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Inside

Historical Overview of the APS and the Use of Animals in Research

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Concern about the welfare of research animals dates to the early days of the American Physiological Society. Physiologists have both defended animal research and advocated the development of scientific standards for animal care. The latter movement was driven by concern for animals along with recognition that good animal care is necessary for reliable research results. External forces, including hostile ones, also influenced the development of animal welfare standards. Those opposed to animal research campaigned against it and publicly denounced controversial instances of animal use. On several occasions this generated well-timed negative publicity about apparent cruelty to research animals that precipitated more rapid changes than might have otherwise occurred. Support for animal research and the welfare of research animals remains an APS priority.

From 1908 to 1926, physiologist Walter B. Cannon chaired the American Medical Association's Committee on the Defense of Animal Research. In that capacity he "directed the defense of animal experimentation against the antivisectionists and kept the Society informed of the state of the problem" (4, 5). In 1909 Cannon formulated Rules for the Use of Animals, which were distributed to laboratories that used dogs and cats. Cannon's Rules remained widely in use throughout the first half of the century and later formed the basis for the Society's Guiding Principles for the Care and Use of Animals (1, 5, 6).

In 1913, physiologist Anton J. Carlson presented a resolution in defense of animal research to the Federation of American Societies for Experimental Biology (FASEB). The resolution expressed support for animal experimentation, pointing to the achievements of animal experimentation and its importance to medical progress (5). The resolution expressed regret at the lack of understanding about animal experimentation and "deplore[d] the persistent misrepresentation of these aims, achievements, and procedures by those who are opposed to this scientific method." The resolution also stated:

> We are firmly opposed to cruelty to animals. We heartily support all humane efforts to prevent the wanton infliction of pain. . . .

The APS established a Committee for the Defense of Animal Experimentation in 1935. In the same year, FASEB instituted a Committee on Antivivisection Activities (2, 5).

APS involvement in animal research issues increased after World War II. This paralleled an increase in federal investment in biomedical research through the NIH. In 1946, the National Society for Medical Research (NSMR) was founded by the Association of American Medical Colleges and about 100 supporting groups. Its purpose was to provide long-range public education on the importance of animals to medical research. Carlson, who was affiliated with the University of Chicago, was asked to become its first president because of his long-standing involvement in promoting standards for animal care and defending research. He had pioneered local efforts to seek out public support for animal research rather than reacting to negative publicity. The NSMR was based in Chicago, which was also the headquarters for the National

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Antivivisection Society and a focal point of activism against animal research.

The Big Truth

"Dr. Carlson advocated meeting the antivivisection problem head on," according to Ralph A. Rohweder, the NSMR's first Executive Secretary. Carlson's approach included encouraging scientists to be more open with science writers from the popular press and a twist on contemporary Soviet-style propaganda that Carlson called "the big truth." He advocated that scientists "repeat the main *facts* about an issue in hundreds of news stories, speeches, pamphlets, exhibits, films, etc.," according to Rohweder (12).

Another element of Carlson's approach was "political positivism." This tactic was carried forward by Carlson's associate, Andrew Ivy, another University of Chicago physiologist and defender of animal research. "In the wars with the antivivisectionists, Dr. Ivy urged that scientists abandon their defense posture and take the initiative," Rohweder wrote in a January 31, 1963 letter. "He advocated the introduction of bills to aid medical research rather than waiting for the antivivisectionists to determine the time, place, and character of legislative contests" (12).

In 1951, responding to a controversy in Los Angeles over the use of pound animals in research, APS approved a resolution calling for the enactment of city, state, and federal legislation as needed "to make available unclaimed impounded dogs and cats, which would otherwise have to be uselessly destroyed, for research purposes by responsible investigators in approved laboratories." This resolution was "sent to appropriate authorities" and in keeping with Ivy's recommendation that scientists seize the political initiative, efforts were made to have state legislatures pass pound release laws to make unclaimed animals available for medical research (12).

Internal Controversy

The Society's involvement in animal research issues came into sharp focus when University of Michigan Professor and Chairman of Physiology Robert Gesell "made a speech before the Society [Business Meeting] in 1952 charging its members with inhumanity in their treatment of animals" (12). This accusation "raised a rather violent reaction among the members," and an ad hoc committee was appointed to meet with Gesell to discuss "the details of his charges of improper and unnecessary use of animals."

According to ad hoc committee member Maurice Visscher, Gesell "was certain in his own mind that there was great waste of animal life in the execution of poorly conceived and poorly planned experiments and he thought that 'regulation' would cure this evil." Gesell wanted the US to adopt a system modeled on the one used in Great Britain based upon its 1876 "Cruelty to Animals Act." The British system involved licensing investigators and a national registry of research protocols (30).

Two days later at a second business meeting, the APS adopted a formal response to Gesell, which said in part: "The American Physiological Society rejects the sweeping allegations made by Dr. Gesell in a recent business meeting. The American Physiological Society rejects unequivocally the inference that its members are insensitive to the moral responsibilities which they have in protecting the welfare of man and animals."

Gesell was also critical of the NSMR, although he had supported its formation. He opposed the NSMR's involvement in promoting pound release legislation and thought it should do more to promulgate criteria for humane animal care and use. NSMR had in fact provided support to the Animal Care Panel, which was founded in 1950 to promote the exchange of information on various aspects of animal care (10).

Guiding Principles

As a result of the Gesell controversy, APS appointed a new standing Committee on the Use and Care of Animals chaired by Hiram Essex (later also a president of the NSMR), which conducted further discussions and correspondence with Gesell about his concerns. This committee revised the rules articulated by Cannon in 1909 into a set of "Guiding Principles for the Care and Use of Animals," which were adopted by Council in 1953 (3, 5). These principles address in broad terms the rationale and design of experiments; conformity with legal requirements concerning the acquisition, husbandry, and veterinary care of animals; minimization of pain in experimental design and the use of appropriate pain-relieving drugs; humane euthanasia; and appropriate supervision of students by experienced investigators. The APS Guiding Principles were widely distributed to laboratories that use animals for research and education. Conducting research under the APS Guiding Principles became a requirement for publication in the Society's journals. A revised version remains in force today as the standard for APS members to conduct animal research.

Gesell, who died in 1954, tried to prevent the use of his statement by antivivisectionist groups, but his speech was widely distributed and used in campaigns against animal research. Neither the Society's response nor a rebuttal by Carlson in the form of a letter to FASEB members was similarly distributed (10).

Legislation versus Standards

Starting in the 1950s, the Animal Welfare Institute (AWI) and the Humane Society of the United States (HSUS) lobbied Congress to pass legislation, patterned on the highly-restrictive British system (30).

One important advocate of this legislation was AWI President Christine Stevens, the daughter of Robert Gesell. Stevens was familiar with conditions

for research animals through her visits to her father's University of Michigan laboratory. As a lobbyist, she had access to Members of Congress through her husband, prominent Democratic Party fundraiser Roger Stevens. The AWI does not officially advocate the abolition of animal research, but her complaint was (and still is) that scientists are not sufficiently committed to providing humane care for laboratory animals (10).

The APS opposed the British model because of concern about interference with the conduct of science through excessive regulation. At the same time, the APS supported the development of standards for animal care. Northwestern University physiologist and veterinarian Bennett J. Cohen was one of the founders of Animal Care Panel (ACP) and chaired the Animal Facilities Standards Committee of the ACP. In 1963 this committee produced the first edition of the *Guide for Laboratory Animal Facilities and Care* (10). Cohen was also the chairman of the APS Committee on the Use and Care of Animals from 1961-1967 (5, 6).

The ACP was renamed the American Association for Laboratory Animal Science in 1967. Its *Guide for Laboratory Animal Facilities and Care* has been revised several times under the auspices of the Institute for Laboratory Animal Research. The resulting document, the *Guide for the Care and Use of Laboratory Animals*, provides an internationally respected science-based approach to humane animal care.

Legislation At Last

The 1966 publication of a *Life* magazine story entitled "Dog Concentration Camp" was a watershed event in the drive to regulate animal care. This article alleged that a pet Dalmatian named Pepper had been stolen from her owners and sold for research. The article was accompanied by photos of dogs held by dealers and research laboratories in deplorable conditions. The article aroused public outrage, and the following year Congress passed the Laboratory Animal Welfare Act (LAWA). The LAWA sought to curb pet theft by requiring that dealers who sell dogs and cats for research be licensed by the USDA. It sought to improve the conditions of research animals by requiring the USDA to establish minimum standards for the housing and care of dogs, cats, primates, rabbits, hamsters, and guinea pigs used in research. This law was amended several times and remains the basis for USDA's oversight of animals used in research, teaching, testing, and for exhibition.

In 1970 the LAWA was amended to extend its protections to animals in the pet trade and in exhibitions. It was renamed the Animal Welfare Act, and the Secretary of Agriculture was given discretion to cover other warm-blooded species beyond the ones specifically

Activist Propaganda Makes Congressional Visits Lively

John N. Stallone
APS Animal Care and Experimentation Committee

In conjunction with the April 1999 Experimental Biology Meeting in Washington, DC, APS Animal Care and Experimentation Committee member John Stallone decided to visit the offices of Members of Congress who were sponsoring the HR 453, the "Pet Protection Act of 1999." HR 453 claims that it would "amend the Animal Welfare Act to ensure that all dogs and cats used by research facilities are obtained legally." In reality it would make it difficult or impossible for scientists to gain access to non-purpose-bred dogs and cats by eliminating UDSA-licensed Class B dealers as sources of such animals. The bill would also discourage pounds from providing such animals directly to research facilities by requiring them first to undergo a registration process with the USDA.

Since the EB '99 meeting was being held in Washington, DC, I decided that it would be worthwhile to visit several members of Congress to discuss the "Pet Protection Bill of 1999" (HR 453). APS Public Affairs Officer Alice Ra'anan accompanied me. Although we were unable to actually meet with any Members of Congress, we did meet with a legislative assistant from the office of Rep. Charles Canady (R-FL) and with the legislative counsel to Rep. Sheila Jackson Lee (D-TX). Rep. Canady is the author of HR 453, and Rep. Lee is a co-sponsor.

Our meeting with Rep. Lee's counsel went quite well. She was new in the office and was unfamiliar with the bill so we were able both to educate her on the details of the bill and to explain the APS position regarding the potential negative impact of HR 453 on biomedical research. She explained that Rep. Lee was sponsoring HR 453 because she had co-sponsored a previous version of the bill. This is not unusual; Members of Congress associate themselves with many bills and resolutions, most of which will never see any legislative action. She was quite receptive to our concerns and assured us that she would relay them to Rep. Lee.

Our meeting with Rep. Canady's legislative assistant (LA) provided us with quite a different experience. As we were waiting in the Congressman's outer office (with a group of brewing industry lobbyists), we saw the lobbyist for an animal activist organization walk directly into the LA's office. About 15 minutes later, we were invited in to speak with the LA in the pres-

named in the legislation. In 1976, the AWA was broadened to regulate carriers, intermediate handlers, and animal brokers. USDA was authorized to conduct investigations and levy fines to punish violations of humane standards.

Militant activism arrives

The 1981 Silver Spring monkeys incident marked the emergence of the "animal rights" movement in the US. The first organization to prominently espouse the animal rights-based notion that humans are not entitled to interfere with the lives of animals was the People for the Ethical Treatment of Animals (PETA). PETA co-founder Alex Pacheco volunteered to work in the Silver Spring, MD, lab of Edward Taub, who was studying neurological recovery in monkeys after nerves in one limb had been surgically severed. Pacheco took advantage of his position as an employee to gather "evidence" of animal cruelty while Taub was on vacation. He then notified local authorities who raided the lab. Eventually, 16 of the 17 charges filed against Taub were dismissed by the courts as baseless, and the last charge was dismissed on legal grounds because state anti-cruelty laws were not written to apply to such activities as research. However, the facts in the case were difficult to ascertain in an atmosphere charged with accusations. Even now, there are disputes as to what took place, but most people have the perception that an NIH-funded researcher had mistreated animals.

During the early 1980s, the Reagan administration also sought in several successive budget submissions to reduce USDA funding by turning over responsibility for enforcing the inspection provisions of the AWA to state agencies, humane societies, industry, and interested individuals (20).

With the administration seeming to back away from AWA enforcement at a time when the public perceived it to be inadequate, Congress was under enormous pressure to act. Rep. Doug Walgren (D-PA), Chairman of the House Subcommittee on Science, Research, and Technology, held hearings in October 1981, focusing on the effectiveness of the existing peer review mechanism in assuring appropriate treatment of animals in research and on the need to develop alternatives to the use of animals (15). Walgren was the sponsor of legislation that would have diverted 30-50% of federal funds for animal research into developing alternatives to the use of animals. Walgren later also introduced legislation to place NIH in charge of regulating animals used in biomedical research, which would have created a duplicate animal welfare oversight bureaucracy. APS opposed these proposals.

Seeking Common Ground

In 1982, Walgren held a series of closed-door meetings for organizations

ence of the lobbyist, who took copious notes of our discussion. We both got the distinct impression that the LA had been "coached" by the lobbyist because the LA was working from a list of prepared questions.

After we concluded our presentation to the LA, the lobbyist criticized the biomedical research community for its dependence upon Class B dealers and lectured us on what she claimed were numerous instances in which such dealers were found to be holding stolen pets and how HR 453 would prevent this problem. We had already pointed out to the LA that acceptable alternate sources for animals, such as pounds, were no longer available in many areas, in large part because of political pressure brought to bear by animals rights activists. We suggested to the lobbyist that her organization work with APS to reverse this problem and facilitate the availability of pound animals as an acceptable alternative to Class B dealers. She did not respond to this suggestion.

The lesson we took from this meeting is that animal rights activists are quite active at the national level and still wield significant influence on the legislative process as well as the general public. We believe that what transpired at this meeting underscores the importance of physiologists communicating directly with Members of Congress about scientists' support for the existing legal framework provided by the Animal Welfare Act and the need to avoid unnecessary restrictions on the use of animals in research.

With the direct influence that animal rights activists clearly can exert on Congress, we can no longer afford to merely be reactive to animal welfare issues, we must take a genuinely *proactive* lead whenever possible to demonstrate our concern with animal welfare. Although taking the lead will cost us each some time and effort, it is not enough for APS alone to be involved. We urge all APS members to become involved in this process as individuals by contacting your Members of Congress and expressing your concern for animal welfare *as well as* excessive restrictions on animal use in research. If we fail to take a proactive role in this issue now, we may be unable to avoid excessive regulation in the future that would adversely affect our research programs.

For information about communicating with Members of Congress, see the APS Legislative Advocacy Toolkit on the APS web site at http://www.faseb.org/aps/EBAdvocacyToolkit.htm or contact APS Public Affairs Officer Alice W. Ra'anan at 301- 530-7105 or araanan@aps.faseb.org.

concerned about animal research. Walgren was looking for a proposal that both the research community and various self-styled animal advocates could accept. During the first several sessions, little common ground seemed to emerge. However, there was behind-the scenes activity. APS Executive Secretary Orr Reynolds and Public Affairs Consultant William Samuels had been privately contacted by AWI President Christine Stevens, and they had agreed to work for a resolution (28). Accordingly, during the fourth Walgren meeting, APS President Francis Haddy made a statement urging that Congress improve the AWA framework, rather than instituting a second set of regulations. "What APS proposes is that we work to improve the shortcomings of the present system by getting the Congress to amend the Animal Welfare Act rather than legislating a duplicate system," Haddy told the group. Mrs. Stevens seconded this notion, and, gradually, other groups (with the notable exception of PETA) decided to go along (6, 27). This agreement spelled the demise of plans to establish a second set of animal welfare regulations through the NIH.

Over the next several years, APS participated in refining various legislative proposals to strengthen AWA oversight of animal research, opposing provisions deemed likely to interfere with research. It was not until December 1985 that Congress finally passed the next set of AWA amendments. Congress that year also passed an NIH reauthorization bill known as the Health Research Extension Act (HREA). The HREA did, in fact, create a second oversight system in that it required NIH to adopt what became known as the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals. It mandated that all institutions performing PHS-funded research provide assurances to the Office of Protection from Research Risks that they comply with the PHS policy, which includes using the *Guide for the Care and Use of Laboratory Animals* for all research involving vertebrate animals. However, this fell short of a duplicate set of regulations.

Regulations to implement the 1985 amendments to the AWA were not finalized until 1991 because of numerous contentious issues with respect to the broad approach that USDA would take as well as the specific requirements of the regulations. APS provided comments at each stage of the development of these regulations. More recently in May 1999, the Society opposed a proposal to extend the AWA to rats, mice, and birds. A petition asking USDA to cover rats, mice, and birds under the AWA was submitted by several animal activist groups. They asserted that under the 1970 AWA amendments the USDA was obliged to cover all species used in research. APS opposed this interpretation on the grounds that some 90-95% of animals in these species used for biomedical research are already afforded humane protection under the *Guide for the Care and Use of Laboratory Animals.* The APS pointed out that covering them also under the AWA would add new regulatory burdens both to USDA and the regulated community without improving the welfare of the vast majority of these animals. The animal activists subsequently filed suit to compel USDA to cover these species so this question may ultimately be decided by the courts.

Protecting Pets Again

In 1990, Congress again amended the AWA to require that pounds hold dogs and cats for five days before releasing them to research institutions or to Class B animal dealers, who provide dogs and cats to research institutions that lack direct access to pounds. The 1990 AWA amendments required that pet owners be notified that animals left at the pound may be used for research. They further required that Class B dealers keep identification records on each animal they acquire, and this record must be transferred with the animal and be retained by the research institution. These records must provide a description of the animal plus identification and contact information for the original owner.

In recent years, the APS has supported funding increases to enable the USDA's Animal and Plant Health Inspection Service (APHIS) to fulfill its enforcement responsibilities. APS has signed letters of support for APHIS funding as part of a coalition of research and animal activist organizations who share a common interest in good USDA enforcement. In 1997, APS Animal Care and Experimentation Committee Chairman C. Terrance Hawk testified before the House Appropriations Subcommittee on Agriculture, Rural Development, FDA, and Related Agencies in support of APHIS AWA enforcement funding. Hawk's testimony was, in part, a response to the efforts of animal activist organizations to eliminate USDA-licensed Class B dealers as sources of non-purpose bred dogs and cats for research. The actvists alleged that Class B dealers harbored large numbers of stolen pets. The activists charged that eliminating Class B dealers was the only solution. In his statement, Hawk noted that these dealers are the only legal source of animals in jurisdictions where pounds are closed to research either because of state and local laws or because of policies advocated by many of the same animal activists. He argued that the 1990 AWA amendments gave the USDA the enforcement powers needed to address this problem. He urged that the USDA be provided with adequate funding, and that it give priority to the enforcing Class B dealer regulations.

In fact, by 1997 the USDA had already made major strides in enforcing those regulations. In 1993 there had been 104 Class B dealers who sold significant numbers of dogs and cats to research institutions. USDA inspectors had performed audits of the records required under the 1990 AWA amendments and found that they could trace back to original owners only 40 percent

of the animals sold by these dealers. Although in most cases the information was missing rather than fraudulent, the report of this trace back audit figured prominently in the activists' campaign to eliminate Class B dealers. In the mean time, the USDA undertook concerted enforcement efforts aimed at improved dealer compliance, including multiple inspections of dealers whose records were incomplete or inaccurate along with heavy fines for noncompliance. By the end of fiscal year 1997, the number of active major dealers had decreased to 36, but a trace-back audit found dealers' records to be 95% accurate. The effectiveness of USDA enforcement of existing anti-pet theft laws clearly undermines the factual basis of activists' assertion that stolen pets were regularly sold to research labs. Nevertheless, their campaigns continue because the safety of pets is a gripping issue.

The accompanying article recounting Congressional visits in April 1999 by APS Animal Care and Experimentation Committee member John N. Stallone illustrates that this issue is still far from settled. While the APS continues to inform Congress about animal research issues including those involving non-purpose-bred dogs and cats, there is also an important role for individual physiologists to play in letting Members of Congress know that animals are important for research and that scientists care about animal welfare. ❖

For further information on pending legislation that would affect the use of animals in research, contact APS Public Affairs Officer Alice Ra'anan at (301) 530-7105 or araanan@aps.faseb.org.

References

1. Appel, Toby A. First Quarter Century, 1887-1912. In: *History of the American Physiological Society: The First Century, 1887-1987*, edited by J.R. Brobeck et al. Bethesda, MD: The American Physiological Society, 1987, pp. 31-62.
2. Appel, Toby A. Second Quarter Century, 1913-1937. In: *History of the American Physiological Society: The First Century, 1887-1987*, edited by J.R. Brobeck et al. Bethesda, MD: The American Physiological Society, 1987, pp. 63-96.
3. Appel, Toby A. Third Quarter Century, 1938-1962. In: *History of the American Physiological Society: The First Century, 1887-1987*, edited by J.R. Brobeck et al. Bethesda, MD: The American Physiological Society, 1987, pp. 97-130.
4. Appel, Toby A. and Orr E. Reynolds. Presidents, 1882-1962. In: *History of the American Physiological Society: The First Century, 1887-1987*, edited by J.R. Brobeck et al. Bethesda, MD: The American Physiological Society, 1987, pp. 131-176.
5. Brobeck, J.R., Orr E. Reynolds, and Toby A. Appel, Editors. *History of the American Physiological Society: The First Century, 1887-1987*. Bethesda, MD: The American Physiological Society, 1987.
6. Cecil, Helene C. and William M. Samuels. Use and Care of Laboratory Animals. In: *History of the American Physiological Society: The First Century, 1887-1987*. Bethesda, MD: The American Physiological Society, 1987, pp. 391-406.
7. Clark, J. Derrell. AAALAC History Through 1990. *AALAS Contemporary Topics* 36 (6): 39-43, 1997.
8. Cohen, Bennett J. Report of the Committee on Use and Care of Animals. *Physiologist* 5 (1): 58-60, 1962.
9. Cohen, Bennett J. Pound Animals for Research and Education. *Physiologist* 27 (4): 190-191, 1984.
10. Cohen, Bennett J., and Franklin M. Loew. Laboratory Animal Medicine: Historical Perspective. In: *Laboratory Animal Medicine*, edited by James G. Fox, Bennett J. Cohen, and Franklin M. Loew. New York: Academic, 1984, chapter 1, pp. 1-17.
11. Cooper, Theodore, and Joseph E. Galligan. Leaving the Island Behind: An Approach to the Animal Experimentation Issue. *Physiologist* 26 (6): pp. 359-360, 1983.
12. Fenn, Wallace O. *History of The American Physiological Society: The Third Quarter Century, 1937-1962*. Washington, DC: The American Physiological Society, 1963.
13. Haddy, F. J. Past President's Address. *Physiologist* 25 (6): 466-468, 1982.
14. Randall, Walter C. Past President's Address. *Physiologist* 26 (6): 351-356, 1983.
15. Samuels, William M. Congressional Hearings on the Use of Animals in Medical research and Testing. *Physiologist* 24 (6): 13-14, 1981.
16. Samuels, William M. Campaign to Eliminate the Use of Animals in Research. *Physiologist* 25 (1): 33-34, 1982.
17. Samuels, William M. Animal Welfare Hidden Costs Could be $100,000 for Each Institution. *Physiologist* 25 (5): 1982
18. Samuels, William M. Congress May Have Three Choices in Legislation Proposed for Animals. *Physiologist* 26 (2): 71-72, 1983.
19. Samuels, William M. Congress Has Something for Almost Everyone. *Physiologist* 26 (3): 112-113, 1983.
20. Samuels, William M. If Laws Are Needed APS Council Favors Proposal by Sen. Dole. *Physiologist* 26 (3): 112-113, 1983.
21. Samuels, William M. APS Provides Testimony on Sen. Dole's Animal Bill. *Physiologist* 26 (5): 270-272, 1983.
22. Samuels, William M. People You Should Know: Doug Walgren. *Physiologist* 28 (1): 5-7, 1985.
23. Samuels, William M. Three Lab Animal Bills May be Reintroduced in 99th Congress. *Physiologist* 28 (1): 8, 1985.
24. Samuels, William M. People You Should Know: John McArdle. *Physiologist* 28 (2): 69-72, 1985.
25. Samuels, William M. House Bill Seeks Penalties for Break-ins at Research Facilities. *Physiologist* 28 (4): 195, 1985.
26. Samuels, William M. Congress Establishes Broader National Policy for Lab Animal Welfare *Physiologist* 28 (6): 477, 1985.
27. Samuels, William M. A Matter of Opinion. *Physiologist* 35(5): 269, 1992.
28. Samuels, William M. Personal communication with Alice W. Ra'anan, June 4, 1999.
29. Shalev, Moshe. Special Report: 30th Anniversary of the Animal Welfare Act and 10 Years of the Animal Welfare Information Center. *Lab Animal*. November 1996, pp. 14-16.
30. Visscher, Maurice B. "The Animal Experimentation Control Bills in the United States Congress. *Physiologist* 6 (1): 53-62,
31. Wood, Earl H. Past President's Address. *Physiologist* 25 (1): 19-23, 1982.

