allen, APS, 9650 Rockville Pike, Bethesda, MD 20814-3991 to arrive on or before **January 15, 2001.**

The Distinguished Research Award in Gastrointestinal Physiology recipient is selected by the Steering Committee to recognize achievement in gastrointestinal research. Nominations are welcomed from the membership. The recipient presents a lecture during the section banquet and receives a cash prize.

Liaison With Industry

Novel Disease Model Award (\$500/graduate student. \$800/postdoc-

Section Awards

toral fellow) will be granted to the graduate student and postdoctoral fellow submitting the best abstracts describing a novel disease model. The model can be cellular or in vivo but should emphasize the potential utility of the system for future research related to a disease process. This award is sponsored by the Liaison with Industry Committee. A copy of the submitted abstract, accompanied by the signed and completed Award Certification Form should be sent to: Linda Allen, Membership Services, APS, 9650 Rockville Pike, Bethesda, Maryland 20814-3991 by **November 6, 2000**.

Neural Control and Autonomic Regulation

The Michael J. Brody Young Investigator Award of the APS Neural Control and Autonomic Regulation Section (\$500) is sponsored by Merck & Co. recognizes a promising young investigator who has made a significant research contribution to the understanding of neural control and autonomic regulation. The award is open to graduate students (post-candidacy exams), postdoctoral fellows, and clinical fellows who present and are first author on an abstract at Experimental Biology. Either the applicant or the abstract sponsor must be a member of APS. Applicants must mail a copy of the submitted abstract; the completed *APS Award Certification Form*; a list of publications; a one-page summary and evaluation of research contributions, written by the applicant and; a cover letter signed by both the applicant and sponsor indicating the date, or expected date, of highest degree. **The deadline for receipt of applications is December 30, 2000.** Send applications to Linda Allen, Membership Services,

APS, 9650 Rockville Pike, Bethesda, Maryland 20814-3991.

Renal

The Aventis Pharmaceutical Excellence in Renal Research Awards are sponsored by Hoechst Marion Roussel and are designed to promote and develop excellence in research pertaining to molecular, cellular, or organ mechanisms involving the kidney. Awards are presented to two categories of students: predoctoral students (including graduate students and medical students) and postdoctoral fellows. Award recipients must be first authors on an abstract submitted to Renal and Electrolyte Physiology for programming at the EB meeting. Prior to the meeting, a first level of evaluation is conducted based on the submitted abstract. A subset of abstracts are further judged during oral presentation at the meeting. Award winners are announced at the annual renal dinner held in conjunction with the meeting and are presented with a cash prize.

The Young Investigator Award for Excellence in Renal Physiology recognizes an outstanding young investigator working in any area of renal physiology. Nominees must be less than 41 years old as of the date of the renal dinner or less than 15 years beyond receipt of their first doctoral degree.

Teaching of Physiology

The Teaching of Physiology Section sponsors the Arthur C. Guyton Physiology Teacher of the Year Award. The award is sponsored by the W. B. Saunders Company. Nominees must be full-time faculty members of accredited colleges or universities and members of APS. They must be involved in classroom teaching and not exclusively

teaching graduate students in a research lab. Each nominee must be nominated by a member of APS. The nominator is responsible for completing application materials and forwarding copies to the chair of the Award Selection Committee. The person selected receives the award at the annual banquet of the Teaching of Physiology Section. The Teacher of the Year receives a certificate, an honorarium of \$1,000, and expenses of up to \$750 to attend EB.

Water and Electrolyte Homeostasis

The Young Investigator Award in Regulatory and Integrative Physiology was established to encourage young investigators to continue research careers in regulatory and integrative physiology. The award is presented annually at the business luncheon of the Water and Electrolyte Homeostasis Section to a young investigator (<40 years old) who has made important contributions to our understanding of the integrative aspects of cardiovascular, renal, and neuroendocrine physiology in health or disease. The award consists of \$500, a plaque, and complimentary registration to the EB meeting. The recipient of the award is invited to present a short lecture on his/her research during a scientific session of the EB meeting. Any member of APS in good standing may apply or be nominated for the award. Applications will be reviewed by the Section's Award Committee and should include a curriculum vitae of the nominee, a brief (one-page) summary and analysis of the research contributions of the nominee, a complete list of publications, and two letters of nomination from members of APS. ❖

Membership

New Regular Members

*transferred from student membership

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Hamda Abdulla Al-Naemi

University of Qatar

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University of California, San Diego

Magdalena Alonso-Galicia*

Medical College of Wisconsin

Steffan Gregory Anderson

Oral Roberts University

John Michael Arthur

University of Louisville

Kevin Brady Atkins

University of Michigan

Nobuyoshi Azuma

Asahikawa Medical College

David M. Barnes

University of Wisconsin

Beth Beason-Armendarez

Rice University

Sheryl Gene Beck

Children's Hospital, Philadelphia

Jordi Bermudez

University De Barcelona

Silvia Bertuglia

CNR Inst./di Fisiologia Clinica

Gurent Beydon

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Shriners Hospital for Children

Douglas Leslie Bovell

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Auburn University

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Fred Hutchinson Cancer Research Ctr.

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P. Michael Conn

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School of Medicine Ribeirao Preto

Valdeci Dacunha

Berlex Biosciences

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Neuroinformatik

Kimberly Dawn Dyer

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Case Western Reserve University

Rolf Ehrsam

University of Basell

Carmen Denise Eilertson

Georgia State University

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University of Western Ontario

John N. Forrest

Yale University School of Medicine

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University of Kansas Medical Center

Taro Furukawa

Tokyo Med. & Dent. University

Stephen L. Gaffin

US Army Res. Inst. for Env. Med.

Natalia I. Gokina

University of Vermont

James R. Goldenring

Medical College of Georgia

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Oxford University

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VA Hospital, Tampa

Peter Walter Grandjean

Auburn University

Richard Aaron Hodin

Beth Israel Deaconess Med. Center

Joachim Hoyer

Medical Center Benjamin Franklin

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Kansas State University

Dorina Mary Iacino

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Sakai Municipal Hospital

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UNTHSC

Jonathan Harvey Jaggard

University of Tennessee, Memphis

Zhi-Gen Jiang

Oregon Health Sciences University

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Boston Univ. School of Medicine

Fruzsina Klara Johnson

Tulane University School of Medicine

Lynelle Rae Johnson*

University of Missouri

Vincent Joseph

ULB, Hopital Erasme

Sharon Leah Juliano

Uniformed Svcs. Univ. of Health Sci.

Bela Kanyicska

Florida State University

Ryuta Kawashima

Tohoku University – IDAC

Harm J. Knot

University of Florida

Johan Hermanus Koeslag

University of Stellen Bosch

Ralf Kohler

Benjamin Franklin-Free U Berlin

Tadayoshi Kosugi

University of the Ryukyus

Ronald Kramp

University of Mons-Hainaut

Carissa Marie Krane

University of Cincinnati

Hidetake Kurihara

Juntendo Univ. School of Medicine

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Brandeis University

Charles Paul Lambert

Univ. of Arkansas for Med. Sciences

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Hsinyu Lee

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Soo Hwan Lee

School of Medicine Ajou University

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Florida State University

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Chang Gung Hospital/University

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Wei Liang

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Hospital E. Herriot

Hajime Miura

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University of Kentucky

Muthu Periasamy

Univ. of Cincinnati College of Med.

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University of Newcastle

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UMDNJ

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University of Tennessee

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Scientific Institute H.S. Raffaele

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Purdue University

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Nopamart Trakranrungsie

Khon Kaen University

Zoltan Istvan Ungvari

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Madhu Varma

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Scientific Institute H. San Raffaele

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Shinong Wang

UCLA Harbor Medical Center

John Anthony Ward

Brooke Army Medical Center

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University of Vermont

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University of Bergen

Tami H. Wolden-Hanson

VA Puget Sound Health Care System

Zhongxin Wu

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University of Tennessee

Lianqin Zhang

Hershey Medical Center

Xinbo Zhang

William Beaumont Hospital

Xiao-Ping Zhang

New York Medical College

Zaixiang Zhang

Brigham & Women's Hospital

Yuehan Zhou

Yale University

Coert Jozef Zuurbier

University of Amsterdam

New Affiliate Applicants

Carlos Roberto Avancini Caramori

Brazil

Herbert W. House

Elon College, NC

Shigehiko Nagoya

Pleasanton, CA

New Student Members

Kathryn Ault-Ziel

University of S. Alabama

Christian Lee Ball

Ohio University

Hector Manuel Baraja

Centro Univ. de Investigat., Mexico

David John Lee Barr

University of Waterloo, Canada

Robyn Rebecca Bates

University of Pittsburgh

Katharina Maria Bauer

East Stroudsburg University

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University of Guelph, Canada

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Jeffrey Francis Breit

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Gregory Allen Brown

Iowa State University

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Sara A. Chelland

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Lai Yee Cheuk

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Marcus J. Freeman

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Kent State University

Kevin Raymond Grzybek

Canisius College

Sarah-Jane Guild

University of Auckland, New Zealand

Todd Alan Hagobian

San Francisco State University

Catherine Hambly

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Min Hwa Kim

Ajon University, Korea

Miyoung A. Kim

California State University-Fullerton

Membership

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University of Louisville

Michael C. Kumin

Canisius College

Brian David LaBudde

Georgia State University

Roberto Landwehr

University of New Mexico

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Illinois State University

Clarence M. Lee

Louisiana State University

Bridget Louise Leonard

University of Auckland, New Zealand

Ali Lotfizadeh

California State University-Fullerton

L. N. Mantrawadi

California State University-Fullerton

Cassie Lee Mathers

East Stroudsburg University

Sean C. McCoy

Frostburg State University

Brian K. McFarlin

Purdue University

Thomas Lewis Miller

Temple University School of Medicine

Tanya April Miszko

University of Georgia

Brett Michael Mitchell

Medical College of Georgia

Trudy Latrice Moore

Howard University

Josue Morisson Moraes

Federal University of Rio De Janeiro

Michael R. Nazareth

Canisius College

Talal S. Nofal

Georgia State University

Clay E. Pandorf

Boston University

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Yeungnam University

Weidong Pei

University of Toronto, Canada

Melissa Lynn Petrucci

Eastern Illinois University

Tasha Luann Phillips

Colorado State University

Christine S. Pierce

Eastern Illinois University

Matthew A. Pikosky

University of Connecticut

Mario Vila Pitaluga Filho

Inst. de Pesquisa Da Capacit., Brazil

David Michael Pober

University of Massachusetts-Amherst

Kristin Elizabeth Poppenberg

Canisius College

Tatiana El-Bacha Porto

Univ. Federal Do Rio De Janeiro

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Sao Paulo State University

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Georgia State University

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Temple University

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Santa Rosa Beach, FL

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Valhalla, NY

Jan Nyboer

Grosse Point, MI

John H. Walsh

Los Angeles, CA

Experimental Biology 2001

Experimental Biology 2001 March 31-April 4 Orlando, FL Physiology InFocus: Neurotransmitters in Cardiovascular Regulation Organizer: Gerald F. DiBona

Neurotransmitters in Cardiovascular Regulation:

Angiotensin

Roger Dampney

Neurotransmitters in Cardiovascular Regulation: Glutamate

Frank Gordon

Neurotransmitters in Cardiovascular Regulation:

Nitric Oxide

David Bredt

Neurotransmitters in Cardiovascular Regulation: GABA

Alan Sved

Section Distinguished Lectureships

Robert M. Berne Distinguished Lectureship of the APS Cardiovascular Section

Lecturer: **William M. Chilian**, Medical College of Wisconsin

Title: *Adaptations of the Coronary Circulation to
Ischemia—From Chaos to Collaterals*

Hugh Davson Distinguished Lectureship of the APS Cell & Molecular Physiology Section

Lecturer: **Carolyn Slayman**, Yale Medical School

Title: *Structure, Function, and Biogenesis of a Model
Cation Pump*

Joseph Erlanger Distinguished Lectureship of the APS Central Nervous System Section

Lecturer: **Gerald Fischbach**, NINDS, NIH

Title: *Plasticity at Peripheral and Central Synapses*

August Krogh Distinguished Lectureship of the APS Comparative Physiology Section

Lecturer: **Peter Hochachka**, University of British Columbia

Title: *Conservation and Adaptation in Evolution of
Human Hypoxia Response Physiology*

Solomon A. Berson Distinguished Lectureship of the APS Endocrinology & Metabolism Section

Lecturer: **Frank Talamantes**, University of CA, Santa Cruz

Title: TBD

Edward F. Adolph Distinguished Lectureship of the Environmental & Exercise Physiology Section

Lecturer: **George A. Brooks**, University of CA, Berkeley

Title: *The Lactate Shuttle: New Interpretation of Old Ideas*

Horace W. Davenport Distinguished Lectureship of the APS Gastrointestinal Section

Lecturer: **Geoff Burnstock**, University College London, UK

Title: *Purinergic Signaling in the Gut*

Carl Ludwig Distinguished Lectureship of the APS Neural Control & Autonomic Regulation Section

Lecturer: **William C. de Groat**, University of Pittsburgh

Title: *Plasticity in Sacral Autonomic Reflex Pathways
During Postnatal Development and After Neural Injury*

Carl W. Gottschalk Distinguished Lectureship of the APS Renal Section

Lecturer: **James Schafer**, Univ. of Alabama, Birmingham

Title: *Abnormal Regulation of ENaC in the Collecting
Duct—Syndromes of Salt Wasting and Retention*

Julius H. Comroe Jr. Distinguished Lectureship of the APS Respiration Section

Lecturer: **John E. Remmers**, University of Calgary

Title: *Breathing and Sleeping: A Physiological
Conundrum for Humans*

Claude Bernard Distinguished Lectureship of the APS Teaching of Physiology Section

Lecturer: TBD

Title: TBD

Ernest H. Starling Distinguished Lectureship of the APS Water & Electrolyte Homeostasis Section

Lecturer: **Richard Roman**, Medical College of Wisconsin

Title: *P450 Eicosanoids in the Control of Renal Function,
Vascular Tone and Arterial Pressure*

Experimental Biology 2001

Societal Lectures

The Walter B. Cannon Memorial Award Lecture

Regulation of G Protein-Coupled Receptors: Molecular Mechanisms, Physiological Implications and Therapeutic Opportunities

Robert J. Lefkowitz, Duke University Medical Center

Henry Pickering Bowditch Award Lecture

Peter M.T. Deen, University of Nijmegen, The Netherlands

Walter C. Randall Lecture in Biomedical Ethics

TBD

Section-Sponsored Symposia

The Role of the Amygdala in the Physiology of Emotion

Ralph Adolphs and William Talman

Programing of the Fetus in Utero: Impact on Physiology in Adulthood

Eugene D. Albrecht

Tight Junction: Convergence of Molecular and Physiologic Insights

James M. Anderson

Neurohumoral Control of the Normal and Diseased Heart

Jeffrey Ardell

Myosin Isoforms and Smooth Muscle Function: New Technology, New Questions

Frank Brosovich and Richard J. Paul

Matching Technology to Education: How to Choose the Right Technology to Meet Your Educational Needs

Corey Cleland

Vasopressin: Integrative and Cellular Mechanisms of Release and Actions

J. Thomas Cunningham and Celia D. Sladek

Gene Therapy for Cardiovascular Disease

Victor Dzau and Kathleen H. Berecek

Endothelial Cellular Response to Altered Shear Stress

Aron B. Fisher and Paul Schumacker

Respiratory Physiology of the Pharyngeal Airway: Modulation by Skeletal Muscle Activities, Central Nervous System State and Disease

Ralph F. Fregosi and Samuel T. Kuna

Combined Impact of Temperature and Exercise Stress on the Physiological Response to Toxic Agents

Christopher J. Gordon and J.J. Steinberg

Potassium Channels That Regulate Vascular Tone: Which are the Important Players?

David Gutterman and Arthur Humeer

Lung Surfactant and Reactive Oxygen/Nitrogen Species: Antimicrobial Activity and Host/Pathogen Interactions Within the Lung

Judy Hickman-Davis

Adaptive Regulation of Epithelial Solute Transporters

Barry H. Hirst and Ronaldo P. Ferraris

Functional Genomics: Activity-Sensitive Gene Regulation in Skeletal Muscle

David Hood

Structure and Gating of Epithelial Ion Proteins

Thomas Kleyman

Genetic Modification of Calcium Handling Proteins in Heart Disease: Insights, Roadblocks and Potential Therapies

Joseph M. Metzger

Effect of Changes in Blood Pressure on Renal Transporters

Alicia McDonough

How Does the Brain Understand Muscle Mechanics?

T. Richard Nichols and James C. Houk

Mitochondria and Energy Metabolism in Heart Failure, Hypertrophy, and Remodeling

Michael Portman

Intermittent Hypoxia: Cell to System

Nanduri R. Prabhakar and Eugene Fletcher

Joint APS/AAA Symposium: Is Asthma the Inflammatory Bowel Disease of the Gut?

Helen Raybould

The Role of Cell Membrane in Regulating Excitability and Contractility During Exercise and Fatigue

Jean-Marc Renaud and Thomas Nosek

Renal and Comparative Physiology of Urea Transporters

Jeff M. Sands and Mark A. Knepper

Model Organisms: Functional Genomics of Membrane Transport

Kevin Strange

The Effects of the Cold War on Russian and East-Block Physiologists

Charles M. Tipton and G. Edgar Folk, Jr.

Protein-Protein Interactions in Signal Transduction

Edward J. Weinman and Shirish Shenolikar

Life, Sex and Death: The Physiological Basis of Life-History Traits and Trade-Offs

Tony D. Williams and Barry Sinervo

Metabolic Complications in HIV/AIDS

Kevin Yarasheski

Experimental Biology 2001

Section-Sponsored Featured Topics

Poster Discussion: Muscle Fatigue

William T. Ameredes

Plasticity and Repair of the Phrenic Motor System

Following Cervical Spinal Injury: Current Concepts

Donald C. Bolser and Gordon S. Mitchell

Calcium Sensing Receptors

Gerda E. Breitwieser

Cerebral Cortical Influences on Autonomic Regulation

David Cechetto

Cellular Mechanisms of Regulated Secretion in the GI tract

Catherine S. Chew and John G. Forte

Robert M. Berne Award Featured Topic

William Chilian

Understanding the Role of the Angiotensin System Through the Actions of Angiotensin (1-7)

Carlos M. Ferrario and K. Bridget Brosnihan

Role of the Endothelial Factor in Hypertension

Gregory Fink and David Pollock

Featured Presenter: David Mattson

Physiology of Urea Transporters

Robert Gunn and Jeff Sands

Cell Signaling in Airway Smooth Muscle

Susan Gunst and Keith Jones

EDHF: Chemical Nature Sites of Action

David Harder

Cellular Response to Mechanical Stress

Rolf Hubmayr and Jeffrey Fredberg

Regulation of Vascular Tone by Oxygen:

Many Mechanisms—Few Answers

William F. Jackson

What is the Role of Mast Cells in Cardiovascular Disease

Joseph S. Janicki and Gregory L. Brower

Wiggers Award: Novel Mechanisms of Cardiovascular

Control by Nitric Oxide

Gabor Kaley

Autonomic and Cardiovascular Regulation:

Focus on Nociceptin and Opioid Peptides

Daniel R. Kapusta

Developmental Regulation of Oxygen Sensing

P. Kumar and John Caroll

Renal Section Young Investigator Award Featured Topic:

Hypertonicity Stress: New Sites of Recognition

H. Moo Kwon

Role of the Endothelium in GI Inflammation

Peter R. Kvietys, J. Steven Alexander

The Emerging Neurobiology of Obesity:

Autonomic and Cardiovascular Implications

Allyn Mark

Mechanisms and Modifications of Alveolar Epithelial Fluid

Transport in the Mammalian Lung

Michael M. Matthay

Comparative Aspects of Circadian Organization in Vertebrates

Michael Menaker and Carla Green

The Evolution and Modification of the Hypercapnic

Ventilatory Response

William K. Milsom and Steve F. Perry

Heat Shock Protein: Environmental and Exercise Stress

Pope Moseley

Electroneutral Ion Transport in the Central Nervous System

John Payne

Neural and Endocrine Regulation of Blood Volume and Arterial Pressure

Pontus Persson and Heimo Ehmke

Invited Presenter: Hartmut Kirchheim

Role of Oxidative Stress in Hypertension

Jane Reckelhoff and Magdalena Alonso-Galicia

Invited Presenter: Christopher Wilcox

Nitric Oxide: Skeletal Muscle Function and Blood Flow

Michael Reid and Michael Delp

Molecular Mechanisms of HCO₃⁻ Transport

Michael Romero and Paul Quinton

Ion Channel Remodeling in Cardiovascular Disease:

Pathogenesis and Therapeutic Implications

Nancy Rusch and Craig H. Gelband

Cell Stress and Protein Kinases: Integrated Signaling in vivo

Kenneth B. Storey

Mechanisms of Muscle Injury in Sepsis

Gerald Supinski

Spinal Cord Injury: Degeneration, Plasticity, Repair and Therapy

Lynne Weaver

Ionic Transport in Gametes and Reproductive Epithelia

Patrick Y.D. Wong and Sylvie Breton

Somatic Sensation During Movement and Its Role in Autonomic Control

Bill Yates

Cross-Societal/Sectional Symposia

The Early Impact of Diabetic Hyperglycemia on Renal and Cardiovascular Function

Michael W. Brands and Pamela K. Carmines

Interplay Between Nitric Oxide and Hemoglobin: Current Concepts

Rakesh P. Patel and Matthew B. Grisham

Membrane Fusion

Dennis Brown

Vagal Mechanisms of Visceral Sensation: Emerging Concepts

Clark M. Blatteis and Helen E. Raybould

Experimental Biology 2001

Guest Society Symposia

American Federation For Medical Research (AFMR)

The Role of Mediators of Innate Immunity in the Inflammation Associated with Trauma

Anne Nicholson-Weller

Lipid Mediators of Angiogenesis

Denis English

Type 1 Diabetes - Etiology, Prevention and Cure

Richard W. Furlanetto

Regulation of Fluid and Electrolyte Balance in the GI Tract

Kim E. Barrett and Richard H. Moseley

Sociedad Española Ciencias Fisiológicas (SECF)

Engineering Islet Cells for Cell Therapy of Diabetes Mellitus

Bernat Soria and Christopher B. Newgard

Neuronal Mechanisms Underlying Associative Learning

José M. Delgado García and Bernard G. Schruers

Society for Experimental Biology and Medicine

Physiology, Pathophysiology, and Genetics of Body Weight/Adiposity Regulation

Peter Havel and Barbara Horwitz

Association of Latin American Physiological Societies (ALACF)

Nutritional Neuroscience

Lucimey Lima Perez and Leon Cintra

Calcium Regulation for Muscle Contraction

Carlo Caputo

Biomedical Engineering Society

DNA Microarray in Bioengineering and Physiology

Shu Chien

Bioinformatics in Biology and Engineering

Shankar Subramaniam and James Bassingthwaight

Mechanical Modulation of Gene Expression in the Musculoskeletal System: From Nucleus to Organism

Clinton Rubin

Microcirculatory Society (MCS)

Microcirculatory Society E.M. Landis Award Lecture

Microcirculatory Society President's Symposium: Signaling

Mechanisms of Nitric Oxide Synthase

Chair: Walter N. Durán

MCS Young Investigator Award

Chair: Samina Kanwar

MCS Poster Sessions

Tutorials/Workshops

Tissue engineering: Opportunities and Challenges

Robert M. Nerem

Experimental Gene Delivery and Therapy: A Tutorial

Craig H. Gelband and Curt D. Sigmund

Integrative Approaches for the Study of Physiological Function in Genetically Altered Mice

John N. Lorenz and David L. Mattson

Education Committee

Refresher Course in Endocrinology: Endocrinology in Modern Medical Curricula

Rick Vari and Andy Lechner

Refresher Course in Endocrinology: Endocrine Case Studies

Rick Vari and Andy Lechner

Teaching of Physiology Section

Perspective on Problem Based Learning: Thorns and Roses

Patangi K. Rangachari and Aviad Haramati

Physiology for Life Science Students and Teachers Workshop

Women in Physiology Committee Workshop

How to Write, Review, and Publish Manuscripts in APS and ASPET Journals

Kim Barrett

Special Symposia Funded by US Army

Genomics and Molecular Basis of Exercise and Environmental Physiology

Organized by: Darrell Neufer, Michael Sawka and Larry Sonna

Molecular Basis of Human Performance

Claude Bouchard

Molecular Response to Hypoxia

Larry Sonna

Molecular Control of Thermogenesis

P. Darrell Neufer

Introducing

Introducing Thomas E. Lohmeier

Effective April 2000, **Thomas E. Lohmeier** succeeded **Ronald H. Freeman** as the Chair of the Water and Electrolyte Homeostasis Section of the APS. Lohmeier has served as the representative for the Water and Electrolyte Homeostasis Section on both the Program Advisory Committee and the Committee on Committees. He has also served on the Program Committee of the APS. Since 1996, Lohmeier has been an Associate Editor of the *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*. Along with his APS activities, Lohmeier is also Vice Chairman of the Publications Committee of the Council for High Blood Pressure Research of the American Heart Association.

Lohmeier has been a Professor of Physiology in the Department of Physiology and Biophysics at the University of Mississippi since 1982. He did both his undergraduate and graduate training at the University of California at Davis, and in 1975 he received his doctoral degree in Physiology. The major aim of his doctoral research was to elucidate the role of the renin-angiotensin system in the control of salt and water balance, and arterial pressure in two-kidney Goldblatt hypertension. After his graduate studies, Lohmeier began two years of postdoctoral training in the Department of Physiology at the University of Missouri School of Medicine under the guidance of James O. Davis. During this time, angiotensin II antagonists became available for experimental studies. As a result, he was able to incorporate these compounds into his research to directly assess the effects of angiotensin II on renal function, sodium balance, aldosterone secretion, and arterial pressure in pathophysiological states such as hypertension and congestive heart failure. After completing his training at the



Thomas E. Lohmeier

University of Missouri, Lohmeier began one year of postdoctoral studies in the Department of Physiology and Biophysics at the University of Mississippi under the mentorship of Arthur C. Guyton. During this time, his research emphasized the integration of physiological mechanisms that contribute to the regulation of cardiovascular and renal function. Subsequently, he was promoted to Assistant Professor and has remained in the department since.

While at the University of Mississippi, Lohmeier's research has focused on neurohormonal mechanisms that are quantitatively important in the control of sodium excretion and arterial pressure, particularly under long-term conditions, such as in hypertension and heart failure. Approximately 10 years ago, he became particularly intrigued with observations from his laboratory that salt and water balance could be achieved in compensated heart failure at substantially reduced cardiac output and arterial pressure. Therefore, he conducted a number of studies to elucidate the neurohormonal mechanisms that alter renal function and permit salt and water balance in compensated heart

failure, despite low arterial pressure. These experiments have led him to his current studies, which incorporate novel approaches to determine whether cardiopulmonary reflexes and arterial baroreflexes have the capability to chronically influence sodium excretion and arterial pressure via long-term changes in renal sympathetic nerve activity.

As Chair of the Water and Electrolyte Homeostasis Section, Lohmeier is grateful for the privilege and challenge of representing the interests of the Section and encouraging the active participation of the membership in APS activities. As the APS has given the sections the opportunity to develop their own programs at the Experimental Biology (EB) meeting, a high priority will be given to establish a scientific program that broadly reflects the interests of the Section and highlights the most outstanding science. To achieve this goal, the Steering Committee will be more active in soliciting input from Section members. To ensure that "new blood" is included in programming, a greater attempt will be made to solicit input from younger members and international scientists. Younger members and international scientists will also be called upon to chair sessions and lead poster discussion groups. Since the section has always emphasized the regulation and integration of physiological mechanisms that impact water and electrolyte homeostasis, it will continue to develop collaborative programs with other sections. At EB 2001, the Water and Electrolyte Homeostasis Section will offer Featured Topics, symposia, a Distinguished Lectureship, a cross-sectional symposium, and a workshop that will include the Cardiovascular, Renal, Endocrine, Neural Control, and Gastrointestinal Sections of APS.

To promote the interests of our section and to further the participation of section members in APS activities, we

Introducing

will continue to encourage our membership to serve on APS committees. In recent years, our membership has been quite successful in getting elected to APS committees. At present, we have more than 20 section members serving on APS committees. Many are serving for the first time.

Another important goal will be to increase our membership, particularly by attracting promising young investigators and international scientists. This effort will be greatly dependent upon our current members personally contacting and recruiting new membership. Additionally, APS has provided a number of Awards/Travel Grants for predoctoral and postdoctoral fellows for participation at EB meetings, and these will be used to support and recruit young investigators. With the elimination of corresponding member status and the opening of regular membership to all physiologists without geographic restriction, we will strive to increase our international membership and to promote their participation in APS activities. In this regard, Pontus Persson from Berlin, Germany, has just been elected as our section representative to the International Physiology Committee. Also, at EB 2001, we will have a

Featured Topic presented in honor of Hartmut Kirchheim, who has recently retired from his position as Professor of Physiology and Head of the Biophysik des Kreislauf at the Physiologisches Institut in Heidelberg. Kirchheim is widely known for his contributions to integrative physiology, particularly in the area of neurohormonal control of renin secretion and arterial pressure.

The Young Investigator Award in Regulatory and Integrative Physiology, and the Ernest H. Starling Distinguished Lectureship Award are given each year to recognize a young and established investigator, respectively, who has made important contributions to the understanding of the integrative aspects of water and electrolyte homeostasis. At the EB meeting, the recipients of these awards will present a lecture on their research and participate in various functions of the section. Additionally, their work will be highlighted by inviting the awardees to submit a paper on their lecture for publication in the *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*.

Our section is fortunate to have outstanding individuals on the Steering Committee. **Joey Granger** (Chair of

the Program Committee) has developed innovative programs that reflect the interests of our section, the highest quality research, and exciting new areas of investigation. Through timely updates of our web site and publication of our newsletter, **John Dietz** (Secretary/Treasurer) has done an extraordinary job communicating section activities to our membership. Finally, our newly elected representative on the Committee on Committees, **J.R. Haywood**, has extensive experience serving the APS and will continue our successful tradition of promoting our membership for service on APS committees. We will also expand the Steering Committee to achieve a more balanced representation of our membership that more broadly reflects overall interests, with particular emphasis on including young investigators. Finally, the overall success of our section will be greatly dependent upon the feedback and participation of our entire membership. The Steering Committee will provide every opportunity for the membership to contribute to the multiple activities of our section. I challenge the membership to seize the opportunity. ❖

IUPS 2001 Christchurch, New Zealand

The 34th World Congress of the International Union of Physiological Sciences will be held in Christchurch, New Zealand, from August 26-31, 2001. Advances in the medical sciences are impacting hugely on our understanding of human function and disease. Nowhere is this greater than in molecular biology and genetics. But capturing this information and using it to treat illness is the new challenge for researchers and clinicians. This

needs an integrated approach to medical research. To this end, clinicians and basic scientists must continue to share their skills, ideas and visions. Our congress, with the theme "From Molecule to Malady," and a multidisciplinary audience will provide a forum to encourage exciting new strategies for research of clinical relevance.

For more information, see <http://www.iups2001.org.nz>.

The Harvey Project

The Harvey Project (<http://harveyproject.org>) is a worldwide collaboration of physiologists, educators, artists and technologists using the Internet to advance the teaching of physiology. The Project is dedicated to building and distributing free, Web-based materials for teaching physiology.

Interactive course materials, when properly designed and used, can greatly improve student learning in both lecture and online courses. The digital medium is particularly effective at explaining complex dynamic processes to students. For instance, students learn how excitation spreads in the heart faster and better when they are shown an animation. With an interactive simulation, students can grasp the relation between blood volume, heart rate and blood pressure more effectively when able to manipulate these variables.

When based on the Internet, such learning objects, or “rich content,” may be distributed and updated with ease and made accessible to learners and educators all over the world. Since rich content leads to more effective teaching, it will soon become a staple in most courses. But while it has great potential to improve learning, rich content is difficult and expensive to build. This type of material requires many technical and creative skills, and demands hundreds or even thousands of hours per hour of instruction. As a result, building rich content is beyond the abilities of most faculty and many institutions.

If faculty are to participate in constructing rich content, consistent with their traditional role in determining course content, they must collaborate and share their efforts. The Web makes it easy for physically distant collaborators to work together.

The Harvey Project was created to bring this about.

The Harvey Project’s “open course” model is based on the following principles:

- 1) Worldwide collaboration of faculty within a discipline;
- 2) Adherence to open standards wherever possible;
- 3) Peer review of developed materials for scholarly accuracy, technical soundness and pedagogical effectiveness;
- 4) Free distribution of the products to schools and universities.

This open course model brings to teaching the spirit of collaboration and sharing that has propelled both scientific research and the open source/free software movement.

The Harvey Project model not only lowers the cost of creating high-quality interactive teaching materials, but also makes it easier to participate in their creation. It has, therefore, the potential to bridge the gap between those who do research and those who write textbooks. The Harvey Project invites those involved in the fields of physiology and medicine to serve as its stakeholders and contributors. The involvement of researchers in the Project will help make the material more accurate, and keep it updated in light of current research.

The goal of the Harvey Project is to help faculty create their own, world-class courses. The Project does not seek to create a complete online course, nor to compete with existing course offerings. To build their courses, faculty will be able to choose among a wide variety of learning objects. Because of this flexibility, the target audience for the Project can range from secondary students to professional students. The Project is creating software tools, such as *Beads&String*, to facilitate building lectures, modules, courses and quizzes. It is also creating standards and guidelines to direct the creation of effective rich content.

As the first embodiment of the open course model, the Harvey Project is a testing ground to develop procedures,

standards and software tools that may be reused by other disciplines.

The Project receives support from a number of sources including industry, members’ host institutions and the US National Science Foundation, but depends primarily upon volunteers.

The Harvey Project is named after the father of modern physiology, Sir William Harvey (1578-1657). It is a virtual community based around a Website at <http://harveyproject.org> and listserver at harveyproj@lists.wayne.edu. New members can register online, and the Website includes a searchable database of hundreds of sites around the Web that are useful for teaching physiology as well as, of course, materials the Project is itself developing.

* * * * *

If you are a skilled teacher, scholar or technologist, and especially if you combine more than one of these roles, the Harvey Project needs your help. The skills we need are, first, a sense of what students can understand easily and what is intrinsically hard for them to grasp, educational design talent, a sense of visual style, a deep understanding of current research, a knack for explaining how things work, and medical illustration skills. On the technical side, we need programming ability in Java, Flash, HTML and Javascript, design talent, database and system administration skills, and even legal skills to draft a license agreement. The beauty of collaborating is that no one has or needs to have all the necessary skills.

Please visit the Project’s Website at <http://harveyproject.org> and participate if you are interested. If you are not a physiologist, consider organizing an open course project in your own discipline. The future of education is too important to be left only in the hands of administrators and commercial developers. ❖

Education

Local Science Teachers and Students Participate in Physiology Workshop at Experimental Biology

San Diego area teachers and students participated in the Physiology for Life Sciences Teachers and Students Workshop on Monday, April 17, at the San Diego Convention Center. The workshop was designed to present participants an opportunity to learn about current research findings, explore hands-on, inquiry based lab activities, learn about education and careers in biomedicine, meet with APS researchers, and tour the posters and exhibits.

Jeffrey B. Graham, University of California-San Diego Scripps Institute of Oceanography, presented “Understanding How Charlie Does it: Hot Tuna and Cool Physiology!” where participants learned about the physiology and evolution of large saltwater fish.

George T. Blevins and Stephanie T. Miller, University of Arkansas for Medical Sciences, and **Alice R. Villalobos**, University of Connecticut presented a Careers in Physiology Panel Discussion where students learned about education and career paths available in biomedicine.

Participants then joined APS members for a box lunch and a tour of the posters and exhibits, where they were introduced to the latest research findings and scientific equipment. For many students, this was the first time they met with a “real scientist;” students often comment that this is their favorite part of the day.



After lunch, teachers participated in a Teacher In-service Workshop, where APS 1999 *Frontiers in Physiology* fellow **Cathy Box**, Tahoka High School, Tahoka, TX, presented “It Takes a Lot of Nerve!” a classroom activity on neuron structure and function; and 1999 Explorations in Biomedicine fellow, **Bob Madsen**, Dull Knife Memorial College, Lame Deer, MT presented “Bee Cool!” a lab activity on honeybee thermoregulation.

APS Physiologists **Barbara E. Goodman**, University of South Dakota School of Medicine, and **Cheryl M. Heesch**, University of Missouri, led students in selected activities of Physiology of Fitness, a hands-on, inquiry-based exploration of factors which affect blood flow and pressure.

The *Frontiers in Physiology* program is designed to create ongoing working relationships between research scientists and middle/high school teachers via research and inservice experiences and electronic communications; and promotes the adoption of National standards for K-12 content and pedagogical techniques among middle and high school science teachers through ongoing inservice activities developed collaboratively by teachers and physiology

research. *Frontiers in Physiology* is a program of the APS, and is sponsored by APS, the National Institute of General Medical Sciences (NIGMS) and the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). Previous support has been provided by the National Science Foundation.

The Explorations in Biomedicine project works intensively with the science faculty at Montana schools and tribal colleges that serve Native American students to create an atmosphere that encourages science studies, the exploration and pursuit of biomedical research careers, and opportunities for students to interact with biomedical researchers in their geographic area and across the nation. The overall goal of this project is to increase interest and participation in biomedical research careers among Native American students. Explorations in Biomedicine is a collaborative program of APS and the American Indian Research Opportunities Consortium and is supported by a grant from the NIH/National Institute of General Medical Sciences (NIGMS) Minority Access to Research Careers (MARC) Program.

For more information about these APS programs, please visit the APS website at: <http://www.faseb.org/aps/educatn/k-12.html>. ❖

Science's Next Wave

Participate in online forums, get information on building a science-based career, and read reports from a network of correspondents—all aimed at the next generation of scientists.

ScienceNOW

Get your breaking science news and updates on the world of science from Science's global news team. New items are posted each working day.

FREE access to APS members!

<http://www.faseb.org/aps/Membership.html>

APS Hosts Physiology Insights Undergraduate Life Science Faculty Workshops



The APS Physiology Insights program will present five multi-day Local Outreach Team (LOT) workshops for two- and four-year college life science faculty at various locations throughout the United States. Workshops include sessions on content, including updates on recent research findings; pedagogy, including explorations of effective methods; and curriculum knowledge, including reform efforts and online and organizational resources.

Physiology Insights is designed to provide faculty at two- and four-year colleges (especially community colleges) with opportunities to learn about science “in action,” that is, how the research process works, what research scientists do, and the intrinsic satisfaction and sense of excitement that comes from conducting scientific research. The program facilitates faculty members’ transfer of knowledge acquired through the laboratory experience to their classrooms via development of new inquiry-based classroom activities; and provides support networks for faculty by developing productive working relationships between teaching faculty and members of the research community. APS and the National Science Foundation (NSF) fund Physiology Insights.

San Diego, CA

Undergraduate life science faculty from two- and four-year colleges in Southern California participated in a Physiology Insights workshop designed as a meeting-within-a-meeting at Experimental Biology 2000. Sessions included research updates on cardiovascular physiology; obesity, physiological genomics, the physiology and evolution of large saltwater fish; pedagogy sessions on teaching physiology laborato-

ries, panel discussions on careers in physiology; and a presentation on funding programs through the National Science Foundation (NSF) Division of Undergraduate Education. APS members **Rob Carroll**, East Carolina University, **Roy D. Russ**, Mercer University School of Medicine, and **Mary Ann Rokitka**, SUNY, Buffalo, led participants in inquiry-based laboratories in cardiovascular physiology, and **Dee Silverthorn**, University of Texas, Austin presented “Creating the Interactive Lecture.”

Ft. Wayne, IN

“Inquiry Methods in Computer-Based Physiology Laboratories” was the theme of the Physiology Insights workshop held at Indiana University-Purdue University, in Ft. Wayne, June 5-7, 2000. Workshop instructors, **Richard S. Manalis**, Indiana University-Purdue University, and past Physiology Insights fellow, **James S. Miller**, of Goshen College presented an introduction to data acquisition; how data is acquired and analyzed digitally through the use of Chart, Excel and PowerLab; techniques for integrating inquiry methods into computer based physiology laboratories, and an introduction of topics suitable for computer-based data acquisition laboratories via a range of hands-on laboratories in the areas of anatomy and physiology, biology, animal physiology, and upper level physiology. Participants planned and implemented a laboratory activity, analyzed data, and prepared a project report/presentation.

Charlotte, NC

“Gradients and Conductances: What Flows Where and Why? - Key Concepts for Teaching Anatomy and Physiology” was the theme of a three-day workshop presented jointly by APS and Human Anatomy and Physiology Society (HAPS) at the HAPS annual meeting in Charlotte, June 10-15. Participants

attended selected symposia and workshops targeted for undergraduate life science faculty that are designed to promote improved pedagogy and provide content updates. These sessions and workshops are the first of a series of double-session thematic updates jointly sponsored by HAPS’s Core Curriculum and Assessment Committee and the APS Teaching Section and Education Committees to be held at this and the next three HAPS annual meetings.

