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Growing Participation of Women in Physiology: 1987-2002

Susan M. Barman, PhD, Michigan State University;
Carole M. Liedtke, PhD, Case Western Reserve University

In 1987, APS published a book entitled: *History of the American Physiological Society: The First Century, 1887-1987* (1). In Chapter 14, Toby A. Appel, Marie M. Cassidy, and **Elizabeth Tidball** chronicled the involvement of women in the Society, as well as in academia, during that period. The article painted a rather dismal picture, with very few women having had a significant role in the functions of the Society. In this year when only the second woman has taken rein as President of the APS (**Barbara Horwitz**), we (past and current Chairs of the Women in Physiology Committee) would like to provide an update on the increased participation of women in the Society during the 15 years since publication of the above cited book. This article also provides information on how members of APS (both men and women) can become more involved in the Society and to help shape its future.

Membership in APS

After admitting the first woman (**Ida Hyde**) to the Society in 1902 and the second (**Mabel Purefoy FitzGerald**) in 1913, there was a modest increase in the number of women elected to membership over the next several years (see Tables 1 and 2 of Ref. 1). Women accounted for 12.3% of APS membership by the early 1920s, but then fluctuated between 4.9 and 11.3% of the membership through 1984. As shown in Figure 1, since that time there has been a slow but steady increase, such that currently 19.9% of APS members are women.

It is expected that women will account for an even higher percentage of APS membership in the near future, as cur-

rently 38% of the "student members" are female. This likely reflects the fact that many graduate programs have experienced an increased ratio of female to male trainees; in fact, women accounted for 41% of PhDs in Physiology awarded in 2000 (4). An important goal of the Society is to assure that young members—both men and women—remain active participants as they progress in their careers. One way to do this is to help these young individuals feel "ownership" in the Society by including them on committees, symposia, and other key functions of the APS. The newly revised Career Mentoring Program, which is organized and managed by the Women in Physiology Committee, is one example of the efforts of APS members to assist young physiologists of both genders to be adequately prepared as the physiologists of the future. Information on this program can be found at <http://www.the-aps.org/education/mentoringprogram/>.

APS Governance

With the exception of **Bodil Schmidt-Nielsen** who was elected to Council in 1971 and then served as President of APS in 1976, no other women served on APS Council during its first century of existence (1).

Election to APS Council and Presidency is a multi-step process that allows the general membership of the APS to have a say in who is chosen for these leadership positions. First, in the fall of each year, the entire voting membership of the APS (all regular members) is asked to bring forward names of individuals who they think would do an admirable job of serving the Society as

President-elect and Councillor. Second, each of the voting members of the Nominating Committee (i.e., Chairs of the 12 APS Sections) is then asked to select from these lists two names in nomination for President-elect and three for Councillor. As the third step in the process, the Nominating Committee meets at APS headquarters in December to finalize a ballot based on this "short list." Strengths and weaknesses of each of these candidates is discussed by members of the Nominating Committee, and after a series of votes, two individuals are

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Headquarters phone: 301-634-7118

Fax: 301-634-7242

Email: info@the-aps.org

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

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identified as candidates for President-elect and five individuals as candidates for Councillor. The fourth and final step in the selection process is a mail ballot distributed to the voting membership.

As is typical, in the 2001-02 voting cycle, only a small percentage of the eligible APS members participated in the first and fourth steps. The initial request for nominees resulted in a list containing 102 names for President-elect and 172 names for Councillor. These lists included 10 women for President-elect and 19 women for Councillor, or roughly 10% of the individuals nominated. This is considerably less than the percentage of the APS membership that are women. The final ballot included one woman as a nominee for Council. Only 1,416 of over 7,500 regular APS members participated in the election of officers that was conducted by mail ballot in early 2002 (3).

On a very positive note, since 1987, 10 women have been elected by the membership to serve on Council (Table 1). Each year two individuals are elected to Council; thus, these 10

What is the Purpose of the Mentoring Program?

This program is designed to provide advice, support, encouragement, and networking opportunities for students, postdoctoral fellows, and junior faculty who are interested in physiology as a career choice or scientists resuming their careers after a period of time outside the academic arena.

<http://www.the-aps.org/education/mentoringprogram/join.htm>

women reflect approximately 30% of the those chosen by the voting members to serve on Council. And in 2001 Horwitz was chosen as President-elect, becoming only the second woman in the history of the Society to compete successfully for this position. Each of these women attained these significant roles in governance of the Society by first being active participants in their Sections and/or by serving on one or more of the major committees of the Society. These kind of activities are required of any APS member (male or female) to gain the recognition needed to first have their name appear on the ballot and then to ultimately win the election.

Committee Representation

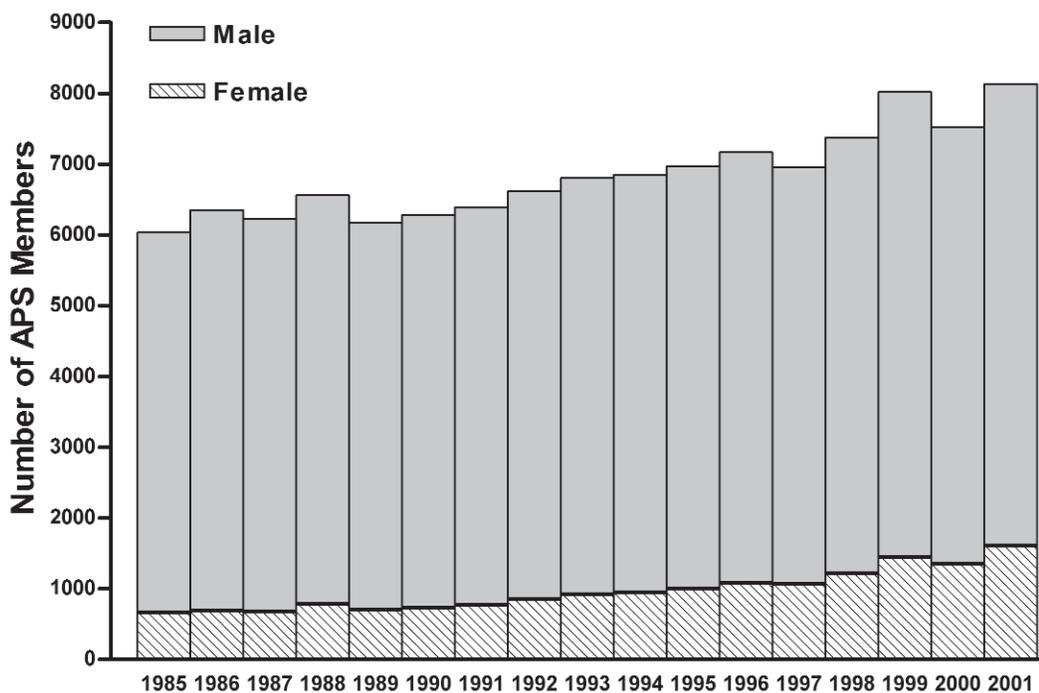
As women have begun to comprise a greater proportion of the Society membership (see Figure 1), one would expect that they would also have a

greater role in the various activities of the APS. This indeed is the case when one considers membership on APS Committees. It was not until 1961 that a woman was appointed to an APS Committee (1). That year, **Louise H. Marshall** began an eight-year service on the Education Committee. In the 1960s, only two other women—**Ingrith Deyrup-Olsen** (Education) and **Neena B. Schwartz** (Program Executive Committee)—served on APS Committees. The 1970s saw an increased participation of women on Committees, likely influenced by a Task Force on Women in Physiology formed in 1973 (5). During the 1970s **Beverly Bishop** and **Helen Cecil** were appointed as Chairs of Membership Advisory and Animal Care and Experimentation Committees, respectively. They were the first women to serve as Chair of an APS Standing Committee.

Since 1987, there has been a marked increase in the appointment of women on APS Committees. In all, 106 women have been appointed by APS Council to serve on one or more committees. Table 2 shows the participation of women on 20 APS Committees in the past 15 years. Twenty-five women have been appointed by Council to serve as Chairs of these committees. Thirty-two women have served on more than one committee, with five serving on three or four committees. Certain committees have had considerable representation by women. Not surprising-

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Figure 1. Numbers of male and female members of APS from 1985-2001.



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ly, the Women in Physiology Committee falls into this category. In addition, the Career Opportunities, Committee on Committees, Education,

Table 1. Women elected by voting members to serve on APS Council since 1987.

Year Elected	Name
1988	Beverly P. Bishop
1991	Helen J. Cooke
1993	Barbara A. Horwitz
1994	Diana L. Kunze
1996	Celia D. Sladek
1998	Phyllis M. Wise
1999	Hannah V. Carey
1999	Jo Rae Wright
2001	Kim E. Barrett
2002	Virginia M. Miller

Table 2. Number of women appointed by APS Council to serve on an APS Committees since 1987

APS Committee	# of women serving	# of women Chairs
Animal Care & Experimentation	7	1
Awards	8	1
Career Opportunities	13	3
Committee on Committees ¹	18	6
Communications ²	2	0
Daggs	2	0
Education	12	2
Finance	2	0
International Physiology	4	0
Joint Program ³	8	1
Liaison with Industry ⁴	3	1
Long Range Planning	6	0
Membership	13	4
Perkins	2	1
Porter	9	1
Public Affairs	6	0
Publications	1	0
Senior Physiologists	1	0
Women in Physiology	16	7

¹Although membership on Committee on Committees requires Council approval, each of the 12 APS sections chooses a member to represent their section.

²Communications Committee was formed in 2002.

³The numbers indicated for Joint Program Committee refer only to those selected by Council. Many other women have served on this committee as APS Section and Group representatives.

⁴Since 2000 membership on Liaison with Industry Committee has been determined by the 12 APS Sections rather than by Council, but the numbers indicated here refer only to women who have served on this committee by Council action.

and Membership Committees have also seen a solid core of women serving. On the other hand, two major committees, Finance and Publications, have not had significant representation by women.

APS Sections

One place where women have taken a prominent role in recent years is by service on the 12 APS Section Steering Committees. The current rosters show that 23 women serve on these steering committees, including three as current Chairs (**Jeanne Seagard**, Neural Control of Autonomic Regulation; **Susan Wall**, Renal; **Penelope Hansen**, Teaching). In addition, past Chairs serve as ex officio Steering Committee members, and women serve in this capacity on five of the 12 sections. With the increasing roles of

the sections in the functions of the Society, notably in programming of the Spring meeting, APS members can actively participate in Society functions by working with the Section Steering Committees. Persons interested in working with APS in this way should contact members of the Steering Committees that represent their research interests and volunteer to become involved in their activities. Many of the Section Steering Committees now include a student/fellow member. This offers a great way for young APS members to take an active role in the functions of the Society. Information about the 12 APS sections can be obtained at the following web site: http://www.the-aps.org/sect_groups.htm.

APS Journal Editors

Although many women served on editorial boards and as Associate or Section Editors of APS Journals before the 1990s, no woman was selected to the prominent role of Editor-in-Chief until then. **Mary Ann Farrell-Epstein** served as an Editor of a series of articles entitled *Modeling in Physiology* that were published in various APS Journals from 1991-97. In 1992, Hansen became Editor of *Advances in Physiology*, a position she held until 2001. In 1996, **Kim Barrett** began a six-year tenure as Editor of *AJP: Cell*. Each year since 2000, another woman has been appointed as an Editor of an APS journal. They are: **Susan Hamilton** (*Physiological Reviews*, 2000-present), **Dee Silverthorn** (*Advances in Physiology*, 2001-present), and **Eve Marder** (*Journal of Neurophysiology*, 2002-present).

Women Physiologists in Academia

Information on the increasing numbers of women enrolled in doctoral programs and serving as faculty in basic science and clinical science departments at medical schools in the US can be found in a recent article by Frank and Matyas (2). As pointed out by these authors, women account for 41% of the total doctoral degrees awarded in physiology in 2000. Also, the percentage of women physiologists

-serving as faculty at US medical schools has risen from 14% in 1989 to 20% in 2000. The numbers specifically for departments of physiology show that the percentage of women has increased from 14 to 22%. Nonetheless, the data show that at every faculty rank, compared to their male cohorts, proportionately fewer women were tenured or on track for tenure.

Currently, nine departments of physiology in the US and Puerto Rico are headed by women. This number has not changed markedly in recent years. Information that was not available from APS resources is whether other female APS members are Chairs of other basic science or clinical departments or directors of major programs within US universities.

Female Recipients of APS Awards

The two most prestigious awards offered by the APS are *Physiology In Perspective: The Walter B. Cannon Award Lecture*, which is awarded to an outstanding physiological scientist, domestic or foreign and *The Henry Pickering Bowditch Award Lecture*, which is awarded to a regular member, under 42 years of age, for original and outstanding accomplishments in the field of physiology. These two lectures are highlights of the annual Experimental Biology (EB) meeting. Although the award winners are selected by the President-elect and President, respectively, nominees for the awards are solicited from the general membership. Members are strongly encouraged to help these APS officers identify outstanding physiologists.

The Cannon Award has been given annually since 1983, but as of 2002, no woman has been a recipient. A list of all of the Cannon Award winners can be found at the following web site:

Would you like to serve on an APS committee?

Would you like to nominate someone for a committee?

For more information, visit

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

Award Lecture Nominations Wanted

Nominations are wanted for the Cannon and Bowditch Award Lectures. The Cannon Award Lecture is awarded to an outstanding physiological scientist, domestic or foreign, as selected by the President-Elect. The Bowditch Award Lectureship is awarded to a regular member, under 42 years of age, for original and outstanding accomplishments in the field of physiology. A nomination shall be accompanied by a candidate's curriculum vitae and three letters detailing the individual's status, contributions, and potential. For complete information visit http://www.the-aps.org/awards/awd_society.htm.

http://www.the-aps.org/awards/society/awd_cannon.htm.

The Bowditch Award has been given annually since 1956. Before 1993, only one woman (**Bodil-Schmidt Nielsen**, 1957) was the distinguished recipient of this lectureship. Since then, three women have received this Award. They are, **Claire M. Doerschuk** (1993), **Barbara Block** (1995), and **Kim Barrett** (1996). A list of all of the Bowditch Award winners can be found at the following web site: http://www.the-aps.org/awards/society/awd_bowditch.htm.

Since 1994, each of the 12 sections of the APS has sponsored a Distinguished Lecture at the annual EB Meeting. To date (through EB 2003), only 10 of the 118 lectures have been given by women. Nearly half of the sections (Cardiovascular, Environmental & Exercise Physiology, Gastrointestinal, Renal, and Water & Electrolyte) have yet to designate a female as the recipient of their Distinguished Lectureship. On the other hand, three of the sections (Central Nervous System, Endocrinology & Metabolism, and Neural Control of Autonomic Regulation) have twice selected a woman as their Distinguished Lecturers. APS members are encouraged to submit names of individuals to be considered for these awards to members of the 12 APS Section Steering Committees. A list of all the Distinguished Lecturers can be found at the following web site: http://www.the-aps.org/awards/society/awd_distinrecip.html.

Closing Remarks

As indicated at the opening, women played, at best, a modest role in the functions of the APS during its first 100 years (1). Clearly this situation

has turned around, and more and more women are assuming key positions in the Society. The authors are optimistic that the growth will continue as the APS flourishes in its second hundred years. Over the course of the next year, it is our aim to interview several of the women who were mentioned in this article and who have paved the way for other women to gain roles in the governance and committees of the APS. Highlights of these interviews will be included in future issues of *The Physiologist*. ♦

We are very grateful for the invaluable assistance of APS staff, most notably Linda Allen, Linda Comley, Melinda Lowy, and Margaret Reich who helped us gather facts regarding participation of women in the APS.

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APS Council Holds Fall Meeting in Virginia

The APS Council held their fall meeting at the Lansdowne Resort in Leesburg, VA, November 8-10, 2002. One of the key issues discussed was the governance structure of the APS. After much discussion and deliberation, it was agreed that the size of the Council should be increased from six to nine members. One new council member would be added each year over the next three years to reach the nine-member limit. Since this will require a change to the APS Bylaws, the issue will be put before the membership for a vote at the APS Business Meeting. The Business Meeting will be held on Monday, April 14, at EB 2003. (For additional information, please see APS Bylaws Changes in the December issue of *The Physiologist* available at <http://www.the-aps.org>.)

Council was also presented with reports from the Publications, Finance, Joint Program, Membership, Communications, Public Affairs, Animal Care and Experimentation, Education, Committee on Committees, and Daggs Award committees. APS staff members Linda Allen, Marsha Maytas, Robert Price, Alice Ra'anan, and Margaret Reich also joined the meeting to assist with the committee report presentations.

The Publications Committee announced the appointment of several new editorships. **Allen W. Cowley, Jr.**, Medical College of Wisconsin, was selected as the second Editor of *Physiological Genomics*, **Marshall (Chip) Montrose**, Indiana University, was chosen to be the Editor of *AJP-GI*, and **Walter Boron**, Yale University, was chosen to be Editor of *NIPS*. The Committee renewed **Susan Hamilton's** Editorship of *Physiological Reviews* and **Asrar Malik's** Editorship of *AJP-Lung*.

Council also approved a motion made by the committee to establish a "Classic Article" Task Force. This task force will develop a definition of a "classic" article, collect potential articles, select the articles, and appoint researchers to write editorials to describe the importance of the work and how it has influenced the present field of research. The articles will be accessible to members online, free of charge. Council also approved a request by the committee to extend honoraria for Editors-in-Chief for up to six months after the end of their last term so they may complete the review process on any outstanding papers rather than sending them to

the new editor.

The Finance Committee presented Council with the final 2002 budget and the proposed 2003 budget, both of which were accepted and approved by Council. In addition, Council approved the establishment of an APS Endowment Fund, transferring approximately \$2.7 million of the Society's Operational Reserves to the new Fund. Initially, the Fund will be used to support the Society's Career Enhancement Award Program, Minority Program, and Undergraduate Summer Research Program. As additional funds are contributed to the APS Endowment, new and existing programs will be supported. The APS Endowment Fund will also receive an additional \$2 million contributed over the years by the families and friends of APS members. The monies associated with the Caroline tum Suden Fund, John Perkins Memorial Fund, Giles F. Filley Fund, Lazaro Mandel Fund, Shih Chun Wang Fund, and Arthur C. Guyton Fund have also been transferred to the APS Endowment Fund. With a current value of approximately \$4.7 million, the APS Council has set a \$10 million target for the APS Endowment Fund. Starting in Spring 2003, the Society will be invit-



APS Council: Front Row: Dale Benos, John Hall, Barbara Horwitz, John Williams, J.R. Haywood; Middle Row: Steve Hebert, Kim Barrett, Celia Sladek, Doug Eaton, Charlie Tipton; Back Row: Mordecai Balustein, Peter Wagner, Robert Carroll, Curt Sigmund, Virginia Miller



Presidents John Hall, Barbara Horwitz, and John Williams model the new APS baseball hats during the Fall Council meeting.

ing the membership to contribute to the APS Endowment Fund through a planned giving program.