Council Meets in Bethesda

The APS summer Council meeting was held in Bethesda, Maryland, at the APS Headquarters on July 19-21, 1999. The summer meeting is highlighted by the Council meeting with a majority of the committee chairs, receiving reports on the committees' accomplishments during the past year, and listening to their plans for the coming year. These committee reports are published in this issue of *The Physiologist*.

Among the issues acted on by Council was two new awards programs. Council approved a proposal by the Careers in Physiology Committee to initiate Undergraduate Summer Research Fellowships. These Fellowships would consist of a stipend for the student, a small grant for the advisor, and the possibility of a travel grant that could be applied for by the student should the research result in an abstract presentation at a subsequent Experimental Biology meeting. The second new award program approved by Council was brought forward by the Section Advisory Committee to increase participation at the EB meeting. Each section will be given funds to use in a travel award program to attract young investigators to the EB meeting who might not otherwise attend. In addition, Council unanimously agreed that one of the Porter Physiology Fellows should be designated the "Eleanor Ison-Franklin Fellow" in honor and memory of the long-time Porter Physiology Development Committee Co-Chair.

Council also approved a request from the Education and Section Advisory Committees for upgrades to the Society's Web site. The upgrades will allow for interactive discussions on educational material being placed in the Archives of Teaching Resources, for example. It will also allow for application materials and other information to be completed online and submitted to the appropriate office. The membership questionnaire is being revised so that more current research information can be included in the membership database, allowing for the section leadership to contact subsets of section members on particular issues of interest.

The Awards Committee received approval to expand to at least 12 members from its current number of 7. With the growing number of awards the Committee has to review, it has become burdensome on the current members. The Committee on Committees has been asked to develop a slate of candidates for Council to approve. In addition, the Liaison With Industry Committee asked Council to restructure the Committee to include representation from each of the sections. Council approved the request and sections have been asked to name a member from their section to serve on that Committee. The restructured Committee will be asked to develop a new charge for the Committee.

Other items of importance include Council acceptance of a Publication Committee statement dealing with pre-publication on the Web (see article on next page). Council also decided to sign onto a letter to Congress endorsing the utilization of Federal funds for stem cell research. Council approved in principle the idea of a Latin American outreach effort sponsored by the International Physiology Committee, pending a proposal solicitation and evaluation plan.

A strategic planning meeting has been scheduled for fall 1999. The last retreat in 1992 resulted in the development of the APS Strategic Plan, which called for the institution of Marketing and Education Offices within APS, greater financial self-sufficiency for the individual society journals, an enlarged Public Affairs Office, and the establishment of specialized APS Conferences. The Long-Range Planning Committee has been working to develop an agenda for the retreat with assistance from the Section Advisory Committee and Council. Within the next month, the membership will be approached with a request for input and ideas that should be considered at the retreat.

Additional details of the Council's actions during the July meeting will be communicated to the membership at the next business meeting and in *The Physiologist.* ❖

APS Council.

APS Committee Chairs.

New Prepublication Policy from the Publications Committee Approved by Council

At their summer meeting, the Council approved a policy statement recommended by the Publications Committee that loosens the restrictions that had been placed on authors who want to put preliminary content from their articles on their personal web sites.

There is a long tradition of authors sharing preprints of their articles with colleagues before submission to journals in an effort to get feedback on their work so as to improve the paper before submission. Authors had begun to place these unpublished articles or parts of them on their web sites in order to invite comment, and journal editors were forced to decide whether or not this was "prepublication." Until this new policy was approved, the APS Publications Committee did consider placement on the web prepublication, which would preclude publication in an APS journal.

The APS Publications Committee, with the consensus of the journal Editors, has reconsidered this policy, and loosened it to allow content to be placed on an author's web site. The new policy will be added to the journal Instructions for Authors and a check box will be added to the Manuscript Submission Form by which an author can indicate whether any portions of the manuscript have been posted on the web or any other electronic media. The new policy is as follows:

> Submitted manuscripts are processed with the understanding that they have not been published previously in print or electronic format, and are not simultaneously being considered by another print or electronic journal for publication. However, data portions of submitted papers that have appeared on an author's personal web site will be permitted, with the proviso that the author inform the editor at the time of the submission that such material exists so that the editor can make a determination of the suitability of such material for publication in the journals of the American Physiological Society. Failure to do so will result in an automatic rejection of the manuscript. Examples of such work include, but are not limited to, immunofluorescence micrographs and/or animated gif/video files posted on a personal web site, or NIH-mandated web posting of DNA microarray data. After the article is published in an APS journal, the data should be taken off the author's web site.

A link can be made from the author's web site to the published article in APS's online journal that allows free access to that article from the author's web site. ❖

Plan now to attend!

Joint APS/Scandinavian Physiological Society Meeting

August 16-19, 2000 — **Stockholm, Sweden**

Organizing Committee:

SPS:	APS:
Gunnar Flemstrom	Gerald F. DiBona
Jan Henrikson	D. Neil Granger
Dag Klinnarsson	L. Gabriel Navar
Kerstin Olsson	John A. Williams
Eric Persson	
Jan Skarphedinsson	
Peter Thoren	

Proposed topics to include exercise and muscle physiology, cardiovascular and vascular smooth muscle, neurophysiology and membrane channels, receptor function and signal transduction, membrane transporters, role of endothelium in organ function, hypertension and inflamation (free radical cell injury).

APS will be supporting a Young Investigator Travel Award Program to assist those APS members participating in the joint meeting.

Further details will be available in future issues of The Physiologist and on the APS Web site (http://www.faseb.org/aps).

Preliminary abstract deadline: May 1, 2000.

Boron Thanks APS Staff

APS President **Walter F. Boron** hosted a staff appreciation reception for the 65 employees at the Headquarters Office in Bethesda, Maryland. Together with Council and committee chairs, Boron thanked the staff for all their efforts over the past year. He noted that because of the commitment and the excellence of the staff, APS continues to provide it members with the quality programs and journals they have come to expect.

A major portion of the staff appreciation reception is the recognition of years of service to the Society. This year, Boron presented a 20-year certificates to Jean Shao (Business Office) and Samer Masri (Circulation Manager); 10-year certificates to Virginia Bourgeois and Mark Goodwin (Copy Editors); and 5-year certificates to Heather Banks (Copy Editor), Stephanie Demma (Copy Editor), Andrea Jackson (Education Office), Helen Popper (Copy Editor), and Carolyn Villemez (Assistant for Journal Production). Boron expressed Council's appreciation for their years of service. In addition, Alice O'Donnell (Assistant to the Publications Manager) was recognized for her work on overseeing the development and implementation of the new Web-based manuscript submission, tracking, and review system, APS Central.

APS President Walter Boron (right) and Martin Frank(left) with APS staff members who were recognized for their years of service: Stephanie Demma, Heather Banks, Mark Goodwin, Jean Shao, Carolyn Villemez, Virginia Bourgeois, and Samer Masri..

Alice O'Donnell, Assistant to the Publications Manager, was recognized at the APS Staff Appreciation Reception for her work on APS Central.

Boron conveyed the gratitude of the Society's leadership for the efforts of all the staff in implementing the actions of the Council and committee chairs, and remarked that, with the staff's help, APS would continue to serve the needs of the physiology community in exciting and profitable ways for many years to come. ❖

APS Sustaining Associate Members

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

Abbott Laboratories
ADInstruments
American Medical Association
Astra Arcus USA, Inc.
Axon Instruments, Inc.
Berlex Biosciences
Gould, Inc.
The Gatorade Company
The Grass Foundation
Harvard Apparatus
Janssen Research Foundation
Eli Lilly and Company
The Mack Printing Group
Merck and Company, Inc.
Nycomed, Inc.
Pfizer, Inc.
Pharmacia and Upjohn, Inc.
Procter & Gamble Company
Rhone-Poulenc Rorer
W. B. Saunders Company
Schering-Plough Research Institute
G. D. Searle and Company
SmithKline Beecham Pharmaceuticals

Membership

Accepted Student Applicants

Christopher Bell
University of Colorado
Russell D. Brown
University of Uppsala
Anthony R. Cammarato
Boston University School of Medicine
Thomas Joseph Carter
Marquette University
Matthew Peter DeVries
Western Michigan University
Paul Fadel
University of North Texas
Gerardo A. Hernandez
Ponce School of Medicine
Leonard J. Lee
Florida Atlantic University
Yong-Chao Ma
Cornell University
Julie Patricia Malanga
San Diego State University
Helen Maria Marriott
University of Sheffield
Shumei Meng
Univ. of Mississippi Medical Center
Marina Mourtzakis
University of Guelph
Jeffrey Scott Otis
Virginia Tech
Susanne Pedersen
University of Copenhagen
Marvin Ellsworth Reid
Baylor College of Medicine
Jennifer Reynolds
University of Texas-San Antonio
Jennifer Rose Schmidt
Marquette University
Andrew William Sheel
University of British Columbia
Mark Kenneth Todd
University of Southern California
Hengtad Zhang
SUNY-Brooklyn

Did you receive your APS Membership Card?

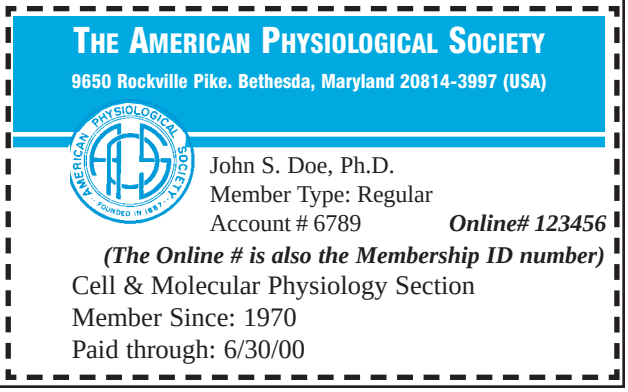
For 1999-2000 dues-paying members, APS is sending out a **Membership Card** with your member number.

If you have not yet received yours, contact the APS Membership Services Department at 301-530-7118, or fax to 301-571-8313, and provide them with your name, address, phone number, fax number, and email address.

Keep your card!

Beginning in January, 2000, you'll need your member number to:

- receive free color in the APS Journals
- purchase the APS Online Collection for $49.50
- access the News in Physiological Sciences



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.

Committee Reports

Animal Care and Experimentation Committee

The Animal Care and Experimentation Committee had another busy year. One of the major ongoing issues for the Society is related to the regulatory burden that animal care and use policies present to its members. Two issues in particular were discussed at our spring EB '99 meeting. First, we believe that the USDA Policies 11 and 12 should be revised. Each of these policies relates to the requirement of investigators to discuss alternatives to painful or distressful procedures. These policies also require that a database search for alternatives be performed, that a list of search terms be provided, that the inclusive dates of the search be stated, and that the date of the search be noted. The main question becomes, "How often are alternatives identified through the database search?" We believe that appropriate revisions to these policies could make the burden less without sacrificing the welfare of animals. Our Committee continues to discuss methods by which we can suggest modifications of these policies. If any reader has suggestions regarding this issue please contact our Public Affairs officer, Alice Ra'anan, at the APS office.

The second main issue regarding regulatory burden is the proposal in the Federal Register to include rats, mice and birds under the Animal Welfare Act (AWA). Currently, rats and mice bred for research are not covered under the AWA. However, humane protection is already provided for these animals through the ILAR Guide for the Care and Use of Laboratory Animals. It has been estimated that over 90% of the rats, mice, and birds used in research are covered under this Guide. Therefore, we feel that redundant regulations extending the AWA to rats, mice, and birds would pose a significant burden to research and would also undermine USDA's effectiveness in other AWA enforcement activities.

Earlier this year all APS members received a brochure entitled, *Questions People Ask about Animals in Research*. If you haven't already read this brochure, please do so. It contains a wealthy amount of information on how to answer common questions about the use of animals in research. This brochure has been very popular as we continue to receive requests for copies. We initially printed 20,000 copies for APS, plus another 8,000 copies that were sold in advance to other organizations (especially to various state associations for biomedical research). We have given away or sold some 16,000 copies. Our distribution policy is that members of the public may receive a single copy at no charge. APS members may receive up to five copies at no charge. Further copies of the brochure cost 30 cents each. We are in the process of obtaining another 10,000 copies. These brochures can be very handy as you give talks to local organizations or schools. Please consider using them in your presentations about the use of animals in research.

Finally, APS co-sponsored with ASPET a symposium at EB '99 entitled "IACUC Issues Forum." As has been the case for the past several years, the meeting was well attended. The symposium was an outgrowth of comments following the 1998 symposium. Although APS held a similar discussion symposium at the 1998 meeting, ASPET felt that another symposium of the same theme would be helpful in 1999. Issues discussed included the role of the IACUC in scientific review of protocols, compliance with protocol approval, in vitro methods of monoclonal antibody production, animal adoptions from research facilities, occupational health issues, and especially, the proposed USDA coverage of rats, mice and birds under the Animal Welfare Act regulations. Many of these issues seem never to go away!

C. Terrance Hawk, Chair

Council accepted the report of the Animal Care and Experimentation Committee.
Council approved a contribution of $5,000 to the National Association for Biomedical Research in support of their efforts in the continuing lawsuit regarding an animal rights activist's challenge to the USDA Animal Welfare Act standards for environmental enrichment for nonhuman primates.
Council reiterated its support for the Animal Welfare Act and for the congressional allocation of funds in support of Animal and Plant Health Inspection Service (APHIS) inspection services.

Awards Committee

The Awards Committee reviewed applications and nominations for five different awards in the 1998-99 year: the Research Career Enhancement Award, the Teaching Career Enhancement Award, the APS Postdoctoral Fellowship Award in Physiological Genomics, the Shih-Chun Wang Young Investigator Award, and the Arthur C. Guyton Award for Excellence in Integrative Physiology.

For the two cycles of the Research Career Enhancement Award, the committee reviewed five applications. Awardees

for this year included **Jason Mateika** from Teacher's College and Columbia University in New York; **Tara Haas**, Yale University; **Rodrigo Iturriaga**, Catholic University of Chile; and **Lawrence Cornett**, University of Arkansas. The Committee reviewed one application for the Teaching Career Enhancement Award program and recommended an award for **Whitney Reilly**, Indiana University School of Medicine.

The request for applications for the APS Postdoctoral Fellowship in Physiological Genomics attracted 26 applicants, an increase from 19 applications received the previous year. The quality of the applicant pool was extremely high, and the Committee spent many hours reading and reviewing the applications and discussing the merits of each one. The recommendations to the council for funding were **W. Grady Campbell** from the University of Texas at Houston and **Elaine W. Joseph** from the Cardiovascular Research Center at the Massachusetts General Hospital in Charleston, Massachusetts.

The Shih-Chun Wang Young Investigator Award received 10 nominees. This award, initiated in 1998, is given to a young investigator with exceptional promise. The field was quite strong this year and the discipline of physiology stands to benefit from many talented young investigators. The nominee presented for Council's consideration was **Craig H. Gelband**, from the University of Florida College of Medicine in Gainesville.

The Arthur C. Guyton Award for Excellence in Integrative Physiology attracted 11 highly qualified nominees. This award, established in 1993, is made to an independent investigator holding the rank of assistant professor studying feedback regulation of physiologic function in an integrative fashion. All nominees were highly qualified and the Committee recommended **Jacob E. Friedman** from Case Western Reserve University School of Medicine in Cleveland for Council's consideration.

The Committee met on several occasions by conference call and considered the greatly expanded reviewing load of this year. The Committee met by conference call at the end of the year to discuss recommendations for reorganization of the workload. Accordingly, the Committee recommends the following:

Expand the Awards Committee. We anticipate that future years will bring a larger number of applications. Given the diverse scientific content of the applications and the expertise of the Committee members, there should be considerable overlap (i.e., multiple points of view) in evaluating each application. Increasing the size of the Committee to a total of 10-12 would permit greater breadth of evaluations. Another advantage of expanding the Committee would be to engage a larger number of APS members into this important function.

Move the deadline for the Young Investigator Awards to November 1. As the schedule now stands, the Committee needs to review both the Young Investigator Award nominees and the Fellowship applications within a short period in January. Moving the deadline for these awards would spread the reviewer's workload and probably improve the quality of the evaluations.

Consider forming two separate committees for reviewing Fellowship Awards and Young Investigator Awards. An advantage of this approach would become evident if the number of awards and, thus, the number of applications would be increased. Thus, if one or two new Young Investigator Awards were to be added to the Committee's workload and if additional fellowships were to be added, it might be most reasonable to ask one committee to evaluate each type of award. The enthusiasm for this approach depends on the extent to which the Council anticipates an increasing number of awards.

Revise the description of the Arthur C. Guyton Award for Excellence in Integrative Physiology. At the request of the benefactor of the award, John Hall proposed some revisions in the description of the award. The Committee considered these changes and suggested further modifications. The major intent of these changes is to emphasize the quantitative aspects of integrative physiology.

John Stokes, Chair

Council accepted the report of the Awards Committee.
Council approved the expansion of the Awards Committee to at least 12 members. This will allow the Committee to apportion the workload through the use of subcommittees or by another means.
Council approved the change in deadline for the various Young Investigator Awards from December 1 to November 1.
Council approved the revised wording of the Guyton Award description.

Committee on Committees

The Committee on Committees is composed of representatives from each of the 12 Society Sections and two Councillors. The section representatives are elected by the steering committee of the section.

The primary duty of the Committee on Committees is to nominate individuals to fill vacancies on the other APS standing committees. This year the committee recommended individuals to fill the following vacancies:

Animal Care Committee	2 (2)*
Awards Committee	3 (2)
Career Opportunities in Physiology	2 (3)
Ray G. Daggs Award Committee	1 (0)
Education Committee	4 (4)
Finance Committee	1 (1)
Honorary Membership Committee	1 (1)
International Physiology Committee	3 (1)
Liason with Industry Committee	2 (3)
Long Range Planning Committee	3 (3)
Membership Committee	4 (1)
Perkins Memorial Fellowship	0 (3)
Porter Physiology Development	2 (3)
Public Affairs Committee	2 (3)
Publications Committee	1 (1)
Senior Physiologists Committee	2 (2)
Women in Physiology Committee	6 (1)

*The vacancies projected for each committee for next year are shown in parentheses above.

The Committee also recommended individuals to fill vacancies on the *NIPS* Managing Board and on two FASEB committees.

The process by which the Committee on Committees identifies appropriate nominees for these committees begins in the fall with solicitation of nominees from each APS section, Chairs of Departments of Physiology, current committee chairs, APS Council, and the general membership. These nominations are due at the APS office in January. During February and March the members of the Committee on Committees prepare initial slates of candidates. Selection is based on an individual's qualification for a specific committee. Section affiliation, gender, and minority or junior investigator status are given serious consideration in order to broaden membership representation on each committee. The Committee meets at the Experimental Biology meeting to finalize recommendations which are presented for approval by the APS Council at their summer meeting. Approved nominees begin their term of appointment in January.

Active member participation in this process is encouraged. Please submit nominations to your section or directly to APS.

At the meeting in April 1999, the Committee on Committees also discussed issues related to adjusting the work load of the Awards Committee and the structure of and charge to the Liason With Industry Committee.

Celia Sladek, Chair

Council accepted the report of the Committee on Committees.
Council approved the slate of nominees for committee vacancies with minor exceptions.

Career Opportunities in Physiology

At the recent EB meeting, the Career Opportunities in Physiology Committee sponsored a Careers Symposium, which was held on Monday, April 19, at 11:30 am-1:00 p.m. The idea of this session was to provide small groups of PhD students and postdoctoral students the opportunity to meet with a wide variety of physiologists working in various traditional and non-traditional settings. Sixteen professionals participated. Free box lunches were provided to the majority of registered attendees.

One hundred and two people pre-registered for and attended this session. An additional 20-25 "walk-ins" were accommodated. The 16 professionals were paired, and each of these eight pairs rotated through eight groups of students (n=12-15), spending about 15 minutes with each group describing what they did, answering questions, etc.

The session was very well received. The written evaluations provided by the participants gave the session high marks. The wide variety of professionals and the broad range of unique and different career opportunities represented were seen to be major strengths of the session. The small group setting and the ability to interact and ask questions also were seen as being very positive features. The major criticism/suggestion was that the session be longer. Based upon this feedback, for next year's meetings the Committee hopes to offer a similar career symposium.

Other on-going activities of the Committee include the production of a new Physiology Careers Poster, revision of the APS Careers brochure, and the possible production of a new VHS tape or CD ROM that highlights various aspects of a career in physiology and the APS.

Last year the Committee recommended that a Summer Research Fellowship Program be initiated. Council declined to approve the recommendation because it believed there were many other such programs in existence. However, the Committee was not able to find any such programs other than for minority students. Therefore, the Committee again recommended that such a program be established. The Undergraduate Summer Research Fellowship program would consist of four annual awards, beginning in the summer of 2000. Each would consist of a $2,000 stipend for the student, a $500 grant for the advisor, and an $800 travel grant that could be applied for by the student should the research result in an abstract presentation at a subsequent EB meeting. The advisor should be required to be an APS member. The Career

Opportunities in Physiology Committee volunteered to develop the application form and the criteria for evaluation and be responsible for the review and ranking of the applicants.

Edward Zambraski, Chair

Council accepted the report of the Career Opportunities in Physiology Committee.
Council approved the establishment of four Undergraduate Summer Research Fellowships with details regarding application and review procedures to be developed.
Council gave the Committee approval to explore the redesign of the "Careers in Physiology" brochure and replacement of the videotape "Physiology: An Inside View" with a new videotape or CD-ROM.
Council approved the allocation of funds for the Careers Workshop.

Education Committee

The Education Committee continues to be busy and active in supporting all levels of education from kindergarten through continuing education for physiologists and other teachers of physiology. During 1998-1999, specific activities sponsored, organized, and participated in by Committee members and the staff of the Education Office have been varied and busy throughout the year.

In the area of continuing education for physiologists, the Education Committee sponsored a well-attended refresher course on cardiovascular physiology at EB ’99 in Washington, DC. There were more than 150 people in attendance at the session, which was ably organized by former Committee chair **Frank Belloni** and included presentations by **John Solaro**, **Harvey Sparks**, and **John Hall** and posters about teaching cardiovascular physiology. A refresher course entitled “Integrating Molecular Biology into the Physiology Curriculum” is being organized for EB ’00.

In the area of enhancing medical education, Committee member **John Dietz** is working on an Archive of Teaching Resources, which includes case histories, test questions, figures, lectures, animations, and links to physiology teaching resources. All APS members are encouraged to contribute to the Archives, the goal of which is to reduce the extra time required for the development of new courses/sections by instructors. In addition, the Association of Chairs of Departments of Physiology is assisting **Rob Carroll,** former chair of the Teaching Section, in soliciting and compiling a Medical Physiology Core Curriculum Objectives listing. Both of these resources will be featured (some of the Archives are already available) in the Education section of the APS web site. A new award, the Orr E. Reynolds Fellowship, was established by Council to hire an APS member for one month during the summer of 1999 to assist the Education Office. The tasks to be accomplished include soliciting, editing, designing, and implementing both short-term and long-term goals for the Archives and other teaching resources for the benefit of APS members. There will be a featured topic on the use of these resources at EB ’00, sponsored by the Education Committee and the Teaching Section.