APS members **Robert Carroll**, East Carolina University presented “Cardiovascular Pressure/Flow Relationships: What Should Be Taught” and “Assessment Materials that Test for Conceptual Understanding Rather than Memorization.” **Barbara E. Goodman**, University of South Dakota School of Medicine presented a content update: “Pulmonary and Renal Pressure/Flow Relationships: What Should be Taught.” **Mary Anne Rokitka**, SUNY at Buffalo, presented “The Elvis Experiment: A Discovery Lab Illustrating Poiseuille’s Law.” **Steven N. Trautwein**, Southeast Missouri State University presented “Using Concept Maps as Co-operative Learning Activities to Explore Physiological Relationships,” while **Patricia S. Bowne**, Alverno College, discussed “Designing a Physiology Course Around Problem Solving.” **Joel A. Michael**, Rush Medical College presented “Misconceptions About Pressure and Flow Relationships: Uncovering and Remediating Them.” **Joseph G. Griswold**, City College of New York, presented “Computer-Based Methods for Learning the Basics of Membrane Potentials.” **Dee Silverthorn**, University of Texas, Austin, presented “Active Learning in Lectures,” and **Daniel E. Lemons**, City College of New York presented “Beyond Virtual Reality: Physical Models for Teaching Cardiovascular Physiology.”

Education

Chicago, IL

Three APS/HAPS members who are also founding members of the national Physiology Education Research Consortium (PERC) will coordinate a three-day Physiology Insights workshop at Rush Medical College in Chicago, September 15–17, 2000. Coordinators include **Joel Michael**, Rush Medical College, **Mary Pat Wenderoth**, University of Washington, Seattle, and **Harold Modell**, National Resource for Computers in Life Science Education (NRCLSE), Seattle. This three-day hands-on workshop will focus on content updates from recent physiological research, including a discussion of “what belongs in the course.” Planned topics include endocrine sig-

naling, physiology and the human genome, and muscle function, as well as explorations of effective pedagogy. Participants will learn about and utilize applying a general models approach to teaching physiology, and diagnosing and dealing with misconceptions.

Workshop and registration information is available at <http://www.faseb.org/aps/educatn/undergrad/PhysInsts/rush.html>.

Washington DC

In cooperation with the American Association for the Advancement of Science’s (AAAS) Directorate for Education and Human Resources Programs, the APS will develop and host a two-day workshop September

24–25, 2000 on identifying and utilizing undergraduate life science resources online. Topics will include an introduction to the range of resources available; techniques for assessing sites in terms of content accuracy, ease of access, long term availability; tools for developing online materials and lessons for student use; tools for promoting student development of online resources use of online resources in inquiry-based teaching; availability of scientific databases; and assessing impact of online activities on student learning.

Workshop and registration information will be available in mid-August at: <http://www.faseb.org/aps/educatn/undergrad/PhysInsts/insiinfo.html>. ❖

Keep up-to-date with APS Education Activities.

Visit the web site often.

<http://www.faseb.org/aps/educatn>

Summer Research Teachers and Research Hosts Honored at Luncheon

The 1999–2000 APS Frontiers in Physiology and Explorations in Biomedicine Summer Research Teachers and their APS member Research Hosts were honored at a luncheon during Experimental Biology 2000. Teachers and their Research Hosts were presented certificates of appreciation.

Remarks APS Executive Director, **Martin Frank**, “The Summer Research Program began in 1990, and was designed to increase teachers’ understanding of the process of science, and help them gain an appreciation of how animals are humanely used in research. Over the years that I have attended this annual luncheon and listened to teachers comment about their experiences, I have been struck by their enthusiasm and excitement for discovery. I have

actually heard teachers talk about being ‘reborn’ as teachers, commenting: ‘I have taught science for 20 years, and now I understand science.’”

Frontiers in Physiology and Explorations in Biomedicine are APS programs designed to create ongoing relationships between research scientists and middle and high school teachers; and, to promote the adoption of the National Science Education Standards for K–12 science content and pedagogical techniques among middle and high school teachers. The Explorations in Biomedicine project works intensively with the science faculty at Montana schools and tribal colleges that serve Native American students to create an atmosphere that encourages science studies, the exploration and pursuit of biomedical research careers.

The Summer Research component offers teachers nationwide a full-time, hands-on laboratory experience for seven to nine weeks at APS members’ research labs. Teachers also attend a one-week retreat at the Airlie Center in Warrenton, VA, where they explore hands-on, inquiry based teaching strategies, consider classroom equity and bioethics issues, and begin to develop their own inquiry lab activities. In the spring following their research experience, teachers attend Experimental Biology to learn of the latest science research findings, meet with physiologists, and tour the posters and exhibits.

More information about these programs is available on the APS website at <http://www.faseb.org/aps/educatn/k-12prog.htm>. ❖

APS Recognizes Outstanding High School Research Efforts at the 51st Annual International Science and Engineering Fair

The 51st Annual International Science and Engineering Fair (ISEF) was held in Detroit, MI, on May 7-13, 2000, and brought together 1,030 of the top high school science fair projects from around the US and from 35 other countries. Students competed across 14 categories of scientific disciplines, including Mathematics, Biochemistry, Medicine and Health, Gerontology, and Zoology. Over 1,200 students presented their individual or team efforts with the hope of garnering national recognition and a portion of the more than \$2.4 million awarded by ISEF's chief sponsor Intel, and the Fair's 60 other affiliated societies, universities, and professional organizations. As in past years, the American Physiological Society provided cash awards plus APS student memberships to outstanding participants whose projects fell within the broad domain of physiological research. To date, APS is the only FASEB member society participating in this event. APS is joined in the Special Awards category by Sigma Xi, the Endocrine Society, and all branches of the Armed Forces, among many others.

The APS judges were drawn primarily from the Department of Physiology at Wayne State University School of Medicine. These local APS members included department chair **Joseph**

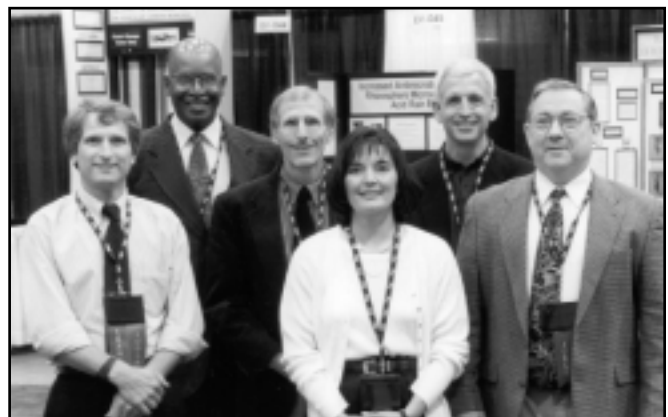
Dunbar and his colleagues **Heidi Collins, Stephen DiCarlo, David Lawson, and Douglas Yingst**. They were joined by **Andrew Lechner**, from the Department of Pharmacological and Physiological Science at St. Louis University School of Medicine. As a member of the APS Education Committee, Lechner served as APS lead judge and awards presenter. The judging team first identified the top 60 candidates based on scientific content, before selecting nine students for interviews at their poster displays. Based on the scientific rigor of each study and the students' abilities to describe their work and answer questions from the team, the APS judges awarded First Place to **Ellyn Anne Easley** for "Effects of Cryoprotectants on the Revivification of Frozen Insects." Easley, a senior at Alamogordo High School in Alamogordo, NM, will use her \$1,000 prize to pursue a biology curriculum this fall at the University of New Mexico in Albuquerque. APS members were most impressed with the multifactorial scientific and statistical evaluation that Ellyn had conducted during the course of three years of research on this subject, which was performed almost entirely in her high school and home. Of note, she achieved over 92% survival of frozen crickets using the empirically

derived combination of subcuticular injection of glycerol, liquid nitrogen immersion, and rewarming at 50°C.

The APS Second Place Award of \$500 went to **Ahmed S. Mousa**, a sophomore at Avon Grove High School in West Grove, PA. Mousa, who finished fourth among APS awardees at ISEF 1999, had extended his earlier work on "Discovery of Angiogenesis Inhibition by Garlic." Ahmed's enthusiasm for research led him to develop a novel in situ model in which endothelial cell proliferation was assayed in chick chorioallantoic membranes, using alliin extracted from whole garlic cloves. Third and Fourth Place APS Awards of \$500 each were earned respectively by **Kimberly J. Buehring**, a junior at Banquete High School in Banquete, TX, and **Jerri L. Ahrens**, a senior at North Toole County High School in Sunburst, MT. Buehring's project, "Succulent Solution to a Burning Problem," involved her isolation over the past three years of an effective ultraviolet retardant from the upper cuticle of succulents belonging to the genus *Lithops*. She used earthworms (*Lumbricus terrestris*) as experimental subjects and devised a novel injury rating scale to determine that the *Lithops* extract was significantly more effective than current commercial products



Andrew Lechner presents APS awards to Ellyn Anne Easley, Ahmed S. Mousa, Kimberly J. Buehring, and Jerri L. Ahrens.



APS Judges: Andrew Lechner, Joseph Dunbar, Stephen DiCarlo, Heidi Collins, Douglas Yingst, and David Lawson.

Education

included in popular sunscreens. Ahrens' project, "Reducing Lethal Ultraviolet Radiation Damage Using Antioxidants," demonstrated the merits of isoflavones, vitamin C, and selenium in protecting fruit flies when added to the media that were fed to the insects. Jerri hopes to major in computer science when she begins classes this fall at Montana State University in Billings.

In addition to these four finalists, the APS also awarded each of the other five interviewed students a one-year complimentary APS membership and subscriptions to *The Physiologist* and to

News in Physiological Sciences. These students included: **Lindsay D. Breedlove**, Hathaway Brown School in Shaker Heights, OH ("Hyperglycemia Induces Oxidative Stress and Caspase Activity"); **Allison Gattis**, Farmington High School in Farmington, NM ("Absorbance of Aluminum in the Brain of Gallus domesticus and Its Effects on Neuron Development in the Cerebral Hemispheres"); **Kimberly E. Olvey**, Lake Brantley High School in Altamonte Springs, FL ("Effect of Platelet-Tumor Cell Interactions through CD40 and Its Ligand on Tumor

Cell Procoagulant Activity"); **Nadia Rivera-Lebron**, Colegio Marista in Guaynabo, Puerto Rico ("Role of Nitric Oxide in the Proliferation of Endothelial Cells"); and **Kan Zhang**, Health Careers High School in San Antonio, TX ("Estrogen Stimulates Gap Junction-Mediated Intercellular Communication in Osteocytes"). In addition to the nine students, their primary high school science mentors also received APS subscriptions, CDs containing K-12 lesson plans, and educational packets for use in their classes. ❖

ISEF 1999 APS Awardees to Attend Harvard and Yale

When **Nisha Nagarkatti** accepted the APS First Place Award at ISEF 1999 in Philadelphia, it was her first taste of national scientific recognition. Then a junior at Blacksburg High School in Blacksburg, VA, her project, "Fas-Fas Ligand Interactions Play an Important Role in Successful Therapy of Cancer," was in its third year and appeared to be well-received by all who reviewed it. So well-received, in fact, that the next night she was awarded one of three ISEF Grand Prizes, including a \$40,000 Intel scholarship and a weeklong trip to the Nobel Prize Ceremonies last December in Stockholm. Not one to rest on her laurels, Nisha was in Detroit at ISEF 2000 with Phase IV of her project and a single-author publication in hand, "Tumor-derived Fas ligand induces toxicity in lymphoid organs and plays an important role in successful chemotherapy" (*Cancer Immunol. Immunother.* 49:46-55, 2000). There, she told APS lead judge Andy Lechner, "I really, really want to thank your society for the award last year and the recognition that has come with it. Stockholm was a wonderful experience, but walking onstage in front of that huge crowd in Philadelphia [about 5,000] for the first time was the most thrilling moment for me." Nagarkatti will be attending Harvard University this fall to major in life sciences.

Another former APS awardee was also in attendance this year in Detroit. **Rishikesh Dalal**, now a senior at Shawnee Mission Northwest High School in Shawnee Mission, KS and the APS second-place winner in 1999, had embarked this year on a new project, "Putative role of chemokine receptors and viral protein R in Th-2 cytokine-mediated pathogenesis of simian HIV." Like Nagarkatti, Dalal also obtained additional recognition after last year's APS honor, including an \$8,000 scholarship that he will begin using this fall at Yale University. With his ready smile, "Rishi" told Lechner how receiving the APS award in 1999 had reinforced his desire to emphasize the physiology of cell-cell interactions in his present study. "Please thank your society for taking the time to acknowledge my efforts and those of the other students here—everyone who stops to look, everything you say and ask us about our work, it matters a lot!" Thus, all three of last year's nongraduating APS awardees in Philadelphia, including **Ahmed Mousa**, had returned to Detroit in 2000 for another round of outstanding high school science research.

The 52nd Annual ISEF is scheduled for May 6-11, 2001, in San Jose, CA. Any APS members wishing to volunteer to serve as local judges should contact Alta Wallington [(301) 571-0692; or by

email: awalling@aps.faseb.org] in the APS education office. Providing recognition awards to these deserving high school students is only one of the many ways in which APS supports pre-college science education. The APS also supports K-12 science educators with programs designed to increase science teachers' curriculum content and pedagogical skills. Among APS programs for such teachers are workshops and materials for K-4 teachers through the "My Health, My World" program coordinated with Baylor University in Texas. Grant-funded programs, such as the "Frontiers in Physiology" and "Explorations in Biomedicine" support middle school and high school teachers who work during the summer directly with APS members in their research laboratories. "Explorations" is specifically designed for teachers in Montana who teach primarily Native American students. "Frontiers," which is offered to teachers nationwide, also supports local workshops on physiology topics for middle and high school science teachers. For more information about APS education programs, send your e-mail to: educatio@aps.faseb.org or visit our website at <http://www.faseb.org/aps/Education.html>. ❖

Andy Lechner

Education

Physiology Insights Fellows Present Classroom Laboratory Activities at the Human Anatomy and Physiology Society (HAPS) Annual Meeting

“Incorporating Hands-On, Inquiry-Based Teaching Methods into the Classroom” was the theme of a workshop presented by the APS Education Office at the annual HAPS meeting in Charlotte, NC, June 10-15, 2000. Thirty-five workshop participants were introduced to the resources and programs of APS including undergraduate teaching, the Archive of Teaching Resources, the APS journal, *Advances in Physiology Education*, information on career resources, and student, faculty, minority, and travel fellowships and awards.

Physiology Insights fellow, **Turner R. Coggins**, an instructor at the College of Southern Maryland, presented “Taking out the Carbage,” an investigative study on low carbohydrate diets. As a Physiology Insights fellow, Coggins worked in the lab of APS member **Adam K. Myers**, Georgetown University Medical Center. **Sharon C. Roseman**, an instructor at Lenoir-Rhyne College, Hickory, NC, presented “D is for DIET,” an activity that allows students to discover the relationships between nutrients, energy, hormones, and metabolism. Roseman conducted

her research in the lab of APS member **James E. Smith**, Wake Forest School of Medicine, Winston-Salem, NC. Both lab activities are hands-on, inquiry-based activities.

Information about the Physiology Insights program is available on the APS website at: <http://www.faseb.org/aps/educatn/undergrad/PhysInsts/insi-info.html>. Instructor/teacher developed and tested lab activities are available on the APS website at: <http://www.faseb.org/aps/educatn/k-12.htm>. ❖

Attention APS Researchers!

Host a science teacher to work in your lab in the summer of 2001!

The APS Summer Research Programs for Teachers allow science educators nationwide at middle schools, high schools, Native American reservation schools, tribal colleges, and community colleges, to learn about science “in action.”

Become a part of APS’ efforts to increase teachers’ and students’ knowledge about what scientists do, how the research process works, and the intrinsic satisfaction and sense of excitement that comes from conducting scientific research.



Frontiers Summer Research Teachers are middle and high school science teachers from across the nation who work in the labs of APS researchers in their own communities.



Explorations Summer Research Teachers are middle/high school science teachers serving Native American students in Montana, and science faculty at Montana tribal colleges who work in the labs of APS researchers outside the state of Montana.

For more information, contact the APS Education Office: (301) 530-7132 or educatio@aps.faseb.org

OR see program descriptions and applications on the website:

<http://www.faseb.org/aps/educatn/k-12prog.htm>

Chapter News

Report on the Midwest Physiological Societies Meeting 2000

The Midwest Physiological Societies held their annual meeting on June 5 and 6, 2000 at the Chicago Medical School in North Chicago, IL. The organizers were Celia Sladek (Chicago Medical School) and Terry Opgenorth (Abbott Laboratories). There were 81 registrants primarily from the Chicago, Milwaukee, and Madison area.

The Program consisted of three oral sessions and a poster session. The topics of the oral sessions were Physiological Genomics, Vascular Biology, and Intracellular Signaling Mechanisms. The oral sessions were initiated by a one-hour presentation by a keynote speaker followed by two shorter invited symposium speakers and several minute oral presentations selected from submitted abstracts. The keynote speakers were Harold Gainer from NIH, Ruth Wu-Wong from Abbott Laboratories, California, and Paul Bertics from the University of Wisconsin, Madison. Invited symposium speakers included Jon Levine (Northwestern University), Allen Cowley (Medical College of Wisconsin), Larry Thaete (Northwestern University), Sharon

Inman (Loyola), Lothar Blatter (Loyola), and Loek Van de Kar (Loyola).

The scientific sessions included 13 oral and 30 poster presentations of submitted abstracts. Presentations by students and fellows were judged by three groups of scientists and cash awards (\$100 each) were given to the best oral presentation and the two best poster presentations. The winners were Emily Farrell, University of Wisconsin for best oral presentation and David Montgomery, University of Illinois, and Marcy Hubert, Chicago Medical School for best poster presentations. Runners up were Xincheng Zhu, University of Wisconsin, John Kapoor, Chicago Medical School, and John Bitner, Chicago Medical School.

The meeting was supported in part by the American Physiological Society (\$1,000 to support Harold Gainer, the keynote speaker from NIH), Abbott Laboratories (provided support for the Vascular Biology Symposium), and Chicago Medical School, Office of Research (provided support for the Cell Signaling Symposium). Additional support from the staff of the Physiology

Department and the Public Relations Department, Chicago Medical School is gratefully acknowledged. The meeting has an existing treasury resulting from previous contributions from the Merck Corporation.

Social interaction among the participants was encouraged with luncheon and buffet dinner tickets included in the meeting registration. Lunch was available immediately adjacent to the poster session in the school cafeteria. The evening buffet was held at the Resort at Illinois Beach State Park and featured a musical presentation by Hector Rasgado-Flores, Associate Professor of Physiology, Chicago Medical School and internationally recognized pianist and composer, and Mabelle Cohen, cellist and medical student at Chicago Medical School.

Next year's meeting will be organized by Richard Moss (University of Wisconsin, Madison), and John Solaro (University of Illinois) and Donald Bers (Loyola University) will organize the meeting in 2002. ❖

Celia Sladek



Midwest Physiological Society Meeting Poster Sessions.



Midwest Physiological Society Meeting Poster Sessions.

House and Senate Pass NIH Funding Measures

The House and Senate have both approved legislation to provide FY 2001 funding for the National Institutes of Health, clearing the way—at least in theory—for a conference agreement on NIH's funding level.

The House acted first on June 14, approving by a vote of 217-214 a bill that would provide NIH with a \$1 billion increase, which is 5.6% more than its FY 2000 budget. The House bill would provide NIH with \$18.8 billion in FY 2001, the same as the President's budget proposal. Retiring House Labor-HHS-Education Appropriations Subcommittee Chairman John Porter (R-IL) is one of NIH's strongest champions and has made no secret that he wanted to give the agency the \$2.7 billion increase that would be needed to keep NIH on the path to a five-year doubling. However, the House leadership insisted that his subcommittee produce a bill conforming to the current budget caps. Porter's version of the bill contains instructions for how a \$2.7 billion increase should be distributed among the NIH institutes when and if the additional funds become available.

On Friday, June 30, 2000, the Senate approved its version of the Labor-HHS spending legislation. The Senate bill, approved on a vote of 52-43, provides a \$2.7 billion increase for NIH at the expense of a number of programs that are Clinton administration priorities. The Senate bill would provide NIH with an appropriation of \$20.5 billion in FY 2001, including \$10 billion to fund 31,524 research project grants. This represents a 6% increase in the RPG budget and is expected to fund 237

more grants than in FY 2000.

The debate over the Senate bill was very acrimonious because of many largely unsuccessful attempts to restore funds to programs that had been cut. President Clinton has threatened to veto the Senate bill because of cuts to education, social services, and healthcare programs, as well as a provision to block implementation of Labor Department standards on ergonomic injury protection in the workplace.