The Joint Program Committee (JPC) updated Council on the status of upcoming APS Conferences in 2003 and 2004. **Curt Sigmund**, chair of the JPC, told Council that one of the goals of the committee for this coming year is to solicit more conference proposals from the membership. To help achieve this goal, the committee will work on producing better guidelines for submitting conference proposals.

The Public Affairs Committee updated Council on the status of the NIH budget. Congress is trying to find a way to get close to the last year of doubling of the budget for NIH, but since "9/11" the fundamental thinking has changed. In the fiscal 2003 budget, the major increase has been for bio-terrorism research, and everything is on hold until the 2003 budget is finalized. Ra'anan, APS Public Affairs Officer, said the hope is that the NIH budget is brought forward due to bio-terrorism funding, but it is doubtful that this will happen.

In July, the Committee on Committees (COC) held a meeting to

review and revise the current process used to select committee members. The Committee on Committees presented Council with their recommendations at this fall Council meeting. They proposed implementing a system consisting of a Candidate Information Form and an Endorsement Form. Those members wishing to serve on a committee will submit a Candidate Information Form, and then have an Endorsement Form submitted on their behalf. Only one endorsement form for each candidate will be accepted by the COC. The committee said that this new process would be more equitable to all candidates, and will provide the committee with more complete candidate information to help them make better selections. Council approved the implementation of the new committee position selection process.

The Education Committee presented Council with a proposal for a new award—the David Bruce Undergraduate Research Award. This award will be presented each year at the EB meeting. Award finalists will be invited to present their research posters at a special poster session on Saturday evening, at which time they will

receive their certificates. The awardees will also be announced at the APS Business meeting. Council accepted the proposal for the award.

The Women In Physiology Committee also presented Council with a proposal for a new award—the Bodil Schmidt-Nielsen Distinguished Mentor and Scientist Award. The award is intended to honor a member of APS who has made an outstanding contribution to physiological research and demonstrated dedication and commitment to excellence in training of young physiologists. The award was established to recognize **Bodil Schmidt-Nielsen**, the first woman president of the Society and a distinguished physiologist who has made significant contributions in her field. Council accepted the proposal for the new award.

Additional details of the Council's fall meeting will be presented to the membership at the 2003 APS Business Meeting. The Business Meeting will be held at EB 2003 on Monday, April 14 at 5:45 PM. All APS members are invited to attend. ❖

Membership

New Regular Members

*Transferred from Student Membership

Benedict C. Albensi

Cleveland Clinic Foundation, OH

Sandrine T.A. Arbogast

Baylor College of Medicine, TX

Ara H. Arutunyan

Texas Tech Univ.

Tracy L. Baker-Herman*

Univ. of Wisconsin

Amy J. Bastian

Johns Hopkins, MD

Shawn E. Bearden

John B. Pierce Lab, CT

Shaliha Bechoua

Massachusetts General Hospital

Adam Carr Bell

Human Genome Sciences, MD

Chantal M. Boulanger

INSERM Unit 541, France

James R. Broughman, Jr.

Kansas State Univ.

Richard Allen Bunday

Univ. of California, San Diego

Dongsheng Cai

Harvard Univ., MA.

Bernard Calvino

ESPCI, France

John Caprio

Louisiana State Univ.

Michael Christiansen

Statens Serum Inst., Denmark

Antonio Colantuoni

Federico II Univ. Med. Sch., Italy

Brian C. Cooley

Medical College of Wisconsin

Graham Trevor Cottrell

Queen's Univ., Canada

Bruno Cozzi

Univ. of Padova, Italy

Alexandre Alves Da Silva

Univ. of Mississippi Med. Ctr.

Richard Debigare

Emory Univ., GA

Christine M. Donmoyer*

Columbia Univ., NY

Alvaro Duque*

Yale Univ., CT

Jian Feng

Univ. of Alabama, Birmingham

- Leon Fernando Ferder**
Poncue Sch. Med., Argentina
- Eduardo Fernandez**
Univ. Miguel Hernandez, Spain
- Richard Charles Fitzpatrick**
Prince of Wales Med. Res. Inst.,
Australia
- Annette M. Gabaldon***
Oregon State Univ.
- James Joseph Galligan**
Michigan State Univ.
- Cheryl Elaine Gariepy**
Univ. of Michigan
- Timothy A. Garrow**
Univ. of Illinois
- Greg G. Geary**
Loma Linda Univ., CA
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- Dieter Jaeger**
Emory Univ., GA
- Aquiles Jara**
Catholic Univ. of Chile, Chile
- Liming Jin**
Medical College of Georgia
- Martin Kaefer**
Indiana Univ.
- Hong Kan**
West Virginia Univ.
- Christina Karatzafieri**
Univ. of California, San Francisco
- Khursked A. Katki**
Scott & White Hospital, Temple, TX
- Prabha KC***
Howard Univ.
- Victoria P. Korovkina**
Univ. of Iowa
- Julie L. Lavoie**
Univ. of Iowa
- Sukho Lee**
Univ. of Pennsylvania
- Yu-Long Li**
Univ. of Nebraska Med. Ctr.
- Zhenbo Li**
Univ. of Iowa
- Shien-Fong Lin**
Cedars Sinai Med. Ctr., Los Angeles, CA
- Merry L. Lindsey**
Medical Univ. of South Carolina
- Michael P. Lisanti**
Albert Einstein College of Med., NY
- Jun-Li Liu**
McGill Univ., Royal Victoria Hosp.,
Canada
- Martia Martina**
Ottawa Health Res. Inst., Canada
- Susan A. Masino**
Univ. of Colorado
- Nichole Karine McDaniel***
UMDNJ, NJ
- Duane R. McPherson**
SUNY at Geneseo
- Steven J. Miller**
Clarian Health, Indianapolis, IN
- Mulugeta Million**
Univ. of California, Los Angeles
- Richard D. Minshall***
Univ. of Illinois, Chicago
- Christina A. Mitchell**
Monash Univ., Australia
- Scott C. Molitor**
Univ. of Toledo, OH
- Robert C. Molthen**
Medical College of Wisconsin
- Nicolette K. Muenter Swift***
Mayo Clinic, MN
- Rene Martin Mueri**
Univ. of Bern, Switzerland
- Akira Nakamura***
Chiba Univ., Japan
- Shridhar Narayanan**
Quest Inst. of Life Sciences, India
- Robert D. Nicholls**
Univ. of Pennsylvania
- Kerry L. Openshaw**
Bemidji State Univ., MN
- W. Michael Panneton**
St. Louis Univ., MO
- Hemal H. Patel**
Univ. of California, San Diego
- Stine Falsig Pedersen**
Univ. of California, Davis
- Darby Stewart Pettitt***
Univ. of Colorado, Boulder
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Duke Univ., NC
- Raymund Y-K. Pun**
Univ. of Cincinnati, OH
- Charles Riggs**
Univ. of Arkansas
- Sanya Roysommuti**
Khon Kaen Univ., Thailand
- Liangyou Rui***
Univ. of Michigan
- Mohammad G. Saklayen**
Wright State Univ., OH
- Elisa Bete A. Santos**
Medical College of Wisconsin
- Allen E. Silverstone**
SUNY, Upstate
- Krishna Singh**
East Tennessee State Univ.
- Deborah M. Sloboda***
Univ. of Western Australia
- Nikolaos Smyrnis**
Nat'l. Univ. of Athens-Aeginition
Hosp., Greece
- Mihaela Stefan**
Univ. of Pennsylvania
- Daniel Thomas Stein**
Albert Einstein College of Med., NY
- Yunchao Su**
Univ. of Florida
- Shozo H. Sugiura**
UMDNJ, NJ
- Francis A. Sylvester***
St. Norbert College, WI
- John P. Thyfault***
East Carolina Univ., NC
- Frank Van Breukelen***
Univ. of Nevada
- Jacqueline Vazquez***
Univ. of Michigan
- Xiao-Jing Wang**
Brandeis Univ., MA
- Michael Keith Wilkerson***
Univ. of Vermont
- QingLin Yang**
Morehouse School of Medicine, GA
- Guang H. Yue**
Cleveland Clinic Foundation, OH
- Junlan Zhang**
Univ. of Alabama, Birmingham
- Hong Zheng**
Univ. of Nebraska

New Student Members

- Ahmed A. Abdellatif**
Univ. of Louisville, KY
- Maria M. Anton**
Univ. of Texas, Austin
- Kathryn Terese Arns**
Univ. of Missouri, Columbia
- Anita Faye Austin**
Meharry Medical College, TN
- Leigh Ann H. Austin**
Univ. of South Florida
- Ola Ayaso**
Massachusetts Inst. of Technology
- Tanja Babic**
Univ. of Western Ontario, Canada
- Jessica Lyn Baker**
College of the Holy Cross, MA
- Megan Elaine Barasch**
Univ. of Illinois, Chicago
- Olivier Belzile**
Hosp. St. Francois D'Assise-U Laval,
Canada
- Maneesha Bendkhale**
Univ. of Texas, Dallas
- Thoddeus Stephen Brink**
Univ. of Chicago, IL
- John Isaac Broussard**
Ohio State Univ.
- Jonathan Thomas Brown**
GlaxoSmithKline, UK
- Nathan Scott Bryan**
LSU-Health Sci. Ctr., Shreveport, LA
- Andrew James Bukowinski**
Western New England College, MA
- Yunfei Cai**
Medical College of Wisconsin
- Tiffany L. Carle**
Univ. of Texas Southwestern Med. Ctr.
- Emilie Carre**
IMN SSA, France
- Jaihe H. Cheah**
Johns Hopkins Univ., MD
- Yi Chen**
New York State Dept. of Health
- Kathryn Grace Cheney**
College of the Holy Cross, MA
- Shih-Chung Cheng**
Univ. of Nottingham, UK
- Adam Joseph Chicco**
Univ. of Northern Colorado
- Michelle Sze-Weng Chow**
Mount Sinai Hospital, Canada
- Caroline Driver Cofer**
Univ. of Alabama, Birmingham
- Marcia E. Cortes**
Univ. of Valparaiso, Chile
- Louise D. Cosand**
Colgate Univ., NY
- Georgina Estrella Cruz**
Univ. of Miami, FL
- He Cui**
Univ. of Illinois
- Julia Talibah Davis**
DePaul Univ., IL
- Yolanda Del Rio-Portilla**
Univ. National, Mexico
- Michael Owen Dixon**
Orkand Corp., MD
- Camilla Ann Drew**
Univ. of California, Los Angeles
- Ceren Ergorur**
Boston Univ., MA
- Doris Joy Detomal Espiritu**
Univ. of Illinois, Chicago
- Raffaello Popa Di Bernardi**
Univ. Federal Do Parana, Brazil
- Tracy Farr**
Univ. of Lethbridge, Canada
- Guglielmo Foffani**
Drexel Univ., PA
- Christine Marie Fogarty**
Univ. of Utah
- Luis Galindo-Charles**
UNAM Fac. Medicina, Mexico
- Olivia Smutney Gardner**
Univ. of North Carolina, Chapel Hill
- Phillip Gregory Greco**
Illinois State Univ.
- Ban Haider**
Guy's Hospital, UK
- Cecily Elaine Hamill**
Emory Univ., GA
- Mary Heng**
Univ. of Michigan
- Katherine Elizabeth Himes**
Univ. of Minnesota
- Tsz Wan Ho**
Chinese Univ., Hong Kong
- Lisa Ann Hoopes**
Texas A&M Univ.
- Allyson L. Howard**
Univ. of California, Irvine
- Yan Huang**
Univ. of Michigan
- Heather Marie Irmiger**
Univ. of Colorado
- Anata Estell Jackson**
Howard Univ., DC
- Azadeh Jebelli**
Univ. of California, Riverside
- Guoying Jiang**
Columbia Univ., NY
- Shannon Joseph**
Univ. of Queensland, Australia
- George Emmanuel Jules**
Meharry Medical College, TN
- Ling Kang**
UMDNJ, NJ
- Rustum Karanjia**
Queen's Univ., Canada
- Andreas Katsiaras**
Univ. of Pittsburgh, PA
- David Jeffrey Kean**
Kent State Univ., OH
- Carrie L. Kelly**
Univ. of Lethbridge, Canada
- Jacob Lowry Krans**
Univ. of Connecticut
- Kuo-Hsing Kuo**
Univ. of British Columbia, Canada
- John Frank LaDisa**
Marquette Univ./Medical College of WI
- Suk King Lai**
Univ. of Hong Kong, Hong Kong
- Erin Virginia Lamont**
Univ. of Alberta, Canada
- Christopher Court Lapish**
Medical Univ. of South Carolina
- Glenda Lassi Tucci**
Massachusetts Inst. of Technology
- Ahmed Lawan**
Ahmadu Bello Univ., Nigeria
- Joyce Leo**
Univ. of British Columbia, Canada
- Eugene Jungsup Lim**
Massachusetts Inst. of Technology
- Nanteetip Limpeanchab**
Univ. of Kansas
- Jenni M. Lockwood**
Univ. of Oregon
- Wendell Jean-Hwa Lu**
Vanderbilt Univ., TN
- Hogtao Ma**
Georgetown Univ., DC
- Faidon Magkos**
Harokopio Univ., Greece
- Kristin Kay Martin**
Oklahoma State Univ.
- Gus John Menger**
Texas A&M Univ.
- Kelly Louise Meredith**
Griffith Univ., Australia
- Iuona Misiuta**
Univ. of South Florida
- Ramirez Samuel Mucio**
National Inst. Psychiatry, Mexico
- Ada K. Mullett**
Concordia Univ., Canada

Adam Emile Mullick

Univ. of California, Davis

Edmond Isaac Ngazal

Nat'l. Inst. for Pharm. R&D, Nigeria

Ying Chun Ni

Univ. of California, Riverside

Carolina Camargo Oliveira

UFPR, Brazil

Julia Kate Pagan

Queensland Inst. Med. Res., Australia

Phillip Denorris Palmer

Meharry Medical College, TN

Sandhiran Patchay

Univ. of London Royal Holloway, UK

Chintan N. Patel

St. John's Univ., NY

Yamini Patel

Univ. of North Texas Health Sci. Ctr.

Myla M. Patterson

Meharry Medical College, TN

Selina A. Pearson

Univ. of Calgary, Canada

Maurice Lamont Penny

Univ. of Missouri, Columbia

Sinac M. Pitts

Columbia Univ., NY

Peter G. Placas

Marquette Univ., WI

Charles Peter Pluto

Medical College of Ohio

Andrei T. Popescu

Univ. of Massachusetts

Soizic Potier

St. Justine Hosp. Res. Ctr., Canada

Rebecca Lynn Pratt

Purdue Univ., IN

Henrik Sander Pyndt

Univ. of Copenhagen, Denmark

Vikram Rajashekara

St. John's Univ., MN

Kristofer Kyle Rau

Univ. of Florida

Monica Recabarren

Univ. of Catolica De Chile, Chile

Stephanie M. Richardson

Meharry Medical College, TN

Maribeth Sian Ruiz

Univ. of California, San Diego

Archana Sheth

Boston Univ., MA

Diana Lynn Simmons

Univ. of Texas Southwestern Med. Ctr.

Arie Ann Sitthichai

Univ. of Utah

Brenda Jean Smith

DePaul Univ., IL

Jason Robert Smith

Tulane Univ., LA

Eric Michael Snyder

Mayo Clinic, MN

Michael E. Sorensen

Georgia Tech.

Norell Melissa Spiler

Rutgers Univ., NJ

Megan Steven

Oxford Univ., UK

Anna Suatikova

Mayo Clinic, MN

Julie E. Suetterlin

St. Louis Univ., MO

Christos Theleritis

National Univ. of Athens, Greece

Lisa Marie Thomson

Univ. of Lethbridge, Canada

Anil Thota

Univ. of Kentucky

Ilse Tindemans

Univ. of Antwerp, Belgium

John Francis Trentini

St. Lawrence Univ., NY

Valter Tucci

Boston Univ., MA

Philip Van Damme

Univ. Ku Leuven, Belgium

Rency Susan Varghese

Univ. of Maine

Kalyan C. Vinnakota

Univ. of Washington

Olivia-Thao Vo

Holy Cross College, IN

Xzang Wan

Univ. of British Columbia, Canada

Peiyuan Wang

SUNY, Buffalo

Xiaofei Wang

Univ. of North Texas HSC

Vabren L. Watts

Meharry Medical College, TN

Douglas Lee Williams

Medical College of Georgia

Kathleen Kerwin Williams

Georgia Inst. of Technology

Elethia A. Woolfolk

Meharry Medical College, TN

Terrence M. Wright

California State Univ., San Marcos

Shaohua Yang

Univ. of Texas Health Sci. Ctr.

Bing Yao

Case Western Reserve Univ., OH

Kun Don Yi

Univ. of North Texas

New Affiliate Members

Rochelle Ann Abrantes

Quintiles, CA

Blake C. Beehler

Bristol-Myers Squibb Co., NJ

Hari Kumar Ondiveeran

McMaster Univ., Canada

APS Elections!

The American Physiological Society 2003 - 2004 election ballot will be arriving shortly.

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

For President-Elect:

Kim E. Barrett
D. Neil Granger

For Councillor:

Gordon S. Mitchell
Helen E. Raybould
Jeff M. Sands
William T. Talman
Mark L. Zeidel

The **deadline** for receipt of the election ballot is on or before **March 5, 2003.**

APS Archive of Teaching Resources Selected as Repository

APS is pleased to announce that the Archive of Teaching Resources (<http://www.apsarchive.org>) was selected to be the repository of The Renal Pelvis web by former APS President **Bodil Schmidt-Nielsen** and **Bruce C. Graves** (with hypertext editing by Terry Dwyer).

The Renal Pelvis web site is available at <http://www.apsarchive.org/renalpelvis/index.htm>. The site contains a wealth of information, including video clips, animations, figures, and text. It covers the phylogeny of urine excretion in vertebrates, with special emphasis on mammals and birds, the only vertebrates known to produce concentrated urine by means of a renal medullary countercurrent system.

Included are discussions and visual examples of the functional and anatomical differences in their countercurrent systems. Information about the renal pelvis in various mam-

malian species, including humans, is presented.

Videos showing the urodynamic events occurring in the different parts of the hamster kidney can be viewed. A description of the process used is also presented.

An hypothesis and a simulation model of how renal pelvic peristalsis might contribute to the concentrating mechanism are presented to further explain the process. In addition, a list

of suggested readings is provided for the interested viewer.

A review article by Dwyer and Schmidt-Nielsen describing the scientific background of the material presented on the web site is published in the February 2003 issue of *News in Physiological Sciences*.