The annual workshop on physiology for life science teachers and students (inviting local high school teachers and some of their students to EB) organized by Committee member **Steve Segal** and the Education Office was held in Washington on April 19, 1999. The keynote address was given by Segal on “Exercise: An Example of Integrative Physiology” about exercise physiology as a career and as a science and how it relates to life. Then the students conducted hands-on activities about cardiovascular, respiratory, and skeletal muscle changes with exercise. Committee member **George Blevins** and **Alice Villalobos** talked about their careers in physiology. Numerous APS members volunteered to be luncheon hosts and tour guides for small groups of teachers and students. During the afternoon sessions, teachers learned from our summer research teachers about the APS programs and resources for K-12 teachers. Students participated in the discovery-based activities from the local outreach team curriculum on blood flow (the Elvis Experiments for “deriving” Poiseiulle’s Law). Several APS members from Local Outreach Teams assisted the 140 students in the design and implementation of their experiments and their preparation of posters reporting their results.

The Education Committee offered a featured topic for EB ’99 entitled “Physiologists and Outreach Activities Directed at the Lower Primary Grades” organized by Committee member **Jim Schadt**. Numerous APS members and friends demonstrated activities that APS members can take with them into the K-5 classrooms to engage children in science and physiology. In addition, the Education Office conducted a pre-conference workshop for training facilitators of the My Health, My World program for science education and activities in K-4 classrooms. The APS is collaborating with Baylor College of Medicine and the Texas Medical Association on this project. Some of these outreach activities are now also available on the Education Office web site.

The *Frontiers in Physiology* program is continuing with its highly successful Summer Research Teacher (SRT) compo-

nent for K-12 teachers to work in the laboratory of an APS member. Each SRT also attends a week-long summer institute in which they receive more in-depth content exposure, practice specialized teaching techniques, and develop specific, hands-on, inquiry-based science activities for use in their classrooms. APS members who volunteered to attend the 1999 institute as "physiologists in residence" included **George Blevins**, **Barb Goodman**, **Mary Anne Rokitka**, **Roy Russ**, and **Dee Silverthorn.** *Frontiers in Physiology* also includes the Local Outreach Team program, in which APS members and educators learn or develop curricular units on discovery-based approaches for use by middle and high school teachers. Many of the activities developed in *Frontiers in Physiology* are now available at the APS web site. Other Education programs that have involved APS members throughout the year include *Explorations in Biomedicine – Engaging Native Americans in Research* for Montana teachers. *Explorations* offered a workshop on "Teaching Physiology: Low Tech to High Tech" in Bozeman, MT in March 1999 with the assistance of APS members **Rob Carroll**, **Barb Goodman**, **Andy Lechner**, **Del Kilgore**, and **Joe Coulter** and LOT/SRT teacher **Sally Schempp**. Another workshop on physiology/health issues for American Indians will be offered in Montana in September 1999.

Dee Silverthorn is both the APS liaison to the Human Anatomy and Physiology Society (HAPS) and the HAPS liaison to the APS. The APS routinely offers workshops and has booths at HAPS meetings and sponsors one speaker at the annual HAPS meeting in the spring. This year the APS speaker at HAPS was Nobel Prize winner and APS member **Ferid Murad.** The Education Office and APS members also conduct workshops and have booths at the National Science Teacher's Association national meeting and the National Association of Biology Teachers national meeting. The APS is the only biomedical society that presents awards at the International Science and Engineering Fair. Committee member **Andy Lechner** spearheaded a team of local APS members in judging and giving the 1999 awards.

The Education Office has an exciting web site with numerous resources for all levels of education (http://www.faseb.org/aps/Education.html). The Office is working on adding more activities and interactive feedback to its web page for "colleague to colleague" evaluation of resources and discussion. Committee members are enthusiastically working on ways to improve both the knowledge of and teaching in physiology at all educational levels. The Education Committee is also committed to finding more effective ways to serve the education needs of the members of the Society. Therefore, feedback on our programs and/or ideas for new programs and activities are always welcome.

Barbara E. Goodman, Chair

Council accepted the report of the Education Committee.
Council approved the upgrading of the APS Web page with the capabilities to allow for interactive discussions and Web-based application/response forms.
Council approved the use of the Orr E. Reynolds fund to support a member for one month during the summer to aid in the development and maintenance of an Online Archive of Teaching Resources.
Council approved the addition of a Society representative to the Education Section of the AAAS.

Finance Committee

During the Spring meeting of Council, the Finance Committee chair reported that the Society continues to be financially sound and enjoys substantial financial growth through prudent investment practices. The Society uses up to 4% of the value of its investments annually as operating income. Only that amount required to balance the budget is withdrawn, the remainder continues in actively managed investment accounts.

The chair reviewed the 1998 budget versus actual income and expenses and presented the modified 1999 budget based on the 1998 actual figures. The Society employs a consolidated operating budget to manage overall operations. The consolidated budget is comprised of the individual budgets for the various cost centers, including publications, membership services, education, public affairs, marketing, executive and business offices. For 1998, the year ended with income of $13,029,100 (including $107,571 used from the allocation of 4% of the managed accounts to balance the budget) and expenses of $11,933,630 plus general and administrative (G&A) expenses of $1,095,470, for total expenses of $13,029,100. (G&A expenses are based on the ratio of the business/executive office expenses to total salary expenses.)

The 1999 budget approved by Council is a balanced budget of $14,201,871. To achieve a balanced budget, $82,076 from the managed accounts will be needed. This is .70%, with 4%, or $1,182,243, available.

The Finance Committee believes the resources are available and encourages the Council, and through it, the sections and committees, to identify new and existing programs to more fully utilize the available 4% investment income for the benefit of members and for enhancing services to the membership. As part of this program to enhance member benefits, the Committee recommended that members who are the first

of last authors, not be charged for color figures in all of the Society's journals.

Because of the strong financial performance of both the Giles F. Filley Memorial Award Program and the Caroline tum Suden Professional Opportunity Awards, the Committee recommended increasing the Filley Award to $25,000 and the number of tum Suden Awards from 20 to 30.

Council reviewed the publications and finance committees' recommendations for 2000 journal subscription prices. It should be pointed out that journal publication is the major source of revenue for the Society and is key to our financial well-being. Members are charged at a reduced rate and most of the profitability is derived from sale of subscriptions to institutions.

The finance committee recommended that member subscription prices remain at the 1998 level as a service to members. Non-member price increases were recommended as follows: consolidated *American Journal of Physiology*, 7.5%; *Journal of Neurophysiology*, 9.1%; *Journal of Applied Physiology*, 2.0%; *Physiological Reviews*, 3.0%; *AJP:Cell Physiology*, 7.0%; *AJP:Endocrinology and Metabolism*, 5.4%; *AJP:Gastrointestinal and Liver Physiology*, 12.5%; *AJP:Lung Cellular and Molecular Physiology*, 5.4%; *AJP:Heart and Circulatory Physiology*, 6.2%; *AJP:Regulatory, Integrative and Comparative Physiology*, 11.8%; *AJP:Renal Physiology*, 7.1%; *Advances in Physiology Education*, 10.0%; *News in Physiological Sciences*,10.0%; *The Physiologist*, 10.0%. The subscription price for *Physiological Genomics* was set at $200.

Print subscriptions include online access to the journals. In addition, members can access the entire online collection for $49.50. It was recommended that the online only institutional subscription remain unchanged from 1999. The Committee recommended to Council to approve a manuscript handling fee of $50 for the *Journal of Applied Physiology*, effective January 2000, as recommended by the Publications Committee.

In the past, 10% profitability for the publications program has been the Society's target. Although this target appears to be achievable, the Committee recommended, to Council, that the appropriateness of this target be reviewed. As part of this review process, the Committee also recommended that an ad hoc committee be designated to review the Society's journal pricing policy. This committee will also review the impact of the Society's online journal pricing policy on revenue generation. It was recommended that this committee be comprised of both scientists and librarians.

The Finance Committee reviews the performance of the four groups managing our investment accounts through the consultative services of Smith Barney. As of December 31, 1998, the accounts had the following market values: Operating Reserve Investment Account I $8,244,249, Operating Reserve Investment Account II $10,006,985, Publication Contingency and Reserve Account $9,283,370, Second Century Program Fund $2,793,947, Caroline tum Suden Account $742,605, IUPS Account $543,036, Perkins Memorial Fund $395,680, Giles F. Filley Memorial Fund $1,202,778, Shih-Chun Wang Fund $160,615, and the Guyton Fund $309,239. Investment performance for the entire fund averaged 20.61% for the year ended December 31, 1998. The equity portion was 23.69% and the fixed income portion was 10.70%. The total fund market value was $33,682,504.

The Finance Committee received the annual audit performed by PriceWaterhouseCoopers, LLP. In the opinion of the auditors, based on generally accepted accounting principles, the financial statements shown below fairly represent the financial position of the Society as of December 31, 1998.

Edward H. Blaine, Chair

Council accepted the report of the Finance Committee.

APS Statement of Financial Position

as of December 31, 1998

ASSETS

Cash and cash equivalents	$ 1,221,846
Investments (net)	39,665,428
Accounts receivable	1,386,107
Accrued interest receivable	306,199
Advances to section editors	211,955
Prepaid expenses	102,095
Furniture, fixtures, and equipment	175,456
Total assets	$43,069,086

LIABILITIES

Accounts payable and accrued expenses	1,134,089
Amount held for custodial funds	62,684
Unearned revenue	
Subscriptions	6,370,032
Dues and other	243,449
Total liabilities	$ 7,810,254

NET ASSETS

Unrestricted	$34,229,145
Temporarily restricted	1,017,187
Permanently restricted	12,500
Total net assets	35,258,832
Total liabilities and net assets	**$43,069,086**

APS Statement of Activities

for the year ended December 31, 1998

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Operating Revenue:				
Subscriptions	$ 7,759,845	$	$	$ 7,759,845
Manuscript handling fee	241,300			241,300
Online subscriptions	33,199			33,199
Back single issues reprints	1,076,828			1,076,828
Advertising and page charges	1,873,505			1,873,505
Sale of handbooks and royalties	107,550			107,550
Membership dues	269,982			269,982
Voluntary contribution and assessment	104,259	242,531		346,790
Conferences and meetings	476,546			476,546
Grants and contracts	790,523			790,523
Interest and dividends	1,180,377	46,033		1,226,410
Other income	25,921			25,921
Net assets released from restrictions	108,759	(108,759)		
Total operating revenue	$14,048,594	$ 179,805		$14,228,399
Expenses:				
Publication	10,675,780			10,675,780
Society general	1,184,600			1,184,600
Second century	35,040			35,040
Education	337,987			337,987
Marketing	159,054			159,054
Council designated	984,898			984,898
Total operating expenses	13,377,359			11,956,468
Operating change in net assets	671,235	179,805		851,040
Net realized gains on investments	2,313,198			2,313,198
Net unrealized gains on investments	1,770,923			1,770,923
Change in net assets	4,755,356	179,805		4,935,161
Net assets, beginning of year	29,473,789	837,382	12,500	30,323,671
Net assets, end of year	$34,229,145	$ 1,017,187	$ 12,500	$35,258,832

International Physiology Committee

The International Physiology Committee (IPC) met April 18, 1999 during the Experimental Biology '99 meeting in Washington DC.

The first order of business was an update given by **Shu Chien**, Treasurer of the IUPS, regarding the financial situation of the IUPS Congress in St. Petersburg. A discussion followed concerning what kind of interactions should the IPC have with the IUPS. Given the fact that APS is a major society participating at the IUPS and since the IPC is expected to deal with international affairs, it was suggested that this committee should establish some direct interactions with the IUPS. As a first step it was suggested that the Chair of the IPC could assist as an "ex-officio" member to the meetings of the IUPS.

The major topic of discussion was the formulation of a plan for the next two years. It was convened that it is time for the APS to concentrate its international efforts towards the sister Physiological Societies and individuals of the Americas. Formulation of a Latin-American initiative was proposed. This proposal consists of using a modest budget with the purpose of accomplishing the following objectives: *1*) supporting meetings and courses in Latin America, *2*) offering free on-line subscriptions of APS publications to educational institutions in Latin America, *3*) supporting the travel expenses of Latin American students and APS members to attend the annual Experimental Biology meeting, and *4*) organizing joint meetings between the APS and the sister Physiological Latin American Societies. The Chair of the IPC was asked to present concrete plans pertaining to this Latin American initiative to the Council.

Hector Rasgado-Flores, Chairman

Council accepted the report of the International Physiology Committee.
Council supported the Committee's ideas for a Latin American outreach effort and requested a detailed plan for such a program.

Joint Program Committee

EB '99 was held in Washington, DC, April 17 through 21, 1999. Scientific sessions and poster sessions were well attended. Scheduling the presentation of posters unopposed by oral sessions and situating the posters among the exhibits was thought to be a success by both meeting attendees and exhibitors alike. The new signage for the poster sessions was very well received with only positive feedback that it enhanced the ability to navigate the posters. The addition of carpeting to the exhibit hall was also a success in reducing the noise level and facilitating discussions around the posters and exhibits with positive feedback from our members, as well as members of the other participating societies and exhibitors. Also new this year were the use of featured topics to solicit abstracts for oral presentations around coordinated, timely topics. This new format was generally thought to be a good idea and was successful in creating more focused oral sessions. The flexibility to allow for the creation of abstract-driven oral sessions was felt to be a critical factor in the success of these featured topics.

There were six sponsoring societies at this year's meeting: APS, American Society for Pharmacology and Experimental Therapeutics (ASPET), American Society for Investigative Pathology (ASIP), American Society for Nutritional Sciences (ASNS), American Association of Immunologists (AAI), and the American Association of Anatomists (AAA). In addition, APS hosted four guest societies: Microcirculatory Society (MS), Biomedical Engineering Society (BMES), American Federation for Medical Research (AFMR), and Society for Experimental Biology and Medicine (SEBM). The attendance was quite good. There were 11,247 registered scientists, 1,454 exhibitors, as well as 648 "other" registrants, for a total attendance of 13,349 persons. Attendance remains a major concern for EB meetings, not only because it reflects the degree of interest by scientists, but also because exhibitors, who are the major source of revenue from these meetings, are encouraged by good attendance.

EB '99 was organized, in part, around eight scientific themes: Cardiovascular Biology, Cell Injury, Inflammation and Repair, Epithelial Cell Biology, Cellular Growth and Development, Metabolic and Disease Processes, Neurobiology, Respiratory Biology, and Signal Transduction and Gene Regulation. As in previous years, certain symposia, workshops, tutorials, and other forms of presentation were placed into the appropriate themes, and each theme ran

throughout the week or part thereof, usually in the same hall(s). This was the seventh year using the thematic format. Abstracts that had been submitted for specific themes were accommodated under the themes as slide sessions, minisymposia, or posters, while the remaining abstracts were organized into similar forms of presentation under the auspices of each of the sponsoring societies. Although the intention of creating themes that would cross society interests was to create a more coordinated meeting, it was generally agreed by the participating societies that the process of organizing the themes has been an impediment to planning the meeting. As a result, on June 4 the EB Program Committee agreed to eliminate themes (as they currently exist) for future meetings with the understanding that some other process be developed to coordinate "inter-Society" programming.

The development of EB '99 represented a transition year for the implementation of the recommendations of APS Council to allow for the sections to have more responsibility for developing the scientific program. The intention of these recommendations was to empower the membership and allow sections the opportunity to create meetings within the EB meeting and highlight the best and hottest science. As a result of these recommendations, each section has created a Section Program Committee (SPC) responsible for developing a designated number of Symposia and "Featured Topics." The Chairs of the SPCs, together with the at-large members Program Committee, comprise a Joint Program Committee (JPC) charged with the overall quality of the APS program, seeding cross-cutting interdisciplinary "In Foci" elements of the APS/EB meeting, seeding oral sessions (Featured Topics), clustering and coordination of abstracts for the poster sessions and planning "inter-Society" programming. These changes have been embraced enthusiastically by the sections and it was considered to have been a major contributor to an exciting EB '99 meeting. The recommended timeline for developing the scientific program has also been modified to maximize inclusion of the late-breaking science at the EB meeting. This included the provision for a Late-Breaking Abstract submission in February. Feedback on the ability to submit abstracts in February was generally good.

EB '99 marked the fourth Physiology InFocus program. Organized by **Victor Dzau** and **L. Gabriel Navar**, the program topic "Genomics and Molecular Medicine" included four half-day symposia scheduled throughout the meeting. Attendance was good, and the quality of the sessions was outstanding. Plans have been made to ensure that Physiology InFocus will be a highlight at EB 2000, both scientifically and in pre-meeting publicity.

Of a total of 6,706 volunteered abstracts submitted, 2,605 (39%) came through APS. Of the 6,636 total abstracts programmed, 3,038 (46%) were incorporated into themes. The remaining 3,598 (54%) were presented under the auspices of the sponsoring societies. Of the 2,605 abstracts submitted to the APS, 1,672 (64%) were presented as part of the themes, whereas 933 (36%) were presented as part of the societal program.

Experimental Biology 2000

The Joint Program Committee (JPC) met in January to schedule abstracts for the EB '99 meeting and develop preliminary plans for symposia and featured topics for EB 2000. These preliminary plans were distributed to the SPCs responsible for soliciting proposals. The JPC met on April 17 to review the symposia proposed by the sections to ensure minimum overlap or duplication and to suggest areas of potential coordination. The Committee also reviewed the symposia sponsored by the various guest societies of APS. The Committee's work was greatly facilitated through the efforts of Linda Allen, who collected and coordinated the distribution of all of the solicited and unsolicited symposia proposals. On June 22, the JPC met again to finalize the recommendations of the SPCs for symposia and featured topics.

In addition to these symposia and featured topics, there will be sessions based on submitted abstracts. There is continuing awareness of the importance of including women and members of underrepresented minorities, as well as junior scientists on the panels of invited speakers. By and large, the proposals that have been proposed this year showed this awareness. The SPCs will be advised to remind applicants of this matter in considering participants for symposia proposals.

The 2000 Physiology InFocus program, organized by **Walter Boron**, will include four sessions and is entitled "Membrane Proteins." Sessions will focus on genomic aspects of membrane proteins, structural biology of membrane proteins, structure-function analyses, and aquaporins.

In addition, there will be 12 Distinguished Lectureships and the Bowditch and Cannon Lectureships. The Society will also hold the second annual Walter C. Randall Lecture in Biomedical Ethics, which will be presented by Edmund D. Pellegrino, Director of the Center for Clinical Bioethics at Georgetown University Medical Center.

APS Conferences

By and large, the APS Conference Program, which was initiated in 1991, has been very successful and is continuing to improve. We are striving for a goal in which APS Conferences will be so prestigious that they will become very competitive. That point is nearly at hand, but, in the meantime, we still have to solicit proposals. One deterrent may be the long lead-time of 2+ years for conference approval. The JPC recommended, and Council approved, shortening the lead-time from 2+ years to 18+ months. This would change the current yearly deadline from February 15, slightly two years prior a proposed conference, to February 15, slightly one year prior to a proposed conference. In addition, the JPC recommended, and Council approved, forming an ad hoc committee to evaluate the APS Conference program. The

committee will be comprised of one or more current JPC member, former APS Conference organizer(s), and former Program Committee member(s) at the time the conference program was first being formed (for historical perspective).

Scheduled APS Conferences include:

1999 APS Conference. September 22-25, Snowmass, CO. "Biology of Potassium Channels: From Molecules to Disease," organized by Steven C. Hebert and Gerhard Giebisch.

1999 APS Conference. October 19-22, Ft. Lauderdale, FL. "Determinants of Vigilance: Interaction Between Sleep and Circadian Systems," organized by Allan I. Pack.

2000 APS Conference. August 23-27, Iowa City, IA. "Baroreceptor and Cardiopulmonary Reflexes" organized by Mark Chapleau.

2000 APS Intersociety Meeting. September 21-23, Portland, ME. "The Integrative Biology of Exercise," organized by Peter Wagner.

2001 APS Conference. October 10-14, Banff, Alberta, Canada. "Cellular and Molecular Physiology of Sodium-Calcium Exchange," organized by Jonathan Lytton.

Judith A. Neubauer, Chair

Council accepted the report of the Joint Program Committee.

Council approved a second conference for 2001 entitled "Genome and Hormones: An Integrative Approach to Gender Differences in Physiology" organized by Virginia Miller.

Liaison With Industry Committee

The current Liaison With Industry Committee has been considering its role in the Society and whether it needs to exist at all. The Chairperson of the committee sent a letter to all APS members that the Society identified as having some affiliation with the Members in Industry Group. Of the 257 letters sent, only 18 written or telephone responses were received. Of the respondents, only two felt the committee should continue in its current form, most felt the committee should be disbanded and a few suggested there may be alternatives to consider. In addition, a strong letter was received from **L. Gabriel Navar** (now Past President of APS) suggesting the Committee should remain as is: "As part of our efforts to be responsive to all our constituency and to be inclusive, APS Council has felt that it is important and worthwhile to have a committee of APS members that work to foster and nurture communications and interactions between the society and our APS members that are associated with the corporate and industrial sector. We prefer the committee structure rather than the appointment of a single individual in order to allow greater opportunities for interaction as well as more sources of ideas and input."

The Liaison With Industry Committee met at the recent Experimental Biology '99 meeting with this issue as the primary focus of its agenda. Those present discussed the responses to the letter to the Members of Industry Group, the letter from Navar, the concerns raised from discussion at Council, and ideas to remedy the situation.

The Committee identified an alternative proposal for its continuance.

> The LWIC should remain as an APS committee so that industry-related action items can be brought directly to Council. However, each of the 12 Society Sections, e.g. Cardiovascular, Cell & General, etc., will identify an industry representative from its Section members to serve on that section's Steering Committee as a full voting member. (In many cases, this arrangement already exists). The LWIC would be made up of these individuals and would meet on an annual basis at Experimental Biology to discuss issues of common concern, or to initiate proposals, through Council, that have Society-wide effects to enhance relationships with industry. A Chairperson from this group will be identified and recommended to Committee on Committees to serve a three-year term to establish continuity. From this group of "liaisons" the Committee on Committees should also identify individuals to serve as full voting members on all other Society committees, if possible. Assignment of industry members to all APS committees would obviate the need for ex officio membership from various committees on the LWIC and visa versa. A Council member, or the Society's Executive Director, should have responsibility to attend (possibly, as a committee member) LWIC meetings at Experimental Biology to facilitate direct communication between Council and industry on subjects of mutual interest.

This proposal was favored because *1*) it takes the greatest advantage of natural people networks, i.e. people in industry who identify with a particular section are most likely to be known by the members of the section and, within the Society context, will have the greatest impact to foster Society-industry relationships at the level of mutual research/career inter-

ests; *2*) with regard to Experimental Biology programming, there is no need for the LWIC to sponsor symposia and it is generally more appropriate for symposia to be sponsored through the logical section affiliation (and, industry members serving on section steering committees would be appropriately positioned to suggest program content and speakers relevant to industry needs and interests); and *3*) the integration of industry members on all Society committees is essential to encourage meaningful contributions by industry members to matters of general importance to the Society and to counteract the prevailing feeling of "separateness" among industry members, and is a fundamentally physiologic concept.

It is also recommended that, "industry" be more narrowly defined as members involved in laboratory-based, commercial research, and that the Societies designation of a Members in Industry Group not be a catch-all for those who do not hold a traditional academic appointment. It is believed that this definition more accurately represents the Society's use of the term industry.

The duties of the new LWIC would minimally be only one of the original five LWIC duties, but could be expanded based on suggestions from Council or in response to an agenda-driven discussion at the next meeting of the LWIC at Experimental Biology 2000.

Terry J. Opgenorth, Chair

Council accepted the report of the Liaison With Industry Committee.
Council approved a revised version of the Committee's proposal as follows:
"The LWIC should remain as an APS Committee so that industry-related action items can be brought directly to Council. However, each of the 12 Society Sections will identify an industry representative from its section to serve on the Liaison With Industry Committee. The LWIC would meet at least once a year at the Experimental Biology meeting to discuss issues of common concern or to initiate proposals, through Council, that have Society-wide effects to enhance relationships with industry. A Committee Chair would be selected by the Committee on Committees to serve for a three-year term to provide lead ership and continuity."
The Council requested that the revised Committee develop a new charge for the LWIC.