Among the contentious items that did receive Senate approval was an amendment by Sen. Ron Wyden (D-OR) instructing the Director of NIH to develop by March 31, 2001 a plan "to require a reasonable rate of return on both intramural and extramural research." This language was substituted for an earlier Wyden amendment that would have required grantees to repay the agency if a drug, biologic, medical device, or other technology developed through NIH-funded research received FDA approval for commercial manufacture. The Senate also tabled an amendment to reinstate a reasonable pricing requirement on NIH intramural licensing requirements because of assurances from Senate Labor-HHS-Education Appropriations Subcommittee Chairman Arlen Specter (R-PA) that he

was planning to hold hearings on drug pricing in July. "The National Institutes of Health have engaged in extraordinary research and have had phenomenal results," Specter said in remarks reported in *The Washington Fax*. "To the extent that research has resulted in profits to private companies, it is fair. . .to ask [that] the federal government share in those proceeds," Specter reportedly said.

On a voice vote the Senate also approved an amendment by Senator Bob Smith (R-NH) provision calling for a General Accounting Office study of "federal involvement in the use of fetal tissue." Smith had earlier introduced an amendment that would have prohibited the use of federal funds to purchase fetal tissue from inducted abortions, but he later withdrew that provision.

Although House and Senate conferees are now free to begin developing a compromise version of the legislation, it is generally expected that Congress and the administration will have to reach an "end game" agreement making new funds available in order to pass appropriations bills that are acceptable to both ends of Pennsylvania Avenue.

The current budget caps were put in place at a time there was strong political pressure to eliminate the federal budget deficit. However, more recently, that deficit has disappeared and has in fact been replaced by a surplus. As of June 30, the Office of Management and Budget was estimating that the budget surplus for the period from 2001 through 2010 would be \$4.2 trillion. This is \$1.3 trillion more than OMB had estimated in February

House Approves NSF, VA Funding

The House approved the FY 2001 VA-HUD appropriations bill June 21 by a vote of 256-169. The measure would give the NSF \$4.06 billion in FY 2001. This sum represents a \$167.1 million increase above this year's budget, but it is still \$508 million below President Clinton's \$4.6 billion request for the agency. The FASEB Consensus Conference on Federal Funding for Biomedical and Related Life Sciences Research recommended a similar figure, with emphases on fundamental research, interdisciplinary initiatives, and improved science education.

The VA-HUD bill also provides \$351 million for VA medical and prosthetics research in FY 2001, an increase of \$30 million or 9% over the current year. The FASEB funding consensus conference recommended that VA medical and prosthetics research be provided with \$370 million in FY 2001.

There was no firm indication when the Senate would take up the VA-HUD bill. President Clinton has threatened to veto the House-passed bill because it fails to fund several of his initiatives. In addition it eliminates the Americorps program.

Public Affairs

when the administration's budget was submitted to Congress.

House and Senate conferees have filed a conference report on a FY 2000 supplemental appropriations bill that addresses several budget issues. The conference report contains a provision that would do away with the requirement that NIH delay its disbursement of some \$3 billion in grant funds until the closing days of this fiscal year. Congress used this technique of so-

called "delayed obligations" last fall in order to provide NIH with a 15% increase by effectively pushing the actual expenditure of the funds into FY 2001. However, there were concerns that holding such a large amount of funding until the end of the fiscal year would cause disruptions in the field and administrative headaches at NIH. With the FY 2000 budget surplus now estimated to be \$40-\$60 billion greater than anticipated, the conferees were willing

to do away with the cumbersome delayed obligations. The conference report also contains a provision that would let Congress sidestep a potentially embarrassing vote by eliminating a provision that was included in this year's budget resolution, which would have required Congress to pass a law formally setting aside the discretionary funding caps instituted by the Balanced Budget Act of 1997. ❖

Revised Animal Research Facilities Cost Manual Available

NIH's National Center for Research Resources (NCRR) has published a revision to its Cost Analysis and Rate Setting Manual for Animal Research Facilities. The manual provides a methodology for calculating what portion of the costs associated with animal research in an animal research facility may be included in the institution's Facilities and Administrative rate. This

edition of the manual incorporates recent policy changes issued by the Department of Health and Human Services permitting animal research facility costs to be reimbursed according to the same principles applied to the reimbursement of other kinds of research.

The rate-setting manual is available in .pdf format on the NCRR web site at

http://www.ncrr.nih.gov/newspub/CAR_S.pdf. Institutions unable to print out the manual may request a single copy from NCRR's Office of Science Policy and Public Liaison at 6705 Rockledge Drive, Suite 5140, Bethesda, MD 20892-7965. The telephone number is 301-435-0888 and the email address is ospio@ncrr.nih.gov. ❖

IACUC Issues Top Animal Welfare Compliance Concerns

The newly-renamed Office of Laboratory Animal Welfare at NIH has posted a nine-page article that discusses common areas of non-compliance with the PHS Policy on Humane Care and Use of Laboratory Animals and the Animal Welfare Act (AWA). OLAW was previously the Division of Animal Welfare of the Office of Protection from Research Risks.

The article, "OLAW and APHIS: Common Areas of Noncompliance," was published in the journal *Lab Animal* [2000;(29)5:32-37] and consists of two sections. One section, written by Stephen Potkay, Director of the Compliance Oversight Division at OLAW, discusses noncompliance issues under the PHS Policy. The second section, written by Ron DeHaven, Deputy Administrator for USDA's Animal Care, Animal and Plant Health Inspection Service (APHIS) discusses noncompliance issues under the AWA.

The article is available in PDF format at <http://grants.nih.gov/grants/olaw/LabAnimal.pdf>

The key compliance issues reported by both OLAW and USDA involve deficiencies in Institutional Animal Care and Use Committee (IACUC) programs. Nevertheless, the USDA's Veterinary Medical Inspectors themselves expressed significant concern about how pain and distress in laboratory animals is managed, as well as how this is reported to USDA. This came out in an internal survey among USDA's 49 Veterinary Medical Officers and their supervisors. As noted by DeHaven in his article:

"Of those [VMOs] surveyed, 94% felt that the IACUC regulations are generally effective and that great strides have been made in improving humane care and use of animals at research facilities since the regulations were adopted. However,

three general areas were commonly identified as needing improvement: acceptable consideration of alternatives to painful or distressful procedures by the Principal Investigators; review of painful procedures by the IACUC; and monitoring of animal use to ensure compliance with approved protocols and institutional policies and procedures."

DeHaven went on to say that the VMOs responding to the survey felt that the Animal Care unit at APHIS should provide clear guidance to research institutions and the VMOs about what constitutes a painful or distressful procedure for AWA purposes; the AC unit's expectations on how facilities should minimize pain and distress; and "how to appropriately report various painful and distressful procedures under the current categorization scheme." ❖

USDA to Revise Distress Definition, Pain and Distress Reporting

The USDA is considering significant revisions to policies that implement the Animal Welfare Act (AWA) mandate to minimize pain and distress in research animals. A first step was taken June 21, 2000, when the USDA issued a new version of a policy document providing guidance on how researchers can demonstrate to their Institutional Animal Care and Use Committees (IACUCs) that they have met the AWA requirement to consider alternatives to procedures that might cause pain and distress in laboratory animals. The document, known as Policy 12 is part of a series of documents that USDA has issued to help its inspectors provide a more uniform interpretation of AWA regulatory requirements.

The new version of Policy 12 is about five times longer than the one it replaces, but it essentially reiterates the same position, namely, that in most cases scientists should conduct a database search in order to determine whether or not there is an alternative to potentially painful or distressing procedures in their research model. In recent years many investigators have expressed dissatisfaction with this burdensome and often irrelevant requirement, asserting that it is time-consuming and rarely yields useful results. The new policy acknowledges that in some cases consultation with colleagues and experts can be used in addition to or instead of database searches, but it makes clear that IACUCs and USDA Veterinary Medical Officers conducting inspections should “closely scrutinize” such cases. The new Policy 12 does not provide guidance as to how differences of opinion between the USDA and research institutions over the adequacy of methods other than database searches will be resolved.

W. Ron DeHaven, the USDA’s Animal and Plant Health Inspection Service (APHIS) Deputy Administrator for Animal Care, gave an indication of USDA’s plans June 22 at a National Research Council Workshop on Definition of Pain and Distress Reporting Requirements. DeHaven said that APHIS plans to issue a working definition of distress in the very near term through changes to its Policy 11. Policy 11 is a document providing guidance about how IACUCs should assess the potential of proposed research procedures to cause pain and distress.

As noted above, the AWA mandates that pain and distress in laboratory animals be minimized. However, to date the USDA has not defined distress in its regulations. DeHaven said that USDA will provide a “working definition” of distress administratively because of concerns that the rulemaking process might take up to three years. “This working definition of ‘distress’ is certainly subject to future change based on comments received through public meetings and comments from the rulemaking process,” DeHaven told the June 22 workshop.

DeHaven said that APHIS also plans to publish an Advanced Notice of Proposed Rulemaking (ANPR) in the *Federal Register*, asking for comments on the new definition of distress, as well as on the question of whether USDA should change the way research institutions report the degree of pain and distress experienced by laboratory animals. DeHaven’s Animal Care unit at USDA will review the comments before deciding whether to seek changes in the current reporting requirements.

“It is important that we hear from all segments of the public on this issue, and especially from the regulated communi-

ty that may be affected by future changes,” DeHaven told the NRC workshop, according to a report provided by American for Medical Progress. APS will give its members additional information about the ANPR when it is published in order to facilitate comments from research scientists.

FASEB will hold a workshop entitled “Setting the Agenda on Animal Welfare” on August 6-7 in Bethesda that will provide an overview both of the current policy debate on categorizing pain and distress in laboratory animals and on current scientific knowledge about pain and distress. The workshop will bring together representatives of biomedical research societies and the laboratory animal science community along with scientists involved in the actual study of pain and distress. It will be co-chaired by FASEB President Mary J.C. Hendrix, Michael Kastello of Merck and Company, and **J.R. Haywood** of the University of Texas Health Science Center at San Antonio. Haywood is the Chairman of the APS Public Affairs Committee and also chairs the Animals and Research Subcommittee of FASEB’s Science Policy Committee. Topics to be discussed by participants include what are meaningful definitions of pain and distress, how best to assess pain and distress, how pain and distress should be addressed in IACUC protocol reviews, and what regulatory or policy changes can best serve to minimize pain and distress. Organizers hope that these discussions will produce consensus views that will be useful to scientific societies and individual scientists in making comments to USDA. For further information, contact APS Public Affairs Officer Alice Ra’anan at 301-530-7105 or araan@aps.faseb.org. ❖

Public Affairs

Patrick White Named FASEB Legislative Affairs Director

Patrick White became FASEB's new Director of Legislative Relations July 5. White had been the Director of Public Affairs for the American Association of Immunologists since 1993. He succeeds Michael Stephens, who returned to Capitol Hill to join the legislative staff of Rep. David Obey (D-WI).

Before joining AAI, White was the principle aide for legislative activities

and external affairs to D. Allan Bromley, who was President Bush's Science Advisor and the Director of the White House Office of Science and Technology Policy. Before that, White worked on Capitol Hill for 10 years, including service as Chief of Staff for former Congressman Bob Davis, a Michigan Republican.

"Our congressional champions, John

Porter, Arlen Specter, David Obey, and Tom Harkin, have been very generous to biomedical research and NIH," White said in a statement announcing his appointment. "I will be privileged to assist our nation's most distinguished scientists in continuing FASEB's successful advocacy." ❖

APS News

DiBona Thanks APS Staff

APS President **Gerald F. DiBona** hosted a staff appreciation luncheon for the Society's 70 employees at a restaurant in Bethesda, Maryland. Together with Executive Director **Martin Frank**, DiBona thanked the staff for their efforts over the past year. He pointed out that over the nearly 30 years he has been a Society member, he has personally witnessed the dedication and the excellence of the staff. Because of the efforts of the staff, APS continues to provide its members with the quality of programs and journals they have come to expect.

A major portion of the staff

appreciation reception is the recognition of years of service to the Society. This year, DiBona presented a 15-year certificate to Martin Frank; a 10-year certificate to Nancy McClusky (Publications Department); and 5-year certificates to Teki Bynum (Peer Review Department), Rasa Hamilton

(Publications Department), Raisa Kapsan (Business Office), Virginia Million (Publications Department), and Gloria Simms (Education Department). DiBona expressed Council's appreciation for their years of service.

DiBona conveyed the gratitude of the Society's leadership for the efforts of all



APS Executive Director Martin Frank and President Gerald DiBona presented recognition certificates to Teki Bynum, Alice O'Donnell, Rasa Hamilton, and Gloria Simms.

the staff in helping to implement the actions of the Council, the committees, and the editors and remarked that, with the staff's help, APS would continue to serve the needs of the physiology community through the implementation of the 2000 APS Strategic Plan.

Obituary

Ernst Knobil (1926-2000)

He was a man, take him for all in all. I shall not look upon his like again.

Shakespeare (Hamlet I)

Ernst Knobil, the 52nd president of the American Physiological Society (1979-80) died of pancreatic cancer in Houston, Texas, on April 13, 2000, at the age of 73. He is survived by his wife and long-time scientific collaborator, Dr. Julane (Julie) Hotchkiss Knobil, and four children: Erich, Mark, Nicholas, and Katharine.

Knobil was born in Berlin, Germany, but in the early 1930's, moved with his parents to Paris, France, where he spent his early childhood. It is ironic that as a boy he attended the Lycée Claude Bernard—a school named after one of the fathers of modern physiology who was to become one of his heroes and models, and with whom he was often compared. He came to these shores in 1940, after the fall of France, but never lost his affinity for France or for the French language. In spite of his quick mastery of English he retained his French fluency, and to the delight of his French colleagues and admiration of his American colleagues, when in France he delivered his scientific addresses in the native language.

He attended Cornell University where, after a two-year stint in the US Army during which he rapidly rose to the rank of Staff Sergeant, he completed his undergraduate degree in Animal Sciences (1948) and a PhD in Zoology (1951) under the mentorship of Samuel Leonard. He then joined the laboratories of Roy Greep at Harvard as a Postdoctoral Fellow and, in 1953, received his first faculty appointment as an Instructor at the Harvard Medical School in the Department of Physiology, then under the stewardship of Eugene Landis. It was as a junior faculty member at Harvard that he carried out his pioneering work on growth hormones that brought him to the attention



of the endocrinology community, and signaled the depth of scientific rigor, creativity, and scholarship that was to mark his career as an endocrinologist, systems biologist, and educator.

From 1961 to 1981, he chaired the newly-formed Department of Physiology at the University of Pittsburgh School of Medicine as the first Richard Beatty Mellon Professor of Physiology. It was there that he commenced his work on the control of the primate reproductive cycle that would propel him into the ranks of the world's leading neuroendocrinologists and would earn him a permanent place in the archives of physiology and medicine. His seminal accomplishment was the demonstration of the presence of a pulse generator in the hypothalamus that controls the periodic discharge of gonadotropin releasing hormone (GnRH), which, in turn, is responsible for the 28-day ovulatory menstrual cycle in primates. In addition to clarifying the basic mechanism of "how we make babies," as he often put it, Knobil's work led to specific treatments for infertility of hypothalamic origin, delayed puberty, and a number of other pathophysiological conditions.

In 1981 Knobil assumed the deanship of the University of Texas Medical School at Houston where he also held the position of H. Wayne Hightower Professor of the Medical Sciences and director of the Laboratory for Neuroendocrinology. He stepped down

from the deanship in 1984, but remained active in the laboratory, in the classroom, and in discharging extramural responsibilities almost to the time of his death. In 1989, he was honored with the title Ashbel Smith Professor by the University of Texas Board of Regents for his lifetime contributions to academic medicine.

In recognition of his scientific accomplishments and academic leadership, Ernie was showered with awards, distinguished lectureships, medals, and elections to high offices in academic societies—accolades too numerous to recount fully in this space. He was elected to membership in the American Academy of Arts and Sciences and the National Academy of Sciences and was a foreign associate of the French Academy of Sciences, the Accademia Nazionale dei Lincei (National Academy of Italy), the Belgium Royal Academy of Medicine, and was an honorary member of the Hungarian Academy of Sciences. He held honorary degrees from the University of Bordeaux, the Medical College of Wisconsin, the University of Liège, and the University of Milan. He told me on several occasions that election and induction into the French Academy was one of the most thrilling events in his star-studded academic career.

Closer to home, in addition to serving as President of the APS, he also served on the APS Council, was on the Editorial Board of the *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology* and was Editor of the *American Journal of Physiology: Endocrinology and Metabolism* and (with Wilbur Sawyer) the volumes of the *Handbook of Physiology* on the pituitary gland and hypothalamus; at the time of his death he was Consulting Editor for *News in Physiological Sciences*. He was a Chairman of the Long-Range Planning Committee

Obituary

whose report “*What’s Past is Prologue: A White Paper on the Future of Physiology and the Role of the American Physiological Society in It*” prompted a revitalization of FASEB and served as a stimulus for the adoption of “integrative biology” as a major theme for the future. He was a Bowditch Lecturer as well as a Cannon Lecturer and was the recipient of the Dags

Award for high contributions to the Society and the discipline of physiology in general. At the time of his death he was Vice-President of the International Union of Physiological Sciences.

Ernie sought perfection in all of his undertakings—good was not good enough. But, while he was demanding, he was no more demanding of others than of himself. He bore himself with

dignity and stature but without pomposity. His writings are objects of beauty with regard to clarity, logic, and elegance—and, they did not come easily. He left an indelible mark on physiological research and education, and on all who were fortunate enough to know him. He will be missed. ❖

Stanley G. Schultz

John Walsh (1939-2000)

John Walsh, our valued colleague and Associate Editor of the *American Journal of Physiology-Gastrointestinal and Liver Physiology*, died on June 14, 2000 at the age of 61 from complications after a heart attack. John was internationally known for his remarkable contributions to the field of gastrointestinal physiology. John was Director of CURE Digestive Diseases Research Center, Research Chief in the Division of Digestive Diseases, and the Strauss Professor of Medicine at the UCLA School of Medicine.

John was born in Jackson, Mississippi, and obtained both his undergraduate and medical degrees from Vanderbilt University. He then completed an Internal Medicine residency at New York Hospital and Cornell Medical Center in New York. His early research experience was with Rosalind Yalow and Solomon Berson where he became an expert in the area of radioimmunoassay of hormones. This led to John’s enormous contributions over the years to the quantitative characterization of normal and pathophysiological

levels of gastrin in blood and tissue. John then moved to work with Morton Grossman at the Center for Ulcer Research and Education in 1970. He served as Director of CURE Digestive Diseases Research Center from 1987. He was Chief of the Digestive Disease Division at UCLA School of Medicine from 1989-1993. He recently served as President of the American Gastroenterological Association, and was a Special Section Editor for *Gastroenterology*.

During John’s research career, he made an astounding number of highly cited observations about the integrative, organ, cell and molecular aspects of gastric acid secretion and other aspects of gastric function. John was a generous collaborator, generous with both ideas and reagents, who had an exceptionally keen mind and a voracious desire to know how things work. In addition to his basic science research, it is telling to note that around one third of his more than 400 peer-reviewed original research papers and 75 book chapters have concerned clinical research. He

was the recipient of the AGA Fiterman Award, the AGA Distinguished Achievement Award and the Abbott Distinguished Research Award in Gastrointestinal Physiology awarded by the Gastrointestinal Section of the American Physiological Society. In 1990, he was the 231st most cited scientist in the world.

John was also a great educator and mentor to scientists and clinicians. He served as mentor to many recipients of the NIH Gastroenterology Training Grant at the UCLA School of Medicine.

John will be greatly missed by all of us at the Journal as well as by many in Los Angeles and around the world. His death is a great loss to the GI community. John is survived by a daughter, Courtney S.W. Phleger of San Francisco; a son, John Harley Walsh Jr. of Brooklyn Heights, N.Y.; a sister Cecile W. Wardlow of Jackson, Miss.; and three grandchildren. ❖

Helen Raybould

Obituary

Carl V. Gisolfi (1943-2000)

Carl V. Gisolfi, Distinguished Professor in the Department of Exercise Science and the Department of Physiology and Biophysics at the University of Iowa, died unexpectedly on June 3, 2000 from a prolonged illness. After graduating from Manhattan College with an impressive academic and athletic record, he became a graduate student at Indiana University and in 1969 obtained a PhD in Physiology under the mentorship of Professor Sid Robinson. Not unexpectedly, his dissertation was in the area of thermoregulation. Subsequently, Gisolfi received a joint appointment in the Department of Physical Education-Men and in the Department of Physiology and Biophysics at the University of Iowa where he established a “state of the art” human climatic research and teaching laboratory. His initial focus was on the integrated responses of non-trained and non-acclimatized subjects to conditions of heat tolerance and exercise training which soon became recognized as landmark investigations in temperature regulation. Later, he extended these studies to include rodents and primates while broadening his research areas of investigations to include fluid balance, gastrointestinal functions, substrate absorption and utilization, heat shock proteins, and neurotransmitter interactions. Gisolfi’s interest in dehydration and rehydration made him a pioneer on the use of oral rehydration solutions containing carbohydrates and he was among the first to demonstrate that increasing the carbohydrate concentration of sport drinks above 2.5 % did not impair gastric, thermal, or circulatory functions. Moreover, it was his CNS studies with primates that effectively refuted the calcium theory of the thermoregulatory setpoint. These collected studies were associated with the publication of more than 100 peer reviewed manuscripts, ten chapters in required textbooks, 115 abstracts, first authorship on *The Hot Brain*, which began dis-



tribution during the week of his death, and numerous invitations from throughout the world to present his results.