Remember that you can communicate to others on how you've used this resource through the comment section attached to it. ❖

Do you have material that you have developed to make your teaching more effective? These can be:

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

problems or cases you've written for your classes

diagram(s) that you've created to illustrate a specific pathway or process that seems to clarify it for your

students

simulations or videos you have developed

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

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

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

“Citation Search”: Type Just Three Numbers to Get Any Article

This article is fifth in a series highlighting tools or features of the HighWire Library of the Sciences and Medicine (HWLSM) site, which is a portal to all of *Medline* plus over 330 journals' full-text, including all the APS journals. The site is at <http://highwire.stanford.edu>.

One of the most frequent tasks the designers of the HWLSM saw researchers doing was also the most obvious one: looking up an article based on a reference citation. The design of the HWLSM makes this as fast as it can possibly be: you type three numbers and click.

If you have the publication year, the volume, and the first page for any article in the 4,500 journals covered by *Medline* and HWLSM's full-text journals, you can retrieve an article. You don't even have to type the journal name, and you don't have to first click your way to the journal's own online site.

The result when you enter those three numbers will be a full article citation, accompanied by a link to the abstract and—in most cases for recent articles—a link to the full-text. For

HighWire-hosted journals, the citation will also show if you have access to the full-text, and, if not, whether and for what fee you can purchase the full-text. Since over 420,000 full-text articles are free at the HighWire site, there is a good chance you'll have full-text access.

From the HWLSM home page at <http://highwire.stanford.edu>, just enter the year, volume, and page in the search entry boxes in the center of the home page—no need to enter author or any other text. (See Quick Search at top center of the home page shown here.) If your article is in one of the 330+ HighWire-hosted journals, click on the appropriate radio button below the year; if not, or if you don't know whether the journal is a HighWire-hosted journal, just click on the “HighWire + Medline” radio button.

You might wonder why you don't have to give a journal name. In most cases, the year, volume and first page information is enough to limit a search result—even in 12 million entries!—to just one to five possible citations. So the search result you will see when you type in those three num-

bers will be small enough that you can pick out the right article much faster than you could type in a journal name or go to a journal's home page to search. In fact, if you don't have all three of the numbers—perhaps a citation you were given wasn't complete—typing even two of them will typically get you a result that is just a page or two of search results to scan.

Past issues of *The Physiologist* have covered these topics about the HWLSM:

February 2002: “Creating a Better Mousetrap”—An Introduction to the HW Portal

August 2002: Finding Full Text Articles, Free and Fast

October 2002: “Have it Your Way”: Tailoring Search Results to Suit Your Needs

December 2002: Search and Track your Favorite Journals Easily

February 2003: Citation Search: Type Just Three Numbers to Get To Any Article

Next issue we'll look at Advanced Searching capabilities in the new portal. ❖

The screenshot shows the HighWire website interface. At the top, it says "HighWire LIBRARY OF THE SCIENCES AND MEDICINE". Below that, it displays statistics: "12,352,341 articles in over 4,500 Medline journals, 448,128 free full text articles from 346 HighWire-hosted journals". There is a navigation menu with links like Home, Search, My Email Alerts, For Institutions, For Publishers, About, Contact, and Help. A user is signed in as Margaret Reich. The main content area is divided into several sections:

- Quick search HighWire + Medline:** Includes fields for Author (with a hint "e.g., Smith, JS"), Keywords, Year, Vol, and Page, and a "go" button. There are radio buttons for "My Favorite Journals", "HighWire-hosted journals", and "HighWire-hosted journals + Medline".
- Browse articles:** Links to "Biological Sciences", "Physical Sciences", "Medical Sciences", and "Social Sciences". It also mentions "Browse using TopicMap, a graphical viewer (what's this?)".
- Browse HighWire-hosted:** A section for browsing specific journals.
- MY EMAIL ALERTS:** A section for monitoring publications.
- MY SITEBAR:** A tool for quick access to searching and favorite journals.
- MY FAVORITE JOURNALS:** A list of journals like "American Journal of Physiology - Heart and Circulatory Physiology" and "Journal of Applied Physiology".



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

Shu Chien
University of California,
San Diego

*"Modulation
of Gene Expression and
Cellular Functions by
Mechanical Forces:
Wisdom of the Body"*

FRIDAY, APRIL 11, 5:45 PM



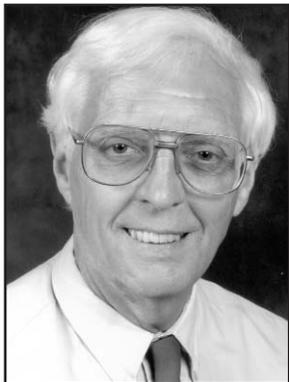
HENRY PICKERING BOWDITCH
AWARD LECTURE

Paul Kubes
University of Calgary

*"Molecular Mechanisms
Underlying Leukocyte
Recruitment in the
Microcirculation"*

SATURDAY, APRIL 12, 5:45 PM

Distinguished Lectureships



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

John Coote,
University of Birmingham, UK

*"The Significance for
Circulatory Control of the
Paraventricular Nucleus"*

SATURDAY, APRIL 12, 10:30 AM



CLAUDE BERNARD
DISTINGUISHED LECTURESHIP
OF THE TEACHING OF
PHYSIOLOGY SECTION

John D. Bransford
Vanderbilt University

*"When Knowledge of How
People Learn Meets
Classrooms and Technology:
Issues and Opportunities"*

SATURDAY, APRIL 12, 2:00 PM



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

John B. West
University of California,
San Diego

*"Thoughts on the Blood-Gas
Barrier"*

SATURDAY, APRIL 12, 2:00 PM



CARL W. GOTTSCHALK
DISTINGUISHED LECTURESHIP
OF THE RENAL SECTION

William J. Arendshorst
University of North Carolina

*"Reactivity of the Renal
Microcirculation in Genetic
Hypertension"*

SATURDAY, APRIL 12, 3:15 PM

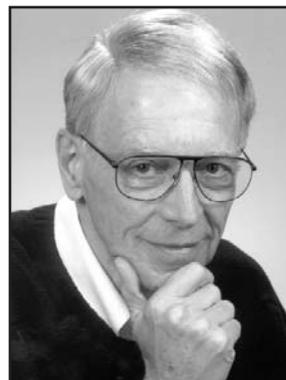


AUGUST KROGH
DISTINGUISHED LECTURESHIP
OF THE COMPARATIVE
PHYSIOLOGY SECTION

Peter Scheid
Ruhr University,
Bochum, Germany

*"The Goose of the Himalaya
and Central Chemosensitivity;
New Ideas From an
Old Problem"*

SUNDAY, APRIL 13, 9:00 AM



ROBERT M. BERNE
DISTINGUISHED LECTURESHIP
OF THE CARDIOVASCULAR
SECTION

Eric O. Feigl
University of Washington

*"Berne's Adenosine
Hypothesis of Coronary
Blood Flow Control"*

SUNDAY, APRIL 13, 10:30 AM



HORACE W. DAVENPORT
DISTINGUISHED LECTURESHIP
OF THE GASTROINTESTINAL
SECTION

Jeffrey I. Gordon,
Washington University

*“Living With Microbes:
An Inside View”*

SUNDAY, APRIL 13, 2:00 PM



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

Jere Mitchell
University of Texas,
Southwestern Medical School

*“Neural Circulatory Control
During Exercise: Insights
From Animal and Human
Studies”*

MONDAY, APRIL 14, 8:00 AM

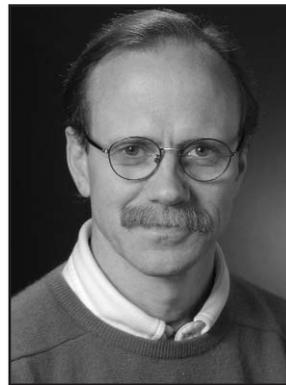


ERNEST H. STARLING
DISTINGUISHED LECTURESHIP
OF THE WATER AND
ELECTROLYTE HOMEOSTASIS
SECTION

Friedrich C. Luft
Humboldt University, Berlin

*“The Role of Genetic Models
in Elucidating
Cardiovascular Reflex
Regulation”*

MONDAY, APRIL 14, 10:50 AM



JOSEPH ERLANGER
DISTINGUISHED LECTURESHIP
OF THE CENTRAL NERVOUS
SYSTEM SECTION

Fred H. (Rusty) Gage
The Salk Institute

*“Regulation and Function of
Adult Neurogenesis”*

MONDAY, APRIL 14, 2:00 PM



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

Christopher B. Newgard
Duke University

*“Mechanisms of Fuel-
Stimulated Insulin
Secretion and How They
Fail in Diabetes”*

MONDAY, APRIL 14, 3:15 PM



HUGH DAVSON
DISTINGUISHED LECTURESHIP
OF THE CELL AND MOLECULAR
PHYSIOLOGY SECTION

Roger Y. Tsien
University of California,
San Diego

*“Unlocking Cell Secrets With
Light Beams and Molecular
Spies”*

MONDAY, APRIL 14, 3:15 PM

Fifth Annual Walter C. Randall Lecture in Biomedical Ethics

Linda MacDonald Glenn, LL.M.

Senior Fellow, Institute for Ethics, American Medical Association

*When Pigs Fly?: Ethical and Legal Issues in Transgenics
and the Creation of Chimeras*

Tuesday, April 14, 2003
2:00 PM
Room 9, Convention Center



Friday April 11, 2003

Room 6A	5:45-6:45 PM Physiology in Perspective: The Walter B. Cannon Memorial Award Lecture Chien
Room 5	1:00-3:00 pm Workshop: Frontiers of intravital microscopy: crossroads of physiology & pathology Goligorsky 3:30-5:30 PM Workshop: Methods to Detect Oxidative and Nitrosative Stress Grisham/Granger
Room 8	8:00 AM-12:00 NOON Education Committee Refresher Course: Muscle Physiology: From Cellular to Integrative Hester/Ordway 3:15-5:15 PM MCS President's Symposium: Mechanisms of Microvascular Dysfunction in Diabetes McDonagh
Room 11B	2:00-5:00 PM Communications Committee Symp: Making Science News Gwosdow
Room 7A	1:00-5:00 PM EB Public Affairs Symp: "IACUC 101" for Scientists Stallone

APS Annual Business Meeting and Award Presentations

Monday, April 14

Room 6A,
Convention Center

5:45-8:00 PM

Don't miss it!

APS EB 2003 Mixer

Band: Mirage

Marriott Hotel & Marina
Marriott Hall 3

Friday, April 11,
9:00 PM-MIDNIGHT

Women in Physiology and Pharmacology Symposium "Presentation Skills"

Experimental Biology 2003
Monday, April 14, 8:00-10:00 AM
Room 11A Convention Center

This symposium will address the various types of presentation skills that a physiologist will need to have to prosper in his/her career. These include:

- Interview skills
- Oral presentation skills
- Poster presentation skills
- Presenting oneself at national meetings
- Facing the public
- Preparing/giving a lecture
- Using visual aids/multimedia effectively

Presentations will be made by speakers, which will be followed by small group discussions of specific topics.

Career Opportunities in Physiology Symposium

"The Drug Discovery Process: Opportunities for Physiologists"

Experimental Biology 2003
Sunday, April 13, 5:30-7:00 PM
Room 11A Convention Center

This symposium will expose young physiologists to new career opportunities, educate others about the important work of the physiologist in drug discovery, and demonstrate how academic collaboration with industry leads to new drug discoveries. The program will lead the audience through the

drug discovery process from discovery of the initial drug target, to the role of the academic scientist, to the development of candidate drugs that have efficacy in a disease model, to preclinical safety, pharmacokinetics, pharmacodynamics, to various phases of clinical trials all the way to getting the new drug on the market. Each speaker will highlight the unique career opportunities at all levels for trained physiologists. ❖

Saturday April 12, 2003

Room 6A	8:00-10:00 Physiology InFocus: Physiological implications of oxidative and nitrosative stress: General overview and disease relevance Grisham/Traber	10:30-12:30 Physiology InFocus: Physiological implications of oxidative and nitrosative stress: Emerging concepts in oxidative and nitrosative signaling Beckman/Jannsen-Heinenger	3:15-5:15 Symposium: Oxidative stress, antioxidant supplementation and diabetes Opara 5:45-6:45 PM Henry Pickering Bowditch Award Kubes
Room 6B			2:00-3:00 PM Julius H. Comroe Distinguished Lectureship West Symposium: NHLBI Program for Genomic Applications (PGA): Background for physiologists Kwitek-Black 6:00-9:00 PM Graduate student highlights in Respiration Physiology Bhattacharya/Stevens/Fregosi
Room 6C	Symposium: Genomics of angiogenesis and the microcirculation Hoying	Cross Sectional: Peroxisome proliferator-activated receptors (PPARS) Guan/Sigmund	
Room 5	Symposium: Modulation of respiratory motoneurons from molecules to behavior Berger	Symposium: Functional genomics and proteomics of hypoxia Prabhakar/Klein	FT: Moving nutrients and mediators in and out of cells Wright/Schuster
Room 4	FT: Causes and consequences of pH variability in vertebrates Hartzler	Symposium: Gap junctional hemichannels: physiology and pathophysiology Reuss/Ebihara	3:15-4:15 PM Carl W. Gottschalk Distinguished Lectureship Arendshorst
Room 3	FT: Preconditioning of myocardium against infarction Kehl/Warltier	Symposium: Novel Ca ²⁺ signaling mechanisms in vascular myocytes: cyclic ADP-ribose, ryanodine receptors and Ca ²⁺ -induced Ca ²⁺ release Li/Van Breeman	FT: The regulation of sympathetic nerve activity in chronic heart failure Zucker
Room 8	FT: Renal hormones and autocoids TBA	Symposium: Molecular regulation of nitric oxide synthase activity Ortiz/Sullivan	2:00-3:00 PM MCS Landis Award Lecture Duran 3:15-5:15 PM ALACF Symp: Plasticity and Behavior Guevara
Room 9	GI FT: New insights on neuro-immune interactions in autonomic regulation Tache	10:30-11:30 AM Carl Ludwig Distinguished Lectureship Coote	FT: Glial/neuronal bi-directional signaling Hatton
Room 11A	FT: Is it the physiology, the students, or is it me? Reflections on the classroom Modell	Symposium: The teacher as an educational researcher Michael/Silverthorn	2:00-3:00 PM Claude Bernard Distinguished Lectureship Bransford FT: Cardiovascular physiology: from bench to classroom Bukoski/Seidel
Room 11B	FT: Control of fuel metabolism and energy balance Wasserman	FT: Stress and growth regulation in endocrine function Pepe	Symposium: Recent advances in the study of hexose transport proteins Ferraris
Room 10	FT: Insights on renal function and blood pressure control from genetically manipulated animals Mattson/Harrison-Bernard	FT: Central neurons and efferent pathways controlling thermoregulation Boulant/Kanosue	MCS Symposium: MCS Young Investigator's symposium Frisbee/Stepp

Sunday April 13, 2003

	8:00-10:00	10:30-12:30	3:15-5:15
Room 6A	Physiology InFocus: Physiological implications of oxidative and nitrosative stress: Oxidative stress: cardiovascular consequences Eiserich/Griendling	Physiology InFocus: Physiological implications of oxidative and nitrosative stress: Oxidative stress: pulmonary consequences Halliwell/Mannick	Cross Sectional: Mitochondria regulation of cell function Bhattacharya
Room 6B		10:30-11:30 AM Robert M. Berne Distinguished Lectureship Feigl FT: Berne Lecture FT: Control of coronary blood flow Feigl	Symposium: Physiology in medicine: renal and cardiovascular physiology Hall/Benos
Room 5	FT: Wiggers Award FT: Nitric oxide and the cardiovascular system Lefer	FT: The lung—a very special place for dendritic cells Grunig	2:00-3:00 PM Horace W. Davenport Distinguished Lectureship Gordon 3:15-5:15 PM Symposium: The chronobiology environment of mammals Refinetti
Room 4	FT: Integrated cell function Bassingthwaight/McCulloch	Symposium: Thin filament regulation of muscle contraction Jin	Symposium: Redox signaling of angiogenic response in the heart Das/Maulik
Room 3	FT: The molecular physiology of HCO ₃ ⁻ transport Romero/Bevensee	Symposium: The pons: a critical component in respiratory control McCrimmon	Symposium: Building better bone: sex genes and drugs Clemens
Room 8	Symposium: Neurogenic hypertension Sved	Symposium: Magnetic resonance: unique non-invasive insights into the physiology of exercise Richardson/Olfert	Symposium: Understanding protein unfolded states: implications for folding, function, evolution and disease Pappu
Room 9	9:00-10:00 AM August Krogh Distinguished Lectureship Scheid	Symposium: Role of the transcription factor, TonEBP/NFAT5 Burg/Handler	Symposium: Redox regulation of renal function and arterial pressure Manning, Jr./Zou
Room 11A	Workshop: Understanding and applying critical translational assays Reinhart/Montrose-Rafizadeh	Workshop: Peer review and publication in APS journals Benos	FT: Muscle fatigue Ameredes 5:30-7:00 PM Symposium: The drug discovery process: opportunities for physiologists Johnson/Norton
Room 11B	FT: Pathophysiological mechanisms of liver injury Lentsch	Symposium: The renin-angiotensin system and development Rose/Rosenfeld	Symposium: Non-arterial circulations: the dark side of cardiovascular biology Warburton/Wang
Room 10	Symposium: Flow/stretch-regulated membrane and ion transport in epithelia Satlin/Apodaca	FT: Arteriogenesis and collateralization Unthank	FT: Oxidant mechanisms in neural regulation of cardiovascular function Davisson

Monday April 14, 2003

	8:00-10:00	10:30-12:30	3:15-5:15
Room 6A	8:00-9:00 AM Edward F. Adolph Distinguished Lectureship Mitchell		3:15-4:15 PM Hugh Davson Distinguished Lectureship Tsien 5:45-8:00 PM APS Business Meeting
Room 6B	Symposium: Caveolin regulation of endothelial function Minshall/Malik	Cross Sectional: Lineage specific programming of stem cells into tissues Al-Aqwati	3:15-4:15 PM Solomon A. Berson Distinguished Lectureship Newgard
Room 5	Cross Sectional: Neuron-glia interactions in nervous system function Ransom/Dietmer	Symposium: Caveolar domains in cell signaling Insel	2:00-3:00 PM Joseph Erlanger Distinguished Lectureship Gage 3:15-5:15 PM Symposium: Remodeling of the brain underlies the success of behavioral therapies for motor dysfunction Taub
Room 4	FT: Development of excitation-contraction coupling in the embryonic heart: from simplicity to complexity Creazzo	FT: Intermittent hypoxia: physiological and genomic consequences Haddad/Prabhakar	History Special Topic: The history and physiology of high altitude decompression sickness Schneider/Powell
Room 3	Symposium: The function and regulation of mitochondrially produced nitric oxide in cardiomyocytes Kanai/Peterson	Symposium: The identities of estrogen receptors mediating nongenomic effects Watson/Shaul	Symposium: The biology of differentiated thyroid cancer: a bench to bedside review Haugen
Room 8	FT: Evolution of vascular regulation from the neonate to the aging adult: mechanisms and functional consequences Boegehold	FT: Tissue response to ischemic injury: adaptive and regenerative strategies Basile/Chilian	Symposium: Career planning for experimental biology, biomedical and physician scientists Barker
Room 9	FT: Comparative aspects of the hormonal responses to metabolic demands Ortiz	10:50-11:30 AM Ernest H. Starling Distinguished Lectureship Luft FT: Hypertension Roman/Lohmeier	2:00-3:00 PM Walter C. Randall Lecture on Bioethics MacDonald FT: Hormonal regulation of renal arteriolar tone Thomson/Cupples
Room 11A	Workshop: Presentation skills Liedtke/Benyajati/Lakoski	FT: Interaction between histone acetylation and DNA methylation Guidotti	FT: Reflex regulation of airway function and breathing Lee/Canning
Room 11B	FT: Epithelial Phenotypes and Function Stevens/Gebb	Symposium: Life to death decisions and the fate of apoptotic cells Cidlowski	FT: Neurohumoral control of body fluid volume and arterial pressure Malpas/Thrasher
Room 10	FT: AstraZeneca Young Investigator Award: Kidney Development and Disease Miner	FT: Regulation of vascular smooth muscle cell phenotype: contractile vs. proliferative Raj	FT: Structure and regulation of epithelial Na and K channels Kleyman/Eaton