Long-Range Planning Committee

As a result of last year's Council meeting, the Long-Range Planning Committee was designated a larger role in the preparation of the Strategic Planning retreat (Nov. 14-16). Our Committee is acting in a coordinating fashion to bring issues from diverse elements of the Society to the retreat. Each of the members of the Committee will be responsible for summarizing issues for Society committees and activities. The assignments are Membership—Beierwaltes, Finance—Duling, Education—Horowitz, Publication—Cook, Meetings—Traystman, Public Affairs—Fink, and Organizational Operations—Duling. The Committee is reviewing the goals and objectives of the last Strategic Plan, the reports of the intervening special strategic planning retreats, and the membership survey conducted in 1998. Members of the committee are preparing brief summaries which addresses the following five items:

1) Issues related to the mission of the American Physiological Society.
2) Current status in terms of programs under the existing strategic plan.
3) Strengths, weaknesses, opportunities, and threats (SWOT).
4) Stakeholders who are critical to the issues addressed.
5) Critical issues for the Society.

This report will be supplemented with a more detailed plan for the retreat during the summer. A summary of the agenda items for the retreat will be published in *The Physiologist* prior to the retreat, and comments will be solicited from the membership.

Brian R. Duling, Chair

Council accepted the report of the Long-Range Planning Committee.
Council accepted the proposed preliminary agenda for the Strategic Planning Retreat.

Membership Committee Report

It is a pleasure to report that the Membership Committee has voted in 504 new members during the past year (includes Summer 1998, Fall 1998, and Spring 1999). This is 182 more new members than we voted in last year (322 new members in 1998). In addition, we have recently completed our Summer 1999 round of voting and have passed another 111 members, to total 615 new members. In this round of voting, we found that the majority of our new members hold a PhD degree (82%), 13% hold an MD degree, and 3% hold both MD and PhD degrees. The remaining applicants hold other degrees (i.e., DVM, MS). Clearly, the membership and advertising offices have been working hard to help increase the number of applicants during this past year. We are hopeful, that the change in policy to include all members as Regular members will increase membership further in the coming year.

Members of the Membership Committee met at Experimental Biology 1999 in Washington, DC. We discussed a number issues related to responsibilities of our Committee. For example, during the past year, the Membership Committee has agreed to extend admission to applicants with one or more publications with their name *anywhere* in the publication list (rather than *first* author). In addition, we agreed to welcome scientists from a variety of disciplines, rather than only those with a more traditional physiology training. By including individuals from different fields of study, we hope to broaden the scope of our society interests and, ultimately, encourage collaborative efforts in research and teaching between our members.

We were very happy that Council voted and agreed to collapse our two membership categories (Regular and Corresponding) and include all new and previous members as Regular members. This will ensure that every member (from the Americas and other countries) has equal rights within the Society.

A major focus of our Spring meeting was discussing methods to increase membership and, specifically, determine how to advertise our new membership categories. A primary concern was to get a complete list of physiology-related societies and journals in other countries to encourage worldwide applicants. In addition, we suggested that the APS encourage new applicants by emphasizing enrollment during the millenium year. There were a number of other methods mentioned, such as encouraging members from other FASEB societies by discounting these individuals' first year of membership and writing to all department chairs to encourage their faculty to join APS. There is some concern that the Membership Application is not readily accessible for applicants in the journals. Hence, it is suggested that the Application is either sent frequently along with other mail to APS members and/or appear more regularly in *The Physiologist*.

Sue A. Shapses, Chair

Council accepted the report of the Membership Committee.

Perkins Memorial Fund Committee

The Perkins Memorial Fund Committee supervises maintenance of the Perkins Memorial Fund and reviews applications and selects recipients of the award, which enables visiting foreign scientists to also bring his/her family to the US to enhance their experience.

For the June 1998 deadline, no applications were received for consideration.

For the December 1998 deadline, the Committee considered one application for the Perkins Memorial Fellowship Award and recommended its approval. Pascal Barbry received the award for February 1998-July 1999 in the laboratory of Michael A. Matthay of the University of California, San Francisco.

Only $3,000 of the $12,000 available for the 1998 awards was used. Members are urged to nominate for the award foreign scientists who are visiting their laboratories for an extended time with their families.

Aviad Haramati, Chair

Council accepted the report of the Perkins Memorial Fund Committee.

Interested in serving on an APS Committee? See the Committee Nomination Form in this issue or on the web at http://www.faseb.org/aps/committee/nominate.htm.

Porter Physiology Development Committee

The Committee recognizes the extraordinary commitment and service of Eleanor L. Ison-Franklin, co-chair of the Porter Physiology Development Committee from 1984 until her death on October 1, 1998. By her work and example, she touched the lives of many, increasing the representation of minorities in research and health professional careers. Her outstanding leadership will be missed. Pamela J. Gunter-Smith, Porter Professor of Physiology and Chair of Biology, Spelman College was asked to assume the position of co-chair. She is a past Porter Predoctoral Fellow (1973-1977) who has served two previous terms as a member of the committee.

On March 31, 1999 the Porter Physiology Development Fund had a budget of $243,335. Included in this amount are new contributions of $123,004 received in 1999 ($14,500 from Merck, $62,984 from the William Townsend Porter Foundation, $40,000 from the American Physiological Society, $20 in voluntary contributions and $5,500 from Procter and Gamble). The Porter Physiology Development Committee expresses its sincere appreciation for this support, which funds the important work of the committee and the educational programs of the APS. The Committee especially thanks the William Townsend Porter Foundation and APS for their continued support.

In January 1999, the Porter Physiology Development Committee served as the review panel for the APS Minority Travel Fellowship Awards. Sixty-five applications were received and reviewed for travel to Experimental Biology '99. Thirty-five travel fellowships were awarded.

The annual meeting of the Porter Physiology Development Committee was held during EB '99 on April 20 in Washington, DC. In addition to Gunter-Smith, the committee welcomed the following new committee members: **Parimal Chowdhury** (University of Arkansas), and **Evangeline Motley** (Meharry Medical College, past Porter Postdoctoral Fellow 1989-1991). The committee thanks **Margaret Colden-Stanfield**, **Rainier Beeuwkes**, **J. Michael Overton** and **R. Clinton Webb** for their past service. The following items were discussed.

General Issues

Mechanisms to increase advertisement of fellowship opportunities

The development of a new brochure to attract applicants and their mentors

Biannual announcement of fellowship opportunities in *The Physiologist* with tear-out application request forms

E-mail to past Travel Fellows

Fellowship notification to departments serving undergraduates (e.g., Departments of Biology)

Survey of current Porter Fellows and Travel Fellows with respect to recommendations for ways to increase the number of applicants

Add Porter Fellowship announcements to the "What's New" section on the APS web site

Issues related to Porter Fellowships

Consider increasing fellowship amounts after review of current stipend levels for other predoctoral fellowships (e.g., NIH)

Issues related to Minority Travel Awards

Recommendations for review criteria in light of a diverse applicant pool (undergraduates, postdocs, predocs and faculty)

Encouraging institutional/mentor funding for minority student travel

Issues related to the Committee

Consider adding a student member to the committee

Create a ListServe to facilitate communication among committee members

Committee co-chair Maurice Goodman proposed that one of the Porter Fellows be designated "The Eleanor Ison-Franklin Fellow." The Committee overwhelmingly approved this motion and suggested that this award be given to the Porter Fellow receiving the highest rating. The Committee agreed to continue discussion of other items during the year (via E-mail and conference call) and/or at the next meeting.

Seven applications for Porter Physiology Fellowships received by the January 15 deadline were considered for funding. All seven were recommended (some pending receipt of additional information) and the candidates notified of their awards in June. The 1999 Porter Fellows are: *1*) **Robert Carter III**, Department of Integrative Physiology, University of North Texas, Fort Worth, TX, 4th year PhD student. Mentor: **Michael L. Smith**; Research: Vestibular Modulation of Autonomic Responses to Orthostasis, *2*) **Stanley P. Carlyle** (renewal), Department of Physiology and Biophysics, Howard University School of Medicine, 3rd year PhD student. Mentor: **Richard Mills**; Research: Blood Pressure Hyper-reactivity in Stress and Hypertension, *3*) **George Ekema** (renewal), Department of Physiology, Wright State University School of Medicine, 4th year PhD student. Mentor: **Lou Lu**; Research: Subunit-specific and Motif-specific Assembly of the GABA Receptor/Channels ρ1 Subunits with β2 and γ2 Subunits to form Heterooligometric Chloride Channels, *4*) **Orlando Gonzalez**, Department of Physiology, University of Puerto Rico Medical Sciences, 3rd year PhD student. Mentor: **Guido E. Santacana Vazquez**; Research: The Role of the Airway Epithelium in Cold-induced Bronchoconstriction, *5*) **Paul Gray**, Interdepartmental PhD program for Neuroscience, University of California, Los

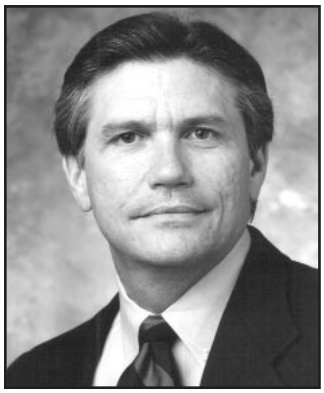
Angeles, 4th year PhD student. Mentor: **Jack Feldman**; Research: The Identification of Specific Cells within the preBotzinger Complex that Serve as the Core of the Respiratory Rhythm Generating Network. *6*) **Cheryl Rust** (renewal), Department of Physiology and Biophysics, Howard University School of Medicine, 3rd year PhD student; Mentor: **Felix Grissom**; Research: Altered IGF Activity in Diabetic Wounds. *7*) **Tracy Yarbrough**, Department of Physiology and Biophysics, University of Iowa, 5th year MD/PhD student. Mentor: **Erwin Shibata**; Research: Human Cardiac Sodium Channels; turned down fellowship due to receipt of other funding.

In addition to awarding new (and renewal) fellowships, funding was continued for three Porter Physiology Fellows awarded in 1998: **Rayna Jo Gonzales** (University of New Mexico), **Ignatio Moore** (Oregon State University), and **Kameha Kidd** (University of Arizona). These young scientists have made excellent progress. Importantly, it is evident from their reports that the Porter Physiology Development Predoctoral Fellowship played a significant role in their success.

Pamela J. Gunter-Smith, Co-chair

Council accepted the report of the Porter Physiology Development Committee.
Council approved the designation of one of the Porter Fellows as the Eleanor Ison-Franklin Fellow in memory of long-time Porter Physiology Development Committee Co-Chair Eleanor Ison-Franklin.

Public Affairs Committee Report



The Public Affairs Committee advises the APS Council on policy issues that influence the conduct of science so that the Society can act on behalf of physiologists. Some issues, such as research funding, are addressed in concert with FASEB providing APS a stronger platform to present its view. During the past year, there were several recurring topics that the Committee continued to address, as well as some new issues that came before us. Importantly, the Public Affairs Committee, with the help of Council, launched an initiative to stimulate the scientific community in making Congress and the public aware of advances in physiology.

A Call to Activism

EB '99 served as the venue to launch "A Call to Activism." Approved by Council last year, the program is designed to facilitate the interactions of physiologists with Congress and the public. APS was joined by five other societies in developing a program for EB '99. Speaking kits were developed to provide APS members with information on how to approach members of Congress. The message was reinforced with buttons supporting the doubling of the NIH budget. The symposium, "A Call to Activism," featuring Shirley Ruhe, Mike Stephens, and former Congressman Butler Derrick was held to provide first-hand advise on how to approach Congress.

In the coming year, the Committee will continue to develop ways to lure the scientific community into activism, providing reminders and materials to facilitate communication. Development of the second phase of the program will be started by emphasizing communication with the general public about science.

Funding

Funding for FY 2000 remains undetermined at this time. The FY 2000 Funding Consensus Conference suggested 15% increases for both NIH and NSF. There are challenges to a 15% increase providing another step toward a five-year doubling of the NIH budget. The principal problem is the budget caps. Until limitations on spending are resolved, there will be slow movement on funding issues since no one will know how much money will be available.

FOIA Release of Research Data

Last year's Postal and Treasury Bill received a last-minute amendment that would require the release of federally funded research data upon request. OMB was required to propose regulations that were posted for comment. Response has been supportive of the regulations, largely because of email "postcards" through promotional efforts of a few websites. OMB, however, will look at the substance of the responses as well as the number of responses. It is expected that a second draft of the comments will be put out for comment. There was hope in late May that an amendment would be added to the House Treasury Postal Appropriation bill for next year to delay implementation of the FOIA provision for one year. However, the House left for its Memorial Day recess without acting on the bill, and in the mean time, opponents gathered their forces against it. It was not clear whether this amendment would succeed. Most observers think that a legislative solution will ultimately be required. The Public Affairs Committee is closely monitoring this issue.

Regulatory Burden

In the past year, NIH commissioned a study on the impact of federal regulations on research. Five areas were examined by focus groups: the use of animals, human studies, hazardous wastes, research integrity, and conflict of interest. The

Mahoney Report was submitted to NIH early this year and posted for comments. The FASEB Science Policy Committee formed a committee to create a response to the report from the scientific community. The APS is also exploring participation in an effort to implement one of the recommendations of the animal group, namely to revise USDA Animal care Policies 11 and 12, dealing with the definition of painful procedures and fulfilling the requirement to seek an alternative to them.

AAAS Mass Media Fellowship Update

Last year's publicity efforts yielded nine applicants for the APS-sponsored AAAS Mass Media Fellowship. Two of the candidates made it to the semi-finalist stage and were placed in this summer's program. APS sponsored one of the fellows. A similar promotional effort will be made this year. Members of the Animal Care and Experimentation and Public Affairs Committees will help screen the candidates this year.

Animal Facility Cost Reimbursement Update

The distribution of direct and indirect costs pertaining to centralized animal facilities remains an active issue. The present stance of OMB is that centralized animal facilities are "specialized facilities." Consequently, they should be charged to direct costs of grants. The argument has been made by APS, FASEB, ILAR and NIH that centralized research facilities are an extension of research space and should, at least in large part, be charged to indirect costs. This issue has been going back and forth for a number of years, then activity increased last fall following a report by ILAR supporting the APS position. A letter from HHS to OMB supporting the APS position has been drafted and is under review at NIH.

With the guidance of Alice Ra'anan, the Public Affairs Committee remains active and attempts to keep the membership informed about activities affecting the conduct of research. Suggestions and comments are always welcome.

Joseph R. Haywood, Chair

Council accepted the report of the Public Affairs Committee.
Council voted to continue the current format of the FASEB Consensus Conference on Federal Funding.
Council decided to sign onto a letter to Congress endorsing the utilization of Federal funds for stem cell research.

Committee Reports are also available on the Web at http://www.faseb.org/aps/Committees.html.

Publications Committee

Several very significant events took place in 1998: the online launch of the *American Journal of Physiology* and *Physiological Reviews*; the decision to allow institutions to purchase online-only subscriptions to APS journals; the start of a new Society journal, *Physiological Genomics*; and the decision to develop a new manuscript tracking system (called APS Central) that has the capability for the electronic submission and review of manuscripts in 1999. This new system will be field-tested beginning July 1, with *Physiological Genomics* and *Journal of Applied Physiology*, with the hope that by Spring of 2000 all of the APS journals will be utilizing this system.

The online launch of *American Journal of Physiology* went smoothly, and several valuable services for users were added to all the online journals during the year, such as CiteTrack for individual subscribers, advance tables of contents, and reciprocal full-text viewing of articles in other journal's reference lists within the HighWire Press publishing group.

Victor Dzau accepted the position as editor for *Physiological Genomics* and chose a prestigious board of senior editors, associate editors, and editorial board members, as well as a deputy editor, Finley Austin, to coordinate the journal in Boston. The journal was announced on the APS web page and promoted widely by advertisements in other journals and through mailings; several research manuscripts were received and the first papers have been accepted. The decision was made to publish the journal online prior to print in July 1999.

Manuscript Submission Fee

A system for payment of the mandatory submission fee ($50) for the *Journal of Neurophysiology* and the *American Journal of Physiology* was successfully implemented. The fee brought in approximately $240,000 for journal operations. It was decided to extend the fee to the *Journal of Applied Physiology*, beginning January 1, 2000. Council approved this decision.

Mandatory Page Charges

The new policy of mandatory page charges was strictly enforced for articles submitted in 1998, and, as a result, although pages published decreased by almost 8%, page charge income only decreased by 5%. Strong objections have been raised particularly by overseas authors who have difficulty accepting the fact that waivers are no longer granted.

The APS Publications Department will track whether submissions from overseas have declined because of this policy. Waivers were still permitted for articles submitted in 1997.

Free Color

The new policy of giving free color to authors in the *Journal of Neurophysiology* who are APS members resulted in 19 authors (with a total of 55 figures) taking advantage of this offer. It is difficult to obtain statistics on how many members joined the Society because of this specific benefit, but there was a great deal of interest in APS membership at the Neuroscience meeting held in Los Angeles. Council approved the extension of free color for APS members who are first and last authors to the *American Journal of Physiology* and the *Journal of Applied Physiology*.

Page Caps

To control escalating costs and reduce the number of pages published, editors were asked to adhere to mutually agreed upon page caps for their journals, as well as to increase rejection rates, and to encourage shorter articles. It was agreed that the smaller journals be allowed to grow and perhaps exceed the page caps. Five journals published less than their page cap, two journals published more, and two were on target. Overall, the cap of the annual number of pages to be published in 1998 was 33,100. The actual number of pages published was 32,511.

Editor Appointments/Reappointments

The Publications Committee reappointed four editors to second terms in 1998: **Jeff Pessin** (*AJP: Endocrinology and Metabolism*), **John Hall** (*AJP: Regulatory, Integrative and Comparative Physiology*) **Peter Strick** (*Journal of Neurophysiology)*, and **Steve Hebert** (*AJP: Renal Physiology*). **Penny Hansen** was reappointed to a third term for *Advances In Physiology Education*. The Committee appointed **David Harder** as the new editor for *AJP: Heart and Circulatory Physiology* and **Gary Sieck** as the new editor for the *Journal of Applied Physiology*; their terms began in January and July 1999, respectively. Following interviews at the 1999 Experimental Biology meeting in Washington, DC, the Committee chose **Asrar Malik** as the next editor for *AJP: Lung Cellular and Molecular Physiology*.

Signal Transduction Knowledge Environment

The APS has agreed to participate in a venture designed to create an electronic knowledge environment. AAAS and HighWire Press have developed a prototype for a virtual journal based on signal transduction research. This project is being funded by The Pew Charitable Trust and The Charles A. Dana Foundation. They have requested the involvement of a select number of HighWire journals, including those of the APS and *Science, Proceedings of the National Academy of Sciences, Journal of Biological Chemistry, Journal of Lipid Research, Journal of Clinical Chemistry, Journal of Histochemistry and Cytochemistry*, and others, to participate for a limited time (June-October 1999) to assess utilization of environments of this sort. Users will have access to the full-text of all articles appearing in any of the participating journals. AAAS will provide feedback on usage during this free trial period to the APS so that the Society can decide whether to continue to participate in the project after October.

Centennial Celebrations

The centennial of the publication of the Society's journals was celebrated by a series of special articles in the journals, new covers, logos, a celebratory banquet, and "A Living History of 100 Years of the American Journal of Physiology" held at the EB '98 Spring Meeting in San Francisco. **Charles M. Tipton**, **Daniel L. Gilbert**, and **Gerald L. Geison** organized the play in which APS members represented historical figures. **Rusty Johnson** and **Brenda Rauner** played themselves.

Other Items of Significance

Books

In 1998 one handbook (Volume 1: *Cellular Endocrinology*, edited by P.M.Conn) and one history book (*High Life: History of High Altitude Physiology and Medicine*, by J. West) were published. A final book in the now discontinued Clinical Physiology Series (*Lung Development*, edited by C. Gaultier, J.R. Bourbon, and M. Post) was published in early 1999.

Manuscripts Submitted

Manuscripts submitted to the research journals decreased by 5% overall in 1998 (6,508 compared to 6,865 in 1997). However, the number of submissions to all the journals for 1999 has, thus far, increased. As of June 1, 190 more manuscripts have been received as compared to the same period in 1998. This represents a 4.4% increase compared to 1997 submissions.

Subscriptions

Personal and institutional subscriptions continue to decline. However, in 1998, 672 members took advantage of the $49.50 offer for all APS journals online and almost 900 more members signed up for 1999. The effect of this offer on individual print subscriptions, if any, is not apparent yet, but it will be monitored by the Subscription Manager.

Mandatory Submission Form

Upon the recommendation of the Publications Committee, Council approved the motion to eliminate the requirement that all authors sign the mandatory submission form. The form must be signed by the corresponding author who signs

on behalf of all of the co-authors. Co-authors, nonetheless, will still be held responsible for abiding by the stipulations on that form. Implementation of this policy has been delayed until January 2000 in order to allow time for APS Central to become established.

Time From Acceptance to Publication

In 1998, the average time from acceptance to publication was 3.5 months (2.5 for rapid publications). As soon as manuscripts are received in the APS office, they are slated for the next available issue.

Retirements of Brenda Rauner and Laurie Chambers

Brenda B. Rauner has been a member of the APS staff since 1973. With the sudden death of Stephen Geiger in 1987, Brenda assumed the position of Publications Manager and Executive Editor. After 26 years with APS, Brenda retired on April 30, 1999. In order to assess Brenda's impact on the Society's publications program, it is worthwhile to reminisce about what it was like during some of the milestones in her career. In 1973, when Brenda joined the APS staff, the journal program produced four journals: *AJP*, *JAP*, *JN*, and *PRV*. These journals published 925 papers for a total of 4,314 pages. In 1987, when Brenda became Publications Manager and Executive Editor, the Society published 2,567 articles for a total of 23,964 pages. However, in 1987, the Society not only published the four main journals: *AJP*, *JAP*, *JN*, and *PRV*, but it also published six AJP sectional journals (*AJP:Cell*, *AJP:Endo*, *AJP:GI*, *AJP:Heart*, *AJP:Regu*, and *AJP:Fluid*). In 1998, the last complete year prior to Brenda's scheduled retirement, the journal program consisted of *AJP*, *JAP*, *JN*, and *PRV*, with *AJP* consisting of eight sectional journals with the addition of *AJP:Lung* and *AJP:Advances*. Each of these journals exists in print and online. In addition, the Society publishes *NIPS* and *APStracts*. In 1998, APS published 3,872 articles for a total of 34,103 pages. As we start 1999, we are preparing for the launch of a new journal, *Physiological Genomics*. Overall, Brenda's career has spanned a period in printing that has gone from hot metal type to digital composition to publication on the web. Her contributions to the Society's publication program were enormous.

Laurie Chambers, long-time Production Manager, has also retired from APS, effective May 31, 1999. Likewise, Laurie's contributions have been outstanding. Laurie first joined the APS staff over 38 years ago, and after an extended leave to raise her children, returned to the APS to work in Publications and was named Production Manager in 1987. Her successor has yet to be appointed.

Appointment of New Publications Manager/Executive Editor

After a nationwide search, Margaret Reich was appointed new Publications Manager/Executive Editor. Margaret comes to the APS with over 15 years of experience in publications serving most recently as Journal Director for *Annals of Emergency Medicine*, based in Dallas, Texas.

Action Items for the July 1999 Council Meeting

Two items were brought before the Council at the July 1999 meeting:

1) That Council accept the recommendation of the Publications Committee to approve the following policy statement concerning prepublication on the web (to appear in Instructions for Authors):

> Submitted manuscripts are processed with the understanding that they have not been published previously in print or electronic format, and are not simultaneously being considered by another print or electronic journal for publication. However, data portions of submitted papers that have appeared on an author's personal web site will be permitted, with the proviso that the author inform the editor at the time of the submission that such material exists so that the editor can make a determination of the suitability of such material for publication in the journals of the American Physiological Society. Failure to do so will result in an automatic rejection of the manuscript. Examples of such work include, but are not limited to, immunofluorescence micrographs and/or animated gif/video files posted on a personal web site, or NIH-mandated web posting of DNA microarray data. After the article is published in an APS journal, the data should be taken off the author's web site.

In addition, the mandatory submission form should contain boxes (yes or no) that the authors must check to indicate whether or not any portions of the manuscript have been posted on the web or any other electronic media.

This action item was developed after questions arose from authors about whether or not postings on the World Wide Web constituted prepublication. The Publications Committee and Journal Editors were polled for their comments and approval before submitting this item.