Gisolfi became a full Professor in 1981 and was designated a Distinguished Professor in 1996. He was an enthusiastic, informed, and effective teacher who taught human, environmental and exercise physiology to undergraduates, graduate, professional, and medical students as well as to individuals enrolled in extension and certification classes. In 1975, he was awarded teacher of the year by the College of Medicine. Gisolfi will also be remembered as a demanding, critical, and caring mentor and during his lifetime, he was an advisor to 13 individuals who received the PhD degree and to eight others who were awarded the MS degree. Because of his reputation as a dynamic and enthusiastic teacher, Gisolfi’s laboratory was a “magnet” for undergraduate Exercise Science students and at the time of his death, he had supervised 38 students conducting various projects.

Gisolfi’s professional service record included being a member of an NIH Study Section, editorial board member and associate editor of the *Journal of Applied Physiology* and of *Medicine and Science in Sports and Exercise* and being a co-editor of the series entitled *Perspectives in Exercise Science and Sports Medicine*. He also possessed exceptional leadership ability, which was demonstrated when he served as member and Chair of the APS Section on Environmental and Exercise

Physiology (EEP) and as the Chair of the APS Program Executive Committee before and during its difficult transition in becoming the Joint Program Committee. It was no surprise to those who knew him that he was elected to the Parish Council of the St. Moore Catholic Church in Iowa City. His honors include receiving a Citation Award and the prestigious Honor Award from the American College of Sports Medicine (ACSM); being elected President of ACSM and of the ACSM Foundation, and being selected by his EEP colleagues to give the important Adolph Lecture at the 2000 Experimental Biology Meeting. The title of his talk was to be “Is the Gut Built for Exercise”.

He was a loving husband to his wife Louise, a devoted father to his daughters Kirsten, Tanya, and Nicole, and a benevolent grandfather to Brendan, Carissa, Aidan, Brodi, and to Kaija. To many, it was a privilege to have known him because his enthusiasm for science and for living brightened the day for those in his presence. His effusive friendly greetings and focused attention made one feel like a long-lost friend or relative. The courage he exhibited during a nine-year period of pain, discomfort, fatigue and impending death was inspirational, as he was always positive about his future and never complained, exhibited signs of self-pity, or blamed fate for his status. Characteristically, his only concern was how his condition would adversely affect the lives of his family, staff, students, and department. Carl V. Gisolfi was truly a gentleman and a scholar. He will be missed.

Memorials in his name can be directed to either the Foundation of the American College of Sports Medicine, 401 West Michigan Drive, Indianapolis, IN 46206-1440 or to St. Jude Children’s Research Center, Box 50, Memphis, TN 38101. ❖

Charles Tipton

National Eye Institute Director Carl Kupfer Steps Down After 30 Years at NIH

With a long record of accomplishment behind him, **Carl Kupfer**, the only person to ever serve as director of the National Eye Institute (NEI) and an APS member, is stepping down from his position on July 15 after 30 years at the helm of the Federal government's leading vision research agency.

"During Dr. Kupfer's long tenure, the NEI has been critical in the shaping of vision research in this country, and his outstanding leadership has contributed enormously to the fabric of the National Institutes of Health (NIH)," said Ruth Kirschstein, acting director of the NIH.

An outspoken and effective advocate for high-quality clinical research at NIH, Kupfer expanded research at the NEI by establishing laboratory programs in molecular biology, immunology, neuroscience, and molecular genetics.



Carl Kupfer

Prior to his appointment as NEI Director, Kupfer served for four years as professor and chairman of the Department of Ophthalmology at the University of Washington School of Medicine.

"My journey at the NEI and the NIH has been richly rewarding," Kupfer said. "As a scientist, clinician, and administrator, I have been wonderfully blessed with experiences that have brought me to the cutting edge of vision research. One of my most satisfying achievements has been helping to shape the direction of this research during the past 30 years. We have seen great advances in treating eye disease and preventing vision loss, and as a researcher, it is immensely fulfilling to know that the sight-saving treatments we developed have helped prolong vision and improved people's quality of life. I know that in the near future, NEI-funded studies and clinical trials will lead to more significant breakthroughs. These have been exciting and challenging times for vision research, and I am fortunate to have been a part of it." ❖

National Academy of Sciences Elects New Members

The National Academy of Sciences announced the election of 60 new members and 15 foreign associates, in recognition of their outstanding achievements in research. Among those elected are three APS members, **Peter Agre**, **Jon H. Kaas**, and **Michael J. Welsh**.

Peter Agre was raised in a small Minnesota farming community where his father taught at St. Olaf College. As a youth, Agre and his brothers worked on dairy farms, participated in wilderness canoe trips, and pursued their love of nordic skiing. Agre majored in chemistry at Augsburg College in Minneapolis and attended medical school at Johns Hopkins where he developed his interest in biomedical research. Following a medical residency at Case Western Reserve University Hospitals and a clinical fellowship at UNC Chapel Hill, Agre returned to Hopkins for a research fellowship in the Department of Cell Biology. In 1984 he

joined the faculty of the Department of Medicine and rose through the ranks.

Agre is presently Professor of Biological Chemistry and Medicine, and his group occupies the Albert Lehninger Laboratory. Agre's research led to the first known membrane defects in congenital hemolytic anemias (spherocytosis) and produced the first isola-



Peter Agre

tion of the Rh blood group antigens. In the early 1990's Agre's lab became well-known for discovering the aquaporin water channel proteins, a breakthrough which has changed the direction of membrane transport research. For this work, Agre received the 1999 Homer Smith Award from the American Society of Nephrology and presented the 2000 US von Euler Lecture in Physiology at the Karolinska Institute in Stockholm.

In addition to his laboratory science, Agre devotes major efforts to teaching and medical school activities. For the past six years he has served as Co-Founder and Director of the Johns Hopkins Graduate Program in Cellular and Molecular Medicine and has served as Chairman of the Young Investigators' Day Student Research Program. Agre serves on the editorial boards of the *Journal of Clinical Investigation* and the *Journal of Biological Chemistry*.

People & Places

Michael Welsh earned his MD from the University of Iowa where he completed house staff training in the Department of Internal Medicine under the direction of Francois M. Abboud. He completed a clinical pulmonary fellowship at the University of California, San Francisco, in the training program directed by John F. Murray. He then completed a fellowship in the laboratory of Jay Nadel at the Cardiovascular Research Institute in San Francisco. He continued his postdoctoral research training in the Department of Physiology and Cell Biology at the University of Texas Medical School in Houston working with Raymond A. Frizzell and Stanley G. Schultz. He returned to the University of Iowa in 1981, where he is currently a Professor of Internal Medicine and Physiology and Biophysics and an Investigator of the Howard Hughes Medical Institute. Welsh has made several fundamental contributions to our understanding of the common genetic disease cystic fibrosis. His laboratory is also investigating the epithelial and neuronal functions of DEG/EnaC cation channels.

Jon Kaas is a recognized leader in the field of systems neuroscience. He has made substantial, lasting contributions to our understanding of the structure and function of the mammalian cerebral cortex, with emphasis on visual, somatosensory, motor and auditory cortex. Besides revealing anatomy, physiology and behavior of these systems, Kaas' work includes plasticity



Michael Welsh

and map reorganization in the cortex triggered by alterations at the sensory receptor surface. Most significantly, Kaas discovered (with Merzenich) that, after cutaneous-nerve blockage or injury in adult animals, the denervated cortex becomes activated by inputs from adjacent body parts, proving that,



Jon Kaas

contrary to earlier beliefs, sensory areas remain plastic into adulthood. Kaas was also the first to describe the time course of such reorganization and the first to demonstrate that similar remapping of cortical areas can occur in mature visual cortex after retinal lesions, and in mature auditory cortex after cochlear lesions. Other major contributions include the discovery of the middle temporal visual area, MT (with Allman). Kaas has identified several visual areas, each containing a separate map of visual space and each having a neuronal-response selectivities pointing to distinctive functions. Kaas also developed a comprehensive model of the organization of the lateral geniculate nucleus, outlining principles common to all mammals and documenting the functional distinction between the magnocellular and parvocellular layers. He generated the first detailed maps of the retinotopic organization of the superior colliculus. Kaas demonstrated that the region formerly known as the primary somatosensory area (SI) in primates is actually composed of four separate areas, each connectionally and functionally unique. Based on his multidisciplinary studies of cortical subdivisions across mammalian species and using data from different primate taxa, including humans, Kaas has proposed detailed hypotheses concerning the evolution of neocortex. Kaas is currently a Centennial Professor of Psychology at Vanderbilt University. ❖

Physiological Genomics Accepted in Index Medicus!

The National Library of Medicine's Literature Selection Technical Review Committee has selected *Physiological Genomics* for inclusion in its MEDLARS system, which means that it will be indexed and included in Index Medicus, MEDLINE, and PUBMED. Inclusion of articles in the Index will be retroactive, so that all articles published to date and in the future will be indexed.

Our second print volume, containing articles published online this year, is available. Please contact Sue Pokroy, spokroy@aps.faseb.org, 301-530-7015, if you would like a copy. As always, you can view all the articles published in *Physiological Genomics* at <http://physiolgenomics.physiology.org/>. Content will be free to all online until the end of 2001.

Thorner Awarded Squibb Grant

The University of Virginia Health System has received a five-year \$500,000 Unrestricted Metabolic Research Grant from the Bristol-Myers Squibb Foundation. The grant will be supervised by **Michael O. Thorner**, chairman of the internal medicine department at the University, a nationally recognized researcher on growth hormone regulation.

Thorner's research focuses on two different aspects of growth hormone regulation. First, he has a major interest in helping define and understand the mechanism by which growth hormone declines with age. Secondly, his studies explore the possibilities of enhancing growth hormone secretion in the elderly.

The metabolic grant program through which unrestricted grants are given by the Bristol-Myers Squibb Foundation offers the world's premier metabolic research institutions the opportunity to pursue new laboratory findings, support promising young scientists or acquire

new laboratory technology.

"This grant will allow us to leverage our research in a unique way," Thorner explained. "We will be able to pursue more innovative and speculative projects. The traditional granting mechanisms require preliminary data and proof of concept before funds are approved and released. This is a rare and wonderful opportunity which we will use judiciously and effectively."

The Bristol-Myers Squibb Unrestricted Metabolic Research Grants Program is one of seven grants programs funded by the Bristol-Myers Squibb Foundation. The others support research in cancer, cardiovascular diseases, infectious disease, neuroscience, nutrition and orthopaedics. Since the program began in 1977, more than \$87 million has been committed to these programs in 179 institutions worldwide.

Each of the seven Bristol-Myers Squibb Unrestricted Biomedical Research Grants Programs also consists

of an annual award for distinguished achievement to an individual researcher. As the supervisor of an unrestricted metabolic research grant, Thorner is a member of an independent Selection Committee that selects the winner of the annual \$50,000 Bristol-Myers Squibb Award for Distinguished Achievement in Metabolic Research.

"Dr. Thorner is a leading investigator of the molecular mechanisms involved in the control of the secretion of growth hormones," said Richard Gregg, vice president, metabolic and Cardiovascular Drug Discovery, Bristol-Myers Squibb Pharmaceutical Research Institute. "He is doing exciting work in understanding alterations in growth hormone secretion with aging, the neuropeptides and receptors involved in the regulation of growth hormone secretion and the modulation of this secretory pathway. We are very proud to have him as a participant in our unrestricted research grants program."

Nielsen Receives Young Investigator Award for Excellence in Renal Physiology

The Renal Section of the American Physiological Society is pleased to announce the 2000 recipient of the Young Investigator Award for Excellence in Renal Physiology: **Søren Nielsen**, Professor of Cell Biology and Pathophysiology, University of Aarhus. The purpose of this award is to recognize an outstanding young investigator working in any area of renal physiology or hypertension. Nielsen presented his keynote lecture, entitled "Roles of renal aquaporins in the physiology and pathophysiology of water balance" during a mini-symposium at the Experimental Biology 2000 meeting in San Diego, CA. Nielsen received his Young Investigator Award during the Renal Dinner on April 17.

Nielsen received his MD degree in 1989 and his PhD degree in 1993 from the University of Aarhus. He has remained at the University of Aarhus, rising progressively from Assistant Professor in 1989, to Associate Professor in 1994, and to Professor in 1997. In 1991-1992, he was a NATO-fellow at the NIH in Mark Knepper's laboratory. From 1994-1999, he was a



Søren Nielsen

Hallas-Müller Research Professor at the University of Aarhus. Nielsen is a recipient of the 1997 Niels og Desire Prize for Young Talented Scientists and the 1997 Anders Jahres Medical Prize for Young Scientists. He has published about 130 manuscripts, reviews, and book chapters.

Since the early 1990s, Nielsen's research has been focused on the cell biology, physiology, and pathophysiology of aquaporin membrane water channels. He performed elegant studies of the cellular and subcellular localiza-

tion of renal aquaporins including: aquaporin-1, the first identified molecular water channel; and of the subsequently identified renal aquaporins. He has devoted a major effort to studies of aquaporin-2, the predominant vasopressin-regulated water channel of the kidney collecting duct and its role in short-term and long-term regulation of body water balance. He has also worked on the role of aquaporin dysregulation in the pathophysiology of water balance disorders. Overall, Nielsen's studies have underscored that aquaporins are of major importance in the physiology and pathophysiology of renal water balance regulation.

The APS Renal Section's Young Investigator Award Committee, a subcommittee of the Renal Section Steering Committee, included: **Douglas Eaton** (Renal Section Sage), **Mark Knepper** (Renal Section Past-Chairman); **Jeff Sands** (Renal Section Chairman), and **Jürgen Schnermann** (Renal Section Program Committee Chair). ❖

W. Ross Adey has joined the Department of Physiology, Loma Linda University School of Medicine, Redlands, CA. Prior to his new position, Adey was with the Department of Biochemistry, University of California-Riverside, Redlands, CA.

Anna N. Ahn, has joined the Department of Organismal and Evolutionary Biology, Harvard University, Bedford, MA. Prior to her new assignment, Ahn was with the Department of Integrative Biology, University of California, Berkeley, CA.

Recently accepting a position as Director of Research, University of Salamanca, Salamanca, Spain,

Francisco Alvarado has left the Department of Microbiology, School of Pharmacy, University of Paris, Chatenay-Malabry, France.

Stephen Edward Alway has affiliated with the Division of Exercise Physiology, School of Medicine, West Virginia University, Morgantown, WV. Prior to his new assignment, Alway was with the Department of Anatomy, College of Medicine, University of South Florida, Tampa, FL.

Having accepted the position of Director, Amylin Pharmaceuticals Inc., San Diego, CA, **Alain D. Baron** is no longer the Director, Division of Endo and Metabolism, Indiana University

School of Medicine, Indianapolis, IN.

George P. Biro has accepted a position as Vice President, Medical Affairs Hemosal Inc., Toronto, Ontario, Canada. Biro had been with the Department of Physiology, University of Ottawa, Ontario, Canada.

Affiliating with the Department of Pediatric Pulmonology, University of Maryland, Baltimore, MD, **Carol Jean Blaisdell** has left the Department of Pediatrics, Johns Hopkins Medical Institution, Baltimore, MD.

Accepting a position with INSERM, Division of Neurobiology and Vestibular System Development,

People & Places

University of Montpellier II, Montpellier, France, **Catherine Marie-Pierre Boyer** is no longer with the Department of Anatomy and Cell Biology, University of Illinois, Chicago, IL.

Having been appointed Chief of Cardiac Surgery, Washington University, St. Louis, MO, **Ralph James Damiano** has left his position as Chief, Cardiothoracic and Vascular Surgery, Department of Surgery, Pennsylvania State University, Hershey Medical Center, Hershey, PA.

Having affiliated with the Department of Biology, Mountain View College, Dallas, TX, **Heather Tanisha Eddy** has left the Department of Physiology and Neuroscience, Medical University of South Carolina, Charleston, SC.

Formerly with the Department of Neurology, University of California, Los Angeles, CA, **Daniel P. Ferris** is now with the Department of Electrical Engineering, University of Washington, Seattle, WA.

Recently, **Richard Martin Green** joined the Division of Gastroenterology and Hepatology, Northwestern University, Chicago, IL. Green was previously with the Division of Digestive and Liver Diseases, University of Illinois, Chicago, IL.

Steven C. Hebert has accepted a position as Professor and Chairman, Department of Cellular and Molecular Physiology, Yale University, New Haven, CT. Prior to his new appointment, Hebert was Director of the Division of Nephrology, Vanderbilt University, Nashville, TN.

Paul M. L. Janssen is now a Research Associate with the Department of

Medicine, Johns Hopkins University, Baltimore, MD. Previously, Janssen was with the Department of Cardiology, University of Goettingen, Germany.

Accepting a position with the Department of Physiology and Kinesiology, Pennsylvania State University, University Park, PA, **Donna Hope Korzick** has moved from the Department of Veterinary Biomedical Sciences, University of Missouri, Columbia, MO.

Michael P. Massett has recently affiliated with the Center for Cardiovascular Research, University of Rochester School of Medicine and Dentistry, Rochester, NY. Previously, Massett was at the Department of Physiology, New York Medical College, Valhalla, NY.

Affiliating with the Department of Pediatrics, Division of Molecular Genetics, Columbia University, New York, NY, **Julie Elizabeth McMinn** has moved from the University of Washington-Seattle VA Medical Center, Seattle, WA.

Thomas A. Miller recently joined the Department of Surgery, Medical College of Virginia, Virginia Commonwealth University, Richmond, VA. Miller was formerly with the Department of Surgery, St. Louis University Health Sciences Center, St. Louis, MO.

Having moved from his post at the Division of Cardiology, Wake Forest University School of Medicine, Winston Salem, NC, **John F. Schmedtje, Jr.**, has joined Consultants in Cardiology, Roanoke, VA.

Jyoti N. Sengupta was formerly with the GI Pharmacology, Discovery Area, AstraZeneca R&D Molndal, Molndal,

Sweden. Recently, Sengupta moved to the Division of Gastroenterology, Medical College of Wisconsin, Milwaukee, WI.

Peter L. Strick has accepted the position of Co-Director, Center for the Neural Basis of Cognition, and Professor, Departments of Neurobiology and Psychiatry, University of Pittsburgh, Pittsburgh, PA. Prior to his new assignment, Strick was with the VA Medical Center, Syracuse, NY.

Timothy Gordon West has joined Biomedical Science, Imperial College of Science, Technology and Medicine, London, UK. Prior to his new assignment, West was with the Department of Zoology, University of Cambridge, Cambridge, UK.

James S. Williams is currently affiliated with the Department of Exercise and Sport Sciences, Texas Tech University, Lubbock, TX. Prior to his new assignment, Williams was with the Department of Exercise Sciences, University of Mississippi, University, MS.

Having affiliated with the Department of Behavioral Neuroscience, Oregon Health Sciences University, Portland, Oregon, **Ling Xu** is no longer with the Department of Neuroscience, University of Pittsburgh, PA.

Fumiaki Yoshizawa has accepted a position with the Department of Animal Science, Utsunomiya University Faculty of Agriculture, Tochigi, Japan. Prior to his new assignment, Yoshizawa was with the Department of Science of Living, Iwate Prefectural University, Takizawa, Japan. ❖

News From Sr. Physiologists

Letters to Karlman Wasserman

Jurg Schneider writes: “Thank you very much for your congratulatory note of February 23. Yours happens to be the first such message I have received about reaching my 80th birthday year! It also struck me as an interesting coincidence, that your primary interest seems to be the field of pulmonary physiology, the very first area in which I did some research on regulatory mechanisms of respiration during postdoctoral studies in Europe.