Tuesday April 15, 2003

	8:00-10:00	10:30-12:30	3:15-5:15
Room 5	Symposium: Subcellular organization of second messenger signaling in cells of the cardiovascular system Lynch/Paul	Symposium: Functional proteomics: applications to the cardiovascular system Ping	
Room 4	FT: Trafficking of membrane transporters in the GI tract and beyond Okamoto	FT: Regulation of ion transporter trafficking Wang/Caplan	
Room 3	Symposium: Everything old is new again: thyroid hormone and the failing heart Long	FT: Developmental plasticity of respiratory control Bavis	
Room 8	Symposium: New roles for ammonia in renal ion transport Weiner/Hamm	FT: Pre-diabetic metabolic syndrome and cardiovascular dysfunction: new concepts Busija	FT: Advances in signaling Biology of Lung Cells Bhattacharya
Room 9	Cross Sectional: AT-1 and AT-2 receptors: cellular action? Sumners/Hay	FT: Identifying genes and targets in cardiovascular autonomic pathophysiological states Paton	
Room 11A	FT: Therapeutic potential of hypothermia: bridging the gap between clinical and basic thermoregulatory research Gordon/Dae	Symposium: Epithelial-neuronal interactions underlying bladder gene-regulation and sensory function Birder	
Room 11B	FT: Epithelial anion channels: structure, form, function Kirk/Fuller	FT: Hypoxic metabolic responses: autoregulation, acclimation and adaptation Tattersall	
Room 10	FT: Functional brainstem anatomy: can we tell cardiovascular and respiratory neurons apart? Gray	Symposium: Regulation of ion channel structure and function by reactive oxygen nitrogen intermediates Matalon/Eaton	

APS Education Committee

“Refresher Course on Muscle Physiology: From Cellular to Integrative” And “Laboratory Session on Human Exercise”

“Refresher Course on Muscle Physiology: From Cellular to Integrative”
Experimental Biology 2003
Friday, April 11, 8:00 AM - 12:00 PM
Room 8, Convention Center

“Laboratory Session on Human Exercise”
Experimental Biology 2003
Friday, April 11, 1:00 - 5:00 PM
Room 9, Convention Center

Muscle physiology is an important component in the teaching of a number of organ systems and of the integration of these systems in response to environmental stresses. Purposeful movement, as well as normal cardiovascular, respiratory, and gastrointestinal function all depend on intact, healthy muscles. This unique refresher course will present up-to-date concepts in muscle physiology. The material in the morning session will cover

smooth, skeletal, and cardiac muscle, followed by an integration of these systems in the context of the physiological response to exercise.

The afternoon workshop will include hands-on demonstrations by commercial companies. ❖

Poster Sessions (12:45 PM - 3:00 PM)

Saturday, April 12

Control of Breathing: Development
 Control of Breathing: Chemoreception
 Hypoxia-Gene Expression
 Neural Control of Cardiovascular Function I:
 Orthostatic Responses
 Neural Control of Cardiovascular Function II:
 Exercising Muscle
 Neural Control of Cardiovascular Function III: Pregnancy
 Central Neurons and Efferent Pathways Controlling
 Thermoregulation
 Hyperthermia and Fever
 Temperature Responses and Regulation
 Muscle Fatigue
 Smooth Muscle, Physiology/Pharmacology
 Development and Adaptation
 Secretion and Absorption
 Insights on Neuro-immune Interactions in Autonomic
 Regulation
 Intracellular Calcium, Calcium Stores and Calcium
 Signaling
 Caveolin and Membrane Domains
 Intracellular Signaling and Second Messengers
 Tight Junctions and Gap Junctions in Epithelia
 Vascular Smooth Muscle
 Cerebral Circulation I
 Microcirculation
 Neurotransmission
 Blood-brain Barrier
 Physiological Genomics: Proteomics
 Physiological Genomics: Microarrays
 Lung Surfactant
 Lung Ventilation and Gas Exchange
 Lung Fluid Balance
 Cytokines and Lung Function
 Signaling Mechanisms in Lung Parenchyma
 Causes and Consequences of pH Variability in Vertebrates
 Osmotic and Ionic Regulation
 Respiration and Acid-base
 Renal Hormones and Autocoids
 Renal Pathology and Toxicology
 Renal Function and Blood Pressure Control in Genetically
 Manipulated Animals
 Mechanisms of End Organ Damage in Hypertension
 and Diabetes
 Gender Differences in Body Fluid Volume and CV Regulation
 Preconditioning of Myocardium Against Infarction
 Blood Pressure Regulation I
 Cardiovascular Physiology: From Bench to Classroom
 Cardiac Electro-physiology
 Endothelial Cell Biology I
 Microvascular Mechanics and Hemodynamics
 Microvascular Permeability/Exchange
 Microvascular Pharmacology/Vascular Control
 Biofluid Mechanics/Biomaterials
 Biotransport/Tissue Engineering

Sunday, April 13

Control of Breathing: Central Connectivity
 and Neurotransmission
 Control of Breathing: Rhythm Generation
 Central Autonomic Regulation I
 The Regulation of Sympathetic Nerve Activity
 in Chronic Heart Failure
 Neural Control of Cardiovascular Function IV:
 Baroreceptor and Cardiac Reflexes
 Neural Control of Cardiovascular Function V:
 Cardiac Regulation
 Pulmonary Hypertension
 Endothelial Cell Biology
 Lung Nitric Oxide and Vasoregulation
 Liver Physiology and Pathophysiology
 Pulmonary Vasoregulation
 Scholander
 Physiological Ecology and Evolutionary Physiology
 Hypoxia/Ion Channels; Hypoxia/Signal Transduction;
 Hypoxia/Transmitters
 Altitude and Hypoxia
 Exercise Responses and Mechanisms I
 Muscle Plasticity
 Chronobiology
 Skeletal Muscle Physiology I
 Hypothalamic, Pituitary, Adrenal, Thyroid
 and Gonadal Hormones
 Reproductive and Gestational Biology
 Lipid, Lipoprotein and Cholesterol Metabolism
 Neuroendocrinology/Neuroimmunology
 Glial/Neuronal Signaling
 Neurological Disorders
 Molecular Physiology of HCO₃ Transport
 Intracellular pH and Acid-base Transport
 Epithelial Transport and its Regulation
 Cotransporters, Exchangers and Pumps in Epithelia
 Renal Organic Solute Transport
 Cell Signaling in Epithelia
 Renal Water Transport, Urea Transport
 and the Concentrating Mechanisms
 Renin Angiotensin System in Volume and Pressure Regulation
 NO, Oxygen Radicals and Lipid Mediators
 in Arterial Pressure and Fluid Volume Control
 Physiological Genomics: Genomic Analysis
 Physiological Genomics: Genetic Models
 Arteriogenesis and Collateralization
 Angiogenesis and Vascular Growth
 Coronary Circulation
 Nitric Oxide and the Cardiovascular System
 Myocardial Ischemia/Myocardial Metabolism I
 Vascular Pathobiology
 Gene Expression and Cardiovascular Function
 Genetic Models of Cardiovascular Function
 Microvascular Pathophysiology
 Microvascular Cell and Molecular Biology
 Flow Regulation; Oxygen Delivery
 Angiogenesis/Microvascular Remodeling
 Mathematical Models/New Approaches/Physiological Systems

Poster Sessions (12:45 PM - 3:00 PM)

Monday, April 14

Airway Epithelial Cell Biology
Control of Breathing: Lung and Upper Airway Receptors and Reflexes
Reflex Regulation of Airway Function and Breathing
Control of Breathing: Integrated Responses
Lung Development
Signaling Mechanisms in Airways
Alveolar Epithelial Biology
Physiological Genomics of the Respiratory System
Physiological Genomics: Gene Transfer and Gene Therapy
Physiological Genomics: Gene Regulation
Evolution of Vascular Regulation From the Neonate to the Aging Adult
Tissue Response to Ischemic Injury:
Adaptive and Regenerative Strategies
Cardiac Function and Dynamics
Hypertension and Diabetes
Pancreatic Hormones and Carbohydrate Metabolism
Obesity and Satiety
Protein and Amino Acid Metabolism
Cerebral Circulation II
Myocardial Ischemia/Myocardial Metabolism II
Oxidized Lipids/Oxidant Stress
Oxidant Mechanisms in Neural Regulation of Cardiovascular Function
Neural Control of Cardiovascular Function VI:
Nucleus Tractus Solitarius
Neural Control of Cardiovascular Function VII:
Ventral Medullary Regions
Cerebral Ischemia
Sensory and Motor Systems
Cell Volume, Osmoregulation and Water Transport
ATPase Ion Pumps
Transporters: Ions, Nutrients, Metabolites, and Drugs
Epithelial Channels, Pumps and Transporters
Epithelial Cation Channels/ENaC/K⁺ Channels
Water Channels
Renal Hemodynamics and GFR
Control of Body Fluid Volume and Arterial Pressure
Hypertension
Comparative Aspects of the Hormonal Responses to Metabolic Demands
Heart, Blood and Circulation
Exercise Responses and Mechanisms II
Bioenergetics
Gravitational
History of Physiology
Hypoxia—Intermittent Hypoxia
Development of Excitation-Contraction Coupling in the Embryonic Heart: From Simplicity to Complexity
Skeletal Muscle Physiology II
Heat Shock Proteins
Gastrointestinal Pathophysiology
Epithelial-Microbial Interactions: Lessons in Communication
Regulatory Peptides and Hormones
Growth Factors
Pancreas
Motility

Tuesday, April 15

Behavioral Neuroscience
Sleep/Wake States
Drug Abuse
Cerebral Cortical Function
Regulation of Ion Transporter Trafficking
Epithelial Polarity, Differentiation and Protein Trafficking
Trafficking of Membrane Proteins
Cytoskeleton, Cell Mechanics and Intracellular Trafficking
Trafficking of Membrane Transporters in the GI Tract and Beyond
The Glomerular Podocyte
Acid Base and Inorganic Ion Transport
Epithelial Cl⁻ Channels/CFTR
Ion Channels
Blood Pressure Regulation II
Shock
Endothelial Cell Biology II
Nitric Oxide/Carbon Monoxide/Vasoactive Molecules
Oxidative Stress Biology
Peripheral Circulation
Therapeutic Potential of Hypothermia: Bridging the Gap Between Clinical and Basic Thermoregulatory Research
Hypothermia and Cold
Exercise Training Responses
Cardiac Muscle Physiology
Contractile and Regulatory Proteins
Calcium and Muscle Contractility
Aging and Muscle Function
Altitude; Hypoxia
Hypoxic Metabolic Response: Autoregulation, Acclimation, and Adaptation
Physiology in Extreme Environments
Muscle and Locomotion
Temperature Adaptation
Neural Mechanisms in Hypertension
Control of Autonomic Regulation II: Hypothalamus and Other Forebrain Sites
Neural Control of Cardiovascular Function VIII:
Angiotensin
Neural Control of Cardiovascular Function IX:
Stress, Environment, Hemorrhage
Developmental Plasticity of Respiratory Control

Sections Special Functions

Cardiovascular

Section Program Committee

Thursday, April 10, 1:00 PM
Marriott, Desert Springs Room

Steering Committee

Sunday, April 13, 7:00 AM
Marriott, Newport Beach Room

Banquet

Monday, April 14, 7:00 PM
US Grant Hotel, 326 Broadway

Working Group on Subsections

Tuesday, April 15, 12:00 PM
Marriott, Coronado Room

Cell and Molecular

Steering Committee

Thursday, April 10, 9:00 AM
Marriott, Irvine Room

Banquet

Sunday, April 13, 6:30 PM
Location: TBD

Reception for the

Distinguished Lecturer
Monday, April 14, 4:15 PM
Convention Center, Room 6A

Central Nervous System

Section Program Committee

Friday, April 11, 12:00 PM
Marriott, La Jolla Room

Steering Committee

Monday, April 14, 12:00 PM
Marriott, La Jolla Room

Reception

Sunday, April 13, 5:30 PM
Marriott, Leucadia Room

Comparative

Steering Committee

Friday, April 11, 7:00 AM
Marriott, Los Angeles Room

Business Meeting and Social

Sunday, April 13, 11:30 AM
Marriott, Cardiff Room

Endocrinology and

Metabolism

Steering Committee

Monday, April 14, 12:00 PM
Marriott, Los Angeles Room

Business Meeting and Reception

Sunday, April 13, 6:30 PM
Marriott, Seaview Room

Environmental and Exercise

Section Program Committee

Thursday, April 10, 2:00 PM
Marriott, Rancho Las Palmas Room

Steering Committee

Saturday, April 12, 7:00 AM
Marriott, Rancho Las Palmas Room

Business Meeting

Sunday, April 13, 7:00 PM
Marriott, Rancho Las Palmas Room

Dinner

Monday, April 14, 6:30 PM
Marriott, Cardiff Room
Speaker: Dr. Clark Blatteis

Epithelial Transport Group

Steering Committee

Sunday, April 13, 12:00 PM
Marriott, Executive Conference Room

Gastrointestinal

Section Program Committee

Thursday, April 10, 4:00 PM
Marriott, Irvine Room

Steering Committee

Monday, April 14, 7:00 AM
Marriott, Los Angeles Room

History of Physiology Group

Business Meeting/Lecture

Sunday, April 13, 12:00 PM
Marriott, Newport Beach Room

Neural Control and Autonomic Regulation

Section Steering Committee

Thursday, April 10, 12:00 PM
Marriott, Executive Conference Room

Reception for the Distinguished Lecturer

Sunday, April 13, 6:30 PM
Marriott, Coronado Room

Parietal Cell Club

Sunday, April 13, 5:00 PM
Marriott, Torrance Room

Renal

Section Program Committee

Sunday, April 13, 7:00 AM
Marriott, La Jolla Room

Reception

Sunday, April 13, 6:00 PM
Marriott, Newport Beach Room

Steering Committee

Monday, April 14, 7:00 AM
Marriott, Rancho Las Palmas Room

Dinner

Monday, April 14, 6:00 PM
US Grant Hotel, 326 Broadway
For more information, contact: Jeffrey
L. Garvin, Tel: 313-916-2048; Fax:
313-916-1479; email: jgarvinl@hfhs.org.

Respiration

Section Program Committee

Monday, April 14, 7:00 AM
Marriott, Irvine Room

Steering Committee

Sunday, April 13, 7:00 AM
Marriott, Los Angeles Room

Business Meeting

Tuesday, April 15, 12:00 PM
Marriott, Torrance Room

Dinner

Monday, April 14, 7:00 PM
Marriott, Marina D Room

Teaching of Physiology

Section Program Committee

Thursday, April 10, 7:00 PM
Marriott, La Jolla Room

Steering Committee

Friday, April 11, 10:00 AM
Marriott, Irvine Room

Luncheon

Saturday, April 12, 12:30 PM
Marriott, Santa Rosa Room

Business Meeting

Sunday, April 13, 5:30 PM
Marriott, Laguna Room

Dinner

Sunday, April 13, 7:00 PM
Location TBD

Water and Electrolyte Homeostasis

Joint Steering/Awards/Section Program Committees

Saturday, April 12, 12:00 PM
Marriott, Desert Springs Room

Luncheon and Business Meeting

Sunday, April 13, 12:30 PM
The Harbor House, 525 East Harbor Drive

Advanced-purchased tickets required.
For more information, contact Jane F.
Reckelhoff, Tel: 601-984-1819; Fax:
601-984-1817; Email: jreckelhoff@
physiology.umsmed.edu

Committee Meetings

Animal Care and Experimentation

Saturday, April 12, 7:00 AM
Marriott, La Jolla Room

Awards

Sunday, April 13, 12:00 PM
Marriott, Irvine Room

Career Opportunities in Physiology

Monday, April 14, 7:00 AM
Marriott, Newport Beach Room

Committee on Committees

Friday, April 11, 7:00 AM
Marriott, La Jolla Room

Communications Committee

Sunday, April 13, 12:00 PM
Marriott, Point Loma Room

Education

Saturday, April 12, 12:00 PM
Marriott, Los Angeles Room

International Physiology

Sunday, April 13, 12:00 PM
Marriott, Los Angeles Room

Joint Program

Friday, April 11, 8:00 AM
Marriott, Marina E Room

Industry Members Mixer

Sunday, April 13, 5:30 PM
Marriott, Carlsbad Room

Liaison With Industry

Monday, April 14, 7:00 AM
Marriott, Desert Springs Room

Long-Range Planning

Saturday, April 12, 12:00 PM
Marriott, Cardiff Room

Membership

Sunday, April 13, 7:00 AM
Marriott, Torrance Room

Porter Physiology Development

Monday, April 14, 7:00 AM
Marriott, La Jolla Room

Public Affairs

Friday, April 11, 7:00 AM
Marriott, Newport Beach Room

Section Advisory

Thursday, April 10, 3:00 PM
Marriott, Point Loma Room

Joint Section Advisory With Council

Thursday, April 10, 7:00 PM
Marriott, Marina D Room

Women in Physiology

Tuesday, April 15, 7:00 AM
Marriott, La Jolla Room

Publications Special Functions

Journal Editorial Boards Group Meeting

Friday, April 11, 3:00 PM
Marriott, Santa Rosa Room

Advances in Physiology Education

Editor and Associate Editors
Friday, April 11, 7:00 AM
Marriott, Irvine Room

AJP: Cell Physiology

Editor and Associate Editors
Monday, April 14, 12:00 PM
Marriott, Irvine Room

AJP: Endocrinology and Metabolism

No meeting

AJP: Gastrointestinal and Liver Physiology

Editor and Associate Editors
Saturday, April 12, 12:00 PM
Marriott, Irvine Room

AJP: Heart and Circulatory Physiology

Editor and Associate Editors
Saturday, April 12, 12:00 PM
Marriott, La Jolla Room

AJP: Lung Cellular and Molecular Physiology

Editor and Associate Editors
Sunday, April 13, 7:00 AM
Marriott, Irvine Room

AJP: Renal Physiology

Editor and Associate Editors
Saturday, April 12, 12:00 PM
Marriott, Newport Beach Room

AJP: Regulatory, Integrative and Comparative Physiology

Editor and Associate Editors
Sunday, April 13, 12:00 PM
Marriott, Desert Springs Room

Journal of Applied Physiology

Editor and Associate Editors
Sunday, April 13, 12:00 PM
Marriott, La Jolla Room

Journal of Neurophysiology

Editor and Associate Editors
No meeting

News in Physiological Sciences

Editor and Associate Editors
Monday, April 14, 12:00 PM
Marriott, Desert Springs Room

Physiological Genomics

Editor and Associate Editors
Saturday, April 12, 7:00 AM
Marriott, Newport Beach Room

Physiological Reviews

Editor and Associate Editors
Saturday, April 12, 7:00 AM
Marriott, Los Angeles Room

Book Advisory Committee

Sunday, April 13, 12:00 PM
Marriott, Torrance Room

History of Physiology Book Committee

Monday, April 14, 12:00 PM
Marriott, Torrance Room

APS Classic Articles Meeting

Sunday, April 13, 7:00 AM
Marriott, Rancho Las Palmas Room

NIH Doubling At Risk

In early January, the APS asked its members to write to the new Congress, urging them to complete action quickly on FY 2003 funding to provide the last installment of the NIH doubling. When the 107th Congress adjourned in November 2002, it had not approved most of the regular appropriations bills to fund government agencies for the fiscal year that began on October 1, 2002.