2) That the Council accept the recommendation of the Publications Committee to reappoint **Stanley Schultz** as Editor of *NIPS*.

Stanley Schultz's second term as Editor of *NIPS* ends June, 2000. Rusty Johnson proposed that the two-term restriction of editors of "review" journals like *NIPS* or *PRV* be waived. Stanley is eager to accept a third term as Editor of *NIPS*, and the Publications Committee is unanimous in its support of re-appointing him for a third term.

I am honored to have been appointed as Chair of the APS Publications Committee. I commit myself to provide the nec-

essary leadership to oversee existing policies and develop new ones with regard to publications, melding the time-honored lessons of rigorous peer review with the new (and unknown) demands of electronic publishing, upholding the high ethical standards that have characterized and distinguished the APS publications program, and, perhaps most importantly, recruiting and choosing the best editors for our journals. A major goal is to have all of the accepted articles published on-line prior to print.

Dale Benos, Chair

Council accepted the report of the Publications Committee.
Council approved the policy statement concerning pre-publication on the Web.
Council approved the reappointment of **Stanley Schultz** to a third term as editor of *News in Physiological Sciences*.
Council approved a one-year extension of **Peter Strick's** second term as editor of *Journal of Neuroscience*.

Section Advisory Committee

The Section Advisory Committee (SAC) met separately and in a joint session with APS Council on April 16 at Experimental Biology '99. The primary areas of discussion included: *1*) programming—progress by the sections in utilizing the new programming format for the Experimental Biology meeting; *2*) membership—mechanisms for attracting the brightest young investigators to join APS and to actively participate in session activities; *3*) section operator's manuals and member databases; *4*) public affairs/advocacy; and *5*) the strategic planning retreat.

Programming

The sections enthusiastically support the new programming format and feel that this has significantly enhanced the quality of the Experimental Biology meeting. Although the process seems to be working well, SAC recommended that the Joint Programming Committee (JPC) address the issue of cross-sectional programming in order to minimize possible overlaps among the sections, and to improve overall coordination of section programming. Combining the section programming topics has reduced the number of abstracts submitted to some sections and increased submissions to others; some topic categories are relevant to research interests of multiple sections. The topic categories should be continuously reexamined, removing outdated topics and adding others to better reflect current research interests.

We also discussed the APS conferences and recommended that the lead time for submitting the conferences for review to be reduced as much as possible, from two years to no more than 18 months. This would likely lead to more conference proposals and help to ensure that the latest research was included in the conferences. SAC felt that the APS conferences could provide an attractive mechanism to highlight research activities of the sections and serve as a means for attracting new members to the sections.

Membership

There is concern that we are not currently attracting enough bright new investigators to the field of physiology. SAC recommends that APS increase the number of travel awards to the Experimental Biology meeting by providing two travel awards ($500 each) for each section and $12,000 each year for an additional 24 travel awards ($500 each) that would be distributed among the sections based on the number of abstract submissions, as is currently done with the Proctor and Gamble Awards. The total financial commitment recommended by SAC was $24,000 for a total of 48 new travel awards.

We believe that one of the major themes for the strategic planning session should be innovative mechanisms to convert the considerable resources of APS to additional benefits for its members; this would then attract additional new members to the Society.

SAC also recommended that the APS membership questionnaire be revised and that APS acquire an online searchable database which Section Steering Committee members could query. This would permit the Steering Committees of the sections to better utilize the talents of the more members, especially if the database included information on the members' research interests, teaching activities, section affiliation, etc. An accessible database would also improve the efficiency with which the Steering Committee communicates with its members.

Most sections have developed an Operator's Manual and and a set of Standard Operating Procedures for Steering Committee members. These manuals continue to be improved and should be a valuable resource. SAC recommends that section membership lists be provided to Steering Committee members on a regular basis and include not only the names of the section members, but also the state and institution, e-mail addresses, and other information as it becomes available from the member database.

Public Affairs/Advocacy

We discussed multiple ways for APS to highlight physiology research and advances in education. One mechanism for doing this is for the Public Affairs Committee to work with

SAC to develop a formal list of the "top ten advances," as well as the "top ten new opportunities" in physiology each year.

SAC also discussed the need for the discipline of physiology to be well-represented on National Institutes of Health study sections. We recommend that APS compile a list of leading physiologists who could serve on the different NIH study sections. This list would be helpful to NIH administrators and would help to ensure that physiologists are well-represented on review committees. SAC recommends that the Public Affairs Committee develop this list each year, based on recommendations of the APS sections. The precise timing for the development of this list should be established by the Public Affairs Committee.

Strategic Planning

The upcoming Strategic Planning Retreat in November 1999 will have far reaching effects on the future of APS and will provide an exciting opportunity to strengthen the sections. Several potential agenda items for the retreat were discussed, and it was decided that each section chair would confer with other members of the Section Steering Committee and submit agenda items by June 1. These agenda items will be forwarded to APS President, **Walter Boron**, and to Council for consideration.

SAC feels that joint meetings with Council have been very beneficial in strengthening the sections and improving programming for the Experimental Biology meeting. SAC recommends that Council continue to meet with the sections in developing strategic plans for APS and facilitating better communication.

John E. Hall, Chair

Council accepted the report of the Section Advisory Committee.
Council approved the sections' travel awards program to attract young investigators to the Experimental Biology meeting.
Council requested the sections' help in revising the membership questionnaire to make it more consistent with current research and teaching activities in physiology.
Council approved the upgrading of the APS Web page with searchable capabilities to allow section leadership to better serve their members.
Council agreed that the Society will develop a list of members willing to serve on NIH study sections and encourage NIH to select candidates for service from this list.

Senior Physiologists Committee

A major responsibility of the Senior Physiologists Committee is to correspond with members of APS who are 70 years old or older. During the year, letters were sent to members on their 70th birthdays and cards were sent to those turning 80 and 90, each with a personal note and a request for a reply to be published in *The Physiologist*. Approximately 171 members were sent letters. In the past year, 38 responses to these letters have been received.

In addition, the members of the committee reviewed two applications for the G. Edgar Folk, Jr. awards. These awards are made to emeritus members 70 years or older for such purposes at attending a meeting, engaging in modest experiments, or completing a manuscript. Names of the awardees are not made public.

Eugene M. Renkin, Chair

Council accepted the report of the Senior Physiologists Committee.

Women in Physiology Committee

The Women in Physiology Committee is charged with identifying the needs of the female membership of the Society and with promoting the discipline of physiology as a rewarding career for young women. We also seek to enhance the professional development of women physiologists at all levels and to increase participation of women in Society affairs. One of the factors that has been identified for the loss of women from scientific careers is the lack of professional mentoring that they receive. Because of this, the Committee sponsors a mentoring program for women at formative stages of their

careers that has since become a model for other such career development programs. Senior physiologists, of either gender, are paired with junior female colleagues on the basis of scientific and/or career interests. The match is made for one year initially, during which time the pairs communicate by mail, phone, or e-mail. Every pair is different, but past participants have noted that they have received advice on such issues as job search strategies, research questions, academic advancement, and the challenge of balancing the demands of a scientific career with one's personal life. It is also sometimes helpful to have a perspective on career issues from someone outside an individual's own institution. Based on feedback that the committee has received, the program is clearly filling a need of the membership. Members are encouraged to participate in the program as either a mentor or mentee; details and applications are available from the Society's Education Officer, Marsha Matyas. We also encourage senior members, and especially department chairs, to bring the program to the attention of students, post-docs and junior faculty in their departments.

The Committee, with the invaluable assistance of Marsha Matyas, has been exploring ways to enhance the Mentoring Program and its already considerable value to participants. Matyas has established a listserv where questions related to mentoring or career development issues can be posted. The listserv has been a forum for lively discussions in the past year. In particular, many tips for surviving the EB meeting were posted in the spring of this year, and even our mentors may have learned a thing or two! The Committee also sponsored a lively Mentoring Program luncheon and workshop at the Experimental Biology meeting in April. In addition to providing ample opportunity for informal discussion and networking, both with senior physiologists and with peers, attendees were treated to a unique opportunity to pick the brains of two senior program officers from the NIH and NSF (who also happen, fortuitously, to be women). Judy Podskalny (NIDDK, NIH) and Grace Wyngaard (Division of Integrative Biology and Neurosciences, NSF) provided a most valuable update on the many new career development awards available from their agencies, with particular emphasis on funding available to women either starting or re-entering a research career. The value of this session was amply demonstrated by the fact that both Podskalny and Wyngaard stayed in the meeting room for more than an hour after the session ended, providing one-on-one advice to women in attendance regarding their career aspirations and funding mechanisms that might help them to accomplish these. We are extremely grateful to these two guests to our meeting for giving up a Sunday to share their expertise with us. At Experimental Biology 2000, to be held in San Diego, we are planning a presentation from Barrett on the joys and challenges of serving as a journal editor, where she will discuss her experiences with *AJP:Cell Physiology*.

We are currently analyzing the data gathered on the employment status and needs of our constituency via a survey distributed to the 1,100 female members of the APS. While the response rate for this survey was somewhat lower than we would have liked, perhaps this reflects an increased satisfaction of our female membership with their careers at present. Nevertheless, some useful information and evidence for encouraging trends are emerging from the data. A summary of the status of the female membership and their professional and societal concerns will be prepared by Committee member Ann Bonham for publication in *The Physiologist* later in the year.

The Committee has the pleasure of serving as the review panel for the Caroline tum Suden/Frances Hellebrandt Professional Opportunity Awards. These provide monetary ($500) prizes to graduate students and postdoctoral fellows (of either gender) on the basis of abstracts submitted for presentation at Experimental Biology. We are fortunate that the Council has recognized the significant value of these awards in encouraging the career aspirations of our younger colleagues and has increased the number of awards available; 26 were made in 1999 and we anticipate making 30 awards next year. Members are certainly encouraged to consider nominating their students and postdoctoral students for these awards. It is exciting to see the high caliber of abstracts submitted for these awards, which certainly provides reassurance that our discipline has a very bright future ahead of it.

The Committee has also discussed several possible additional activities, such as partnering with the Women's Committees of sister societies with related goals, identifying ways to secure additional input from graduate students and fellows, and coordinating activities of the female membership of the various sections. We are also very open to suggestions and requests from the membership; please do not hesitate to contact Kim Barrett in San Diego if you have any requests for issues that you would like the Committee to address.

Kim E. Barrett, Chair

Council accepted the report of the Women in Physiology Committee.
Council approved the allocation of funds for the Mentoring Luncheon.

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

M. Judah Folkman
Children's Hospital, Boston

Starling's Hypothesis of Transcapillary Fluid Exchange: Then, Now, and the Future

SATURDAY, APRIL 15, 5:15 PM

HENRY PICKERING BOWDITCH AWARD LECTURE

Curt D. Sigmund
University of Iowa

End Stage Renal Disease: Of Rat and Man

SUNDAY, APRIL 16, 5:15 PM

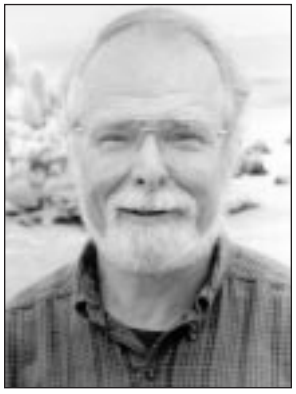
Distinguished Lectureships

CARL W. GOTTSCHALK DISTINGUISHED LECTURESHIP OF THE RENAL SECTION

Heini Murer
University of Zurich, Switzerland

Cellular Mechanisms in Renal Phosphate Handling: Old Questions and Some New Answers

SATURDAY, APRIL 15, 3:00 PM

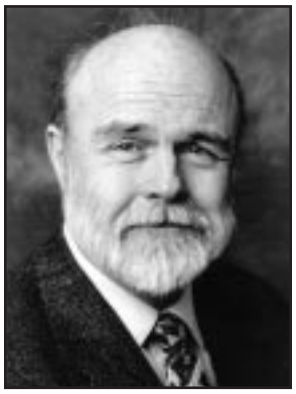


AUGUST KROGH DISTINGUISHED LECTURESHIP OF THE COMPARATIVE PHYSIOLOGY SECTION

George N. Somero
Stanford University

Co-evolution of Proteins and Their Aqueous Milieu: Messages From the Medium

SUNDAY, APRIL 16, 8:00 AM



CLAUDE BERNARD DISTINGUISHED LECTURESHIP OF THE TEACHING OF PHYSIOLOGY SECTION

Clyde F. Herreid
State University of New York, Buffalo

Teaching in the Year 2061

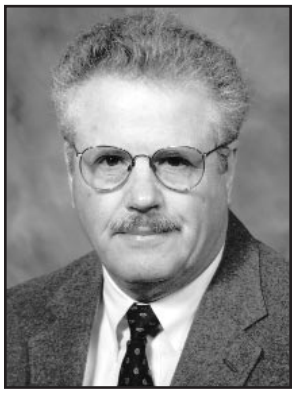
SUNDAY, APRIL 16, 2:00 PM

JOSEPH ERLANGER DISTINGUISHED LECTURESHIP OF THE CENTRAL NERVOUS SYSTEM SECTION

Catherine Rivier
Salk Institute

Role of Gaseous Neurotransmitters in Regulating Hypothalamic-Pituitary-Adrenal Axix

SUNDAY, APRIL 16, 2:00 PM

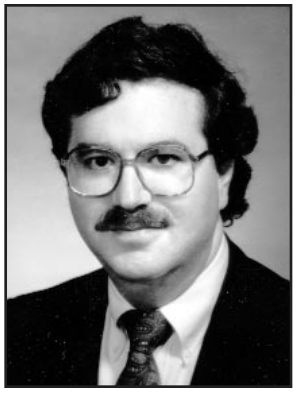


ERNEST H. STARLING DISTINGUISHED LECTURESHIP OF THE WATER AND ELECTROLYTE HOMEOSTASIS SECTION

Gerald F. DiBona
University of Iowa

The Neural Control of the Kidney in Health and Disease

SUNDAY, APRIL 16, 3:00 PM



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

Jeffrey S. Flier
Beth Israel Deaconess Medical Center

Leptin: Physiology and Role in Disease

SUNDAY, APRIL 16, 3:00 PM

HUGH DAVSON DISTINGUISHED LECTURESHIP OF THE CELL AND MOLECULAR PHYSIOLOGY SECTION

Ferid Murad
University of Texas, Houston

Cellular Signaling with Nitric Oxide and Cyclic GMP

MONDAY, APRIL 17, 9:00 AM

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

John A. Clements
University of California,
San Francisco

Lung Surfactant: A Fantastic Voyage From Theory to Practice

MONDAY, APRIL 17, 2:00 PM

ROBERT M. BERNE DISTINGUISHED LECTURESHIP OF THE CARDIOVASCULAR SECTION

David R. Harder
Medical College of Wisconsin

Cellular and Molecular Mechanisms Mediating Functional Hyperemia in the Brain

TUESDAY, APRIL 18, 8:00 AM

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

Carl V. Gisolfi
University of Iowa

What's Your 'Gut' Reaction to Exercise?

MONDAY, APRIL 17, 10:15 AM

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

Francois M. Abboud
University of Iowa
College of Medicine

Functional Genomics of Baroreceptors

MONDAY, APRIL 17, 3:00 PM

HORACE W. DAVENPORT DISTINGUISHED LECTURESHIP OF THE GASTROINTESTINAL SECTION

Ernest M. Wright
University of California
Los Angeles

Molecular Insights Into Intestinal Salt, Sugar, and Water Absorption

SUNDAY, APRIL 19, 8:30 AM

WALTER C. RANDALL LECTURE IN BIOMEDICAL ETHICS
SUPPORTED BY AN EDUCATIONAL GRANT FROM TAYLOR UNIVERSITY

Edmund D. Pellegrino
Georgetown University Medical Center

MONDAY, APRIL 17, 2:00 PM

Section-Sponsored Featured Topics

Recent Advances in Comparative Solute Transport and Molecular Biology of Aquatic Organisms
Gregory A. Ahearn and Michele G. Wheatly

Muscle Fatigue
William Ameredes

Role of Excitatory Amino Acid Neurotransmission in Control of Cardiorespiratory Function
Susan M. Barman and Steve Mifflin

Phosphoinositide Signaling: Implications for Transport Regulation
Kim Barrett and Bonnie Blazer-Yost

Impact of Gender and Pregnancy on Renal Function
Christine Baylis

Control of Gene Expression: Exercise/Environment Stress
Frank W. Booth and Jacob Friedman

Diseases of Protein Trafficking and Expression
Dennis Brown and Janet Van Adelsburg

The Threshold of Consciousness in the Zoological Kingdom
Michael Cabanac

Proteomics and Functional Genomics in Gastrointestinal Tract Research
Robert Coffey

Mechanics of Cardiac Remodeling
James W. Covell

Emerging Concepts: Protein Kinase C Isozymes and the Regulation of Diverse Cell Response
Edward C. Dempsey and Paul A. Insel

Dietary Flavonoids and Cardiovascular Regulation and Pathophysiology
John D. Folts

Respiratory Control: Plasticity, Redundancy or Both?
Hubert V. Forster and David Gozal

Cell Physiology of VEGF
Michael Goligorsky

Medical Physiology Instructional Resources
Barbara Goodman

Regulation of Water and Electrolyte Homeostasis
Joey P. Granger and F.G. Knox

Role of Oxidative Stress in Cardiovascular-Renal Disease
Kathy Griendling and Christine Schnackenburg

Fatty Acid Metabolites and Signal Transduction in the Microvasculature: Genetic, Molecular, and Functional Mechanisms
David R. Harder

Alpha-Adrenergic Vasoconstriction in the Coronary Vasculature
Gerd Heusch

Neurohumoral Mechanisms of Hypertension
Carmen Hinojosa-Laborde and Cristof Klett

Plasticity of the Neuromuscular Synapse
Bernard J. Jasmin

MAP Kinase Pathways and the Cell Stress Response
Gary Johnson and David Sheikh-Hamad

Molecular and Cellular Regulation by Nitric Oxide
Paul Kubes and Matthew Grisham

New Frontiers in Central Autonomic Regulation: Beyond the RVLM
Andrew J. Lawrence

Cardiovascular Regulatory Effects of Dietary Sodium, Calcium, and Potassium
Julian Lombard

Intracardiac Ganglia and Cardiac Function: Central and Peripheral Control
V. John Massari

Ventral Respiratory Group Neurons: Roles in Rhythm Versus Pattern Generation
Donald R. McCrimmon and Edward J. Zuperku

Physiology and Pathophysiology of Aquaporins
Soren Nielson

Salt and the Brain: Mechanisms by Which Dietary Salt Alters Autonomic Nervous System Regulation
John W. Osborn and Virginia L. Brooks

Oxygen Sensitive Ion Channels and Second Messengers
C. Peers

Endocrine Cells as Sensory Transducers
Helen Raybould and Patrick Tso

Models of Heart Failure
John Ross, Jr.

Biomechanics and Bioenergetics of Airway Smooth Muscles
Gary Sieck and Jeffrey Fredberg

Point/Counterpoint: Does Deconditioning Affect Blood Pressure Regulation?
Lawrence Sinoway and James A. Pawelczyk

Co-Evolution of Proteins and Their Aqueous Milieu: Messages from the Medium
George N. Somero

Role of Angiotensin in Central Neural Control of the Circulation
Alan F. Sved

Interstitial Cells of Cajal
Sean Ward and Kent Sanders

Imidazoline Receptors and Cardiovascular Control: Brainstem Mechanics and Therapeutic Potential
J. Michael Wyss

Capillaries: How their Structure and Function Can Alter to Meet Tissue Demands

Cardiovascular Section and the Microcirculatory Society

A. Baldwin and V. Huxley

Ann Baldwin, Ingrid Sarelius, Fay Hansen-Smith, Gavin Thurson, David Sims, and Virginia Huxley

Over the past decade, evidence has accumulated challenging the notion that the smallest blood vessels, the capillaries, are static, uniform, semipermeable pipes with no function except as a passive barrier marking the boundary between the vascular compartment from the tissue compartment. Instead, capillaries are dynamic structures which participate in the active regulation of water, waste, and nutrient exchange: the formation and destruction of exchange vessels and sites for initiation of signals to regulate the flow of blood into the exchange vascular network. The presentations will consider the varied nature of capillaries and how their functions are coordinated to achieve "whole organ" exchange.

Muscle Research in the 20th Century

MyoBio Group and Environmental & Exercise Physiology Section

Michael Bárány

Michael Bárány, Hugh Huxley, Micharany, John Gergely, and Clara Franzini-Armstrong

The later half of the 20th century has witnessed an explosion in our understanding of the mechanisms that control muscle contraction and processes the convert chemical energy into kinetic energy. The purpose of this symposium is to have four outstanding investigators in the area of muscle research reflect on the most important breakthroughs in this filed during the 20th century. Hugh Huxley will speak on the structure and function of muscle, Michael Bárány will progress in mechanochemistry, John Gergely will speak on the processes that regulate contraction, and Clara Franzini-Armstrong will discuss the excitation-contraction coupling process.

Neurobiology of the GnRH Neuron

Endocrinology & Metabolism and Central Nervous System Sections

D.W. Brann and J.L. Roberts

Daniel J. Spergel, Pamela L. Mellon, Margaret E. Wierman, and Darrell W. Brann

The aim of this symposium is to provide a state-of-the-art update of the field of control and regulation of GnRH neurons. This is an important topic since GnRH is the preeminent central signal in the control of reproduction. The program was designed to cover several critical aspects of the neurobiology of GnRH neurons, including new methods and animal models for the study of GnRH neurons, identification of transcription factors involved in the control of the GnRH gene, identification of factors which regulate GnRH neuron survival and migrating transmitters and steroid hormone control of GnRH neurosecretion, and aging of the hypothalamic-GnRH neuronal system. Thus, the symposium will present a comprehensive coverage of cutting-edge issues in the neurobiology of GnRH neurons.

Hypoxia-Induced Muscle Damage from Reactive Oxygen Intermediates: From Pathways to Function

MyoBio Group

Marco A.P. Brotto and Thomas M. Nosek

Thomas M. Nosek, Irwin Fridovich, Periannan Kupposamy, Thomas Clanton, and Marco A.P. Brotto

Conditions such as hypoxia, reperfusion, vitamin E deficiency, muscular dystrophy, oxidative stress, and repetitive activation of muscle are associated with increased production of reactive oxygen intermediates (ROI). Furthermore, prolonged exercise is accompanied by increased concentrations of ROI within muscle cells from membrane-associated reactions, involving NADPH oxidase and increased mitochondrial respiration. Strenuous exercise and some pathological conditions may produce so much ROI that they overwhelm the natural intracellular buffering system and denature proteins important in the contractile and excitation-contraction coupling (ECC) processes. Numerous labs have demonstrated that hypoxia has deleterious effects on both cardiac and skeletal muscles. Production of specific ROIs have been proposed to be involved in this response.

In this symposium we will explore the pathways by which ROIs are produced under normoxic and hypoxic conditions (Irwin Fridovich) and the role of ROIs in the decreased contractile function observed in the ischemic heart (Periannan Kuppusamy) and hypoxic skeletal muscle under resting (Thomas Clanton) and fatiguing (Marco Brotto) conditions.

Oxygen Sensing and Signaling: Role of Reactive Oxygen Intermediates

Hypoxia Group

H. Franklin Bunn

Helmut Acker, Hao Zhu, Paul Schumaker, Peter Ratcliffe, and Nandrui Prabhaker

During the last two years there has been remarkable progress in our understanding of mechanisms whereby cells

sense changes in oxygen tension and transduce signals to maintain cardiorespiratory homeostasis during hypoxia. Changes in oxygen tension regulate the transcription and/or the mRNA stability of a number of physiologically relevant genes. Examples include tyrosine hydroxylase, the rate limiting step in dopamine synthesis, erythropoietin, the hormone responsible for red blood cell production, and vascular endothelial growth factor, which plays an important role in both tumor pathogenesis and response to ischemia. An understanding of adaptation to hypoxia at the molecular level requires creative input from a number of scientific disciplines, including classic physiology, pharmacology, and cell and molecular biology.