“Years later, after my immigration to the US it was work on respiratory stretch receptors by recording action potentials from afferent vagal fibers, that impressed my mentor Bob Gaunt, who urged me to apply for membership in the American Physiological Society. Although my interests shifted towards pharmacological work later on, my membership in the APS was always something I was especially proud of, all the way through my industrial career. Later on, when the practice of medicine beckoned again, physiological thinking guided my activities in Emergency Medicine and the laryngoscope became a constant reminder of the critical importance of an open airway in the management of respiratory failure.

“But this is now behind me and over the past few years I have developed an interest in the aging process and the problem of handling it for those who are fortunate enough to enjoy reasonably good health. Although I am no longer active in scientific work or writing, I did manage to publish my thoughts on aging in the form of a book written for the lay public. I am afraid, however, that there are no ‘words of wisdom.’ I call it a prescription for enlightened maturation that has proven to be of value to me through my early retirement years.

“My wife and I continue to lead an active life, trying to stay informed about the ongoing explosion of knowledge in

medicine. We travel quite extensively and the internet provides an active exchange of views with our friends both in the US and abroad.

“Remaining physically and mentally active is unquestionably very important for maintaining a feeling of well-being as one gets older. Medically the years after 80 are often referred to as the ‘failure decade.’ While perhaps technically correct, the term is emotionally deflating and I must say that I prefer a French classification that recently came to my attention. They now distinguish between 80-85 year old as ‘jeune vieux’ and above 85 as ‘vieux vieux.’ This sounds much more acceptable and civilized. ‘Vive la différence!’”

James S. Robertson writes: “My wife and I are enjoying retirement in Gaithersburg, Maryland. Our home borders on a woody state park, which is nice for walks, and often there are deer from the park grazing in our back yard.

“Somehow we seem to keep busy. We enjoy fairly frequent visits from our two granddaughters, one in high school, the other in college, and our grandson, who is in graduate school in psychology, along with his wife and our great-grandson, age 5, as well as our grown children, two in Pennsylvania and one in California.

“My scientific activities have been reduced to participation in some activities of the National Council on Radiation Protection and Measurements and as an active member of the Medical Internal Radiation Dose Committee of the Society of Nuclear Medicine, which meets three times per year in various cities around the country. On an informal basis, I sometimes contribute to the geometry and number theory problems that appear in the problem solving section in the American Mathematical Monthly.

“For recreation I am in an evening bowling leagues, and in fair weather play outdoor tennis. I try, with infrequent success, to beat my computer pro-

gram at chess, but find playing with an occasional live opponent more stimulating. We also participate in monthly luncheon meetings of a church social and fund raising senior citizens group called M&M, for Mature and Methodist. Sometimes we have a guest speaker, and part of my ‘job’ is to introduce the speaker.

“One day a week I do volunteer work at the Welfare and Recreation’s office and shop (ERWA) at the Department of Energy building where I used to work. We sell used books and discount tickets to theme parks, ball games, etc., sponsor a softball league, arrange an annual picnic for employees, and charter trips to performances in New York. This gives me some contact with previous colleagues and friends, and access to the research library.”

J. Edward Rall writes: “Thanks for your recent letter of congratulations on my eightieth birthday. I have read with interest throughout these many years comments by ‘senior’ physiologists. Indeed some 15 or so years ago I was asked to and gave a lecture on ‘Life After Retirement’ and used some 10 years of comments by Senior Physiologists on what they did after retirement. As I recall it, most of those who wrote were still working, most were teaching or writing reviews. A few had totally retired and traveled or gardened. It was surprising how many of them were still intellectually active—usually in their scientific sphere. Of course, those in nursing homes or suffering from Alzheimer’s or strokes couldn’t reply so it was a skewed sample but nonetheless revealing.

“I have followed the general trend. I retired and became Emeritus shortly before my 75th birthday but was permitted to keep a small lab and office. I still have a postdoctoral fellow and two former fellows will spend four months with me this summer. As a result, I have published half a dozen papers and eight or 10 book reviews since I retired.

News From Sr. Physiologists

However, as my energy level slips it seems prudent to close my lab this Fall but continue to come to NIH, attend two journal and data clubs and keep up, more or less, in my field of the last 20 years, molecular biology and, more particularly, nuclear hormone receptor activity. I am truly grateful for having had the last 15 years to witness the breathtaking advances in molecular biology. Even some 18 years ago when we had cloned the gene for a low abundance enzyme, by the time the paper appeared, techniques had changed so much that what took us two years to accomplish could then have been done in three or four months. Now with so much sequence data available and with microchip arrays of cDNAs, what is possible is mind-boggling.

“On a more mundane level, the advent of the computer with word processing, Email, literature searches, and the www, has made my secretary-less life easy and comfortable.

“My only advice to younger scientists is do what you enjoy—you will do a much better job if you love what you are doing and are not working just for the money. And don't ignore the fact that biology is the most exciting field in the world.”

Letters to Ken Zierler

Maurice McGregor writes: “Thank you for your letter. I am touched that an old friend should reach out across the years. What was our common interest? I think it was the analysis of indicator dilution curves. You were very much of the professional, and I, the enthusiastic amateur.

“With the passage of time my interests have slowly veered towards the physiology of society and health care systems, how they work, and of course the pathophysiology, how they go wrong, and the therapeutic interventions which might make for better function. So my interest has been more in the areas of health care policy, technol-

ogy evaluation, and even clinical practice guidelines. Just as fascinating and possibly even more challenging, at least to the somewhat shrunken brain of the elderly. But attempting to solve worthwhile problems is an addiction which does not seem to lessen with the years. It still gives me great pleasure.

“Through you I greet those fellow addicts in the human physiology arena. Amongst them are intellectual and moral giants whom it has been a privilege to know. I congratulate them and rejoice with them on having chosen an occupation (obsession, addiction) which they can profitably and joyfully indulge until the last synapses cease to function.”

W. Stanley Newcomer writes: “Firstly I must apologize to you for not answering sooner your congratulatory letter on behalf of the American Physiological Society last October.

“I am retired but unfortunately I cannot report to you that I am still doing research with a zillion dollar annual budget. I chose the easy way, the path of least resistance on retirement. My wife and I enjoy good health and consequently travel moderately frequently. We find Elderhostel programs to be an enticing bargain. Also we have taken five of six grandchildren (not all at the same time) to Europe; it is to Greece with number six this summer. In between travel it is swimming five days a week, baking herb bread and hot cross buns for a church sale, pursuing a long-time hobby (bryology), etc., etc.

“Aside from the above plug for Elderhostel I have no profound words of wisdom to pass on the seventy-niners.”

Alexander Leaf writes: “I think I ignored the letter on my 70th year, which was the year of my formal retirement. I was 70 in the last year that there was a mandatory academic retirement age. But since then I have continued with research on a daily, year around

basis. At present I have three NIH grants, all R01s, including one clinical trial. These keep me busy and the lab research has been great fun. When I resigned as chairman of Medicine here at age 60 after 15 years, I was dissatisfied with the way our profession was headed. We were engaging in increasingly expensive, high cost, invasive technologies most of which were palliative at best, for conditions we knew were preventable. So I had no good reason to refuse Dean Tosteson's request that I chair a new Department of Preventive Medicine. During the ensuing 10 years prior to retirement, I became interested in dietary prevention of coronary heart disease. That is what I have been pursuing for the last 10 years.

“Following on the work of two Australians we confirmed their reports that administration of fish oils to animals will prevent ischemia-induced fatal ventricular arrhythmias with high probability (in our dog studies, $P < 0.005$). We found that each of the major dietary *n*-3 polyunsaturated fatty acids (PUFAs) are highly effective in preventing sudden cardiac death. With those surprising results, I wanted to find the mechanism of their anti-arrhythmic action. The search over the past six years has been quite rewarding, I think.

“We started using cultured neonatal cardiomyocytes to examine the effects on their spontaneous, synchronous and rhythmic contractions when exposed to arrhythmogenic agents and then to the *n*-3 PUFAs. We found that cardiotoxins, e.g., elevated Ca^{2+} concentrations, ouabain, isoproterenol, thromboxane, etc., all accelerated the beating rate of the myocytes and produced fibrillatory behavior. If we added low μM concentrations of the fish oil fatty acids to the bathing medium it prevented the arrhythmias when the cardio toxins were added. If the tachyarrhythmias were established, addition of the free fatty acid to the arrhythmic myocytes returned them to a regular beating rate. Finally, if we then added delipidated

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bovine albumin and extracted the fatty acids, the arrhythmia promptly resumed. This taught us that these fatty acids need only partition into the hospitable lipophilic environment of the acyl chains of the membrane phospholipids to exert their antiarrhythmic action. No covalent linkages with any membrane constituent are required. When we determined the electrophysiology of this effect we found that the fatty acids cause an increase in the depolarizing stimuli necessary to elicit an action potential by 40-50 percent. They also prolong the refractory period of the myocytes by some two to three fold. These actions stabilize electrically every myocyte in the heart. The action is almost immediate. It is a direct action of the free fatty acid (nonesterified). These effects in turn result from the action of the PUFAs to modulate the ionic currents through the sarcolemma. We have reported that these fatty acids are potent inhibitors of the voltage-dependent Na^+ current, the L-type Ca^{2+} current and, with lesser potency, the two major repolarizing outward K^+ currents. Their inhibitory effects in the Na^+ and Ca^{2+} currents, which we think are the two most important actions for the antiarrhythmic action, result from a voltage-dependent shift of the steady state inactivation potentials to very hyperpolarized potentials. In addition to the rat myocytes we have studied the effects on the human myocardial sodium channel α -subunit alone or coexpressed with the $\beta 1$ -subunit alone or coexpressed with the $\beta 1$ -subunit in HEK293t cells. With both subunits transfected the electrophysiology of the human sodium channel mimics that of the sodium channels in the rat cardiomyocytes. The effects on both Na^+ and Ca^{2+} currents are concentration dependent producing classical sigmoid curves with inhibitory effects evident at nM concentrations. The effects occur when the moles percentage of fatty acid to moles of membrane phospholipid is well under one percent. These effects

are only produced by polyunsaturated fatty acids and not my monounsaturated or saturated fatty acids.

“Currently we are just completing studies which show that point amino acid mutations in the Na^+ α -subunit at two sites within the 2400 amino acids of that subunit will reduce the effects of the PUFAs on the channel conductance. Current dogma would say that these two sites are where the fatty acids bind to the channel protein to modulate its conductance. Once we found that these PUFAs modulate the basic electrical activity of the heart, we strongly suspected that they would affect all excitable tissues, namely also skeletal muscle and nervous system—and they do. In the CNS we have found they affect the Na^+ and Ca^{2+} currents of CA1 hippocampal neurons similarly to their effects in the heart. The consequence of this effect is that they are anticonvulsants in the rat cortical stimulation model of epilepsy. But they are affecting all neurons, but only those that are dysfunctional.

“There remains much yet to learn about what these interesting dietary PUFAs do, but we finally convinced NHLBI that clinical trials are needed to learn if what we have found in the lab will apply to humans at risk. Three clinical trials have now been reported suggesting strongly that these PUFAs will prevent sudden cardiac death in humans, so our clinical trial may already be over due. Since there are some 250,000 sudden cardiac deaths annually in the USA alone and millions more worldwide, there may be considerable potential public health benefit from what we have been learning—as a clinician, I hope so.

“There have been a host of publications. Our most recent review article appeared in the *J. Membrane Biology* 1999; 172: 1-11. I have been invited to write the prefatory chapter for the *Annual Reviews of Physiology 2000*, which should appear in the Fall, should anyone be interested in learning more

about the Nut who is having more fun with his research after retirement than ever before. My close collaborators Yong-Fu Xiao and Jing X. Kang made these investigations possible. They did the work and most of the thinking—and I hope have shared in the fun. So my one advice to young investigators is to do what you really enjoy, as you will do that well.”

Letter to Arthur Baue

Bob Elsner writes: “Many thanks for your kind 80th birthday greetings! I was out of town when your note arrived, hence the delay in replying.

“My life since retiring in 1988 has been busy and enjoyable. I like to think of it as a time to catch up with some of those things one might have wished to do and never quite had the time for. I continue to work at the University of Alaska, and I find the continuing associations with students and colleagues stimulating and gratifying.

“Fortunately, I have been able to continue a modest program of research in the comparative physiology of diving mammals. These interests have taken me for several years to Inupiat Eskimo villages on the north coast of Alaska where I have excellent cooperation from Native seal and whale hunters. With their help I can obtain fresh tissues (heart, kidney, etc.) for laboratory study and incidental to their subsistence hunt. I have been working with isolated coronary arteries from seals in an attempt to clarify some of the influences governing coronary blood flow in these animals. The question relates to the seal’s unusual cardiac performance (intense bradycardia, intermittent myocardial perfusion) during long breath-holding dives.

“In another project we are studying possible mechanisms involved in the protection of seal tissues from adverse effects of oxygen radicals that may be expected to be produced by the frequent episodes of ischemia and reperfusion

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that they experience during each dive. Another isolated vessel project is concerned with the operation of thermoregulatory circulation in the whale's tail. The Alaska situation is unusual in being one of the few places where access to such tissues may be had. In these and other researches I have been enjoying productive collaborations with colleagues around the world, notably California, Mexico, Australia, Norway, and Sweden.

"In recent years I have also worked with Japanese and Korean colleagues in studies of human breath-hold divers, the ama. There are some 16,000 ama divers, both men and women, in Japan, and another 3,000 in Korea, who are engaged in the harvest of edible products from the sea floor. We have been recording dive depths, temperatures, heart rate, and other variables from them during open ocean and laboratory dives.

"I have had a long interest in the development of a design for a new arctic research ship intended to improve our investigative capabilities by being able to operate in sea ice and open seas in the Alaska region. Such a facility is required for adequate study of some interesting and potentially important oceanographic and biological questions. I am currently engaged with others in the planning for such a ship, and I would hope to live long enough to see it become a reality.

"Alaska suits our lifestyle very well. My wife, Betty, and I are keen nature observers and cross-country skiers. We can enjoy these activities right out the back door of our home. Betty is a retired physician with several years experience in organizing rural health clinics and the teaching of village health aides."

Letter to Michael Bárány

Newell Stannard writes: "I was delighted to receive your greeting on my 90th birthday and your request to

write something for *The Physiologist*.

"I joined the APS in 1938 under the sponsorship of one of America's great physiologists, Wallace O. Fenn. Despite meager participation in APS affairs in recent years because of duties in other directions, I have never lost interest in physiology and read *The Physiologist* avidly. It was thus especially gratifying to be remembered by my old friends.

"In the 20 years since my last communication, the 'big red book,' *Radioactivity and Health—A History* was completed, was well-received, and has gone to a second printing. Work with national committees has been completed and the committees disbanded. Last year I finally retired from my adjunct appointment at University of California, San Diego. It was getting too hard to get there.

"My first wife died in 1991 and in 1994 I married a lady, originally from Toronto, whom I sang beside in a local chorale group. I am still active as Historian and Member of the History Committee of the Health Physics (Radiation Safety) Society, do a bit of consulting, and participate each year in a lecture series at Lake Tahoe that bears my name.

"It is not easy to be concise with comment for posterity from the perspective of 90 years, but I will try.

"Despite an early interest in becoming a practicing physician I am glad that circumstances pushed me into biomedical-science instead. It has provided an exciting and fulfilling career.

"I worry over the overspecialization in research and the trend away from the physician-scientist. We need scientists with a real appreciation of the problems of medical practice and physicians with enough research experience to appraise critically new developments or to do research themselves.

"In our zeal to learn more and more at the molecular level, physiology must never lost interest in or neglect the whole organism. The whole continues

to be more than the sum of its parts and physiologists are the ones, along with the other integrative scientists, to explore the many mysteries that remain at the whole organism level. Let molecular biology do its thing but don't be seduced away from what physiology has done best. We can still be awed by what lies ahead."

Letter to Eugene Renkin

Martin Zade writes: "In Sweden all university professors retire at the age of 65, willing or not. However, I was able to keep an office in the Department of Physiology at Uppsala University during another two and a half years. Then the new state policy was effectuated whereby our universities (all run by the state) have to pay a high rent for each square meter of floor space to the state. I had to move home, and there I finished the writing of my last scientific paper, on jumping red blood cells (*J. Micr.* 192, 54, 1998). The Department has and still continues to contract in space. I am expanding my extraphysiological life and enjoy it together with my wonderful wife. In summertime we devote ourselves to the maintenance of our country estate and in wintertime I cherish my collection of ancient oil lamps, an interest ignited by Gene Stead Jr. at Duke University in 1972. When possible we go travelling. I appreciated the greetings from APS on my 70th, and am looking forward to a card when 80."



Positions Available

Muscle Biologist: The Department of Animal Sciences, University of Illinois at Urbana-Champaign, invites applications for a tenure-track Assistant Professor (full-time, 9 month, 60% Research, 40% Teaching) in muscle biology. A PhD in a discipline related to muscle biology is required. Basic knowledge of muscle structure, function, and characteristics that ultimately impact the quality of muscle foods is essential. The candidate will be expected to develop a strong externally funded research program, to advise and interact with undergraduate and graduate students, to teach courses relevant to the needs of the department, and to complement the existing faculty in the Department of Animal Sciences and other departments within the University. Applications will be received until **August 31, 2000** or until an outstanding candidate is identified. Applicant should submit a curriculum vitae, academic transcripts, a cover letter describing the applicant's interest and qualifications for this position, and three reference letters from qualified individuals. Application materials should be sent to Dr. Robert Easter, Head, Department of Animal Sciences, University of Illinois, 1207 West Gregory Drive, Urbana, IL 61801. Additional information concerning the Department of Animal Sciences is available at www.ansci.uiuc.edu. [EOE/AA]

Postdoctoral Fellowship/Research Associate: An opportunity is available to work at the confluence of molecular and cellular biology and tissue engineering. The individual will participate in the study of mechanisms involved in cell-cell communication (spatio-temporal signaling pathways) using cardiac tissue culture models. Our team consists of scientists who speak the languages of cell biology as well as bioengineering and biocomplexity. This position is in a laboratory that is part of a multi-center (Drexel/University of Pennsylvania/Harvard University) research initiative to develop a live cell microscopy system to image cellular network organization and adaptation. Applicants with background and experience in cellular biology and/or tissue engineering are encouraged to apply. Review of the applications will start in May 2000 and will continue until the position is filled. It is anticipated that the selected applicant will be able to begin working on the project by July 1, 2000. Curriculum vitae and three references should be sent to: Dr. J. Yasha Kresh, Prof. and Research Director, Departments of Cardiothoracic Surgery and Medicine, Med. College of Pennsylvania -Hahnemann University, 245 N. 15th Street, MS 111, Philadelphia, PA 19102-1192. Email: j.yasha.kresh@drexel.edu. [EOE]

Assistant Research Scientist: The Department of Internal Medicine, Cardiovascular Diseases Division, is seeking an Assistant Research Scientist to develop and integrate new state-of-the-art methodologies to the application of transgenic animals and to implement development of those methods in the Transgenic Animal Facility. This position requires that a person in this classification have the academic knowledge of a discipline generally associated with a Doctoral degree or an equivalent professional degree, i.e., MD, DDS, or DVM. In addition, such a person will have demonstrated the ability to plan and execute a research study through some progressively responsible independent research work. Experience with the production and analysis of transgenic mice and an understanding of basic mouse genetics and with the characterization of gene-targeted mice and the use of recombinase-based systems is desired. Please send a resume and cover letter indicating #44413 to: Carol Wehby, Human Resources, Internal Medicine, E400 GH, 200 Hawkins Drive, Iowa City, IA 52242-1081. [EOE/AA]

Tenure-Track Positions: The University of Tennessee, Department of Physiology, is actively recruiting for three tenure-track faculty positions. Academic rank is dependent upon experience and qualifications. Candidates should have a PhD or MD degree, a good track record in publications, and postdoctoral research experience with a background in cellular and/or molecular biology. The abilities to establish an independent research program in the areas of cardiovascular, gastrointestinal, developmental, endocrine, or epithelial physiology and to engage in teaching activities of the department are expected. See our website (<http://physio1.utmem.edu>) for information regarding the department. Applicants should send a curriculum vitae, copies of three representative publications, and the names of three references to: Dr. Leonard R. Johnson, Chair, University of Tennessee Department of Physiology, 894 Union Avenue, Memphis, TN 38163. These positions will remain opened until filled. Minorities and females are encouraged to apply. [EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA]

Positions Available

Postdoctoral Research Fellow: An NIH-funded postdoctoral position in a large multidisciplinary group is available immediately to study the vascular biology of maturation in the cerebral circulation. The applicant selected will be able to choose from a wide variety of projects related to signal transduction pathways involved in both contraction and relaxation of cerebral arteries, with particular emphasis on nitric oxide synthases, guanylate cyclase, calcium ATPases, and myosin light chain kinase. A broad variety of methodological approaches are available including fura-2 photometry, arterial permeabilization, in vitro contractility, endothelial cell cultures, autoradiographic quantitation of receptor binding, enzyme activity assays for NOS and guanylate cyclase, Western blotting, and quantitative RT-PCR. The highly competitive salary for this position will be negotiated on the basis of years of relevant experience, publication record, and the strength of letters of recommendation. Highest priority will be given to applicants with a well-demonstrated ability for scientific writing. Interested applicants are invited to send a copy of their curriculum vitae and two recent first-author publications to: William J. Pearce, PhD, Professor of Physiology and Pharmacology, Professor of Biochemistry, Center for Perinatal Biology, Loma Linda University School of Medicine, Loma Linda, CA 92350.