The 107th Congress ended in an impasse on funding for most domestic programs because fiscal conservatives in the administration and Congress wanted to limit domestic spending. Their reasons for this included the economic downturn and the need for increased spending on military and homeland security preparedness. However, the votes weren't there to pass FY 2003 funding bills lacking increases for popular domestic programs. While there was no immediate risk of a government shutdown since Congress passed a series of continuing resolutions, the longer the government operated on FY 2002 funding levels, the greater the risk that Congress might eliminate part of the final installment of funds to complete the NIH doubling. With most observers predicting that the new Congress would try to resolve FY 2003 funding issues right away, the APS sent out an alert in early January asking Society members to contact their legislators.

While the NIH has been a politically popular cause, a number of factors led to its being caught in the funding stalemate. The Bush administration was on record as supporting the doubling of the NIH budget and had included funds for the final installment in its FY 2003 budget proposal. Nevertheless, to keep total budget numbers trimmed, the NIH's gain came at the expense of other public health and education programs. The Senate, which had a Democratic majority during the latter part of the 107th Congress, approved an FY 2003 Labor-HHS-Education spending bill with the doubling increase for the NIH and increases for other public health and education programs. However, the total spending in the Senate bill was unacceptable to fiscal conservatives.

For its part, the House Appropriations Committee was held to such a meager funding allocation that it could not to craft a politically acceptable bill.

Most political observers believed that with Republicans in control of both houses of Congress and the White House, the pressure would be on to reach agreement quickly on FY 2003 spending at the administration's preferred levels. A model letter was posted on the APS website for physiologists to fax to their Senators and Representatives urging them to complete the NIH doubling. ❖

Congress Passes NSF Reauthorization Bill

On December 19, 2002, President Bush signed legislation authorizing a doubling of the National Science Foundation (NSF) budget over five years. The NSF Authorization Act of 2002 authorizes \$5.54 billion in FY 2003 and continues with funding increases up to \$9.84 billion in FY 2007. While authorizing legislation does not guarantee funding levels, it does provide strong justification for a particular program. This can be powerful when the appropriations committees are making funding decisions for the upcoming fiscal year.

In the last two years of this five-year authorization, the NSF must also meet a series of management goals laid out by President Bush in his President's Management Agenda. The President put forth this agenda in FY 2002 as a strategy to improve the performance of the federal government.

A full text of the legislation can be found online on the NSF's website at: http://www.nsf.gov/od/lpa/congress/107/final_authorization_language.pdf. ❖

What Do USDA's "Animal Use" Numbers Mean?

The numbers of regulated animals used in research continued to decline during fiscal year 2001 according to the USDA's Annual Report on Animal Welfare Act (AWA) Administration

and Enforcement Activities.

The USDA regulates the use of animals in biomedical research, education, and testing. Covered species include most warm-blooded vertebrate animals, with the notable exclusion of birds and rats and mice that are bred for research. The USDA registers research and educational facilities that use regulated species and licenses those who breed, buy and sell, or transport them. Its oversight responsibilities include assuring that animals are legally acquired, provided with adequate veterinary care and housing, and that they are shipped under appropriate conditions.

The AWA statute requires the USDA to submit to Congress a report on "the nature and places of all investigations and inspections conducted by the Secretary." The USDA also asks registered facilities to report the number and species of animals they have used along with the perceived degree of "pain or distress" those animals may have experienced.

In 2001 slightly more than 1.2 million regulated animals were needed for research, education, and testing. The National Association for Biomedical Research (NABR) estimates that during the same period approximately 30 million rats and mice were bred for research. While the precise numbers of rats and mice are not available, it is clear that the vast majority of warm-blooded vertebrates needed for research are rats and mice.

One reason activists have given for why the USDA should regulate rats and mice under the AWA is to provide an accurate count of animals involved in research. However, such a census would provide very little useful information compared with the problems that additional regulation would cause. Congress resolved the issue last year by codifying the long-standing administrative exclusion of rats, mice, and birds from the AWA. This came after researchers emphasized that the vast majority of rats, mice, and birds needed for research are already subject to oversight from the Public Health Service and the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC), and that redundant USDA regulation would be a burdensome addition.

(continued on page 26)

(continued from page 25)

The AWA report is sometimes treated as a report card on progress towards the ultimate goal of eliminating animal research. Although in recent years the overall trend among USDA-regulated species has been downward, there have been fluctuations for some species. Changes in the numbers of animals needed reflect such factors as levels of funding, the focus of research, and the development of new techniques. Animal usage broadly echoes funding levels, but the focus of research and new techniques can push the numbers in either direction.

Table 1. USDA Regulated Animals in Research (FY 2001)

Species	Numbers
Dogs	70,082
Cats	22,755
Non-human primates	49,382
Guinea pigs	256,193
Hamsters	167,231
Rabbits	267,351
Sheep	26,236
Pigs	60,253
Other farm animals	75,169
Other animals	242,251
Total	1,236,903

Some research areas or new techniques may result in the use of fewer animals, while others may lead to the

use of more animals. Genomic studies involving gene insertions and deletions are current examples of new

“Pet Theft” is an Urban Myth

The USDA's regulatory duties under the Animal Welfare Act (AWA) include licensing Class B dealers who buy and sell random source (non-purpose bred) dogs and cats for research. In areas where research facilities are not allowed to purchase animals from pounds, Class B dealers supply animals that are older, genetically diverse, or have specific physiological abnormalities. The USDA's FY 2001 AWA report includes an update on efforts to assure that pets are never used in research labs.

During the 1980s and 1990s, there was a high level of public concern about Class B dealers, due at least in part to sensational but unsubstantiated allegations by animal activists of large-scale pet theft for research. The 1985 AWA amendments required Class B dealers to keep records on each individual dog and cat, including the person who sold it to the dealer. In 1993 APHIS inspectors began

conducting intensive “trace back” audits of these records.

In 1993, there were more than 100 Class B dealers selling dogs and cats to research, but only 40% of their animals could be traced back to the original owner. The USDA stepped up enforcement of record-keeping requirements through fines and by suspending or revoking licenses. Many dealers stopped selling dogs and cats for research, but among those that remained, the success of trace backs increased rapidly to more than 90%. As of 2001, about 20 Class B dealers were selling dogs and cats to research, and the success rate in tracing their animals back to the original owner was 96%. Thus, the public can have a high level of confidence that research animals are being legally acquired and that pet theft for research is no more than an urban myth. ❖

Public Affairs Highlights at EB 2003

Friday, April 11

“IACUC 101 for Scientists”

http://www.the-aps.org/pub_affairs/IACUC/eb03.htm

1:00-5:00 PM

San Diego Convention Center Room 7A (Upper Level)

Pre-registration required (no fee).

For more information contact Alice Ra'anana (araanana@the-aps.org).

“Making Science News”

http://www.the-aps.org/press_room/eb03symp.htm

2:00-5:00 PM

San Diego Convention Center Room 11B
Sponsored by APS

For more information contact Stacy Brooks (sbrooks@the-aps.org)

“Human Research Protection Programs 1a: How to Navigate Human Subject Protection Regulations”

<http://www.asip.org/mtgs/EB03/HumRes.pdf>

3:00-5:00 PM

San Diego Convention Center (Room TBA)

Sponsored by the American Society for Investigative Pathology.

Pre-registration required (no fee).

For more information contact Tara Zeitner (meetings@asip.org)

Saturday, April 12

“Shaping AAA Public Policy”

1:00-3:00 PM

San Diego Convention Center 24 A & B
Sponsored by the American Association of Anatomists

For more information, contact Andrea Pendleton (apendleton@anatomy.org)

Sunday, April 13

“ASBMB Public Affairs Lecture by NIH Director Elias Zerhouni”

8:30-9:30 AM

San Diego Convention Center (Room TBA)

Sponsored by the American Society for Biochemistry and Molecular Biology

For more information contact Peter Farnham (pfarnham@asbmb.faseb.org).

“Special Symposium in Honor of Ruth Kirschstein and the presentation of the Howard Schachman Public Service Award to Dr. Kirschstein”

1:00 PM

San Diego Convention Center (Room TBA)

Sponsored by the American Society for Biochemistry and Molecular Biology

For more information contact Peter Farnham (pfarnham@asbmb.faseb.org).

research areas that are increasing the numbers of animals used. Another flaw in the assumption that the statistics represent trends is the fact that animals in long-term studies are almost certainly counted more than once.

Clearly, for the foreseeable future animals will be needed to study human diseases, to educate physicians and scientists, and to assure the safety of drugs, devices, and surgical treatments for human and animal use. Publishing animal census data is a virtual invitation to flawed comparisons with data from other years or other countries. It would be difficult to argue that this information promotes animal welfare, but it is easy to see how it creates misconceptions about it. ❖

Animal Activist Funding Update

A look at the finances of scores of animal activist groups was published in the November 2002 issue of *Animal People*, a monthly newsletter that provides in-depth reporting on animal activist causes. The 13th annual “Who Gets The Money?” feature was based on analysis of the IRS Form 990 filed by 146 animal activist groups for the fiscal year 2001. Groups that are not incorporated as charities do not file tax returns and are not covered by the report. These include some of the most groups, such as Stop Huntingdon Animal Cruelty; Stop Animal Exploitation Now; the Animal Defense

League; and the Animal Liberation Front.

The combined budgets of the twelve most prominent activist groups involved in biomedical research issues totaled nearly \$100 million in FY 2001. In contrast, the combined budgets of all the major national and state organizations dedicated to engaging activists on these issues came to only about \$4 million. These pro-research organizations include Americans for Medical Progress; the Foundation for Biomedical Research; the National Association for Biomedical Research; incurably ill For Animal Research; and States United for Biomedical Research, which is the federation of state societies to promote biomedical research. Researchers are encouraged

(continued on page 28)

Table 1. FY 2001 Finances of Major Animal Activist Organizations

Organization	FY 2001 Budget (FY 2000 Budget)	Program Expenses	Overhead Expenses	Net Assets
American Anti-Vivisection Society	\$1,219,000 (\$1,235,214)	\$1,060,852	\$158,148	\$11,561,737
Animal Legal Defense Fund	\$3,360,728 (\$3,133,399)	\$2,650,369	\$710,159	\$2,739,392
Animal Welfare Institute	\$1,072,951	\$922,164	\$150,787	\$2,697,873
Doris Day Animal League	\$2,844,348 (\$2,743,811)	\$2,380,515	\$463,833	\$869,833
Foundation to Support Animal Protection*	\$2,430,555	\$262,285	\$2,168,270	\$5,751,414
Fund for Animals	\$5,600,721 (\$5,386,201)	\$4,126,678	\$1,474,043	\$19,438,862
Humane Society of the U.S.	\$58,865,207 (\$50,431,797)	\$32,670,203	\$20,506,459	\$94,613,384
In Defense of Animals	\$2,339,784 (\$1,841,705)	\$1,919,079	\$420,685	\$1,483,334
National Anti-Vivisection Society	\$2,657,596 (\$2,620,228)	\$2,021,384	\$636,212	\$6,005,630
New England Anti-Vivisection Society	\$885,239 (\$1,084,575)	\$720,510	\$164,727	\$6,502,011
People for the Ethical Treatment of Animals*	\$13,499,614 (\$17,668,699)	\$10,933,077	\$2,566,537	\$4,480,988
Physicians Committee for Responsible Medicine*	\$2,915,847 (\$2,533,289)	\$2,456,236	\$459,611	\$238,807

Source: *Animal People* (November, 2002)

**Animal People* remarked upon the extraordinarily close relationship between the Foundation to Support Animal Protection (FSAP), PETA and PCRM. The FSAP board consists of PETA cofounder and president Ingrid Newkirk, PCRM founder and president Neal Barnard, MD, and Nadine Edles, who had not previously been publicly identified with any activist organization. The sole function of FSAP, according to its IRS Form 990 is to “Provide support to various charitable, educational and scientific organizations specified in the Corporation’s Certificate of Incorporation.” The organizations specified are PETA and four PETA subsidiaries, PCRM, and the Washington (DC) Humane Society.

(continued from page 27)

to donate to these organizations so they will have the resources they need.

Fiscal year 2001 filings include the post-September 11 period when the declining economy and a changed set of priorities began to affect charitable giving. Nevertheless, most of the major activist groups that oppose biomedical research still managed to maintain their program expenditures, although some had to dip into their reserves to do so.

"Who Gets The Money?" once again points out the close financial relationship between People for the Ethical Treatment of Animals (PETA) and the Physicians Committee for Responsible Medicine (PCRM) through the Foundation to Support Animal Protection (FSAP). *Animal People* has concluded that for all practical purposes, PETA and PCRM ought to be considered as a single fundraising unit because of their partnership in FSAP.

The table on page 27 provides information drawn from the *Animal People* report on the twelve largest animal activist organizations involved in biomedical research issues.

Animal People further reported that in fiscal 2001 "FSAP apparently continued as in past years to pay the mortgage on the PETA headquarters and lease the site to PETA; did mailings in the names of the beneficiaries; and granted \$160,000 to PCRM, [which was] 55% of the total PCRM budget." FSAP granted the Washington Humane Society \$5,000 in 1999 but has given it nothing since. Thus, "the major purpose of FSAP appears to be to enable PETA and PCRM to evade public recognition of their relationship, the real extent of their direct mail expenditures, and the real extent and nature of their assets."

Animal People therefore concludes that "if FSAP, PETA and PCRM were seen as a joint fundraising unit, as the existence and activities of FSAP indicate they should be, their total spend-

ing came to \$18,846,016." Their declared overhead was \$5,194,418, which is 28% of the combined budget. Their total assets were \$10,471,309, of which 55% was held by FSAP, including 58% of the cash and securities. The combined FSAP, PETA and PCRM payroll was \$4.64 million, of which FSAP paid \$1.3 million, or 28%.

For more about the concerns being raised about PETA, PCRM, and FSAP, as well as the Humane Society of the United States, see "Animal Charities Get Poor Marks for Stewardship" in the December 2002 issue of *The Physiologist*. ❖

"Lab Rats or Sick Kids?"

The Center for Consumer Freedom (CCF) began running an advertising campaign in late 2002 that was critical of efforts by PETA and other activists to undermine support for health charities. The headline of the ad was "Lab Rats or Sick Kids?" and it was illustrated by a pair of photographs. One photo showed a group of brown rats on a patch of pavement. Beside it was a photo of a sick child in a hospital bed. The text of the ad reads:

"People for the Ethical Treatment of Animals repeatedly attacks doctors and scientists working to find cures for disease. PETA is engaged in a campaign to cripple [health charity organizations] because they use animals in their important research. And PETA has actually given tens of thousands of dollars to violent criminals convicted of destroying medical research and firebombing laboratories in the name of 'animal liberation.'"

The ad concludes with the admonition, "Don't let extremists like PETA stop the search for cures."

The CCF describes itself as "a coalition supported by restaurant operators, food and beverage companies, and concerned individuals, working

together to promote personal responsibility and protect consumer choices." The CCF maintains a web site at <http://www.consumerfreedom.com> that provides a stream of information about "actions that restrict your right to make your own choices, and to extremism that endangers businesses and individuals in the name of ideology." The CCF also operates another web site (<http://www.ActivistCash.com>) that profiles activist groups and provides information about their funding. To view the "Lab Rats or Sick Kids?" ad, go to the CCF web site and click on "See our latest ads." CCF says it is running the ad "to expose the radical agendas and activities of extremist groups." ❖

Government Launches Science Portal on the Web

Ten federal science agencies have launched an Internet gateway to assist the public in navigating government science information. The home page for the site is <http://www.science.gov>, and it was launched in December 2002.

Created by an interagency task force dubbed the Science.gov Alliance, the site enables users to browse or search through government-funded resources such as reports, databases, fact sheets and web sites. The gateway is intended to serve a wide range of users, including agency scientists, libraries, entrepreneurs and other members of the business community, educators, students, and the general public.

Science.gov enables users to search the text of selected web sites, view science news highlights from federal agencies and browse federal science web sites and other interagency portals for access to more specific information on selected topics. ❖

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. Your

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

Postdoctoral Positions

Postdoctoral Research Position: A postdoctoral research position in kidney microvascular physiology is available in the laboratory of L.M. Harrison-Bernard, PhD, Assistant Professor of Physiology at Tulane Medical School, to directly study the function of the renal microvasculature. Current projects funded by the NIH-NIDDK place special emphasis on discerning the distinct functions of the angiotensin receptors in the kidney vasculature. The interaction of vasoconstrictor and vasodilator hormones will be assessed using transgenic null mouse models. The fellow will be engaged in highly sophisticated video-microscopic analysis of the renal microcirculation of the mouse. To directly assess the renal microvascular responses, vessels are studied in an intact tubular environment using the mouse in vitro blood perfused juxtamedullary nephron preparation. Microsurgical and microdissection skills are preferred. Salary range is \$25,000 to \$30,000 depending on level of experience. Walker, Harrison-Bernard, Cook, Navar. "Dynamic interaction between myogenic and TGF mechanisms in afferent arteriolar blood flow autoregulation." *Am. J. Physiol. Renal Physiol.* 279:F858-F865, 2000. Harrison-Bernard, Cook, Oliverio, Coffman. "Renal segmental microvascular responses to AngII in AT1A receptor null mice." *Am. J. Physiol. Renal Physiol.* In Press, 2002. Interested applicants should have an MD, PhD or both and should send a current CV, a statement of research interests and career goals, and names and addresses of three references to L.M. Harrison-Bernard, PhD at lharris@tulane.edu or Tulane University School of Medicine, Department of Physiology SL39, 1430 Tulane Avenue, New Orleans, LA 70112-2699, USA. Women and minorities are encouraged to apply. [AA/EEO]

Postdoctoral Positions: Postdoctoral positions are available in molecular virology/cell biology at the University of Pennsylvania-Children's Hospital of Philadelphia. Projects concern: 1) structure-based design of vectors for AIDS vaccine delivery; 2) cell biology of picornavirus entry; 3) cellular function of the coxsackievirus/adenovirus receptor. (See

Science 275: 1320; *J. Virology* 76: 9474, *PNAS* 98:15192; *J. Virology* 76: 2667). Please send CV and names of three references to: Dr. Jeffrey Bergelson, Abramson 1202E, Children's Hospital of Philadelphia, 3615 Civic Center Boulevard, Philadelphia, PA 19104. Email: bergelson@email.chop.edu.