Papers presented at this symposium cross interdisciplinary lines and provide a timely and valuable impetus to further advances in the critically important area of research. The focus of the symposium will be the role of reactive oxygen intermediates in oxygen sensing and signaling. After Bunn provides a brief overview and introduction, Acker will present physiological studies on carotid body glomus cells and hepatic cells, supporting a model which a cytochrome *b*-like heme protein senses oxygen and transduces a signal via reactive oxygen intermediates. Zhu will provide new information on a recently cloned candidate oxygen sensor, a cytochrome *b*5-cytochrome/*b*5 reductase fusion protein which fulfills many of the criteria implicit in Acker's model. Schumacker will present an alternate model of oxygen-sensing and signaling, based on mitochondria as a source of reactive oxygen species. These presentations on oxygen sensing will provide an appropriate background for Ratcliffe's talk on the mechanism by which low oxygen tension activates HIF-1, the heterodimeric transcription factor which plays an essential role in the regulation of genes important in adaptation to hypoxia. The relative importance of reactive oxyen intermediates in carotid body chemoreception and regulation of gene expression will be the focus of the final talk by Prabhakar.

Redox Regulation of Cardiomyocyte Life and Death

Cardiovascular Section

D.K. Das

Dipak K. Das, Roberta Gottlieb, Genevive C. Sparagna, Pawan K. Singal, Nilanjana Maulik, and Balz Frei

Many diseases, including ischemic heart disease, are influenced and regulated by changes in the redox system. The role of free radicals and antioxidants in this process has not been well considered in the context of the redox system. The symposium considers probable roles of mitochondria, nitric oxide and superoxide dismutase in the redox abnormalities and transcription regulation of genes which are redox sensitive.

Emerging Concepts: Protein Kinase C Isozymes and the Regulation of Diverse Cell Response

Respiration Section

Edward C. Dempsey and Paul A. Insel

Edward C. Dempsey, Alexandra C. Newton, Daria Mochly-Rosen, Alan P. Fields, Mary E. Reyland, and Robert O. Messing

This symposium will focus on a major concept in signal transduction that has emerged over the past few years. The theme is the importance of heterogeneity within key intracellular kinase cascades, like protein kinase C (PKC), and how individual isozymes of an enzyme family contribute to the regulation of diverse cell responses. Eleven different isozymes of PKC have been described. Over the past few years there have been major advances in our understanding of how these individual isozymes contribute to diverse cell responses and how their activity and expression are regulated. Many of these concepts are not widely appreciated as yet. There have also been many advances in the experimental approaches available for the investigation of PKC isozymes. These are also not well known. This symposium will address the questions *1*) How do individual isozymes of PKC contribute to the regulation of diverse cell responses? and *2*) What are the best approaches to studying the role of PKC isozymes in different cell responses? The symposium will begin with a brief summary of what is known about individual PKC isozymes and cell responses relevant to lung biology (like permeability, secretion, contraction, growth, and apoptosis) and then a number of questions will be raised that the subsequent speakers (all world experts in the field) will address. New ideas on mechanisms that regulate PKC activity will be discussed, including the interaction of reactive oxygen species with PKC and the identification of novel PKC kinase that regulates phosphorylation of the enzyme. The concept of targeted translocation of PKC isozymes within the cell and importance of isozyme-specific binding proteins will then be reviewed. Emerging concepts on the link between individual PKC isozymes and two important cell responses (proliferation and apoptosis) will then be explored. The symposium will conclude with a look at one of the new research tools recently developed, isozyme-specific knock-out mice. Each speaker will emphasize contemporary approaches to studying PKC isozymes and their role in cell responses. Strengths and weaknesses of different experimental strategies will also be reviewed. Future directions for investigation will be identified and discussed both in the presentations and during the discussion periods.

Adhesion and Motility of Metastic Cells

North American Society for Biorheology and American Federation for Medical Research

Cheng Dong and Kim Anderson
Martin A. Schwartz, Bebdicht Pauli, Cheng Dong, Kim Anderson, and Hynda Kleinman

Cell adhesion and motility are two intimately related biological processes that effect the course of metastasis of cancer cells. These biological processes eventually result in cell interactions with its environments. Recent NEW developments in the research have focused on cell receptor/ligand interactions related to cancer cell adhesion to endothelium; dynamic cell adhesion to endothelium or actual trapping in smaller capillaries during the process of extravasation; interactions of tumor cells with basement membrane; signal transduction associated with tumor cell migration; cell motility and cytoskeletal dynamics, etc. The symposium will bring together investigators with backgrounds in both engineering and cellular physiology to share the most recent finding relating cancer cell metastasis to adhesion and motility.

This symposium will be co-sponsored by the North American Society of Biorheology (NASB) (Dr. Schmid-Schonbein, President of NASB and member of APS).

The History of Organ Transplantation: Physiological Aspects

History of Physiology Group and Comparative Physiology and Environmental & Exercise Physiology Sections

G. Edgar Folk, Jr. and Henry Brown
Henry Brown, Nicholas L. Tilney, William Haskell, and Barbara S. Stay

This two-hour session with a featured speaker and adjunct speakers crosses many disciplines including physiology, pathophysiology, immunology, biochemistry, pathology, medicine, and surgery. It addresses the historical background of the need for transplantation and how understanding of each of the disciplines had an important part in bringing about successful clinical transplantation; this can now correct the underlying pathophysiology. Present methodology and future directions in understanding xenotransplantation (i.e., between species) is to be briefly mentioned, important because of dearth of human organs. The hope of replacing a lost or diseased part or of enhancing one's abilities is as old as antiquity. The mythical Icarus and Daedalus implanted feathers, albeit with wax, in their arms to make functional wings. A famous renaissance painting depicts a saint attaching a black leg to a white recipient. In the eighteenth century John Hunter, considered by many to be the father of modern surgery, observed that certain cattle he termed "free martins" had tissue compatible with siblings. The kidney, because of its critical role in clearing the body of waste, as well as its function in blood pressure regulation, was an organ early considered for transplantation since no known treatment could prolong life when it failed. Kolff in the 1930s to 1950s developed artificial dialysis of blood to clear nitrogenous waste in this situation, but it is cumbersome, fraught with complications, and will maintain life for only about 10 years. Joseph Murray (recently a Nobel Laureate) after World War II joined Francis D. Moore's Department of Surgery at Harvard at what was then the Peter Bent Brigham Hospital. The group was then interested in transplantation. Building on Hunter's report of the "free martin" he successfully transplanted a healthy kidney from one identical twin for a failing one of the other twin. Since then better understanding of the immune system, early exposed and summarized in Ilya Mechnikov's classic 1890 "Lessons on Inflammation" has been very helpful in permitting transplantation of organs from unrelated donors. Immunosuppression mediation, early with azothioprine, developed by Sir Roy Calne, also then a fellow in Fr. Moore's Department, has been replaced by cyclosporin and its derivatives and steroids. The liver, the "metabolic mill," was known to have great regenerative power by the ancients, exemplified by Prometheus. Chained to a rock by Zeus for having stolen fire from Olympus, he had his liver eaten each day by the vulture only to regenerate each night. Its role in nitrogen metabolism and hepatic encephalopathy was known to both Hippocrates and Galen. In conditions where liver failure cannot be reversed, liver transplantation, as developed by Thomas Starzl in the 1960s, is successful enough often to be a preferable method of treatment. There will be a comments on heart transplants.

This symposium will contain short reports on the ability to exercise after receiving organ transplants in human subjects, with additional comments on the capability of animals lower and mammals to receive transplanted organs.

Tissue Engineering of Vascular Grafts for the Third Millenium

Biomedical Engineering Society

John A. Frangos and Nicolas L'Heureux
Howard P. Greisler, Jennifer L. West, Joan Zeltinger, Stephen F. Badylak, Nicolas L'Heureux, and John A. Frangos

From engineering to physiology, from biology to chemistry, tissue engineering intrinsically requires a multidisciplinary approach. Seen by many as one of the most promising fields in biomedical research, tissue engineering will have to truly merge these different approaches to mature into a full-fledged discipline.

One of the most challenging organs to recreate is the artery. Unlike many organs and tissues, the blood vessel has a critical paracrine function, as well as a demanding mechanical

function. A successful transition from in vitro to in vivo requires sufficient mechanical strength but also an appropriate blood compatibility and inflammatory response. The failure of small diameter synthetic vascular grafts has shown that his dual role is critical for long-term patency. Tissue engineers are using natural or synthetic biodegradable materials in an effort to control the inflammatory process. This approach can be combined with the seeding of cultured cells to provide blood compatibility. Cells can also play a role in a well orchestrated remodeling process that allow the removal of the implanted material while maintaining appropriate mechanical properties.

This symposium will present various approaches to design "smart" tissue engineered vessels working with the body in a remodeling process that will provide long-term patency. From fully-synthetic biodegradable prosthesis to completely biological vessel, a full spectrum of issues will be discussed, covering current and future strategies to control the remodeling process.

Molecular and Functional Diversity of Epithelial Chloride Channels

Epithelial Transport Group and Cell & Molecular Physiology Section

Cathy Fuller and Dale Benos
W.B. Guggino, J. Cuppoletti, B. Pauli, and C. Fuller

Non-ligand gated anion channels have been among the last channels to be characterized at the molecular level. One consequence of this has been increased controversy in the field of epithelial Cl^- transport. The basic problem lies in defining which anion channels contribute to regulated Cl^- exit across the apical membrane of an epithelial secretory cell. For the last ten years it has been widely accepted that CFTR is the major apical membrane Cl^- channel and that other anion channels play minor roles in regulated fluid secretion. Furthermore, the regulation of secretion, by mechanisms other than those relying on the cAMP/adenylate cyclase system, has been largely attributed to other causes, e.g., the opening of basolateral K^+ channels increasing the driving force for Cl^- exit through a nearly constitutively open CFTR pore. However, recent findings prompt an urgent re-assessment of the role of CFTR as the only player in epithelial fluid transport; epithelial cells, in fact, contain a multiplicity of Cl^- channels that can participate in fluid secretion. CFTR has itself been show to have a non-traditional role regulating other membrane channels that contribute to the classical CF phenotype, most notably ENaC and a second as yet poorly defined Cl^- channel, the ORCC. However, the mechanisms underlying these interactions are for the most part obscure. The ORCC has not yet been cloned; is it truly a separate channel, or could it be an already identified channel operating as an ORCC under certain conditions? Multiple members of the extensive CIC family can also be expressed within a single epithelial cell, and data has begun to emerge that the primary role of these channels may lie in volume regulation. As the epithelial CIC isoforms are considered candidates for "alternative" Cl^- conductance pathways in cystic fibrosis (CF), understanding the regulation of these channels is fundamental to their possible role as therapeutic targets in the treatment of CF. The most recently identified (and the most controversial) family of Cl^- channels to be described are those activated by Ca^{2+}, the CaCCs. Ca^{2+}-activated Cl^- secretion in epithelia has been hotly debated, as Ca^{2+} can increase Cl^- and fluid secretion by opening basolateral K^+ channels in the absence of a direct effect at the apical membrane. The cloning within the last year of an additional bovine, two human and one mouse cDNA with extensive homology to the original bovine CaCC (bCaCC), has led to the identification of a CaCC channel family expressed in several epithelial tissues including a gut and airway. One of these new family members acts as a cell adhesion molecule and all family members isolated to date are post-translationally processed, something not previously associated with ion channels. Preliminary studies suggest that the original bCaCC is located at the apical membrane of tracheal and submucosal gland epithelial cells, consistent with a direct role for this channel in airway Cl^- secretion. The purpose of this symposium is to address issues of Cl^- channel diversity in the light of recent data and to re-evaluate current concepts concerning the mechanisms of Cl^- secretion in epithelia with particular reference to events at the apical membrane.

The Metabolic Status of Theropod Dinosaurs: New Insights from Comparative Physiology

Comparative Physiology Section

J.W. Hicks
James W. Hicks, Willem Hillenius, Colleen Farmer, and Kevin Padian

A major controversy in paleontology that has received considerable attention concerns the evolution of birds and their relationship to theropod dinosaurs. Much of this debate result from the analysis and interpretation of anatomical features shared in both birds and theropods. The description of a recently discovered fossil of a small theropod dinosaur, Sinosauropteryx prima, from northeastern China adds fuel to this debate. This fossil exhibits well-preserved integumentary structures that may provide the first evidence of simple feathers; suggesting an insulative function and an endothermic physiology. One requirement of endothermy is a continuous high rate of oxygen delivery to rapidly metabolizing tissues, thus requiring a highly effective oxygen transport system.

However, an argument proposed against the endothermic status of the theropod dinosaurs is that the cardiopulmonary system was incapable of sustaining endothermic gas exchange rates. Furthermore, it has been suggested that the lungs of theropod dinosaurs could not have given rise to avian lungs.

This symposium will be forum for the exposition and discussion of recent findings from the studies of extant vertebrates that provide insights into the metabolic status of dinosaurs and implications about the phylogenetic relationship between theropods and birds. The goal of this symposium is to expose the physiological community, particularly comparative physiologists, to this ongoing debate in paleobiology and to stimulate fresh perspectives into the metabolic status of theropod dinosaurs. The symposium will not take a pro-endothermy or pro-ectothermy stance, but will present a rigorous analysis of the morphological and physiological evidence of both extinct and extant vertebrates. Furthermore, this symposium will underscore the fact that advancing our understanding of the dinosaur-avian connections requires the direct participation of comparative physiologists.

Timeliness of the Proposed Symposium

The debate regarding the metabolic status of theropod dinosaurs and their relationship to birds has continued for over two decades and has been argued, primarily, by paleobiologists. For many physiologists, particularly comparative respiratory physiologists, the arguments that characterize the debate, at first glance, seem untestable and, therefore, contributions by physiologists have been rather minimal. Recently, due to newly discovered fossils in Northeastern China and in Northern Italy, the controversy concerning the metabolic status of theropods has received considerable attention in both the scientific and lay press and has been the issue of several recent symposia (Society of Integrative and Comparative Biology; Evolution of Feathers, Jan. 1999; Dinofest, at the Philadelphia Academy of Sciences, 1997; and the Ostrum Symposium held at Yale, 1999). All of these symposium have lacked contributions from physiologists. The proposed symposium will expose comparative physiologists to issues that define this controversy and will present new information that illustrates the new insights into avian evolution that is gained by studying the physiology of extant vertebrates.

Epithelial-Microbial Interactions: Lessons in Communication

Gastrointestinal and Cell & Molecular Physiology Sections

M.F. Kagnoff

Jeffrey L. Gordon, B. Brett Finlay, Martin F. Kagnoff, and Gail A. Hecht

A single layer of epithelial cells separates the intestinal lumen form the host's internal milieu. It is now recognized that the epithelium engages in "cross-talk" with the luminal enteric microbial flora and with microbial pathogens that bind to and invade epithelial cells. These interactions can result in the activation of signaling pathways within epithelial cells that culminate in the activation of epithelial cell genes and products, including those that are key components of the epithelial cell innate immune response, and those that alter epithelial cell function. Products released by epithelial cells can act in an autocrine or paracrine manner on the epithelium and on adjacent and underlying immune and inflammatory cells in the intestinal mucosal. This symposium will focus on communication between the commensal bacterial flora and noninvasive bacterial pathogens (e.g., *H. pylori*) and the intestinal epithelium, the strategies and pathways used by enteroinvasive microbial pathogens that lead to altered epithelial cell gene expression, the role of the epithelium in signaling the onset of innate and acquired host mucosal immunity, and mechanisms by which enteric microbes can alter epithelial cell secretory function.

Low Saturated Fat, High Carbohydrate Diets: Effects on Triglyceride and LDL Synthesis, the LDL Receptor and Cardiovascular Disease Risk

Society for Experimental Biology and Medicine

Robert H. Knopp

Lisa C. Hudgins, Richard J. Deckelbaum, Ernst Schaefer, Robert Knopp, and Walter C. Willett

Saturated fatty acids of dietary or endogenous origin are an important cause of hypercholesterolemia. One of the approaches to the population-wide reduction of plasma cholesterol levels is to restrict saturated fatty acid intake. The most widely endorsed dietary recommendation is to restrict dietary fat in to and with it, saturated fat, substituting carbohydrate. The limitation in this approach is a tendency of the body to manufacture saturated fatty acids from carbohydrates which can manifest as an increase in plasma triglyceride levels, a reduction in HDL-C levels and a failure of LDL-C levels to fall further. To explore the mechanism and conditions wherein these effects obtain and their potential cardiovascular disease consequences, a panel of experienced clinical investigators will present their latest research relevant to the subject. One possible conclusion from this symposium is that more dietary fat restrictions, substituting with carbohydrates, may not necessarily be better and the approaches to selectively restricting saturated fat intake without augmenting carbohydrate intake beyond a certain point may offer a better opportunity to successfully lower plasma and LDL cholesterol levels without potentially adverse effects on other lipoprotein species.

Interaction of Body Fluid Balance and Thermal Strain

G. W. Mack
Sue Schneider (Fortney), Gary W. Mack, Hiroshi Nose, and Nina Stachenfeld

The ability to regulate body temperature effectively during heat exposure depends on the body's ability to activate appropriate heat dissipating responses. The two major thermoregulatory responses to heat stress are the transfer of heat from the body core to the skin via increased skin blood flow and heat transfer from the skin to the environment by evaporation of sweat. The enormous capacity of humans to dilate blood vessels in the skin during thermal stress is the hallmark event that contributes to cardiovascular strain. Cutaneous vasodilation during heat stress leads to a reduction in central blood volume and reduced venous return. The compensatory cardiovascular adjustments leads to a spiraling positive feedback loop which tends to drive body core temperature to excessive levels and predisposes individuals to a variety of heat related disorders (e.g., heat syncope, heat exhaustion, and heat stroke). The ability to prevent excessive hyperthermia and resist heat related disorders is dependent on a complex interaction between reflexes that regulate heat dissipating mechanisms and reflexes which regulate arterial blood pressure and body pressure and body fluid balance. Understanding the nature of these interactions provides insight into factors which contribute to successful heat tolerance (i.e., exercise training) or intolerance (i.e., elderly individuals).

Involvement of the Cytoskeleton in Regulation of Vascular Smooth Muscle Contractile Function

Cardiovascular Section and the Microcirculatory Society

G.A. Meininger
Kristine E. Kamm, Gerald A. Meininger, R. Clinton Webb, Richard J. Paul, and Don Ingber

The cellular cytoskeleton of vascular smooth muscle cells is composed of microtubules, actin filaments, and intermediate filaments. Many intracellular processes are regulated or modulated by these cytoskeletal elements. Microtubules have been shown to modulate the generation of contractile force in fibroblasts, cardiac myocytes, and vascular smooth muscle cells. Disruption of the microtubules with drugs which deplymerize microtubule filaments is associated with an increase in cell force production and constriction of arterial blood vessels. In contrast, drugs which stabilize microtubules have reverse. In addition, variations in microtubular polymerization alter vascular tone, reactivity, and calcium handling. The two major controversial views to explain the actions of microtubules on cell contractile function are *1*) participation of microtubules in cell signaling pathways critical to regulation of the contractile apparatus, and *2*) microtubules influence regulation of the matrix-membrane-cytoskeletal mechanical axis and, hence, cell mechanical properties.

Lung Redox Homeostasis: Emerging Concepts

Respiration Section

Marilyn P. Merker and Christopher A. Dawson
Bruce Pitt, Marilyn P. Merker, Augustine Choi, Paul Hassoun, and Aron Fisher

Significant attention has been focused on the role of antioxidant enzymes such as superoxide dismutase, catalase and glutathione peroxidase in oxidant-induced lung injury. The vast literature featuring these "classic" protective pathways has sometimes obscured growing interest in other molecular mechanisms involved in regulating lung cellular redox homeostasis. In this symposium, which will be concerned, primarily, although not exclusively, with pulmonary endothelium, alternative and emerging research in the area of lung responses to oxidative processes will be presented. The symposium will be dedicated to the role of endothelial plasma membrane NAD(P)H oxidase in ischemic lung injury (Fisher), transplasma membrane electron transport systems in regeneration of antioxidatns in the blood (Merker), protective role of xanthine oxidase lung injury and its regulation by cytokines and oxygen tension (Hassoun), metal homeostasis and metallothionein in lung endothelial responses to oxidant stress (Pitt), and the regulation of the stress response enzymetheme oxygenase in lung oxidant injury (Choi).

Afferent Regulation of the Stress Response: New Views and New Approaches

Central Nervous System and Endocrinology & Metabolism Sections

D. Morilak
Eric Stone, Karel Pacak, David Morilak, Paul Sawchenko, and Joseph DiMicco

Much attention has been focused on afferent regulation of activity in the hypothalamic paraventricular nucleus (PVN) as the integrator and common final output for the endocrine and autonomic responses to stress. In addition, the central noradrenergic neurotransmitter system has been intensively studied as a widespread modulator of neural activity in many brain regions involved in the response to stress, and has been proposed to be essential for the primary activation of the PVN in response to a variety of stressors. The speakers in this symposium will present recent evidence obtained using a variety

of novel approaches that will stimulate a re-examination of previous views regarding afferent regulation of the endocrine and autonomic responses to stress. This panel will address issues of stressor-specificity in the activation and regulation of the stress response and of the anatomical, molecular, and neurochemical mechanisms by which such exquisite specificity may be imposed on what has often been perceived to be a generalized, monolithic and rather non-specific process. Stone will first discuss potential molecular mechanisms underlying the modulatory role of norepinephrine throughout the brain in stress, exploring the relationship between NE receptor activation and induction of c-Fos expression. Pacak will discuss stressor-specificity in the release of norepinephrine and the induction of immediate early gene expression in brain regions contributing to stress-induced activation of the HPA axis, suggestion that the role of NE in activation of CRH neurons in the PVN is stressor-specific. Morilak will discuss studies using in situ hybridization to identify cellular postsynaptic targets of adrenergic modulation, and potential interactions of norepinephrine with neuropeptide transmitters that may account for stress-specific differences in the degree to which norepinephrine modulates the stress response in the PVN and associated brain regions. Sawchenko will discuss studies employing immediate-early gene technology in combination with axonal transport and ablation methods, suggesting that hypothalamic neuroendocrine and autonomic responses to so-called "physiological" challenges are mediated via central autonomic pathways and circumventricular structures, while responses to "psychological" stressors appear to involve complex interactions between ascending somatosensory/nociceptive projections and the limbic forebrain. Finally, DiMicco will present evidence that it is activation of neurons in the nearby dorsomedial hypothalamus rather than the PVN that appears to mediate the cardiovascular response to stress in rats, and also suggests that stress-induced recruitment of the hypothalamic-pituitary-adrenal axis relies upon activation of neurons in the DMH. These results provide a new perspective regarding the possible location of hypothalamic "command neurons" responsible for the major physiologic changes associated with stress and the process of stress adaptation.

eNOS Dysfunction in Vascular Disease I

Cardiovascular Section

K.A. Pritchard, Jr. and D.G. Harrison

Thomas F. Lusher, Zvonimir Katusic, Ton J. Rabelink, Jeannette Vasquez-Vivar, and Philip S. Tsao

NOTE: eNOS Dysfunction in Vascular Disease II (programmed by ASIP)
K.A. Pritchard, Jr.

Endothelial nitric oxide synthase (eNOS) is extensively involved in regulation of the peripheral circulation by producing nitric oxide (NO) in response to the physical and chemical environment of the tissues and blood vessels. This symposium and the other to be held on a similar topic will consider normal regulation of eNOS and various pathophysiological conditions which suppress or increase NO formation. Included in the discussions will be the effects of hypertension, oxidative stress, atherosclerosis, and diabetes on the function of eNOS and NO.