Research Physiologist: The Thermal and Mountain Medicine Division, US Army Research Institute of Environmental Medicine invites applicants for a Research Physiologist Position. Applicants should have a strong background in systems/integrative physiology; experience with molecular/genomics research and physiological stimulation modeling are desirable. Applicants should have postdoctoral experience with a strong record of publications and grant writing. This is a civilian (contingent to six years) position that could become permanent; salary range of \$51,9898 to \$80,367 depending on qualifications. The successful candidate will develop a human research program regarding thermoregulation, physical performance, adaptations and maladaptations to cold exposure. Thermal and Mountain Medicine Division consists of approximately 50 scientists organized into program units studying Cold Stress Physiology, Heat Stress Physiology, Mountain Stress Physiology, Environmental Genetics and Environmental Pathophysiology. Women and minorities are strongly encouraged to apply. Send curriculum vitae to Dr. Michael N. Sawka, Chief, Thermal and Mountain Medicine Division, US Army Research Institute of Environmental Medicine, Kansas Street, Natick, MA 01760-5007. Tel: 508-233-5665; Email: Sawka@na.amedd.army.mil.

Assistant Research Scientist: The Department of Internal Medicine, Cardiovascular Diseases Division is seeking an Assistant Research Scientist to perform basic research to advance knowledge of cellular and molecular mechanisms involved in the function of ion channels in cardiac myocytes and vascular smooth and muscle cells. The work will require expertise in theoretical and methodological aspects of cellular electrophysiology as well as cardiac and vascular physiology. Requires a person in this classification have the academic knowledge of a discipline generally associated with a Doctoral degree, or an equivalent professional degree, i.e., MD, DDS, or DVM. In addition, such a person will have demonstrated the ability to plan and execute a research study through some progressively responsible independent research work. A PhD degree in Neuroscience and/or Physiology; research experience in the area of cellular electrophysiology, cardiac and vascular physiology, and molecular biology is desirable. Please send resume and cover letter indicating #44417 to Carol Wehby, Human Resources, Internal Medicine, E400 GH, 200 Hawkins Drive, Iowa City, IA 52242-1081. The University of Iowa is an Equal Opportunity and Affirmative Action employer. Women and minorities are strongly encouraged to apply.

Research Integrative Physiologist: NIH-funded center with the primary mission to study the pathophysiology of chronic fatigue syndrome seeks a research integrative physiologist to assist in the work. Our work suggests that some patients may experience fatigue due to a problem in their brain while others have a problem in their heart and/or vessels. I am seeking a colleague at the Assistant/Associate Professor level with physiological expertise that would help us understand the pathophysiology of this medically unexplained illness. Specifically, I am seeking someone with interests in blood flow (especially brain blood flow), in cardiovascular regulation, or in autonomic neural function. The individual would receive a faculty appointment in the Department of Neurosciences of the New Jersey Medical School. Faculty level and salary would depend on credentials, publication record, and skills. The position is funded with grants. Therefore, the faculty member would be expected to join in with the Center's active research program but also to develop his/her line of research and to seek independent funding for this effort. The physiological activities of the Center occur at the East Orange VA Medical Center. The VAMC is in suburban NJ—40 min from midtown Manhattan and 40 min from NJ horse country. Interested candidates should email or fax their curriculum vitae to: Benjamin H. Natelson, MD, Professor of Neurosciences, UMD-New Jersey Medical School. Tel: 973-395-7737; fax: 973-395-7114; email: bhn@nbunj.jvnc.net.

Positions Available

Assistant Professor, Associate Professor, or Professor in Exercise Physiology or Exercise Biochemistry: The Pennington Biomedical Research Center in Baton Rouge, LA, is seeking an individual with research experience in exercise physiology/exercise biochemistry. The candidates should have a proven track record of research funding in physical performance. The successful candidate will develop a research program and lead a multidisciplinary team whose mission is a better understanding of the physiological and molecular mechanisms involved in the development of human obesity and in the response to physical training. Qualifications include a PhD in exercise physiology, exercise biochemistry, or related area and 5 years experience in an academic or research setting. Resumes will be accepted until the position is filled. Please send curriculum vitae and names of three references to: Evelyn P. Bennett, Assistant Director, HRM, Pennington Biomedical Research Center, 6400 Perkins Road, LA 70804-4124, REF: Ravussin-Faculty (Exercise Physiology/Exercise Biochemistry). [EOE/AA]

Postdoctoral Researcher: The Pennington Biomedical Research Center in Baton Rouge, LA, is seeking an individual with proven experience in exercise physiology/biochemistry. The candidate should have experience in designing and executing protocols involving physical training programs to enhance health and performance. The successful candidate will perform research in a multidisciplinary team whose mission is a better understanding of the physiological and molecular mechanisms involved in the development of human obesity and in the response to physical training. Qualifications include a PhD in exercise physiology, exercise biochemistry, or a related area, and experience in new technologies relevant to study of health and performance desirable. Resumes will be accepted until the position is filled. Please send curriculum vitae and names of three references to: Evelyn P. Bennett, Assistant Director, HRM, Pennington Biomedical Research Center, 6400 Perkins Road, LA 70804-4124, REF: Postdoctoral Researcher #021496. [EOE/AA]

Postdoctoral fellowship(s): Available immediately to study the dysfunctional central regulation of energy balance that occurs in diet-induced obesity and type II diabetes. These studies involve the investigation of hypothalamic glucose-sensing neurons in both brain slices (visually guided) and freshly dissociated neurons using whole cell and single-channel patch-clamp recording techniques. In addition, single-cell PCR techniques will be used to characterize glucose-sensing neurons. Expertise in electrophysiology and molecular biology is desirable but not mandatory. Preference will be given to applicants with a strong interest in understanding the central mechanisms involved in obesity and diabetes. Salary will be commensurate with NIH standard. Send a curriculum vitae and the names of three references to Dr. Vanessa H. Routh, Assistant Professor, Department of Pharmacology and Physiology, New Jersey Medical School, 185 S. Orange Ave., Newark, NJ 07103. Email: routhvh@umdnj.edu (preferred); fax: 973-972-4554. Review of applications will begin immediately and continue until the positions are filled. [EOE/AA]

Assistant Professor: Applications are invited for a tenure-track Assistant Professor position in the Department of Exercise Science, The University of Iowa, commencing August 2001. The Position requires a PhD or equivalent degree and a strong potential to attract external funding. Postdoctoral training and teaching experience are highly desirable. Scientists investigating areas related to exercise and movement sciences are invited to apply, including but not limited to neuroscience, integrative or exercise physiology, biomechanics, and anatomy. The successful applicant will develop a strong independent research program in his/her area of expertise and teach undergraduate and graduate students. He/she will teach at least one course in biomechanics. Review of applications begins in October 2000 and continues until the position is filled. Submit a letter of application, curriculum vitae, selected reprints, a 5-year research plan, and three letters of reference to: Dr. Kelly J. Cole, Department of Exercise Science, S. 501 FH, The University of Iowa, Iowa City, IA 52242. Minorities and women are especially encouraged to apply. [EOE/AA]

Equipment Exchange

Force transducers: Could you help? Do you have any force transducers you have no use for? I am in need of three (3) Grass FT03 Force transducers for a Graduate Student project. Those who are interested in donating should contact

cp@npd.ufpe.br for shipping instructions. Carlos Peres da Costa. Depto. de Fisiologia e Farmacologia. Universidade Federal de Pernambuco. Recife. PE 50670-901. Brazil.

Positions Available

Faculty Position in Molecular Imaging: The Departments of Physiology and Radiology, Michigan State University, invite applications for a full-time tenure-track appointment at the Assistant/Associate Professor level. The successful candidate will be expected to develop an independent research program in the area of molecular imaging. Individuals whose research exploits modern NMR techniques as it relates to chronic diseases, e.g., detection of brain function, tumors, and/or cardiovascular disorders, are particularly encouraged to apply. Candidates must hold a PhD, MD, or equivalent doctoral degree; have postdoctoral experience; and demonstrate potential for developing a vigorous externally-funded research program and outstanding teaching in the department's educational program. Interested individuals should provide a complete curriculum vita, a brief statement of research interests, and copies of key publications. Applicants should also request letters of recommendation from three individuals who can evaluate their accomplishments and future potential for research and teaching. Review of applications will begin October 15, 2000 and continue until the position is filled. Applications should be sent to: Ronald A. Meyer, PhD, Chairperson, Molecular Imaging Search Committee, Department of Physiology, Michigan State University, East Lansing, Michigan 48824-1101. Email: rmeyer@pilot.msu.edu; Internet: www.psl.msu.edu. Handicappers have the right to request and receive reasonable accommodation. [EOE/AA]

Research Physiologist: Research Physiologist needed immediately for full-time position at Brooks Air Force Base in San Antonio, Texas. Applicant should have at least one year of postdoctoral experience. Our primary focus is research and modeling on the biological effects of electromagnetic fields, including cardiovascular and stress responses, thermoregulation, and motor control. Open to US citizens only. Successful candidate must be eligible for a Security Clearance. Position will remain open until filled. Please send curriculum vitae and references to Dept. TD, Veridian Engineering, Inc., 9601 McAllister Freeway, San Antonio, TX 78216. FAX: 210-308-7498. [EOE /AA]

Postdoctoral Position: A position is available in Rehabilitation Sciences at the University of British Columbia, Vancouver, B.C., Canada. Work will involve examining respiratory muscle injury related to exertion in humans and animals by utilizing biochemical, histologic, immunohistologic, plasma markers, and in vivo and in vitro physiology. Qualifications include a PhD in physiology, exercise physiology, physiotherapy, or a related field. Experience in the above-mentioned techniques is desirable, but highly motivated individuals are encouraged to apply. Send curriculum vitae, names of three references (with contact numbers), and a letter outlining research experiences and interests. Review of applications will begin immediately and will continue until the position is filled. Send applications to Dr. W. D. Reid, School of Rehabilitation Sciences, Faculty of Medicine, T325-2211 Wesbrook Mall, Vancouver, B.C. V6T 2B5, Canada. Tel: 604-822-7402; Fax: 604-822-7624; email: wdreid@rehab.ubc.ca.

Jackson Cardiovascular-Renal Meeting 2000 November 8-11, 2000, Jackson, Mississippi



The Center for Excellence in Cardiovascular-Renal Research of the University of Mississippi Medical Center invites you to participate in an international meeting of basic science, clinical, and epidemiology researchers. Meeting topics include physiological genomics, vascular pathophysiology, hypertension, heart failure, stroke, kidney disease, and cardiovascular disease in African Americans. The meeting will feature state-of-the-

art lectures, "Hot Topics" papers, and poster sessions led by international experts in cardiovascular and kidney research. Investigators in all areas of cardiovascular-renal research are encouraged to submit abstracts. The meeting is endorsed by the National Heart, Lung and Blood Institute, the Council for High Blood Pressure Research, American Heart Assoc., the American Society of Hypertension, and the American Physiological Society. The full program can be found at <http://cecr.umsmc.edu>. The deadline for abstracts is **September 1, 2000**.

For more information, contact: Meeting Secretariat, Kathy Brailey. Fax: 601-984-1817 email: kbrailey@physiology.umsmc.edu

A Cursing Brain? The Histories of Tourette Syndrome

Howard I. Kushner

Cambridge, MA: Harvard University Press, 1999, 303 pp., illus., index, \$29.95.

ISBN: 0-674-18022-4.

Tourette Syndrome (TS) is a hereditary neurobehavioral disorder characterized by the presence of chronic motor and vocal tics that start in childhood or adolescence and can be suppressed for a short period of time. It is named after George Gilles de la Tourette, a French physician, who in 1885 described a famous TS patient, the Marquise de Dampierre, and several other subjects with the disorder. Kushner has produced a delightful and detailed history of Tourette syndrome and has emphasized how the hypotheses about the cause of TS varied according to the belief system of a wide range of writers on the subject. This is why I call this review *Tourette Syndrome: A Rorschach Test for Physicians*.

The object of the Rorschach test is a remarkably varied and complex disorder that in addition to the tics, can be (but is not always) associated with a range of comorbid disorders including hyperactivity, impulsivity, obsessive-compulsive behaviors, compulsive swearing (coprolalia), disinhibited sexual compulsions, anxiety, enuresis, and other behaviors. To further complicate the situation the tics spontaneously wax and wane and are made worse by stress. Finally, since genetic factors are involved, one or more relatives often have some of these same symptoms, with or without tics. This is the object of the projective “test” that has been taken by physicians for over 100 years, in which the exercise is to identify the cause of these symptoms. While it should come as no surprise that this “test” would produce different answers in different writers, Kushner’s book

emphasizes that these changing claims of the etiology of Tourette syndrome often were due less to compelling and robust scientific findings than to the dynamics of the political culture of medicine [and the personal pre-existing views of the physicians]. I will attempt to briefly illustrate this and other themes of Kushner’s book.

Gilles de la Tourette never saw or examined the Marquise de Dampierre. He took his description of her from a much earlier 1825 report by Jean Itard. However, she was still alive when Gilles de la Tourette wrote his 1885 paper, and reading the translations of his paper gives the impression that his mentor, the famous French neurologist Jean-Martin Charcot, had seen her. Remarkably, Kushner points out that other than possibly passing her once on a Paris street, Charcot also never personally examined the Marquise de Dampierre. Unfortunately, this tendency to write extensively about the cause of a disorder when one has never seen a patient, or only one patient, pervades the early history of TS.

It is also ironic that based on our modern understanding Gilles de la Tourette probably came closer to getting the cause of TS correct than most other writers over the next 100 years. He felt it was primarily a neurological rather than a psychological disorder and was hereditary. The latter was based on Gilles de la Tourette’s other patients and upon Charcot’s definition of predisposing family pathologies including nervous habits, alcoholism, and problems with anger control. This view was immediately challenged by their own contemporaries who suggested that most cases were the result of hysteria or were simply one of many forms of chorea and should not be singled out as specific disease. Itard himself thought the Marquise de Dampierre’s tics were due to an “underdeveloped will.” In response to these attacks, Gilles de la Tourette and Charcot later suggested that if the tics could be cured by hypno-

sis or other suggestion the cause was hysteria; if they could not be cured they had Gilles de la Tourette disease.

In 1902 Henry Meige and E. Feindel published *Les Tics et leur Traitement (Tics and Their Treatment)*. This work was based on the study of one case called “O.” Despite the contrary views of the patient himself, Meige and Feindel concluded that all tics were psychological in origin and occurred in those who had “a psychological predisposition that above all confirmed a hereditary weakness [disease] of the will.” The tics were “bad habits.” They believed that the onset of tics could be connected to a response to an earlier pain and the response to the pain was “characteristic of a nervous and badly trained child.” Meige and Feindel made the same mistake that teachers make today, concluding that since the tics can be voluntarily suppressed for a period of time that they must be psychogenic in origin.

The range of behaviors, and especially the cursing, provided a rich source of material for a psychoanalytic explanation of TS. The seminal paper was written in 1921 by Sandor Ferenczi, a Hungarian psychoanalyst. Without ever examining a single ticcing patient, relying instead on the case of “O” in *Les Tics et leur Traitement*, he concluded that tics were “stereotyped equivalents of Onanism [masturbation]” and that tics resulted from repressed masturbatory desires and constitutional narcissism where the smallest injury to a part of the body strikes the whole ego. Coprolalic outbursts were a substitute release of energy in those incapable of enduring a stimulus to their body without an immediate defense reaction. Kushner points out that Ferenczi’s explanations, based on never seeing an actual patient, “formed the bedrock of all future psychoanalytic claims about the causes of tics and involuntary cursing.”

Unfortunately, actually seeing a patient or two did not necessarily help much. “Most patients’ case histories

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were replete with evidence that could be marshaled to support whatever assumption an examining physician brought to the clinical encounter.” Taking the lead from Ferenczi many considered that the origin of tics was in psychic repression, usually due to guilt over masturbatory habits. If this were the case one would think there would be a need to explain why TS did not affect every adolescent, rather than apparently being extremely rare.

An alternative hypothesis, based on the knowledge of Sydenham’s chorea resulting from rheumatism due to an infection, was that tics were similar to rheumatic chorea and all sources of infection needed to be removed. In some cases this was taken to the extreme of removing “infected” teeth, then tonsils, then adenoids, and if that did not work, progressively removing the sinuses. The problem with all of the supposedly effective treatment modalities, based on the respective theoretical orientation of the physician, was that due to short-term follow-up it was impossible to distinguish a cure from a temporary waning of the tics. As a result, with enough denial or sloppy follow-up, every treatment seemed to work.

For a while, TS disappeared off the medical horizon. However, between 1943 and 1949, Margaret S. Mahler, a psychoanalyst living in the US, reintroduced it using the designation “Gilles de la Tourette’s Disease.” Mahler was, in fact, the adopted daughter of a Budapest psychoanalyst, Vilma Kovacs, former student and analysand of Sandor Ferenczi. Of the many psychoanalysts that visited the Kovacs household, none played a greater role in Mahler’s career than Ferenczi himself. She proposed that although tics might have an organic substrate, they appeared only in those susceptible children who had experienced severe, repressed, psychological conflicts. As has happened with other disorders such as autism, the parents were considered to be at fault. The

parental restraints, or lack of restraints, produced in predisposed children an inability to assert normal control over their motor activities. Mahler’s etiologic hypothesis suggested what tics were best treated with psychoanalysis. However, she noted that there was no connection between “the thoroughness of treatment and good therapeutic results,” which, translated, means the treatment did not work. In typical psychoanalytic obtuseness, this was taken as support of their theories with failure being reconstructed as success. It was proposed that the tics impaired the ego to such an extent that there was a “veritable incontinence of emotion” with “erotic and aggressive instinctual impulses,” continually escaping through the tics and vocalizations, making them resistant to analysis. Mahler went on to suggest that “doing nothing was dangerous” because even if the tics disappeared they might be replaced by a severe personality disorder. As Kushner states, “What might appear to the uninitiated as a failure of psychoanalytic method actually had dialectically confirmed its most profound theoretical insights.” In modern double-blind tests, what drug that failed to outperform a placebo would be accepted by the FDA, regardless of the spin placed on the study by pharmaceutical companies.

From the 1950s on, there were increasing numbers of reports that medications, especially neuroleptics, were successful in treating the tics. In the US, under the strong encouragement of the Tourette Syndrome Association, the high rate of success of neuroleptics put the psychoanalysts on the defensive and helped lead to the presently accepted assumption that TS is a biologically based, hereditary neurological disorder. However, for a while the success of neuroleptics led to a wide pendulum swing to the opposite assumption that TS was purely a neurological disorder.

Kushner points out that Arthur Shapiro and Elaine S. Shapiro, based on their many studies of the treatment of TS with haloperidol, were largely responsible for this shift of opinion and for the formation of the Tourette Syndrome Association, a lay organization whose purpose was to increase public awareness about TS and its successful treatment with medication. However, as often occurs in science, practitioners may find it difficult to give even an inch to their opponents. Thus, it was claimed that TS was purely neurological and not associated with *any* behavioral or psychiatric disorders. Arthur Shapiro took this to the extreme of stating that the obsessive-compulsive behaviors that were present in up to 50% of TS patients were not really obsessive-compulsive behaviors but a TS type that only he was able to differentiate from the psychiatric type. However, in recent years it is widely accepted that a range of psychiatric comorbidities (ADHD, obsessive-compulsive behaviors, anxiety, mood-disorders, and others) are present in many TS subjects. As shown in Fig. 1, it would have required only a modest rearrangement of thinking to come to a model that contained the elements of TS as both a neurological and psychiatric disorder.

Thus, when the psychoanalysts held sway, it was believed that various psychiatric conditions (anxiety neuroses, obsessions, compulsions, hyperactivity, and others), which were then thought to be of purely psychological origin, were the cause of the tics (Fig. 1A). With the success of neuroleptics and other drugs, the pendulum swung to the opposite

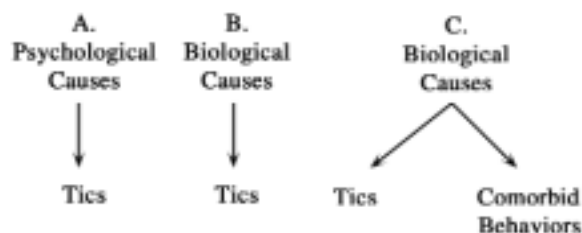


Figure 1.