Postdoctoral Positions: Postdoctoral positions are available to join a group studying serum lipoproteins and their functions in lipid transport and cellular cholesterol metabolism. The major areas of interest in the laboratory deal with the molecular mechanisms underlying the cardioprotective properties of high-density lipoproteins (HDL), and the structure-function relationships of apolipoproteins A-I and E. A particular focus is on understanding the interactions of HDL and its apolipoproteins with cell surfaces and lipids. These positions provide opportunities to gain experience and make contributions in physical biochemistry (spectroscopy and calorimetry), molecular biology/expression of engineered proteins, and cell biology (cholesterol flux and receptor interactions). The successful candidates are expected to have a PhD in Biochemistry or related discipline and relevant experience. Those interested should send a CV with contact information for three references to: Michael C. Phillips, PhD, DSc, Joseph Stokes Research Institute, Children's Hospital of Philadelphia, and the University of Pennsylvania, Suite 302C Abramson, 3615 Civic Center Blvd., Philadelphia, PA 19104; Tel: 215-590-0587; Fax: 215-590-0583; Email: phillipsmi@email.

Postdoctoral Positions: Postdoctoral positions are available at the University of California, Berkeley, to study mechanisms of membrane trafficking, attachment and fusion in vitro and in vivo. For further information and literature citations see <http://mcb.berkeley.edu/faculty/CDB/forte.html>. The laboratory uses the gastric parietal cell as a model to study regulated recruitment of transporters (proton pumps) to the cell surface. Studies in primary cell culture evaluate the role of SNARE proteins and regulatory small GTPases in the translocation process in real time using fluorescently-tagged proteins. The role of specific proteins and lipids in triggered fusion

processes will be assessed in vitro using proton pump-enriched vesicles from parietal cells, functionally reconstituted biological membranes, and liposomes of designed composition. Successful candidates will have a PhD or equivalent, and experience in cell and membrane physiology and/or biophysics. Positions are for two years, funded by NIH-NIDDK, with a salary range of \$31,000-\$40,000, depending on level of experience. Send C.V., reprints, statement of career goals, and contact information for three references to Dr. John Forte, Department of Molecular & Cell Biology, 245 LSA, MC#3200, Univ. of California, Berkeley, CA 94720; Email: jforte@uclink.berkeley.edu.

Postdoctoral Fellow: Applications are invited for a postdoctoral fellow to participate in an extensive study of how small mammals (woodrats) detoxify plant toxins and evolutionary costs associated with dietary specialization. Overview of Research: Previous work suggests that dietary specialists absorb lower concentrations of plant toxins compared to generalists. A part of the project examines three mechanisms that may decrease toxin absorption: 1) tannin-binding proteins 2) p-glycoproteins and 3) intestinal detoxification. Theory predicts that specialist herbivores have detoxification systems that are more efficient in processing secondary compounds in their diet compared to generalist herbivores processing similar doses of the same compounds. The potential tradeoffs of dietary specialization will be addressed by 1) comparing the maximal levels of novel toxins that specialists and generalists can ingest in feeding trails; 2) measuring functionalization and glucuronidation capacities of specialists and generalists using probe drugs; and 3) surveying the detoxification systems of generalists and specialists with DNA microarrays. The successful candidate will have a PhD and should have experience in one of the following areas: animal physiology, pharmacology, toxicology, plant-animal interactions. The ability to conduct both laboratory and field work is necessary. An interest in developing techniques and analysis of DNA microarrays is also useful. Position is for two years with possibility of extension and can begin immediately. The position is funded through a grant from NSF. Send CV, statement of research inter-

ests, reprints, and complete information for three references to Dr. Denise Dearing, dearing@biology.utah.edu; Biology Department, University of Utah, Salt Lake City, UT 84112.

Postdoctoral Fellowship in Hawaii:

A postdoctoral fellowship for two years is now open at the University of Hawaii to study cellular mechanisms of stimulus-secretion coupling in peptidergic secretory cells (<http://www.pbrc.hawaii.edu/ian/>). Applicants should have experience in patch clamping, preferably with capacitance measurements. Desirable is experience in fluorescence microspectroscopy (e.g. fura), and cell culturing. The current project examines the role of electrical activity and Ca²⁺ movements in control of the secretion of the osmoregulatory hormone prolactin, from dissociated tilapia pituitary cells. In this fish, prolactin cells are segregated in the pituitary and, hence, easily isolated. Prolactin mediates adaptation to hypotonic conditions; prolactin secretion increases with reduction in medium tonicity. Testing of the hypothesis that transduction of medium tonicity occurs via stretch-activated channels is the current challenge. Recruitment will continue until the position is filled; early availability is sought. Send a statement of career goals, resumé, names and Email or phone contacts for three references to Ian Cooke, Békésy Laboratory of Neurobiology, University of Hawaii, 1993 East-West Road, Honolulu, HI 96822; Fax: 808-956-6984; Email: ian@pbrc.hawaii.edu.

Research Positions

Program Manager-Research: Internationally recognized biomedical research laboratory is seeking a manager to assist the Laboratory Director and senior laboratory staff with a variety of administrative functions. Duties will include: 1) Design and implementation of a database to organize large volumes of scientific and clinical data in a form accessible for use by Director and other laboratory staff; 2) Preparation of tables, charts and slides from raw data with minimal supervision. Scanning in and labeling data with minimal supervision; 3) Drafting abstracts for presentations and funding proposals based on avail-

able templates; 4) Preliminary screening of applicants for laboratory positions; 5) Correspondence with regulatory agencies, national organizations and other external entities on matters within scope of responsibility. Maintenance of appropriate cataloging of all correspondence with such entities; 6) Composition of draft correspondence for Director with minimal direction; 7) Setting priorities for self and for Director, particularly regarding the organization of the Director's schedule. Requirements include: 1) Undergraduate degree, including courses in science; 2) Preference given to candidates with an advanced degree or relevant experience; 3) Sufficient technical experience to draft abstracts and letters related to the research program; 4) Previous experience as a project manager would be helpful; 5) Excellent computer skills, including PowerPoint, Adobe Photoshop, Access or other database program, and MSWord; 6) Excellent communication skills, including ability to write clear, grammatical English; 7) Strong organizational and interpersonal skills. The salary range for this position is \$50,000-\$74,000, commensurate with experience. Please respond with CV via mail or Email to: Lab Manager Search, c/o Rollie Essex, Administrative Director, Hematology and Oncology, The Children's Hospital of Philadelphia, 34th Street and Civic Center Boulevard, Philadelphia, PA 19104; email: essex@email.chop.edu.

Research Associate: Seeking an individual with a PhD and postdoctoral training. Must have background in cell/molecular biology and biochemistry. To work within a group designing experiments and supervising technicians conducting studies on the metabolism of lipids in tissue culture cells. Ability to work within a collaborative research environment essential. Contact: Savoy Moyer, GI/Nutrition, moyers@email.chop.edu.

Research Associate: The University of Colorado Health Sciences Center, Department of Physiology and Biophysics, seeks a full-time Research Associate Position. This position requires a PhD in Physiology or Neuroscience and at least two years of postdoctoral training in neuroendocrinology.

Both tissue culture and animal models are in use in the laboratory. Expertise in tissue culture, brain dissection, perfusion of brain explants and hormone assay is required. The researcher's primary responsibility will be to investigate regulation of vasopressin and oxytocin release from the posterior pituitary. The researcher will also present the research findings at professional meetings, assist in writing grant applications to support this research, and contribute to the overall smooth operation of the lab. Salary: \$37,000-\$40,000 per year plus benefits. The University will accept applications starting **February 1, 2003**. Send application and resume to: Dr. Celia Sladek, Department of Physiology and Biophysics, University of Colorado Health Sciences Center, 4200 East 9th Avenue, C236, Denver, CO 80262; Fax: 303-315-8110; Email: Celia.Sladek@UCHSC.edu. The University of Colorado is committed to diversity and quality in education and employment.

Biologist/Physiologist: The National Heart, Lung, and Blood Institute, a major research component of the National Institutes of Health and the Department of Health and Human Services, is recruiting a Biologist/Physiologist with experience in the renal physiology of rats and mice to supervise a small laboratory investigating the role of renal sodium transporters and water channels in blood pressure regulation. Applicants should provide evidence of knowledge and abilities in the following: 1) Knowledge of principles, theories, and concepts of physiology, cell biology, biochemistry, molecular biology or related biological science; 2) Ability to carry out physiological experiments in rats and mice; 3) Ability to communicate orally and in writing; 4) Ability to carry out quantitative analysis of scientific data; and 5) Ability to teach scientific methods and physiological concepts. Two years of experience carrying out physiological experiments in animals is required. Experience with blood pressure telemetry and immunochemical techniques (immunocytochemistry and immunoblotting) is desirable. Salary range is \$46,469 to \$72,400 (GS-11/12) depending on experience. US citizenship required. For information on how to apply and obtain vacancy announcement or for more specific information call Christine Fisher at 301-496-6477 (refer-

ence Announcement # HL-02-0153) or via Fax-back by calling 301-594-2953 and using Fax ID #4032. Send applications to DHHS/NIH/NHLBI, Bldg. 31, Rm 5A28, 31 Center Drive MSC 2484, Bethesda, MD 20892-2484. Applications must be postmarked no later than **January 20, 2003**. DHHS and NIH are Equal Opportunity Employers.

Faculty Positions

Faculty Position: Chapman University is seeking applications for a faculty position in the Department of Physical Therapy. Requirements for the position include relevant PhD with expertise in one or more of the following areas: systems physiology, neurophysiology or cardiopulmonary physiology. In addition, we are seeking someone with a distinguished record of research, publication, and extramural funding. Successful applicants will have demonstrated excellence in teaching and commitment to cultural diversity. Chapman, an independent, comprehensive university, is located in Orange County in a culturally diverse community with major medical facilities and research institutions. *US News and World Report* has ranked the academic quality of Chapman in the upper quartile of all four-year colleges and universities in the Western US. Submit cover letter, vita, evidence of qualifications, and a list of five references with addresses, telephone numbers and email addresses to: Dr. Don Gabard, PT, PhD, Search Committee Chair, Department of Physical Therapy, Chapman University, Orange, CA 92866 or gabard@chapman.edu. Application review begins immediately and continues until the position is filled. Chapman University is committed to providing equal career opportunities to all individuals.

Assistant Professors: The University of Minnesota School of Medicine, Duluth, is seeking applications from outstanding physiologists to fill two positions at the Assistant Professor level. The positions are regular, 12-month, tenure-track appointments to begin as early as the summer of 2003. The successful candidates will be expected to establish well-funded independent research programs

and will have opportunities to conduct collaborative research in a dynamic and congenial environment. These persons will also be expected to teach medical, pharmacy, graduate and undergraduate students in team-taught courses. Individuals who have expertise in any area of physiology or neurocommunication are encouraged to apply. **Qualifications:** Candidates must have a PhD (or MD with equivalent training) and postdoctoral experience with a demonstrated record of research productivity. Applications will be evaluated beginning **February 1, 2003** and continue until the positions are filled. Interested individuals should submit a letter of application, curriculum vitae, a succinct statement of proposed research directions and should arrange to have three letters of recommendation sent under separate cover to: Physiology Search Committee, Dr. Lois Jane Heller, (Professor of Physiology, University of Minnesota School of Medicine Duluth, 1035 University Dr., 355 S Med., Duluth, MN 55812-3031 (lheller@d.umn.edu). The University of Minnesota is an equal opportunity educator and employer.

Assistant Professorships (2): Two nine-month, tenure-track positions are available in Health and Exercise Science. **Qualifications include:** Doctorate in exercise science, health, kinesiology or related field; significant postdoctoral experience; publication record; and evidence of grant procurement capability. Responsibilities include teaching relevant undergraduate and graduate classes, develop a nationally recognized and funded research program, and participate in student advisement and relevant service activities. Research focus areas within which candidates will be considered for these positions include: aging, behavioral aspects of physical activity and/or health, cancer prevention and/or rehabilitation, cardiopulmonary physiology, neural control of movement, and obesity. Submit a letter of application, curriculum vita, three letters of reference, and official transcripts by **January 17, 2003** to Robert Gotshall, PhD, Health and Exercise Science, Colorado State University, Fort Collins, CO, 80523-1582, 970-491-6374, gotshall@cahs.colostate.edu. Search remains open until a suitable candidate is identified. Colorado State is an Equal Opportunity Employer committed to excellence through diversity.

Assistant Professor: Biomedical Pharmacy Faculty: This 12-month assistant professor position, starting summer 2003, emphasizes teaching biochemistry, immunology, pathology, pharmacology, and physiology in integrated Doctor of Pharmacy degree courses. The position also requires School and University service, and research and scholarly productivity. Minimum qualifications include a PhD degree in one of the above or very similar science majors with appropriate courses and dissertation research, and a record of excellent work performance. Preference will be given to applicants with a pharmacy practice degree, college teaching experience, and relevant research and publications. Please submit application letter with teaching philosophy statement, curriculum vitae, and three recommendation letters from persons familiar with your current qualifications to: David W. Newton, PhD, Bernard J. Dunn School of Pharmacy, Shenandoah University, 1460 University Drive, Winchester, VA 22601; Fax: 540-665-1283. [EEO]

Associate Professor: The University of Minnesota School of Medicine Duluth invites applications for a full-time tenure track Associate Professor position in the Department of Behavioral Sciences, with a joint secondary appointment in the Department of Family Medicine. Primary responsibilities include conducting and directing innovative and original research in behavioral medicine with a focus on stress and hormonal factors in hypertension and cardiovascular disease risk and the psychobiological effects of stress on nicotine withdrawal and tobacco abstinence. Other responsibilities include direction of a cardiovascular/behavioral medicine laboratory, contributing to an interdisciplinary research program linking the academic expertise in the School of Medicine with the clinical expertise in the practice community in the above-mentioned areas, and collaboration with area healthcare systems in the development of effective patient education and behavioral health programs. Requirements include: PhD in Psychology with Clinical Psychology specialty, eligible for Minnesota licensure at Licensed Psychologist level, completion of an APA-approved clinical internship and demonstrated experience directing research in biobehavioral risk factors for cardiovas-

cular diseases. The candidate must have demonstrated experience in procuring major grant funding to support these research programs and expertise in the psychoneurobiology of stress, behavior change strategies in preventive medicine, the relationship of social factors, lifestyle and personality to health status. Salary will be in the low to mid-\$70,000 range, commensurate with qualifications and experiences. Please submit a letter addressing the specific qualifications above, a curriculum vitae and three (3) names of references by **February 28, 2003** to: Dr. James G. Boulger, Chair, Search Committee, Room 234, Department of Behavioral Sciences, University of Minnesota School of Medicine Duluth, 1035 University Drive, Duluth, MN 55812-2031; Email: bhsc@d.umn.edu. [EEO]

Assistant Professor: The University of Iowa Department of Exercise Science invites applications for a tenure-track faculty position commencing in August 2003. Applicants must have a PhD or equivalent degree and a strong potential to attract external funding. Postdoctoral training and teaching experience are highly desirable. Outstanding candidates are sought who can develop a strong independent research program at any level of inquiry, teach in departmental undergraduate and graduate courses, and train graduate students and postdoctoral scientists. The ideal candidate will complement existing faculty research programs in motor control, neuromuscular biomechanics, or integrative physiology. Excellent opportunities exist for collaboration with scientists within the department and the Colleges of Medicine and Engineering. This position includes significant start-up funds in addition to laboratory renovation. Review of applications will commence **February 15, 2002** and continue until the position is filled. Submit a letter of application, curriculum vitae, a brief research plan and the names and contact information of three references to: Kelly J. Cole, PhD, Department of Exercise Science, S. 501 Field House, The University of Iowa, Iowa City, IA 52242. Minorities, women and disabled individuals are strongly encouraged to apply. [EEO/AA]

Assistant/Associate Professor: The Univ. of Toledo Dept. of Kinesiology is seeking candidates for a tenure track appointment in Clinical Exercise Physiology. The position will involve teaching undergraduate and graduate courses in clinical exercise physiology and related areas, supervision of undergraduate and graduate (MS and PhD) student research, and service on committees. In addition, this individual will be expected to develop a nationally visible research program. The qualifications for this position include a PhD in Kinesiology, Physiology or a closely related field, with a record of research achievement in clinical aspects of exercise physiology. Candidates with research expertise in areas such as exercise and cardiopulmonary/metabolic disease prevention, obesity, and lifespan changes are strongly encouraged to apply. Postdoctoral research experience and an interest in collaborative research are also highly desirable. The department has comprehensive laboratory facilities, an in-house rehabilitation clinic, and will soon be moving into a newly renovated comprehensive facility that includes a vivarium. Excellent collaborative opportunities exist with other Univ. programs, as well with the nearby Medical College of Ohio, and other area health care and sports medicine facilities. Additional information on the department can be found at <http://www.utoledo.edu/~kinesiology/>. Interested applicants should submit a formal letter of application, a curriculum vitae, graduate transcripts, three letters of recommendation, a statement of their teaching and research interests, and examples of their publications (limit of three) to: Danny Pincivero, PhD, Search Committee Chair, Dept. of Kinesiology, Health Education Center, University of Toledo, Toledo, OH 43606; Email: danny.pincivero@utoledo.edu; Tel: 419-530-5291. This position will begin August 2003. Although the position will remain open until it has been filled, applicants are encouraged to submit their material by **January 13, 2003** for full consideration. The Univ. of Toledo is an Equal Access, Equal Opportunity, Affirmative Action, Title IX Employer, committed to excellence through diversity. The filling of all positions is contingent upon funding and University of Toledo Board of Trustees approval.