Differential Control of Sympathetic Outflow: A Window into Central Mechanisms Mediating Patterned Autonomic Responses

Neural Control and Autonomic Regulation and Central Nervous System Sections

Shaun Morrison and Gerard Gebber

Alan Sved, Tadeusz Scislo, Gerard Gebber, Michael Gilbey, and Shaun Morrison

The central nervous system is responsible for the elaboration of the patterns of sympathetic outflow to different tissues that is an essential component in the maintenance of homeostasis and in the autonomic support of behaviors, adaptations to changing environment, and responses to disease or injury. The symposium speakers have used multidisciplinary approaches (anatomical, electrophysiological, and neurochemical) to examine the differential regulation of sympathetic outflow to functionally specific targets and will relate this information to the organization and performance of central neural circuits that selectively govern the sympathetic discharge to different tissues. A common goal of these presentations will be to provide the audience with an insight on how these data increase our understanding of the neural substrates underlying the generation of the patterns of autonomic activation that support behaviors such as the defense response of thermoregulation. Not only will the variety of target organs and physiological perturbations to be discussed (cardiovascular, thermoregulatroy, metabolic, etc.) broaden the audience interested in this symposium, but the overlap of sympathetically-controlled tissues studied with different approaches will also provide a significant cohesion among the presentations, a strengthening of the conclusions that can be drawn from them and an articulation of areas for future investigation. This symposium addresses a topic that is currently of wide general interest and which relates to one of the fundamental integrative aspects of central autonomic regulation.

Fever: The Role of the Vagus

Environmental & Exercise Physiology, Central Nervous System, and Endocrinology & Metabolism Sections

A. A. Romanovsky
H.-R. Berthoud, Andrej .A. Romanovsky, Lisa E. Geohler, and C.M. Blatteis

Objective: The recent upsurge of interest in the vagus nerve has been precipitated by a series of studies showing that vagal afferentation is important for the development of several host defense responses, including the febrile, to systemic inflammation. There is also a growing body of evidence suggesting that vagal afferents, as well as efferents, may play important roles in non-febrile thermoregulation, in both health and disease. However, the participation of the vagus nerve in body temperature regulation and the mechanisms of this participation have not been discussed in detail at any recent conference; this will be the objective of this symposium.
Conflicting Issues: Among others, the following conflicting issues will be addressed: Does vagal thermosensitivity exist and is it functionally important? Are vagal efferents involved in the thermoregulation, and, if so, what are the mechanisms of this involvement? Does vagotomy result in febrile nonresponsiveness? What pyrogenic mediators are responsible for activation of vagal afferents in fever?
Scope: The speakers will review both structural and functional interactions between the vagus nerve and the thermoregulatory system at different levels: from molecules to individual organs to the whole organism. A wide range of histological, electrophysiological, pharmacological, and thermoeffector activity date will be analyzed.
Future Directions: Each speaker will identify one of the most important and/or contradictory issues as a topic for future research.

Refresher Course: Integrating Molecular Biology into the Physiology Curriculum

Education Committee and Teaching of Physiology Section

J.C. Schadt and A.J. Lechner
Elmer Price, Jeff Robbins

The purpose of this refresher course is to provide a background in terms of molecular biology concepts, techniques, and terminology which will aid society members in their teaching of contemporary physiology. More specifically, the presentations will deal with the use of molecular techniques to answer physiological questions or to diagnose and treat phathophysiological conditions. The workshop will consist of *1*) four oral presentations (20 Min each); *2*) poster presentations (viewed before and after oral presentations); and *3*) a panel discussion of posters and oral presentations. The opening oral presentation will be given by Elmer Price. This talk will cover, in general terms, molecular techniques, the biological basis of these techniques, the associated jargon, etc. This initial talk is designed to provide an introduction to the techniques emphasized in the subsequent talks. The topics for the subsequent oral presentations would be: *1*) The use of molecular techniques (e.g. site-directed mutagenesis, expression systems, etc.) to study channel biology; *2*) The use of gene therapy to study and, ultimately, correct physiological problems; and *3*) the use of transgenic and knock-out models to answer physiological questions. Jeffrey Robbins will discuss transgenic and knock-out models. We have invited speakers for the other two topics, but we do not have commitments yet. Handouts covering each oral presentation will be provided for those attending the course. The posters will be solicited from APS members and will be oriented toward topics such as the importance of molecular biology to the teaching of contemporary physiology, or how to teach molecular biology to our target students (e.g. medical students, physiology graduate students, etc.). In order to provide maximum exposure for the poster presenters, the poster presentation will also be programmed in a Teaching of Physiology Section poster session.

Teaching Physiology Laboratories in the 21st Century

Teaching of Physiology Section

Dee U. Silverthorn
Dee U. Silverthorn, Mora Terwilliger, Jon Harrison, Whitney M. Reilly, and Roy D. Russ

The traditional physiology student laboratories of the 1960s have almost disappeared as the century draws to a close. Many factors have played a role in this change: animal rights issues, cost, the advent of computers, and the shift in bench research away from whole-animal studies, creating a generation of instructors who lack the expertise to conduct the traditional experiments. But what kinds of hands-on experiences are our undergraduate and graduate physiology students getting to replace those traditional labs? The speakers in this symposium will discuss different solutions to the problem. Terwilliger will begin with a description of her laboratories in which students use invertebrates and molecular techniques to answer basic physiological questions. Harrison will then describe his newly-renovated undergraduate laboratories that combine computers, physical models, and inquiry. Reilly will talk about how incorporating technology in the laboratory changed the curriculum, and Russ will end with his experiences changing from animal laboratories for medical students to simulated lab experiences. The session will conclude with a panel-audience discussion regarding the problems and issues involved in implementing the different lab formats.

Intrapituitary Interactions: Another Level of Endocrine Regulation

Endocrinology & Metabolism Section

J. Schwartz and G.V. Childs

Jeffrey Schwartz, Carl Denef, Louise Bilezikjian, Shlomo Melmed, and Gwen V. Childs

The aim of this symposium is to provide an overview of the extent to which interactions among the cells of the anterior pituitary occur and how they act influence the developmental, biosynthetic, and secretory activity of the gland. The program is designed to cover the subject from a number of perspectives, including the various types of cells, the various classes of intercellular factors, and the subcellular mechanisms that are involved in the interactions. By enlisting the participation of a distinguished group of scientists who are investigating a diverse set of pituitary systems tied together by a common theme, the symposium has been developed to use these different systems as models to illustrate the types of intrapituitary interactions and to provide a basis for understanding the physiological relevance of these interactions. Thus, the symposium will produce a comprehensive picture of a rapidly evolving field of research.

Microvascular Remodeling: Physical Stimuli and Molecular Regulation

Biomedical Engineering Society

Thomas C. Skalak

Thomas C. Skalak, Axel Pries, Patricia D'Amore, Richard Price, Duncan Stewart, and Keith Gooch

This session will bring together researchers in microvessel remodeling from varied backgounds, so the session will have an interdisciplinary aspect. The five participants will address the role of mechanical stresses in long-term regulation of individual microvessel structure, microvascular network pattern formation, the role of specific molecular signals in the recruitment of smooth muscle cell precursor cells to developing capillaries and arterioles, and two therapeutic topics—the design of tissue-engineered networks for blood supply to artificial tissue constructs, and delivery of exogenous angiopoietin to lung microvessels to prevent hypertensive conditions. The specific question addressed is how is the development of microvessel networks regulated in vivo by spatially-regulated production of growth factors in response to local environmental stimuli? Conflicting issues are the linage of recruited fibroblasts or smooth muscle cells, molecular guidance of arteriolar pattern by mechanical versus metabolic factors, and the alteration of pattern formation by rational manipulation of stresses or growth factors. The session will offer the combination of whole network, single vessel, isolated and co-cultured cell approaches to understanding this problem. This combination of approaches is usually not treated in a single session. Future directions inpatterned substrates for guidance, microvessel-specific gene expression systems, inducible cell-specific gene expression, and in vivo lineage techniques will be discussed.

Complement Activation and Inhibition in the Cardiovascular System

Cardiovascular Section

G.I. Stahl and S.A. Rollins

Benedict R. Lucchesi, Allan M. Lefer, Henry Marsh, Scott A. Rollins, and Gregory L. Stahl

The immune system is involved in many human cardiovascular diseases. Inappropriate activation of one area of the immune system, complement activation, has been shown to play an important role in atherosclerosis, myocardial ischemia, and reperfusion injury. Molecular characterization of the initiating events governing complement activation and development of novel therapeutic modalitites for inhibition of complement activation or its effector components is an active and timely component of basic and clinical research. Several complement inhibitors, including soluble complement receptor type 1 and recombinant anti-C5 therapy, are in Phase II clinical trials. Further, other promising novel technologies for inhibition of complement activation are in pre-clinical development. This symposium will demonstrate the translation science involved in the development and clinical use of pharmacological inhibitors in cardiovascular disease.

Mechanisms Regulating Endothelial Cell Barrier Function

Respiration and Cell & Molecular Physiology Sections

Troy Stevens and Asrar Malik

Asrar Malik, Dan Predescu, Joe G.N. Garcia, D. Michael Shasby, Troy Stevens, Mary Townsley, and Jahar Bhattacharya

Endothelial cell barrier disruption is a cardinal feature of vascular inflammation. Despite this significance, controversy exists regarding important molecular mechanisms activated by neurohumoral inflammatory mediators that are responsible for barrier disruption. Contribution of transcytotic vesicles to addressed by Malik and Predescu. Moreover, it is unclear whether inflammatory agonists principally increase protein permeability by activating myosin light chain kinase-dependent "contraction" or by decreasing cell-cell and cell-matrix tethering. This issue will be addressed by Garcia and Shasby. Finally, increased cytosolic calcium represents an important stimulus for endothelial barrier disruption, but cal-

cium-driven processes contributing to barrier disruption are poorly understood. This issue will be addressed by Stevens, Townsley, and Bhattacharya. These investigators collectively provide new information regarding the molecular proceeds activated during the course of inflammation. Important areas for future investigation will be discussed.

Integrin Mechanics

Biomedical Engineering Society

K-L. Paul Sung and George A. Truskey

K-L. Paul Sung, David Cheresh, Bauer E. Sumpio, Scott L. Diamond, George A. Truskey, and Douglas A. Lauffenburger

Over the last few years, significant advances have been made in molecular and cellular biology to elucidate the mechanisms of integrin involvement in cell mechanical function: adhesion, migration, and invasion. The aim of this symposium is to summarize the recent advances in research on the integrin molecules that mediate cellular adhesion, migration, and tumor cell invasion, as well as signal transduction from extracellular molecules to the cytoplasm, so that the physiology and pathophysiology of integrins can be understood at the molecular and cellular levels.

The papers to be presented in this symposium will integrate molecular biology and mechanical approaches to the study of integrin function. Sung will briefly introduce the recent advances in integrin structure/function. Following this brief introduction, five papers will be presented by experts actively working in the field. Cheresh will give an overview of the direct influence of alpha V integrins on the processes of angiogenesis and vascular remodeling in the tumor. He will discuss the mechanistic blockage of angiogensis by alpha-V integrin which disrupts intracellular signaling events in vascular cells leading to the induction of apoptosis. Sumpio will deal with endothelial cells exposed to cyclic mechanical strain and will focus on the role of cyclic strain in modulating endothelial cell morphology, proliferation, and migration function via the focal adhesion proteins focal adhesion kinase (pp125FAK) and paxillin which are tyrosine phosphorylated. Confocal microscopy revealed that ßl integrin reorganize in a linear pattern with the long axis of elongated cells after four-hour exposure to mechanical stretch. His results indicated that the integrin acts as a mechanotransducer, capable of coupling the outside forces on a cell to biochemical signals in the focal adhesion. Diamond will present his study on kinetics and mechanics of platelet and neutrophil interactions under shear fields. Information of platelet-neutrophil aggregation studies using high speed/hing resolution DIC imaging will be discussed. Truskey will discuss the relationship between local deformation of the apical cell membrane and focal contact dynamics. A combined atomic force microscopy (AFM)/total internal reflection fluorescence (TIRF) microscopy system is used to apply known forces and focal movement of the cell membrane or fluorescently labeled proteins. The symposium will close with a paper on integrin-mediated adhesion/migration/signaling work by Lauffenburger. He will present the idea that the integrin mediated cell adhesiveness, migration rate, and signaling messages can be modulated by growth factors. His talk will cover micromechanical property changes via integrins by MAP kinase signaling mechanisms, combining methods which include the use of a flow chamber to determine adhesion force. These interdisciplinary approaches, combined with recently developed experimental methods, include the use of a flow chamber, confocal microscopy, centrifugation force, atomic force microscopy, and total internal reflection fluorescence microscopy systems. These approaches are at the interface of molecular, cellular, and biophysical sciences and are aimed at elucidating the mechanisms of cell adhesion in health and disease.

Bioinformatics: Analysis From Sequence to Disease

P.J. Tonellato and D. Brown

Donna Brown, Phil Green, Lincoln Stein, Eric Lander, Richard Karp, and Evgeni Selkov

Session II:

K. Call and J. Eppig

James B. Bassingthwaighte, Peter J. Tonellao, Mark S. Boguski, Janan Eppig, Kathy Call, and Hershell Safer

Three defining activities of bioinformatics are *1*) collection and categorization of large amounts of biomedical data from high-throughput strategies involving new technology (e.g., expression profiling, gene sequencing, phenotyping): *2*) processing of data to identify underlying relationships (e.g., determining homology between rat and human genes); and *3*) hypothesis- or discovery-driver analysis to extract hidden information within the data (e.g., construction of genetic circuits from expression profile experiments). For each activity, the amount of data and complexity of analysis generally requires the development and use of databases and computationally intensive processes. Modern approaches to addressing these issues have resulted in the development of sophisticated computer workstation environments that provide informatics databases and tools to the scientific community. The goal of this session is to provide a forum for presentation and discussion of recent advances in bioinformatics tools and environments. Special emphasis will be placed on presentation of emerging strategies designed to advance scientific understanding of data derived from basic science research laboratories.

Cellular Transport Systems in the Regulation of FFA Metabolism

Environmental & Exercise Physiology and Endocrinology & Metabolism Sections

L.P. Turcotte

Michael D. Jensen, Ger Van der Vusse, Lorraine P. Turcotte, and Judith Storch

Regulation of FFA utilization is a critical area of research in metabolism. Transport systems are believed to be important factors in the regulation of many cellular mechanisms. Although several transport systems have been identified for FFA, the role of these transport systems in the regulation of FFA metabolism has been generally ignored. The purpose of this symposium is to present evidence for the presence of cellular transport systems for FFA in muscle cells and for the role of these transport systems in the regulation of FFA metabolism.

Apoptosis in Lung Pathophysiology

Respiration Section

Bruce D. Uhal

Bruce D. Uhal, Alan Fine, Yvonne Janssen, and Jack A. Roth

Apoptosis is now known to be of fundamental importance in all cell types, but its roles in the lung are only recently being identified. Over the last two to three years, separate bodies of literature suggest both beneficial and detrimental roles for apoptosis in lung pathophysiology, depending on the cell type in question and the timing and location of the apoptotic stimulus. Evidence is rapidly accumulating in support of an important role for FAS (APO1,CD95) in a surprising variety of pulmonary cell types, and suggests an involvement of this receptor in the pathogenesis of lung fibrosis and other diseases. These data are in contrast to other numerous works documenting important positive roles for apoptosis in the resolution of lung injury. Therefore, knowledge of the regulation of apoptosis in key lung cell populations is of fundamental importance. Apoptosis in response to highly reactive molecules is believed to be an important determinant in pathologenic processes in the lung, and the signalling pathways induced in specific lung cell subsets are beginning to be elucidated. The role of apoptosis as a regulator of tumor growth is crucial to understanding lung tumorigenesis and its control. Very recently, the concept of local renin/angiotensin systems (RAS) as key regulators of apoptosis is emerging in investigations of lung pathophysiology and pharmacologic manipulation of pulmonary fibrogenic processes. The session will allow experts in each of these areas to present their most recent work and to stimulate interest in this important topic. Directions for the future will be suggested by each speaker in his/her area, all in the context of clinically relevant problems.

Physiology of Water Transport

Cell & Molecular Physiology and Comparative Physiology Sections

E.M. Wright

Ernest M. Wright, Peter Agre, Mark Knepper, Alan Verkman, and Donald Loo

Water homeostasis is essential for life at all levels from the cell to the whole organism. In recent years there has been a resurgence of interest in water balance due to the identification of membrane proteins responsible for water transport in and of cells, aquaporins and cotransporters. This, in concert with advances in molecular biology, has led to the reexamination of some long-standing problems in the physiology of water balance. This symposium will highlight the recent advances from molecules to man. The topics to be covered are the structure and function of water transport proteins, the regulation of water transport, and the use of knockout animal and human models to examine the role of water transporters in renal, GI, and pulmonary physiology.

Other Sessions

Aquaporins and Other Members of the MIP Family

Physiology InFocus

P. Agre

Therapeutic Manipulation of Angiogenesis

American Federation for Medical Research

Douglas Arenberg

Extracellular ATP and cAMP as Paracrine and Interorgan Regulators

Renal Section

Lise Bankir and Edward Inscho

Edward Inscho, Paul Insel, Erik Schwiebert, Peter Devreotes, and Lise Bankir

Cells and Genes and Their Applications for Therapies for the Brain I

Central Nervous System Section

B.L. Davidson and H. Federoff

Evan Snyder, Howard Federoff, Beverly L. Davisdon, and Fred Gage

Cells and Genes and Their Applications for Therapies for the Brain II

Central Nervous System Section

B.L. Davidson and H. Federoff

Xandra Breakefield, Ronald D.G. McKay, Alfred Lewin, and Phillipe Hantraye

Experimental Biology 2000
April 15-18, 2000 • San Diego, CA

President-Elect Symposium: Biochemical Signaling in the Control of Microcirculatory Function
Microcirculatory Society
Walter N. Duran
Sarah Y. Yaun, C. Wayne Smith

The Mammalian Distal Tubule: Physiology and Disease
Renal and Cell & Molecular Physiology Sections
David H. Ellison and James B. Wade
James B. Wade, Richard P. Lofton, David H. Ellison, Heino Velazquez, and Gary E. Shull

Host Polymorphisms and Susceptibility to Infectious Diseases
American Federation for Medical Research
Mark Goldsmith
Mark Goldsmith, S. O'Brien, P. Gros, A. Hill, J. Casanova, R. Locksley, and J. Blackwell

Chemokines: From Bench to Bedside
American Federation for Medical Research
Sudhir Gupta
Sudhir Gupta, D. Taub, W.S. Walker/K.J. Kennedy, C. Mueller/P.R. MacDermott, M.D. Rothenberg/T.J. Williams, Tobert Gallo/Ed Berger, and J.J. Openheim

MAP Kinases: New Implications for Renal Cell Function
Renal Section
Dietmar Kültz and David W. Good
Roger J. Davis, John M. Kyriakis, Dietmar Kültz, David W. Good, and Tomas Berl

Role of TGF-α in Renal and Cardiovascular Fibrosis: Mechanisms and Therapeutic Prospects
Water & Electrolyte Homeostasis Section
Nicholas J. Laping
Anita Roberts, Rik Derynck, Jeffrey Kopp, and Nicholas Laping

Ion Regulation in Cell Organelles
Cell & Molecular Physiology Section
T. Machen
Terry Machen

Regulation of Transporters and Channels by Binding Proteins
Cell & Molecular Physiology Section
D. Rotin
Daniela Rotin

Point/Counterpoint: Does Deconditioning Affect Blood Pressure Regulation?
Environmental & Exercise Physiology Section
Point: **Lawrence Sinoway**, Hershey Med. Ctr., Penn. State Univ.
Counterpoint: **James A. Pawelczyk**, Penn State Univ. Col. Hlth. & Human Devel., Univ. Park

Bone Marrow Transplantation Non-Malignant Diseases
American Federation for Medical Research
George C. Tsokos and Seth Berney
George C. Toskos, Seth Berney, Bevra Hahn, Ann Traynor, Richard Burt, Charles Link, Richard Pope, Dan Furst, and Sherine Gabriel

Physiological Function Explored in Microgravity
Comparative Physiology and Environmental & Exercise Physiology Sections
C.E. Wade
Charles E. Wade, Kenneth Baldwin, Charles A. Fuller, Benjamin Levine, and Herman Vandenburgh

Cancer Genetics
American Federation for Medical Research
Peter Wiernik

Going from the Pharmaceutical Industry to Academia

David M. Pollock
Medical College of Georgia

Consideration of a dramatic change in our career represents a very agonizing decision for most of us. This may be why people are often reluctant to give thought to a major career change despite some degree of dissatisfaction or lack of fulfillment with their current work. Having recently made such a career move myself, I would like to review some of the factors I considered in making the move from a scientist working in the pharmaceutical industry to an academic tenure-track faculty position within a state-supported medical school. To advise a readership that is in academia, I will attempt to provide some insight into what it has been like to work in industry and then make the difficult move back to academia. To help in understanding how such a decision is made, I would like to review the pros and cons of each work environment.

How Did We Get Here?

For many of us who earned our graduate degrees and/or did postdoctoral research in traditional medical school physiology departments, our training was oriented toward some day acquiring a tenure-track faculty position similar to our mentors. Since expansion of medical school faculty positions has not kept pace with the number of new PhDs over the past couple of decades, alternative career paths have had to be considered by many students. Considering a career other than academia is a difficult process for most students and postdoctoral fellows. During pre- and postgraduate training, students usually have little contact with scientists in industry or have mentors with no first-hand experience or knowledge of alternative career paths. This problem is most prevalent in basic science departments in medical schools and not as evident in schools of arts and sciences. Often a career in industry is considered a secondary option or something one did in the pursuit of financial rewards and not for scientific or intellectual satisfaction. Fortunately, this attitude has been changing as the emergence of the biotechnology sector has encouraged faculty members to give greater consideration to the commercial value of their discoveries and increased opportunities for consulting in industry.

There are many reasons for pursuing a career as a research scientist within the pharmaceutical industry. This review is from a personal perspective of the various factors that I believe should be considered in such a decision. I personally felt comfortable in moving to Abbott Laboratories after graduate and postdoctoral training because of its reputation of recent growth in basic science research, particularly in vascular biology. For the first five years, everything went well, as I was able to maintain my productivity in terms of publishing, participating in national and international meetings and scientific societal activities. However, as often happens in industry, several waves of reorganization were initiated that moved the company away from a primary interest in cardiovascular drug discovery, my general area of expertise. This led to my being assigned to areas that did not allow me to continue working in an area of my scientific interest and even forced me to move beyond where my training and expertise had taken me. For some, this may represent an exciting new challenge or opportunity. However, after trying this for about two years, it became clear to me that this was not personally fulfilling. Thus, a move back to academia was considered but not without a tremendous amount of reflection, reservation, and anxiety. This decision was also compounded by the need to consider my spouse's career.

The Pros and Cons

Irrespective of the career path, every occupation has pros and cons. This certainly applies to the choice of working as a scientist in industry or academia. Any individual will not necessarily thrive in both areas. Much depends upon one's personality, talents, and goals. Having seen both sides, it is clear that quite often academicians and industry scientists believe the other is better off than they are in many ways. This "grass is greener" syndrome, of course, is not unique to scientists but is just a part of human nature.

Even before taking a job in industry or academia it is important to talk with as many individuals as possible to discuss the positive and negative aspects to both career paths. From my experience, there is no *advantage* to working in one setting or the other. The decision should be based on your personal situation and career goals.

The world of academic research is probably more familiar to everyone since at some point we were party to that environment. However, the perspective and goals change quite dramatically between that of a student and faculty member. For a typical tenure-track faculty position, the main goal is to become an independent investigator. This can provide a great deal of satisfaction for many people. While it is

tempting to blame grant and manuscript reviewers for many of our problems, your success is very much dependent upon yourself and your ability to accomplish quality research and know how to deal with the "system" in place to provide grant funding.

Some of the advantages to working in industry may be obvious, whereas others may not. One notion that seems to stick in the minds of many academicians is salary. Few can argue that salaries are not better in industry, but the differences are not very dramatic at the start of one's career. There are exceptions, of course, with some differences between companies and even individuals. If you have a rare talent that is in high demand, then you may be able to command a higher salary level. Larger companies also have the prestige to give them a competitive advantage in recruiting packages (much like big name and big budget schools). In addition to salary, the potential for other financial benefits in industry, such as stock options and profit sharing, are not found in academia. As one gains seniority or moves up the corporate ladder, the salary gap widens between industry and academia. Also, advancement opportunities are more abundant in industry and salaries have the potential of monumental jumps. In terms of other traditional benefits, there seems to be no clear advantage of industry over academia. In recent years, in fact, corporations have tightened up or reduced some of their benefit packages as demands for profit increase. Unlike industry, academic positions often are affiliated with teaching hospitals that sometimes allow dramatically reduced health care costs for faculty and their families. Within academia, vacation and family leave policies are generally much more lenient.