Book Reviews

extreme that TS was purely a neurological disorder and had nothing to do with any psychiatric disorder (Fig. 1B). A more moderate hypothesis (Fig. 1C), that draws on all prior theories of TS, is that many of these psychiatric disorders are themselves biological, and that a common set of biological factors (genes, infections, other) can cause both the tics and the comorbid behaviors.

Kushner points out that in France even today, a psychological, psychoanalytic view of TS still holds sway, again due more to political than to scientific

considerations. Since France was occupied by the Germans during the war, this may in large part be a reaction to avoiding any biological or genetic theory that remotely resembles the abuses of the Nazis, in the name of eugenics. This, of course, ignores the fact that Stalin killed as many or more Soviet citizens in the name of purely environmental, anti-genetic theories [Lysenkoism]. The problem is not so much the science as it is that tyrants will use any viewpoint they wish if it helps their further preconceived ideas.

Kushner's book is highly recommended not only to understand the fascinating history of TS but more importantly to understand the frequent tendency of physicians to bring to the table of clinical research their preexisting philosophical orientations. ❖

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Patterns of Human Growth Second Edition Cambridge Studies in Biological Anthropology 23

Barry Bogin
New York: Cambridge University Press, 1999, 455 pp., illus., index, \$39.95.
ISBN: 0-521-56438-7.

The goal of Bogin's second edition on human growth, in his own words, is "to consider the growth of the human body in a unified and holistic manner." The volume succeeds admirably. Not only is the coverage comprehensive and informative but the writing is clear and accessible. Studies of human growth have traditionally been descriptive. In contrast, Bogin approaches human growth from an anthropological and evolutionary perspective and weaves together information on individuals, populations, cultures and other primates and mammals. In eight chapters, the book touches almost every base and includes a very useful bibliography.

The background Chapter 1 provides a useful history. Studies of human growth began more than 200 years ago, although observations about human growth go back thousands of years. Out of an interest in the relationship

between early life and later development, 17th century European physicians pursued longitudinal studies on birth weight and child health. By the 20th century longitudinal and cross-sectional studies accumulated information on the tempo of growth of body systems as well as height and weight. Within early 20th century anthropology Franz Boas's research on immigrants to the US challenged traditional ideas about typology and human variation. Chapter 2 introduces the basic principles of growth in delineating the stages of the human life cycle. Bogin introduces a new stage, "childhood," that lies between the stages of "infancy" and "juvencity," and sets the stage for later discussion of the significance of this uniquely human stage of growth.

The evolution of human growth in chapter three provides a comparative dimension with vertebrates, mammals, and primates and discusses, for example, the role of lactation, brain growth and learning. Valuable comparative information highlights the differences between growth in humans and other primates: 1) the greater potential for human growth at adolescence; 2) the pronounced delay in the onset of sexual maturation in humans; 3) the markedly increased potential in humans for growth in height and weight during adolescence.

The core of the book (Chapter 4) focuses on the evolution of the human life cycle and the author's views of human growth from a life history perspective. The human species is like no other in its life history. Each individual spends nearly two decades as a dependent infant, a child, juvenile and adolescent before reaching social and sexual maturity. Other primates move directly from infancy into the juvenile stage. Bogin makes a convincing case for a childhood stage. Infancy ends with weaning about age three. Although independence in locomotion and feeding is achieved, the child remains dependent on older individuals for care and feeding between ages three to seven. Childhood is constrained by an immature dentition, a small digestive system, a calorie-demanding brain that is both relatively large and growing rapidly, and a diet that must be procured, prepared, and provided by older members of the social group. The end of childhood is marked, for example, by a growth spurt in first permanent molar eruption, completion of brain growth, and a shift in cognition, and the ability to maintain attention and focus on complex problems. Bogin reviews some of the fossil evidence and speculates about when, during the course of the last million years or so of human evolution, these changes might have taken place.

Book Reviews

This chapter also provides a valuable critique of neotony as an overly simplistic description of complex growth changes.

Bogin then (Chapter 5) looks at human variation across populations. His overview draws on excellent studies on from Africa, Asia, Europe, Central and South America and documents inter-population variation in height, weight, body proportions, and body composition. The data include his own extensive research on the Mayas living in Guatemalan villages as well as in Florida and California. A specific population might vary over time, for example, in stature. Bogin provides a useful discussion of the meaning of these secular trends and addresses possible social, economic, and political determinants. Here, as in other chapters and throughout the book, Bogin recognizes that the biological individual is growing up within cultural and physical environments.

In Chapter 6 Bogin addresses specific environmental factors that influence

growth, such as nutrition. Data on the protein and energy intake of weaned children from five developing nations is discussed within the context of disease, dietary deficiencies, and cultural practices of infant and child feeding. Growth is also influenced by milk consumption, altitude, climate, and urbanization. Bogin points out that the formation of cities during the agricultural revolution and later during the industrial revolution “has been a major force shaping both human biology and culture” (p.297). In the discussion of cities, he evaluates their biological impact on migrants when they shift their socioeconomic status and social class—shifts that can be positive or negative.

The genetic and endocrine regulation of human growth (Chapter 7) includes mention of the role of homeobox genes in determining the growth of multicellular organisms. Homeobox genes act at the earliest stages of development to delimit the relative position of body regions. By showing how genes influence morphology, this area of research

no doubt will provide insights about how DNA and proteins can alter morphology, a key to understanding evolutionary change. To address the interplay between genes and environment Bogin reviews studies on growth of twins, biological relatives, and adopted children and their adopted families. Bogin also discusses the links between the endocrine system and nutrition and emotions. There are no simple correlations. The final chapter reviews the author’s biocultural approach to human growth, that is, individuals are more than biological organisms but must be studied within social, economic, and political contexts.

I am enthusiastic about this book. It will be appreciated by all readers interested in human growth for the quality and quantity of the information, the clear presentation of the complexities and variables, and for the synthesis and new ideas it provides. ❖

Adrienne Zihlman
University of California, Santa Cruz

Books Received

The Brain’s Sense of Movement, trans. Giselle Weiss, Alain Berthoz
Perspectives in Cognitive Neuroscience.
Cambridge, MA: Harvard Univ. Press, 2000, 337 pp., illus., index, \$45.00.
ISBN: 0-674-80109-1.

Endocrine Physiology
Balint Kacsóh
New York: McGraw-Hill, 2000, 741 pp., illus., index, \$34.95.
ISBN: 0-07-034432-9.

The Extended Organism: The Physiology of Animal-Built Structures.
J. Scott Turner
Cambridge, MA: Harvard Univ. Press, 2000, 235 pp., illus., index, \$47.50.
ISBN: 0-674-00151-6.

The Hot Brain: Survival, Temperature, and the Human Body.
Carl V. Gisolfi and Francisco Mora
Cambridge, MA: MIT Press, 2000, 272 pp., illus., index, \$45.00.
ISBN: 0-262-07198-3.

Nutrition and Exercise Immunology.
David C. Nieman and Bente Klarlund Pedersen
Boca Raton, FL: CRC, 2000, 191 pp., illus., index, \$89.95.
ISBN: 0-8493-0741-4.

Performing in Extreme Environments.
Lawrence E. Armstrong
Champaign, IL: Human Kinetics, 1999, 340 pp., illus., index. \$19.95.
ISBN: 0-88011-837-7.

Physiology by Numbers: An Encouragement to Quantitative Thinking, 2nd Edition.
Richard F. Burton
New York: Cambridge Univ. Press, 2000, 236 pp., illus., index, \$24.95.
ISBN: 0-521-777038.

Announcements

Aging Research Information Source

The National Institute on Aging (NIA) announces a free source of information on aging research. The CAAR (Current Awareness in Aging Research) is a weekly email report produced by the NIA-supported Center for Demography of Health and Aging at the University of

Wisconsin-Madison that helps researchers keep up to date with the latest developments in the field, especially research relevant to the social sciences. The reports include links to key scientific publications, reports, and news releases as well as announcements

about funding opportunities and congressional testimony. Information about CAAR, including an archive of back issues and subscription information, is posted at the following URL: <http://www.ssc.wisc.edu/cdha/caar/caar-index.htm>. ❖

Pickwick Postdoctoral Fellowship

Each year the National Sleep Foundation awards the Pickwick Postdoctoral Fellowship, which funds postdoctoral scientists in the study of basic sleep mechanisms and disorders. Fellows will receive funding of \$35,000 per year for one or two years. Applicants must be currently sponsored or planning to conduct research in recognized North American programs of study or laboratories with strong mentoring in the appropriate area. Resident aliens must document their permanent residency status. Fellowships are available for basic,

applied or clinical research. Candidates must hold either an MD, DVM, PhD or DO degree, the degree or subsequent training having been completed within the last five years. It is essential that there be evidence of aptitude for, and proficiency in research. For more information, please visit the <http://www.sleepfoundation.org/activities/pickwick.html#postdoc>. If you have any questions, feel free to call the National Sleep Foundation at 202 347 3471, extension 203. ❖

PRIM&R/AAMC Workshop on “Effective IRBs: The Fundamentals”

The third and last scheduled PRIM&R/AAMC workshop on “Effective IRBs: The Fundamentals” will be held at the Westin O’Hare Hotel just outside Chicago on September 18, and there is still room to register.

This event is for IRB staff and members, investigators, research administrators, and others who would like a solid grounding in the human subjects regulatory requirements. The faculty for this event will include Dale Hammer-

schmidt, University of Minnesota; Moira Keane, University of Minnesota; Gary Chadwick, University of Rochester; Jeffrey Cohen, OPRR; and Ada Sue Selwitz, University of Kentucky. In addition to presentations on the history, ethics, and details of the regs, there will be ample opportunity to pose to this distinguished faculty questions concerning the special issues and challenges that are faced. There will also be an interactive session involving

small team discussions of specific cases.

To learn more about the program, and to obtain the registration materials, visit <http://www.aamc.org/meetings/specmtgs/irb00/start.htm>.

If after visiting the web site, there are still questions on the program, contact Allan C. Shipp, AAMC, at 202-828-0484. For questions concerning registration matters, please contact Melissa Shaw at 202-862-6103. ❖

PRAT Fellowships for Postdoctoral Scientists at the NIH

The Pharmacology Research Associate (PRAT) Program of the National Institute of General Medical Sciences (NIGMS) sponsors postdoctoral fellows conducting research at the NIH in the pharmacological sciences. This can include research in the areas of signal transduction, drug metabolism, immunopharmacology, chemistry and drug design, structural biology, endocrinology, neuroscience, clinical pharmacology, among other areas. Potential fellows make an application together with a preceptor to the PRAT Program. Selected fellows receive a two-year appointment, salary, supplies and travel funds from the NIGMS to support research in the pre-

ceptors’ laboratories. Candidates may apply prior to coming to NIH or FDA, or they may have started postdoctoral research at NIH or FDA within the 12-month period prior to the application receipt deadline. Applications are due on or before January 5, 2001 for fellowships starting in October of that year. Only US citizens or permanent residents are eligible. Contact the PRAT Program Assistant at 301-594-3583 or prat@nigms.nih.gov to request a PRAT Fact Sheet and an application kit, or visit the NIGMS home page at http://www.nih.gov/nigms/about_nigms/prat.html to view the PRAT Fact Sheet. ❖

Scientific Meetings and Congresses

August 30-September 3

World Congress of Lung Health and 10th European Respiratory Society Congress, Florence, Italy. *Information:* ERS Headquarters Lausanne, 1, boulevard de grancy, CH-1006 Luasanne, Switzerland. Tel: +41-21-613-0202; fax: +41-21-617-2865; email: congres@ersnet.org or scientif@ersnet.org.

September 5-10

XIth International Vascular Biology Meeting, Geneva, Switzerland. *Information:* IVBM 2000, c/o MCI Group SA, Rue de Lyon 75, 1211 Geneva 13, Switzerland. Tel: +41-22-345-3600; fax: +41-22-240-2363; email: anne-lise@mcitravel.com.

September 7-10

American Heart Association Scientific Conference on Interactions of Blood and the Pulmonary Circulation, Sedalia, CO. *Information:* Project Coordinator Scientific Conference on the Interactions of Blood and the Pulmonary Circulation, Office of Professional Education, American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231-4596. Tel: 214-706-1543; fax: 214-706-5262; email: sciconf@heart.org; Internet: <http://www.americanheart.org/Scientific/confer>.

September 7-13

2000 Pre-Olympic Congress, International Congress on Sports Science, Sports Medicine and Physical Education, Brisbane, Australia. *Information:* Amanda Costin, 2000 Pre-Olympic Congress, C/-Queensland University of Technology, Human Movement Studies, Locked Bag 2, Red Hill, Queensland 4059, Australia. Tel: +61-7-3864-5824; fax: +61-7-3864-9690; email: a.costin@qut.edu.au.

September 10-15

First International Symposium on Microgravity Research and Applications in Physical Sciences and Biotechnology, Sorrento, Italy. *Information:* Conference Secretariat, ESTEC Conference Bureau, PO Box 299, 2200 AG Noordwijk, The Netherlands. Tel: +31-071-565-5005; fax: +31-071-565-5658; email: confburo@estec.esa.nl; Internet: <http://www.estec.esa.int/CONFANNOUN>.

September 10-15

Principles and Practice of Tracer Methodology in Metabolism, Galveston, TX. *Information:* Robert R. Wolfe, PhD, Course Director, Department of Metabolism, University of Texas Medical Branch and Shriners Burns Hospital, 815 Market St., Galveston, TX 77550. Fax: 409-770-6825; email: rwolfe@utmb.edu.

September 14-17

XIV Congress of the Cardiovascular System Dynamics Society, Baltimore, MD. *Information:* David A. Kass, or J. Yasha Kresh, Johns Hopkins Medical Institutions, Baltimore, MD. email: dkass@bme.jhu.edu or j.yasha.kresh@drexel.edu; Internet: <http://www.hopkinscme.org/CSDS>

September 14-25

Supramolecular Structure and Function (Seventh International Summer School on Biophysics), Rovinj (Istria), Croatia. *Information:* Prof. dr. Greta Pifat-Mrzljak, Ruder Boskovic Institute, HR-10000 Zagreb, Croatia, POB 1016. Tel: +385-1-4561-127; fax: +385-1-4680-239; email: pifat@rudjer.irb.hr; Internet: <http://rudjer.irb.hr/~dpavlek/biophysics2000.html>.

September 18

Prim&R/AAMC Regional Workshops on "Effective IRBs: The Fundamentals," Chicago, IL. *Information:* Meetings Registrar, Association of American Medical Colleges, 2450 N Street, NW, Washington, DC 20037-1126. Tel: 202-828-0892; fax: 202-862-6160; email: srobinson@aamc.org; Internet: <http://www.aamc.org>.

September 20-22

26th Annual Topics in Gastroenterology and Liver Disease, Baltimore, MD. *Information:* Program Coordinator, Johns Hopkins University School of Medicine, Office of Continuing Medical Education, Turner 20/720 Rutland Avenue, Baltimore, MD 21205. Tel: 410-955-2959; fax: 410-955-0807; email: cmenet@jhmi.edu; Internet: <http://www.med.jhu.edu/cme>.

September 22-26

American Society for Bone and Mineral Research 22nd Annual Meeting, Toronto, Canada. *Information:* ASBMR Business Office, 1200 19th Street, NW, Suite 300, Washington, DC 20036-2422. Tel: 202-857-1161; fax: 202-857-1880; email: ASBMR@dc.sba.com.

September 23-23

American Clinical Neurophysiology Society Annual Meeting, Montreal, Canada. *Information:* American Clinical Neurophysiology Society, PO Box 30, Bloomfield, CT 06002. Tel: 860-243-3977; fax: 860-286-0787; email: acns@ssmgt.com.



MEMBERSHIP APPLICATION FORM

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Do you currently hold membership in the APS? Yes No

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Institution Street Address _____

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EDUCATIONAL STATUS *(Important: if you are enrolled as a student, include the degree and pending date of completion)

Dates*	Degree*	Institution	Major Field	Advisor
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POSTDOCTORAL RESEARCH TOPIC (if applicable): _____

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Membership Application (Continued...) **Applicant Last Name** (please print) _____

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Current Position:

Dates	Title	Institution	Department	Supervisor
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Prior Positions:

Dates	Title	Institution	Department	Supervisor
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LIST YOUR PUBLICATIONS FROM THE PAST 5 YEARS (List them in the same style as sample below).

Sample: Cheung, Stephen S., and Tom M. McLellan. Heat acclimation, aerobic fitness, and hydration effects on tolerance during uncompensable heat stress. *J. Appl. Physiol.* 84(5): 1731-1739, 1998.

IMPORTANT INFORMATION:

Do not include a curriculum vitae or reprints.

Mail your application to: Membership Services Department, The American Physiological Society
9650 Rockville Pike, Bethesda, Maryland 20814-3991 (U.S.A.)

Send no money now: You will receive a dues statement upon approval of membership.

Approval Deadlines: Regular membership applications are considered for approval by the Council three times per year. Student and Affiliate membership applications are accepted monthly upon approval of the Executive Director of the Society.

Questions? Call: 301-530-7171 ■ Fax: 301-571-8313 ■ E-mail: members@aps.faseb.org ■ Web: www.faseb.org/aps

TRAVEL AWARD APPLICATION

*XXXIV IUPS Congress
Christchurch, New Zealand
August 26-31, 2001*

Application Deadline: December 1, 2000



The U.S. National Committee for the International Union of Physiological Sciences is seeking **applications for travel awards for the XXXIV IUPS Congress in Christchurch, New Zealand, August 26-31, 2001.** Information about the Congress is available at <http://www.iups2001.org.nz>.

The Committee will screen the applications, and the awards will be made by The American Physiological Society (APS), which is raising funds for the travel. **The travel awards will be approximately \$1,000 to help cover the majority of the airfare to New Zealand.**

The awards are intended for individuals resident to the United States who have no other source of funds to attend the Congress. Federal employees are eligible. It is anticipated that more applications will be received than can be funded. **To achieve as high a rank as possible, the following factors should be considered:**

- complete all questions on the application
- provide copies of letters of invitation if you have been invited to the Congress to make a presentation
- provide an indication of participation in the Congress, including presentations and attendance for most or all sessions
- have travel plans that include other professional visits or work

The deadline for submissions of applications for travel awards is **December 1, 2000.** The application is on the following two pages. **All applicants must submit six copies of the application to USNC/IUPS, National Academy of Sciences, Attn: Paul Turner, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.**



APPLICATION FORM

Surname _____

XXXIV IUPS CONGRESS TRAVEL GRANT PROGRAM

Christchurch, New Zealand; August 26 - 31, 2001

1. Name and Degree: _____ Year of highest degree: _____
2. Position or employment title: _____ Year of Birth: _____
3. Address: _____

4. Phone number: _____ Fax number: _____
5. E-mail address: _____
6. Country of citizenship: _____ Visa status if not U.S. citizen: _____
7. Underrepresented Minority Applicants: Please circle ethnic group to which you belong:
African American Hispanic Native American Pacific Islander
- 8a. Gender: Male _____ Female _____
- 8b. Do you need special assistance or accommodations? _____
9. Attending entire Congress? Yes _____ No _____ If not, which days will you attend? _____
Will you present an invited paper or poster at the Congress? Yes _____ No _____
If so, please indicate the sessions you will address. If invited, attach letter of invitation.
Invited to give public lecture (give title): _____

Invited to Congress symposium (give title; indicate chairman): _____

10. Do you intend to submit a poster? (If yes, please give title): _____

11. Please describe your area of specialty (e.g. cell physiology, neurophysiology, etc.):

12. Member of: APS _____ SGP _____ SICB _____ Soc. Neurosci. _____ BMES _____ Microcirc. Soc. _____ Other _____
13. Are you employed by the federal government more than half-time? Yes _____ No _____
14. Travel: a. City of departure _____ b. Support requested _____
c. Amount of other support available (excluding personal) _____
15. Recent publications (not more than 5 titles, giving full refs). If listing abstracts or manuscripts in press, please indicate.

Deadline for postmark of applications: December 1, 2000
Submit six (6) copies to USNC/IUPS, National Academy of Sciences,
2101 Constitution Avenue, N.W., Washington, D.C. 20418. Attn: Paul Turner

Continued next
page



Surname _____

16. Anticipated abstract (Not more than 250 words on paper or poster you plan to present at the Congress, including names of author and coauthors and indicate presenter. If none, abstract of current work.)

17. Give a brief resume of the scientific purposes and goals of your trip in addition to attending the Congress, including other meetings: satellite symposia, laboratories you plan to visit, work on collaborations, etc.