Assistant/Associate Professor: The Univ. of Toledo Dept. of Kinesiology is seeking candidates for a tenure track appointment in Exercise Physiology. The position will involve teaching undergraduate Anatomy and/or Physiology and graduate courses in the candidate's area of expertise, supervision of undergraduate and graduate (MS and PhD) student research, and service on committees. In addition, this individual will be expected to develop and maintain a nationally visible research program. The qualifications for this position include a PhD in Kinesiology, Physiology, or a closely related field, with a record of research achievement in exercise biology. Teaching experience, research expertise in cellular and molecular aspects of exercise, particularly as it relates to skeletal muscle, postdoctoral research experience, and an interest in collaborative research are all highly desirable. The department has comprehensive laboratory facilities, an in-house rehabilitation clinic, and will soon be moving into a newly renovated comprehensive Health and Human Services facility that includes a vivarium. Excellent collaborative opportunities exist with other University programs, as well with the nearby Med. Coll. of Ohio, and other area health care and sports medicine facilities. Additional information on the department can be found at: <http://www.utoledo.edu/~kinesiology/>. Interested applicants should submit a formal letter of application, a curriculum vitae, graduate transcripts, three letters of recommendation, a statement of their teaching and research interests, and examples of their publications (limit of three) to: Frank Pizza, PhD, Chair of Search Committee, Dept. of Kinesiology, Univ. of Toledo, Toledo, OH 43606; Email: Fpizza@pop3.utoledo.edu; Tel: 419-530-4178. This position will begin August 2003. Although the position will remain open until it has been filled, applicants are encouraged to submit their material by **January 13, 2003** for full consideration. The Univ. of Toledo is an Equal Access, Equal Opportunity, Affirmative Action, Title IX Employer, committed to excellence through diversity. The filling of all positions is contingent upon funding and University of Toledo Board of Trustees approval.

Letters to Michael Barany

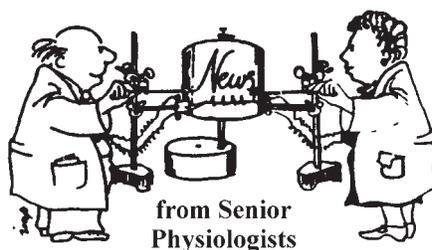
Beverly Bishop writes: "It was with pleasure that I received your kind and thoughtful letter congratulating me on my 80th birthday. The date, October 19th, has come and gone and elections are almost upon us. Please do not interpret my delay in responding to your letter as an indication that I did not appreciate the time and effort you expended to write to me, or do not think, as Marty suggested, that some seniors don't respond because they do not want others to learn their age. My age is spelled out in a short biographic sketch hanging in the Medical School lecture hall for all students and public to see. I couldn't keep it a secret if I wanted.

"You requested information about my current activities and my thoughts about research and teaching. That is a big order, but I'll try to comply.

"All my activities revolve around my University responsibilities. My research and teaching loads are the same or heavier than they have been in my 49-year tenure with the Department of Physiology. I still enjoy and thrive on these responsibilities. I feel as if I am the most fortunate individual alive because of my continuing good health, my happy marriage and my enduring participation in one of the most outstanding departments at UB.

"My husband and I still love flying, snorkeling, swimming, traveling, gardening, and just being together. We both feel productive in this troubled world.

"I am currently responsible for more teaching than in previous years. As is the case for most senior, systems Physiologists, our teachings are still appreciated and concern is openly expressed about where our replacements will come from when we move off the scene. The younger faculty is extremely knowledgeable about genetics and molecular biology, but they are less informed about organ systems, currently the key topics of medical courses. My teaching is at all levels from upper-class undergraduates through all the professional and basic science graduate courses. In recent



years UB's numerous and widely dispersed neuroscientists have worked cooperatively and diligently to integrate our teaching and research efforts. We have created new graduate courses, published a textbook, and generated the appropriate reports and requirements to acquire NYS's approval to grant MS and PhD degrees in Neuroscience. This effort has been one of my major 'causes' for the last several years. (Some things take longer in State institutions.)

"I am excited about new directions in my research. For years I focused almost exclusively upon the neural control of the respiratory muscles and other rhythmical activities. In the last three to five years, I have become fascinated with the biological clock's control of so many physiological functions. This shift in my research focus came about as a result of a group of the faculty combining their efforts to understand sleep apnea. Our first goal was to develop a small animal model that we could afford to study. We selected the Sprague-Dawley rats and implanted them with an abdominal probe for continuously monitoring body temperature and level of motor activity while being subjected to 10% O₂. From the results of those first experiments I was hooked on a new path of research. The questions driving my interest are: what are the physiological mechanisms by which hypoxia causes body temperature to fall and to lose its circadian rhythm during throughout the hypoxia; why does ambient temperature play such a big role in this hypoxic-induced response; how does the suprachiasmatic nucleus (SCN), the site of the biological clock, exert its control over the central thermoregulatory neurons; etc.? My interest in research will not wane until these questions are

answered.

"I could not write this letter without acknowledging what a major role the American Physiological Society has played in my personal and professional life. The Society has had tremendous impact upon my professional development. I learned the importance of physiology to our culture and of science to our country. I consider it an enormous privilege to have had the opportunity to serve on the APS Council and a very large number of its committees over the years. I intend to continue to participate actively in its many activities. My poster is already submitted for the 2003 EB meeting, is yours?

"Again, my sincerest thanks for your birthday greeting."

Francisco Alvarado writes: "Asked by Michael Bárány to write about my experience in the field of physiology, with emphasis on my 'philosophy about research,' I immediately thought of phlorizin. This beautiful molecule has always been my favorite. My wife Barbara and I even named our youngest daughter, born at Louisville, 1968, Agnes Florizina, which is, of course, Spanish for phlorizin.

"Predestination exists. For some reason, when studying 'General Pathology' as a third-year medical student at the University of Madrid (about half a century ago!), my imagination was aroused when I learned that dogs injected with phlorizin, a glucoside extracted from the roots of apple trees, lost D-glucose in their urine. Because glucosuria is the key symptom of diabetes, the term 'phlorizin diabetes' was coined at the time. Very soon, however, researchers realized that this was not true diabetes and proposed, correctly, that the effect is due to the inhibition of glucose reabsorption from the renal tubular fluid by phlorizin.

"I encountered phlorizin again when, in September 1960, I joined Robert K. Crane as a postdoctoral fellow of the Department of Biochemistry at the Washington University School of Medicine, St. Louis. Crane had just

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completed his magisterial review on Intestinal Sugar Transport (*Ann. Rev. Physiol.*, 1960). He handed to me the manuscript (still in the typewritten form) and asked me to read it to propose my own research project.

"From this review, I learned two important series of facts. First, thanks mainly to Crane and colleagues, the structural elements necessary for a sugar to interact with the still-hypothetical membrane sugar carrier were defined. Namely: a pyranose ring, a free -OH group with the D-glucose configuration at C2; and a sixth carbon atom where certain modifications were acceptable. Secondly, phlorizin was a strong inhibitor of sugar transport whereas the aglycone, phloretin, was a weak inhibitor.

"On this basis, I did not hesitate in proposing to Crane the hypothesis that: 1) due to its D-glucopyranoside moiety, phlorizin should be a fully competitive inhibitor of D-glucose transport; and 2) modifying the -OH at C2 should yield an essentially inert analog. Implied in these premises was the conclusion that presence of the polyphenol moiety, phloretin, attached by a beta-glucosidic bond to the D-glucose, strongly increases the relative affinity of phlorizin for the carrier. Probably to test my determination or something, Bob said that he did not believe in my hypothesis, but nevertheless authorized me to go ahead with the project.

"I began by attempting to synthesize the mannoside analog. However, it soon became evident to me that neither Bob nor I were sufficiently good at synthesis. Crane's group included an organic chemist dedicated full time to the synthesis of sugar analogs, Kenneth Hawkins. But not even Ken was able to help us to come out of the impasse. All I could get was much head scratching and looks of bewilderment. Apparently, this particular mannoside was a tough cookie. I gave up on that front, and concentrated instead on demonstrating competition by using some indirect approach. But to find such an approach was not evident.

"Obviously, my problem was one of

lack of faith. I did not believe that a direct kinetic approach to my questions was feasible with the methods available at the time. Not seeing any other way out, however, I finally decided to try the impossible, to undertake a direct kinetic demonstration of competition by using the recently developed "tissue-accumulation method" of Crane and Mandelstam (TAM; *BBA*, 1960). The method seemed crude but, did I have any other alternative?

"When I finally dared to perform the experiment, the miracle happened. The results were much better than I would have dreamed. As substrates I tested two non-metabolizable sugar analogs (6-deoxy-D-glucose and 1,5-anhydro-D-glucitol), and both revealed fully competitive inhibition kinetics, with an apparent affinity (defined as the $1/K_i$ values) about one-thousand times higher than that of D-glucose itself. This was exactly what I had been looking for.

"And, in addition, one key question resulted from this line of work. What is there in the brush border membrane surface that permits isolated pieces of intact intestinal tissue, in vitro, to exhibit practically perfect Michaelis-Menten transport kinetics? This was not simple biochemistry. It concerned questions such as membrane structure, and geometry (see, for instance, Alvarado, *BBA* 1967). Since then, this question has animated the thinking of many physiologists.

"After verifying my calculations (it is clear that, at that time, I was an unknown quantity), Bob in one morning wrote a short phlorizin paper, that I wanted to have sent to the *JBC*. But, predictably, the *JBC* squarely rejected the paper on the grounds that (here, I quote from memory) 'one cannot perform this type of an analysis by using pieces of whole intestinal tissue.' Unimpressed, we sent the same material to *BBA*, which, at that time, was a prestigious, quite new biochemical journal. The paper was accepted without problem (Alvarado and Crane, *BBA* 1962).

"This was the first of my series of papers on transport. Having discovered its virtues, I continued uninhibitedly to apply the kinetic approach to my research. I do not regret it.

Kinetics has the disadvantage that many people do not like it and, consequently, have a tendency to dismiss it. But it provides a precise conceptual framework, indeed, a language, permitting to approach (and solve) many problems quantitatively. It is true that, in themselves, kinetic demonstrations can hardly be used as rigorous proof of anything but, in my already long experience, how many rigorous scientific proofs can I say to have seen? Even physicists cannot tell us with certainty where a given, simple electron might be. I thank my former teacher in Spain, Alberto Sols, for having aroused in me an early interest in kinetics.

"Summing up, if asked for any advice to give to budding physiologists, I would say that the best bet is to use good working hypotheses. But, in reality, there is an even better road to success. Simply, be lucky if you know how. Were it not for my good luck, I think I would have ended my career in utter anonymity. Instead, I am now looking forward to terminate as a respected Senior Physiologist. I thank my collaborators and the APS for having helped me so much to achieve this deed.

"And I end by thanking Robert K. Crane for having believed in me when I most needed it. Indeed, Bob has helped me in more ways than one. But explaining this fact would call for another, entirely different type of story."

Letters to Edgar Folk

Peng Li writes: "Thank you for your letter. I was the Chair of the Department of Physiology, Shanghai Medical University, China (now called Shanghai Medical College of Fudan University). My work is related to the neural regulation of cardiovascular function, especially the mechanism of stress-induced cardiovascular diseases and effects of acupuncture on cardiovascular diseases and its mechanism. I have collaborated with Dr. Longhurst since 1995. In 1997, I retired from Shanghai and came to University of California, Irvine (UCI) to continue the study of acupuncture

with Dr. Longhurst as a researcher. We have been successful in getting two NIH grants to support our work, and published two monographs and five papers since 1998. I have organized a satellite meeting of IUPS in New Zealand in 2001 with Drs. Sato and Campbell. I have recently been helping Dr. Longhurst to organize another international meeting at UCI next year to discuss the mechanism of acupuncture. We may possibly organize a symposium in the IUPS Congress in 2005 in San Diego, if the APS committee would like us to do so. We have many interesting findings and I hope can continue to work for several years to understand more about the scientific base of acupuncture. We are trying to combine the Chinese Medicine and Western Medicine into Integrative Medicine

and to serve people better. Although the life of a human being is short, I am glad to do my best to serve people in the world to live healthy and peacefully.”

Matthew N. Levy writes: “Thanks for your letter of December 3, 2002. I did celebrate my 80th birthday on the second day of this month, and my health appears to be good. I am a Professor Emeritus of Physiology and of Biomedical Engineering at Case Western Reserve University (CWRU). I am an active participant in a research project on the effects of iron overload on cardiac function in experimental animals. These experiments are conducted at the Metrohealth Medical Center, which is a hospital affiliated with CWRU. Also, I spend considerable time revising the physiol-

ogy textbooks I have edited with my colleagues over the past few decades. Unfortunately, my dear friend and collaborator, Robert Berne, died about one year ago.

“My wife, Ruth, and I travel frequently to visit our children and grandchildren in Solon, OH, a local town, and in Richmond, VA, a greater distance away. Our granddaughter in Solon is a senior in high school, and our grandson in Solon is a senior in the Engineering School at CWRU. Our Richmond grandchildren are all in elementary school, and their parents, Ursula and Jim, are faculty members at Virginia Commonwealth University. Ursula teaches French, and Jim is an Endocrinologist, with a major emphasis on the clinical and physiological features of diabetes mellitus.” ❖

Book Review

“Why Animal Experimentation Matters: The Use of Animals in Medical Research”

Ellen Frankel Paul and Jeffrey Paul, (Editors).

Transaction Publisher's, New Brunswick (USA), 2001, 224 pp., index, \$49.95

ISBN 0-7658-0025-X

The book *Why Animal Experimentation Matters: The Use of Animals in Medical Research* presents a solidly pro-science view of the justification and need for animal-based biomedical research. The chapters are authored by historians, philosophers, ethicists, and research scientists who are uniformly strong proponents of research. The book, therefore, offers much needed balance for the numerous and well-publicized published works that strongly and unilaterally oppose animal research. Despite the lack of contributions espousing abolitionist opinions, the selected authors thoroughly discuss, albeit later refute, numerous moral, ethical, philosophic, and cost-

benefit arguments that oppose animal research.

In the introduction, Ellen Frankel Paul provides concise summaries of the philosophic perspectives of two influential opponents of animal-based research, Peter Singer and Tom Regan, the medical benefits that have accrued through animal-based research, and some key aspects of the chapters that follow. The introduction sets the tone of the book as a defense of animal experimentation and a challenge to an extremist cause. In chapter 1, “Experimental Animals in Medical Research: A History,” historian Kenneth F. Kiple and sociologist/anthropologist Kriemhild C. Ornelas provide a more detailed historic recounting of how animal research has advanced biomedical science and human and animal health, with a corresponding history of the development and growth of the anti-animal research movement and animal protection laws.

Two biomedical research scientists, Adrian Morrison and Stuart Zola, both stress the importance of understanding how research is conducted and how biomedical progress relies on the use of animals to advance human medicine. Morrison, in his chapter “Making Choices in the Laboratory,” provides his personal ethical perspec-

tive, perhaps summarized by the phrase ‘compassionate science,’ and debunks purported examples of medical advances that have not required animal use. Zola’s chapter, “Basic Research, Applied Research, Animal Ethics, and an Animal Model of Human Amnesia,” focuses on the danger of categorizing research as basic or applied for purposes of assigning value to or justifying some types of research but not others. He argues that requiring even “potential” practical benefit, as opposed to viewing the advancement of knowledge per se as a potential benefit, may preclude vital work. He views scientific inquiry for the advancement of knowledge as a worthy and critical endeavor, with the caveat that the advancement of knowledge through research requires sound science.

Several of the chapters are particularly provocative. In his chapter “The Paradigm Shift toward Animal Happiness: What It Is, Why It Is Happening, and What It Portends for Medical Research,” ethicist Jerrold Tannenbaum provides a thought-provoking discussion of evolving attitudes regarding animal welfare, well-being, and happiness. He raises concern about the eventual impact of requiring

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enrichment or “positive” experiences for animals, as opposed to simply providing for their basic welfare, on the future of biomedical research. H. Tristram Engelhardt’s chapter “Animals: Their Right to Be Used,” argues that because morality and moral significance are articulated by humans, the moral significance that humans assign to animals is based on how animals are valued or used. Developing that logic, he concludes that animals have a “right” to be used, and, therefore, to become more valuable to humans, for purposes of sport, food, agriculture, education, and research. Particularly interesting is his application of the so-called “3 R’s” to humans (i.e., one should always attempt to replace research on humans with research on animals; if this is not possible, one should reduce the role of humans to the extent possi-

ble through the use of animals; all medical procedures and other products should be maximally refined through the use of animal subjects). He further concludes that the costs of animal welfare to research and to other endeavors approved by law should be borne by those expressing the concern.

Other chapters develop philosophic approaches that justify animal-based research. Baruch R. Brody’s chapter “Defending Animal Research: An International Perspective,” favors balancing human and animal interests via a “discounting” approach that considers human as well as animal interests. Biologists Charles S. Nicoll and Sharon M. Russell argue against moral equivalence of animals and humans from evolutionary and biological perspectives in their chapter “A Darwinian View of the Issues Associated with the Use of Animals in

Biomedical Research.” Finally, philosopher R.G. Frey in the chapter “Justifying Animal Experimentation: The Starting Point” accepts the view that the benefits of biomedical research justify the use of animal life and then discusses questions relevant to experimentation on humans.

In summary, this book presents intriguing and novel perspectives on the necessity and justification for animal-based biomedical research. It also provides good overviews of the history and accrued benefits of animal research, as well as rebuttals to common arguments of opponents of animal use. The book is well-referenced and indexed and should provide a useful resource for those who are asked to debate or defend the use of animals in research. ♦

Linda A. Toth
Southern Illinois University

Books Received

Aquatic Ecosystems: Interactivity of Dissolved Organic Matter.

Stuart E.G. Findlay and Robert L. Sinsabaugh (Editors).
Burlington, MA: Academic, 2003, 512 pp., illus., index, \$99.95.
ISBN: 0-12-256371-9.

Behavior and Its Neural Control in Gastropod Molluscs.

Ronald Chase.
New York, NY: Oxford Univ. Press, 2002, 314 pp., illus., index, \$85.00.
ISBN: 0-19-511314-4.

Biological Membranes: Theory of Transport, Potentials and Electric Impulses.

Ove Sten-Knudsen.
New York: Cambridge Univ. Press, 2002, 671 pp., illus., index, \$100.00.
ISBN: 0-521-81018-3.

The Brain’s Sense of Movement.

Alain Berthoz.
Translated by Giselle Weiss.
Cambridge, MA: Harvard Univ. Press, 2002, 337 pp., illus., index, \$22.95.
ISBN: 0-674-00980-0.

Epilepsy and the Family: A New Guide.

Richard Lechtenberg.
Cambridge, MA: Harvard Univ. Press,

1999, 264 pp., illus., index, \$15.95.
ISBN: 0-674-00973-8.

The Extended Organism: The Physiology of Animal-Built Structures.

J. Scott Turner.
Cambridge, MA: Harvard Univ. Press, 2002, 235 pp., illus., index, \$24.95.
ISBN: 0-674-00985-1.

The Languages of the Brain.

Albert M. Galaburda, Stephen M. Kosslyn, and Yves Christen (Editors).
Cambridge, MA: Harvard Univ. Press, 2002, 418 pp., illus., index, \$65.00.
ISBN: 0-674-00772-7.

Medical Aspects of Harsh Environments, Volume 1.

Kent B. Pandolf, and Robert E. Burr.
Textbooks of Military Medicine.
Washington, DC: Borden Institute, Office of the Surgeon General, US Army Medical Department, 2001, 609 pp., illus., index, \$67.00.
ISBN: 0-16-05107-6.

Medical Aspects of Harsh Environments, Volume 2.

Kent B. Pandolf and Robert E. Burr.
Textbooks of Military Medicine.
Washington, DC: Borden Institute, Office of the Surgeon General, US Army Medical Department, 2002,

1204 pp., illus., index, \$67.00.
ISBN: 0-16-05118-44

Nutritional Aspects and Clinical Management of Chronic Disorders and Diseases.

Felix Bronner (Editor).
CRC Series in Modern Nutrition
Boca Raton, FL: CRC Press, 2003, 335 pp., illus., index, \$129.95.
ISBN: 0-8493-0945-X.

Skeletal Muscle Structure, Function, & Plasticity: The Physiological Basis of Rehabilitation, 2nd Edition.

Richard L. Lieber.
Baltimore, MD: Lippincott Williams & Wilkins, 2002, 369 pp., illus., index, \$57.00.
ISBN: 0-7817-3061-9.

Sleep-Related Breathing Disorders: Experimental Models and Therapeutic Potential.

David W. Carley and Miodrag Radulovacki (Editors).

Lung Biology in Health and Disease (Exec. Editor: Claude Lenfant), Vol 171.

New York: Marcel Dekker, Inc., 2003, 385 pp., illus., index, \$185.00.
ISBN: 0-8247-0877-6.

Schultz to Receive Achievement Award



Stanley Schultz, who is Professor and Vice-Chairman of the Department of Integrative Biology and Pharmacology and holds the

Fondren Family Chair in Cellular Signaling at the University of Texas Medical School in Houston, will receive the 2003 Solomon A. Berson Alumni Achievement Award from the New York University School of Medicine. Schultz has served as President of the American Physiological Society and is currently Chief Editor of *News in Physiological Sciences*. ❖

James Todd Auman has affiliated with the National Institute of Environmental Health Sciences, National Center for Toxicogenomics, Research Triangle Park, NC. Prior to his new assignment, Auman was associated with the Department of Pharmacology and Cancer Biology, Duke University Medical Center, Durham, NC.

Scott Boitano has joined the Department of Physiology, Arizona Respiratory Center, University of Arizona, Tucson, AZ. Boitano was formerly with the Department of Zoology and Physiology, University of Wyoming, Larimer, WY.

Carlos Raul Cassanello accepted a position with the Department of Physics, University California, Berkeley, CA. Prior to his new affiliation, Cassanello was with the Department of Physiology, Sloan Center Theoretical Neurobiology, San Francisco, CA.

James Bradley Chambers recently moved to the Department of Psychiatry, University of Cincinnati, Cincinnati, OH. Prior to his new assignment. Chambers was associated with the Department of Psychology, Florida State University, Tallahassee, FL.

Mark R. Eichinger has accepted a position with the Department of Biology, Luther College, Decorah, IA. Previously, Eichinger was associated with the Department of Pediatrics, University of New Mexico School of Medicine, Albuquerque, NM.

Lara Renee Gawenis has associated with the Department of Molecular Genetics, Biochemistry, and Microbiology, University of Cincinnati, Cincinnati, OH. Prior to her new assignment, Gawenis was with the Dalton Cardiovascular Research Center, University of Missouri, Columbia, MO.

Joseph R. Haywood has been appointed Chair, Department of Pharmacology and Toxicology, Michigan State University, East Lansing, MI. Haywood was formerly with the Department of Pharmacology, University of Texas Health Science Center, San Antonio, TX.

Joseph A. Hill recently affiliated with the Department of Internal

Medicine and Cardiology, University of Texas Southwestern Medical Center, Dallas, TX. Hill moved from the Department of Internal Medicine and Pharmacology, University of Iowa, Iowa City, IA.

Pamela Parker Jones moved to the Department of Life Sciences, Winston-Salem State University, Winston-Salem, NC. Jones was previously affiliated with the Department of Kinesiology and Applied Physiology, University of Colorado, Boulder, CO.

Chad M. Kerksick has affiliated with Health Human Performance Recreation, Baylor College, Waco, TX. Kerksick moved from the Department of Human Movement, Science & Education, University of Memphis, Memphis, TN.

Stephen M. Roth has affiliated with the Department of Kinesiology, University of Maryland, College Park, MD. Roth formerly had been associated with the Department of Human Genetics, University of Pittsburgh, Pittsburgh, PA.

Susan M. Wall has joined the Department of Medicine, Renal Division, Emory University School of Medicine, Atlanta, GA. Wall was formerly with the Division of Renal Diseases and Hypertension, University of Texas Health Science Center, Houston, TX.

Fu-Xian Yi has moved to the Department of Obstetrics and Gynecology, University of Wisconsin, Madison, WI. Prior to his new assignment, Yi was with the Department of Physiology, Medical College of Wisconsin, Milwaukee, WI. ❖

Advertise your job vacancy to over 10,000 members and subscribers!

Ads are accepted for either positions available or positions wanted under all categories. The charge is only \$75. All ads are also posted on the APS Career Opportunity Web page for a period of three months.

If you would like to have your ad listed in *The Physiologist* and on the APS Career Opportunities Web page (http://www.the-aps.org/careers/car_pos_

[avail.htm](#)), the following items are needed: a copy of the ad, the name of a contact person, and either a purchase order number, credit card number (with expiration date and name of cardholder) or billing address. Send the information to Linda Comley (Email: lcomley@the-aps.org; Tel: 301-634-7165; Fax: 301-634-7242).

NIAMS Funds Multiple Grants in Heritable Disorders of Connective Tissue

Eight new research grants funded by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) will shed light on heritable diseases of connective tissue. The new grant awards support individual research projects as well as collaborative exploratory and developmental grants that investigate the cause of one or more of these disorders and novel treatment pathways. NIAMS is a component of the National Institutes of Health (NIH) within the U.S. Department of Health and Human Services.

Heritable disorders of connective tissue are rare diseases that result from mutations in genes responsible for building tissues. Disorders of connective tissue—the material between cells that gives tissues form and strength—include such conditions as osteogenesis imperfecta and Ehlers-Danlos syndrome, and, in total, may affect as many as a million people in the United States.

“We are pleased with the quality of research that has been proposed in response to the Request for Applications,” says NIAMS Director Stephen I. Katz. “We need to understand more about these disorders and how they can be effectively treated, and I believe these eight research projects are an important step in that direction.”

The Request for Applications (RFA) was issued in response to recommendations made at the Third Workshop on Heritable Disorders of Connective

Tissue that was held at NIH in November 2000 and sponsored by NIAMS, the NIH Office of Rare Diseases, and several nonprofit organizations outside NIH. In addition to the NIAMS grants, several grants have been awarded by the National Heart, Lung and Blood Institute, another component of NIH and a co-sponsor of the RFA.

Heritable connective tissue disorders in humans are associated with many mutations that affect connective tissue proteins, including over 300 mutations affecting collagen, a protein substance found in skin, bone, cartilage, and all other connective tissues. Researchers supported by these grants will study the functions of connective tissue proteins and how mutations result in disease:

Role of ADAMTS-3 in Procollagen Processing, Suneel S. Apte, Cleveland Clinic, OH;

Genetics of Sagg: A Heritable Mouse Model for Cutis Laxa, Paul J. Christner, Thomas Jefferson University, Philadelphia, PA;

Collagen-Proteoglycan Interactions in Connective Tissue Disorders, James D. San Antonio, Thomas Jefferson University, Philadelphia, PA;

The Role of Sedlin in Maintaining Cartilage Integrity, George E. Tiller, Vanderbilt University, Nashville, TN;

Targeted Mouse Models for Studying Skeletal Dysplasia, Michael D. Briggs, Victoria University of Manchester, England;

Altered Matrix Cells and Intermolecular Interactions, Andrzej Fertala, Thomas Jefferson University, Philadelphia, PA;

Control of Bone Formation in Craniometaphyseal Dysplasia, Ernst J. Reichenberger, University of Connecticut School of Medicine and Dentistry, Farmington;

Pathogenesis of Laminin-alpha2 Deficiency, Jeffrey B. Miller, Boston Biomedical Research Institute, Watertown, MA.

For more information on heritable disorders of connective tissue, contact: National Institute of Arthritis and Musculoskeletal and Skin Diseases

1 AMS Circle
Bethesda, MD 20892-3675

Tel: 301-495-4484 or

877-22-NIAMS (226-4267) (toll free)

TTY: 301-718-6366

Fax: 301-718-6366

Email: NIAMSInfo@mail.nih.gov

Internet: <http://www.niams.nih.gov>

The mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), a component of the US Department of Health and Human Services' National Institutes of Health, is to support research into the causes, treatment and prevention of arthritis and musculoskeletal and skin diseases, the training of basic and clinical scientists to carry out this research, and the dissemination of information on research progress in these diseases. ❖

Gift Planning Opportunities

APS is pleased to invite the membership to consider including the APS in their gift giving plans. Over the last several years, the Society has received donations of land and securities, all of which have been used to launch the Society's various young investigator award programs.

Many options exist if you are interested in including the APS and its Endowment Fund in your financial or estate planning. Some options include:

Immediate Gifts: Cash, gifts of appreciated securities, gifts of closely

held stock, gifts of tangible personal property, retirement assets, charitable lead trusts and gifts of real estate.

Life Income Gifts: Gift annuities, deferred payment gift annuities, charitable remainder trusts, charitable remainder unitrusts, and charitable annuity trusts.

Gifts of Insurance: Ownership of life insurance policies can be donated, or the APS can become the beneficiary of policies owned by others.

Designated Gifts: Gifts given to honor or memorialize an individual or

an organization and can include scholarships, programs, etc., which are specified for support and named for individuals.

Gifts by Will: Bequests of a percentage of estate, stated dollar amount or specific property or assets.

For more information on gift giving to the APS, please contact Martin Frank, Executive Director (Tel.: 301-530-7118, Email: mfrank@the-aps.org), or Robert Price, Director of Finance (Tel.: 301-530-7173, Email: rprice@the-aps.org).

Thirteenth Annual Bristol-Myers Squibb Award for Distinguished Achievement in Infectious Diseases Research Call for Nominations

Bristol-Myers Squibb Company will present an annual award to a scientist making an outstanding contribution to infectious diseases research. Candidates for the award are to be nominated by individuals affiliated with medical schools, hospitals, and infectious disease research centers.

Award: US \$50,000
Deadline for Receipt of Nominations: **April 7, 2003**
Announcement of Award Recipient: October 2003
Rules and official nomination forms are available from: <http://www.bms.com/foundation/awards.html>.

For more information, write to: Secretary, Award Committee, Bristol-Myers Squibb Award for Distinguished Achievement in Infectious Diseases Research, Route 206 and Province Line Road, Mailstop D14-03, Princeton, NJ 08540. Email: achievement.awards@bms.com.

Nominations Sought for King Faisal International Prizes

King Faisal Foundation, Saudi Arabia's most prominent philanthropic organization, was founded on the precepts of preserving and promoting Islamic culture and of assisting the least fortunate. These goals are achieved through various means, not less of which is the annual presentation of the King Faisal International Prize. By recognizing leading scientists and academics for their contributions to humanity and prominent individuals whose service to Islam has

benefited large numbers of people, the Foundation hopes that the direct and indirect effects of the Prize will be far reaching.

Through its stringent selection procedures, the King Faisal International Prize (KFIP) has become one of the world's pre-eminent awards. So far, a total of ten KRIP laureates have been awarded Nobel prizes for the same work recognized by the KFIP.

The General Secretariat of the KFIP is pleased to invite nominations for

the year 2004. The Prize of Medicine will be awarded in the topic of **Invasive Cardiology** and the Prize of Science will be awarded in the topic of **Biology**.

More information on the nomination procedure can be obtained by writing to: Public Relations Department, King Faisal Foundation, P.O. Box 352, Riyadh 11411, Saudi Arabia. Tel +9661-4652255; Fax: +9661-4656524; Email: info@kff.com. ❖

Eighth Annual Computed Body Tomography for the Technologist 2003

This meeting, May 29-June 1, 2003, presents a comprehensive review and update of the current role of Computed Body Tomography for the CT Technologist with an emphasis on Spiral (Helical) CT and the multidetector CT technology. The lectures are designed to present the material from both an anatomic and pathologic approach with emphasis on CT technique and optimization of scanning protocols. Recent advances in CT application, including multidetector CT, CT angiography, and three-dimensional imaging will be addressed. The

role of CT compared to other imaging modalities, both from a cost-effective standpoint and from better clinical management, will be discussed and addressed during the various lectures. After attending the meeting, the technologist will have a better understanding of the current state-of-the-art of CT and will be aware of the changes that are taking place in clinical CT scanning today. This hopefully will inspire and excite the technologist to optimize their daily practice.

This course is approved for AMA category 1 credits. The American

Registry of Radiologic Technologists recognizes Category 1 for Category A credit for the radiologic technologist.

Course location: MGM Grand Hotel, Las Vegas, NV

For more information, contact: Office of Continuing Medical Education, Johns Hopkins University School of Medicine, Turner 20, 720 Rutland Avenue, Baltimore, MD 21205-2195; Tel: 410-955-2959; Fax: 410-955-0807; Email: cmenet@jhmi.edu; Web: <http://www.hopkinsmedicine.org/cme>. ❖

March 1-5

Biophysical Society 47th Annual Meeting, San Antonio, TX. *Information:* Biophysical Society, 9650 Rockville Pike, Bethesda, MD 20814; Tel: 301-530-7114; Fax: 301-530-7133; Email: society@biophysics.org; Internet: <http://www.biophysics.org>.

March 12-16

The National Comprehensive Cancer Network's 8th Annual Conference: Practice Guidelines and Outcomes Data in Oncology, Hollywood, FL. *Information:* National Comprehensive Cancer Network, 50 Huntingdon Pike, Suite 200, Rockledge, PA 19046. Phone: 215-728-0862; Fax: 215-728-3877; Internet: <http://www.nccn.org>.

March 20-22

First International Meeting on Neural Engineering, Capri Island, Italy. *Information:* Jodi Strock. Tel.: 732-981-3451; Fax: 732-465-6435; Email: j.strock@ieee.org; Internet: <http://www.dartmouth.edu/~ne2003> or <http://www.ieee.org>.

April 9-11

4th International Symposium on Agmatine and Imidazoline Systems, San Diego, CA. *Information:* John E. Piletz, Depts. of Psychiatry, Pharmacology & Physiology, University of Mississippi Medical Center, 2500 North State St., Jackson, MS 39216-4505 USA. Email: AISymposium@psychiatry.umsmed.edu; Internet: <http://aisymposium.aacdp.org/>.

May 13-17

The 30th Annual Meeting of the International Society for the Study of the Lumbar Spine, Vancouver, Canada. *Information:* Secretary, Dr. Scott Bodes, Sunnybrook and Women's Health Science Center, Room MG 323, 2075 Bayview Ave., Toronto, Canada M4N 3M5. Tel: 416-480-4833; Fax: 416-480-6055.

May 28-31

Canadian Society for Pharmaceutical Sciences Symposium, Delta Centre-Ville, Montreal, Quebec, Canada. *Information:* Canadian Society for Pharmaceutical Sciences, 3119 Dentistry/Pharmacy Centre, University of Alberta Campus, Edmonton, Alberta, Canada, T6G 2N8. Phone: 780-492-0950; Fax: 780-492-0951; Internet: <http://www.ualberta.ca/~csp/>.

June 2-5

Eighteenth Annual Offering of Critical Issues in Tumor Microcirculation, Angiogenesis and Metastasis: Biological Significance and Clinical Relevance, Boston, MA. *Information:* Internet: <http://steele.mgh.harvard.edu>.

June 8-12

The Joint Meeting of the 13th Annual Meetings of the American Summer Neuropeptide Conference & The European Neuropeptide Club (ENC), Montauk, NY. *Information:* Orit Khafi, Neuropeptides Conference Secretariat, P.O. Box 3190, Tel Aviv 61031, Israel.. Phone: 972 3 520 99 99; Fax: 972 3 523 92 99; Email: meetings@unitours.co.il.

June 28-July 3

3rd Congress of the Federation of European Physiological Societies, Nice, France. *Information:* Sophia Antipolis, Faculte des Sciences, 06108 Nice Cedex2, France. Tel: +33 4 92076851; Fax: + 33 4 92076850; Email: FEPS2003@unice.fr; Internet: <http://www.unice.fr/FEPS2003/>.

June 29-July 4

International Society for Developmental and Comparative Immunology (ISDCI) - 9th International Congress, St. Andrews, Scotland. *Information:* Dr. Val Smith or Mrs. Jane Williamson, Gatty Marine Laboratory, School of Biology, University of St. Andrews, Fife KY 16 8LB. Email: v.j.smith@st-and.ac.uk or jmcw@st-and.ac.uk; Internet: <http://www.st-and.ac.uk/~seeb/ISDCI/home.htm>.

July 9-13

Enteric Nervous System Conference 2003, Banff, Alberta, Canada. *Information:* Dr. Keith Sharkey, Department of Physiology and Biophysics, University of Calgary, 2220 Hospital Drive NW, Calgary, AB, Canada. Phone: 403-220-4601; Fax: 403-283-3028; Email: ksharkey@ucalgary.ca; Internet: <http://www.med.ucalgary.ca/webs/ENS/index2.html>.

July 20-24

XIX International Congress of Biochemistry & Molecular Biology, Toronto, Canada. *Information:* Congress Secretariat, National Research Council Canada, Ottawa, ON, Canada K1A 0R6. Tel: 613-993-9431, Fax: 613-993-7250; Email: iubmb2003@nrc.ca; Internet: <http://www.nrc.ca/confserv/iubmb2003>.

August 15-20

First Gordon Research Conference on Cellular Osmoregulation: Sensors, Transducers and Regulators, Bristol, RI. *Information:* Conference Co-Chairs Janet M. Wood (jwood@uoguelph.ca) and Karlheinz Altendorf (altendorf@biologie.Uni-Osnabrueck.de) or Gordon Research Conferences, P.O. Box 984, West Kingston, RI 02892-0984 USA. Internet: <http://www.grc.org/scripts/dbml.exe?Template=/Application/apply1.dbm>.

August 20-23

International Society of Adaptive Medicine 7th International Congress, San Diego, CA. *Information:* University of California, San Diego, Office of Continuing Medical Education, La Jolla, CA 92093-0617. Toll free: 888-229-6263 or Tel: 858-534-3940; Fax: 858-534-7672; E-mail: ocm@ucsd.edu; Internet: <http://cme.ucsd.edu/isam/index.html>.