One reason the potential for advancement is greater in industry is because there are more jobs and job levels open to the PhD. Within larger companies, there are numerous career paths that can be taken, such as clinical administrators, scientific advisors, and writers within sales and marketing divisions, to name but a few. The management track in industry often requires sacrificing time and effort devoted to research. In contrast, the so-called "research track" in industry, while present, does not offer as many financial or leadership opportunities. For the typical tenure-track faculty member, there are only a few options for advancing one's career in terms of job title and description, other than associate and full professor. Thus, other sources of job satisfaction are critical through efforts in research, teaching, and service.

Another advantage to working in industry is the multidisciplinary project team system. This form of organization can be very rewarding in terms of being able to work and interact with a wide variety of people. This exposure to a broad range of techniques and disciplines expands and enhances one's experience far beyond the typical narrow focus of academic research. The possibility of contributing to the development of a new drug or product to impact human health is also exciting but often oversold since it is not a frequent occurrence. In order to maintain productivity and competitiveness, state-of-the-art laboratories are the norm in most companies with the latest equipment, plentiful space and the most recent methodologies. Core facilities are given solid support and are operated by well-trained experts. The laboratory staff are also treated more as professionals than simply "technicians" and often can advance their careers to levels similar to those with advanced degrees. By giving them more responsibilities, better salaries, and opportunities for advancement, more is gained from their skills and expertise.

The equivalent of the project team does not really exist in academia. While the larger academic laboratories can approximate this, it is unusual that the principal investigator has experience in managing a group as a team as opposed to coordinating several individual projects related to the general focus of the lab. Also, the diversity of scientific expertise is typically not present. Unfortunately, in both industry and academia, managers, directors, professors, and chairmen are too often focused on their own careers to place a concerted effort in promoting the careers of those under them. They often simply lose sight of the fact that success always reflects upwards.

A definite advantage to working in academia is the opportunity to work with students and postdoctoral fellows. They can be a tremendous source of satisfaction as they are eager to learn from your experience and expertise. They have a large personal stake in ensuring their own success, which also contributes to your success. In industry, you are able to work with many more people of diverse backgrounds, although opportunities for actual mentoring are more difficult to develop.

The environment within academia is often more open in terms of discussing and sharing research information. Too often in big pharmaceutical companies there is a great deal of internal competition for resources and recognition. The work environment in academia is also more flexible and relaxed, although this can vary a lot among different laboratories.

Scientists within academia are more apt to be open to collaborations based on pure scientific curiosity that can lead to more publications and grants. In industry, while the project team may function well, there is often little incentive for collaborations, which may take time and resources away from the focus of the project's goals.

An advantage to working in industry is not having to write grants and depend upon a few anonymous reviewers to determine the prosperity of your research program. There are less obvious forms of stress that one has to deal with when working in industry. Most companies have a limited amount of money to put behind the development of new drugs. While it may seem obvi-

ous that your project can succeed at developing a successful product, your managers may disagree. You may also be faced with specific deadlines to complete particular experiments or studies. However, as everyone knows, results do not always allow completion of studies as planned due to technical difficulties or unexpected results.

Whereas job-related stress is a reality common to both industry or academia, there are some differences in the source of your frustrations. In industry, the organizational structure and internal politics can consume a tremendous amount of your mental energy. Frustration can arise from working for a long time on a project that is suddenly terminated due to lack of marketing potential or some other reason beyond your control. In academia, the stress is perhaps more self-induced. The pressure to keep your laboratory going in terms of productivity and, most importantly, in terms of writing and receiving adequate grant funding can be a source of considerable anxiety.

Perhaps one of the most obvious negative aspects of an academic career is the almost hostile funding climate. It often seems as though your entire career is in the hands of two or three grant reviewers who neither have a clear understanding of your capabilities, nor are aware of how their decisions may have a major impact upon your entire future. Furthermore, most universities are increasing their reliance on extramural funding as a means of justifying promotion, tenure, space allocation, and other benefits while minimizing the rewards for teaching and service roles.

One the biggest concerns often cited concerning a research career in industry is the relative lack of control individual scientists have over the research he or she conducts. Typically upper levels of management (some not even being scientists) are making decisions that influence the research you perform. Such decisions can be based on business reasons (potential for profit) or scientific interpretation (e.g., will a new drug candidate have sufficient efficacy and safety to be a useful product). The frustration of having others influence your work is compounded by the fact that the management structure is more extensive in industry than academia. In addition, a very competitive situation may exist within the company where project teams are competing for limited resources. Despite the perception that highly profitable companies should have plenty of research dollars available, most have tightly managed research budgets with little year-to-year flexibility.

More now than in the past, companies are undergoing reorganizations and reallocation of human resources that are not under your control. You may be asked to do work that does not capitalize on your expertise or best utilize your talents. For some people, such an assignment is not readily tolerated while others may enjoy learning and doing new jobs. This can be especially traumatic if re-assignment includes relocation or possibly a layoff.

In most jobs, we depend upon our immediate supervisor to have considerable influence on our success. In academia, there are almost as many management styles as there are chairmen. While the totally hands-off approach may provide a great deal of independence and autonomy for the faculty, it may be an indication that the chairman is not fulfilling his/her important leadership role within the work environment. At the opposite extreme, the chairman may be a control person who desires your laboratory to be simply an extension of his/her own laboratory.

Many of these advantages and disadvantages of industry versus academia are likely to carry more weight for some individuals than others. Each must decide the degree to which these factors influence the approach to work and career. When considering a job in industry or academia, one should consider these and other factors that may be most important for their success and contentment.

Moving Back to Academia From Industry

The qualifications needed to secure a typical tenure-track faculty position are the same whether you are moving from within academia or making the move from industry. Not everyone who spends time in industry will be in a position to take an academic position. The most important requirement for academic employment is to remain "active" in the scientific community during your tenure in industry so you can readily establish your own active research program. A reputation through contributions in publications, participation at meetings, and professional society involvement are essential. Ideally, you will have written and even been awarded national research grants that can be transferred to your academic position. However, industry does not encourage extramural grants and it is even against company policy in many cases. More often than not, industry scientists become apathetic about developing a professional reputation outside the company since it is usually not recognized or important to your managers. However, even if you are not considering a move to academia, a serious effort should be made to maintain your proficiency as a contributing scientist.

Before contemplating a move to academia, it is important that you have solid, well-conceived ideas for a research program before the interview process. A list of specific research aims and potential sources for extramural funds is important while at the same time taking advantage of your research accomplishments in industry.

Whether you are seeking a position in industry or academia, one should not underestimate the importance of personal contacts. Networking recommendations are exceedingly important and a compelling reason to attend and network with the academic scientist at meetings. Participation in professional societies, such as APS, are extremely valuable for career development to help open doors in the future.

The move from industry to academia will usually necessitate a reduction in both salary and position relative to your experience. Even with several years beyond graduate school, you may have to start out as an assistant professor. Many universities require a proven record of grant funding before consideration is given for an associate or full professorship. Of course, this does not mean that it cannot happen; negotiation should always be considered. In my case, a two-career family makes moves even more difficult. It is rare that two tenure-track faculty positions are open at the same time, so often one will have to consider an alternative career other than their first choice.

Industry vs. Academia: Why Us vs. Them?

Finally, I would like to emphasize that there are many misconceptions held by scientists working in academia about what it is like to work in industry and vice versa. As with many prejudices, some of these are based on limited experiences and exposure to a few individuals that have been expanded into broad generalizations. For example, there are those who believe scientists in industry are second-rate and chose that career path because they were unable to secure an academic position. Whether justified or not, this prejudice is felt by many working in industry. This bias is perpetuated when industry scientists are not readily sought for editorial boards, conference speakers, or invited for departmental seminars. Contacts are often initiated only when the academician needs a new drug, antibody, or money. On the other hand, industry scientists often regard the academician as arrogant that veils a reluctance to consider them as competent research scientists. These problems have led to a great deal of apathy on the part of many industry scientists when it comes to participating with the wider scientific community. Unfortunately, much of this stems from a lack of understanding by the academician of the nature of what industry scientists actually do. Within the pharmaceutical industry, it is often said that a particular academician "does not understand the drug discovery process," which is often true.

In the end, we will all benefit when there is more open communication between industry and academic scientists. All too often, the onus is placed on the industrial scientist to take initiative when it comes to improving relations between industry and academia. For those of us in academia, it is our responsibility to make the effort in our professional activities (organizing meetings, mentoring students, etc.) to change their perceptions of colleagues in industry, which will certainly be to everyone's benefit. ❖

Education Outreach Efforts Gain Momentum

Summer Research Teachers Convene for Training

Twenty-three 1999 APS Summer Research Teachers (SRTs) participating in the APS *Frontiers in Physiology* and *Explorations in Biomedicine* programs gathered at the Airlie Center in Warrenton, VA, July 13-18 to attend a retreat under the direction of APS Education Officer, Marsha Lakes Matyas, for inquiry-based teaching instruction and assistance in developing hands-on, inquiry-based science activities to use in their classrooms. SRTs participated in numerous hands-on laboratory activities, shared summer research experiences, evaluated their current teaching techniques, and collaboratively developed strategies to implement teaching methods promoted by the National Science Education Standards.

Frontiers in Physiology and *Explorations in Biomedicine* are APS programs designed to build ongoing working relationships between research scientists and science instructors through research experiences and to promote the adoption of national standards in content and teaching technique among science teachers. *Frontiers in Physiology* is sponsored by the APS and the NIH Science Education Partnership Awards (SEPA). *Explorations in Biomedicine* is sponsored by the APS and the National Institute of General Medical Sciences (NIGMS)/Minority Access to Research Careers (MARC) Program. While the 17 *Frontiers in Physiology* participants teach at middle and high schools across the US, the six *Explorations in Biomedicine* participants teach primarily Native American students at middle and high schools, and tribal colleges on Montana reservations.

SRTs spend a major portion of their summer conducting research in APS host laboratories to experience "science-in-action" and the life and work of a science researcher, and then attend the retreat at the Airlie Center for inquiry-based teaching instruction and assistance in developing an inquiry-based science activity to be submitted to APS for print and online publication. To date, the APS Education Office has published more than 150 teacher activities in hard copy and offers more than 45 teacher-tested middle and high school level science activities on a wide variety of topics on the APS web site at: http://www.faseb.org/aps/educatn/k-12curr.htm. SRTs will also attend Experimental Biology 2000 in San Diego, CA to further their science experiences and to learn about the latest life-science research findings. Many SRTs will present their research findings and/or activities at poster sessions.

Past SRTs Join APS Members as Advisors

Serving as advisors-in-residence and fielding numerous questions related to science content, use of animals in research, and classroom equity issues, were APS Education Committee Chair, **Barbara E. Goodman,** University of South Dakota School of Medicine, and Education Committee member, **George T. Blevins,** University of Arkansas for Medical Sciences.

Also joining the retreat to assist in the workshop training and science activity development were past SRTs, Richard Carruba, Brackenridge High School, TX; Nancy Kellogg, Brawley Union High School, CA; and Kolene Krysl, Millard Central Middle School, NE.

Applications for the 2000 summer research programs are now available at the APS Web site: http://www.faseb.org/aps/educatn/k-12prog.htm. For additional information about the summer research programs, email the APS Education Office at educatio@aps.faseb.org or call 301-530-7132.

Local Outreach Institute Serves Dual Purpose

Impacting the Science Education of Thousands

While *Frontiers in Physiology* is a nationwide program, and *Explorations in Biomedicine* focuses primarily on serving the North West Native American population, Local Outreach Teams (LOTs) serve to develop connections between physiology researchers and local teachers and schools. LOTs develop new physiology resources and materials for middle and high school classrooms and disseminate them through inservice workshops for local teachers. Using external funding, the APS provides the LOTS with financial resources to offer stipends for LOT teachers, workshop training, printed and laboratory materials, and workshop cost reimbursement.

Since the program began in 1995, 22 LOT teams have presented workshops to hundreds of middle and high school teachers throughout the nation, focusing on inquiry-based teaching training, the use of animals in research and teaching, and the importance of biomedical research, cumulatively impacting the science education of thousands of students.

Two New LOTs Launched

Representatives from two new LOTs for 1999-2000 met for training at the Airlie Center in Warrenton, VA, June 24-27. The Dull Knife Memorial College and East Carolina University Team, led by APS member **Robert G. Carroll**, attended by Martin Old Crow, Lodge Grass Elementary School, MT; and the University of Montana Team, led by **Delbert L. Kilgore, Jr.,** and

attended by William R. Galey, University of New Mexico School of Medicine; Kathy Knudson, Polson Middle School; and Mary Alice Thomas, Polson High School, received training that will enable APS physiologists and local teachers to deliver hands-on, inquiry-based APS physiology activities to their middle and high school teachers on Montana Native American reservations.

Representatives from each LOT team received training in the APS workshop units, ***"Neural Networks,"*** a series of middle school lab activities concentrating on autonomic neural functions, and ***"Physiology of Fitness,"*** a collection of high school activities teaching cardiovascular and respiratory functions. LOT instructors included current LOT members and former SRTs: Lesli Adler, Thomas S. Wooton High School, MD; Lisa Bidelspach, Clear Creek High School, TX; Mary Lightbody, Columbus Public Schools - Science Teacher Support Team, OH, and APS member **Norman W. Weisbrodt,** of the University of Texas Medical School.

In addition to reviewing physiology content, new LOT members learned how to model inquiry-based and problem-solving pedagogy recommended by the National Science Education Standards through interactive, hands-on modeling of teaching methods.

The LOTs will implement their outreach efforts to middle or high school teachers in Montana during the 1999-2000 school calendar year. Each LOT will present at least one inservice workshop, either "*Neural Networks*" or "*Physiology of Fitness,*" and one to two follow-up workshops where participants share suggestions for classroom activities, are presented information and suggestions on integrating the Internet as a science education resource, and develop networks between teachers and researchers.

For more information about developing a Local Outreach Team in your community, visit the APS website at: http://www.faseb.org/aps/educatn/lot.htm or contact the APS Education Office at 301-530-7132 or email: educatio@aps.faseb.org. Applications for 2000-2001 LOTs will be available in September 1999.

New LOT Curriculum Units in Development

Representatives of five existing LOT teams also met at the Airlie Center to begin drafting five new curriculum units that will be used at workshop presentations. Unit topics include vision, gastrointestinal physiology, renal physiology, cell structure and function, and the human lever system. APS Education Officer, **Marsha Lakes Matyas,** provided guidelines for writing and developing new LOT units. Curriculum developers were encouraged to integrate multi-media and Internet resources into their units.

Drafting new units were representatives from The Medical College of Wisconsin, Center for Science Education Team, led by **Jeffrey L. Osborn** and attended by Jill Crowder, Milwaukee Area Technical College, Larrietta Jenkins, Maryland Avenue School, WI; and Suzette Svoboda-Newman, Medical College of Wisconsin, WI; the Texas Tech University Health Sciences Center Team, led by **Lorenz O. Lutherer** and attended by Herb Janssen, Texas Tech University, Sandra Chitwood, Watson Junior High, TX, and Cathy Box, Tahoka High School, TX; the Massachusetts General Hospital Team, led by **Andrea R. Gwosdow,** and attended by Nadine Solomon, Arlington High School, MA; the Indiana University School of Medicine Team, led by **C. Subah Packer,** and attended by Bill White, Arsenal Technical High School, IN, and Sandi Mahl, Seymour Middle School, IN; and the University of South Dakota Team, led by **Barbara E. Goodman** and attended by Sally Schempp, Vermillion Middle School, SD, and Marilyn Jensen, Beresford Junior High, SD.

Also in development is a middle school version of the current high school unit *"Physiology of Fitness."* The new unit, to be titled *"Physiology of Exercise,"* was written by **Barbara E. Goodman,** University of South Dakota School of Medicine and LOT member/past SRT, Sally Schempp of Vermillion Middle School. ❖

Nebraska Physiological Society Holds Second Annual Meeting

The second annual meeting of the Nebraska Physiological Society (NPS) was held on June 19 at Skutt Student Center in Creighton University at Omaha in Nebraska. Twenty-six posters were presented in the meeting this year. The meeting started at 9:00 AM with a welcome address by **Irving H. Zucker**, President of the Society, and a brief overview of the purpose of the meeting, targeting especially the younger investigators and students. This was followed by a keynote speech by **L. Gabriel Navar** from Tulane University School of Medicine, the Past President of the American Physiology Society. Navar's attendance was sponsored by APS. The title of Navar's talk was "Interactive Paracrine Regulators of the Renal Microcirculation." Navar's talk highlighted the paracrine mechanisms of the renal microcirculation and resulted in a stimulating discussion. The posters displayed at the meeting were from investigators in the Departments of Physiology and Biophysics, Pharmacology, and Obstetrics and Gynecology at The University of Nebraska Medical Center, the Physiology and Pharmacology group at The University of South Dakota, the Department of Biomedical Sciences at Creighton University School of Medicine, and The University of Nebraska at Kearney. A full spectrum of physiological topics including reflex control of cardiac function, exercise and cardiac regulation, osmoregulation and endocrine function in fish, ion channels, cerebral microcirculation, nitric oxide and cardiovascular regulation, renal microcirculation, developmental endocrinology of the ovary, autocrine and paracrine control of airway epithelium, brain catecholamine receptors, and the outreach opportunity for science education. The key feature of the meeting was a thorough interaction between people working in totally different areas and systems, and many of these discussions actually resulted in follow up interactions between investigators several days after the meeting. We were very pleased to have an exhibition booth set by Nikon, Inc. of Omaha to demonstrate their microscopes and accessories. This was of great benefit to several people who did not have a prior opportunity to see a hands-on demonstration of various research microscopes and obtain a direct understanding of the benefits and limitations of various equipment. We were also grateful to obtain an advertisement from Calbiochem. The luncheon was kindly sponsored by the Nikon Company and by Calbiochem.

Following the Saturday poster session, the NPS business meeting was held. Navar elaborated on the current state of the American Physiological Society, emphasizing the need for physiologists to support the Society by becoming members and publishing their best work in *The American Journal of Physiology*. Navar highlighted several positive and supportive steps that APS has taken to help their members in research and education. A detailed discussion followed. Next, **Barbara Goodman** from The University of South Dakota School of Medicine discussed middle/high school outreach programs emphasizing various means to motivate younger people and their teachers in physiological sciences. **Irving H. Zucker**, current President of the NPS, elaborated on the present status of NPS and its progress during the last year. This was followed by the treasurer's report furnished by Shyamal K. Roy, Secretary and Treasurer of the NPS. NPS has progressed steadily although the flow of the revenue has been modest. Several options were discussed to increase the NPS treasury. For example, obtaining more advertisement revenue, membership dues, etc. Following the treasurer's report, the new NPS President-Elect was chosen. **Pamela Carmines**, Professor of the Department of Physiology and Biophysics at UNMC was elected unanimously. Zucker also proposed some changes in NPS by-laws and a joint meeting with the Midlands Chapter of the Society for Neuroscience. Thorough discussion was followed to clarify various pros and cons. Changes in the by-laws were unanimously accepted. The proposal for a joint meeting will need further input from the membership. The third annual meeting of the NPS will be held at The University of Nebraska at Kearney.

The minutes of the second annual meeting of the NPS will be available at our website http://www.unmc. edu/NPS.

Shyamal K. Roy
Univ. of Nebraska Medical Center

NIH Awaits Funding Action

After a series of canceled mark-up sessions in mid-July, House Appropriations Subcommittee action on NIH funding was postponed until after the August recess. September 9 was the date set by Rep. John Porter (R-IL) for his Labor-HHS-Education Appropriations Subcommittee to mark up the NIH funding bill. Senate action was also expected to take place in September. The main obstacle continued to be that the Labor-HHS Appropriations Subcommittees did not have enough money available for the programs under their jurisdiction.

According to advance information, it was anticipated that at the House mark-up the subcommittee would provide $17 billion for NIH in FY 2000. This would be an 8.6% increase over the FY 1999 level of $15.6 billion. This sum still falls about $1 billion short of the 15% increase that both Porter and his Senate counterpart, Sen. Arlen Specter (R-PA) hoped to provide. A 15% increase would keep NIH on a path to double its budget between fiscal years 1998 and 2003, but the 8.6% increase was seen as the best that Chairman Porter would be able to manage under the existing budget caps.

The obstacle for the House Labor-HHS Appropriations Subcommittee was that it had been allocated only $78 billion for FY 2000 to fund all the programs under its jurisdiction. This amount was $11 billion less than subcommittee's FY 1999 allocation. The total went down because of the budget caps that had been put into place two years earlier to reduce the federal budget deficit. Although the deficit had been eliminated, and in fact the government was running at a surplus, the Republican-controlled Congress remained locked in a political struggle with the White House in which staying within the budget caps was considered a badge of honor.

The House Labor-HHS subcommittee's funding allocation was further decreased by $16 billion in late July when money was shifted to programs in other funding bills in order to secure the support of enough Representatives to pass the legislation. The raid on Labor-HHS funding contributed to the expectation that more money would have to be made available before the bill could be brought to the House floor. It was also hoped that this infusion of funds would enable Chairman Porter to provide an even larger increase for NIH. ❖

NSF, VA, and NASA Funding Barely Holds the Line

Before departing for the August recess, the House Appropriations Committee approved funding recommendations for the National Science Foundation, VA Medical and Prosthetic Research, and NASA life sciences, ratifying the recommendations of its VA-HUD-Independent Agencies Subcommittee. Unfortunately, due to the same problem with the budget caps that plagued NIH funding (see accompanying article), the House Appropriations Committee was unable to provide the levels of support FASEB and the APS had recommended for these programs. The House VA-HUD Subcommittee was provided only $66 billion to cover its programs, which was $5 billion below what was available to it last year.

Consequently, the VA-HUD Subcommittee cut the NSF appropriation by $24 million below its FY 1999 level to $3.6 billion. This amount was $275 million below the President's FY 2000 request. Despite the overall reduction, Research and Related Activities (R&RA) was increased by $8.5 million to $2.8 billion. The modest increase still left R&RA $226 million below the President's request. APS supports the FASEB consensus conference recommendation that NSF be provided with $4.2 billion for FY 2000. House VA-HUD Appropriations Subcommittee Chairman James Walsh (R-NY) has said that he hopes he can increase NSF funding when the bill is brought to the House floor in September.

The House Committee also provided $326 million for VA medical research, an increase of $10 million over the FY 1999 level. The FASEB consensus conference had recommended a $44 million increase for the VA.

Although NASA's overall budget was reduced by 7.4% to $12.65 billion, the Office of Life and Microgravity Sciences and Applications (OLMSA) was to be kept at its current level of $263.5 million. This involved a $7 million or 2.7% increase over a cut that had been recommended in the President's request. Funding for the Life Sciences Division is contained in the OLMSA budget. The Life Sciences Division had a budget of $120.8 million in FY 1999. FASEB had recommended a $50 million increase in the program for FY 2000.

House consideration of the VA-HUD bill had originally been scheduled prior to the August recess but was delayed because of the death of the father of Rep. Alan Mollohan (D-WV), the Ranking Minority Member of the subcommittee. The Senate VA-HUD subcommittee has not yet drafted its version of the legislation. ❖

OMB Proposes FOIA Refinements

The Office of Management and Budget published a Federal Register notice on August 11, 1999 asking for comments on definitions of key terms used to implement a law giving the public access to federally-funded research data under the Freedom of Information Act (FOIA). Comments on these definitions were due by September 10, 1999. OMB planned to finalize the proposal by September 30, 1999 because earlier legislative efforts to delay implementation were unsuccessful.

Many in the academic research community judged the current, narrowly-written proposal to be the best possible option given the broad legislative language underlying it. It was believed that if the proposal was finalized in this form, its impact on most biomedical research would be limited. Still at issue, however, would be research into health implications of regulated industries, such as pharmaceuticals, medical devices, and hazardous materials.

The origin of this notice was an amendment to the FY 1999 Treasury-Post Office Appropriations section of last year's omnibus funding bill, requiring the OMB to provide for public access to the underlying data from federally-funded research. Sen. Richard Shelby (R-AL) sponsored the provision in response to a long-running dispute in which the coal industry sought access to the scientific data behind Environmental Protection Agency air pollution standards. The Shelby amendment required OMB to amend its circular A-110 by September 30, 1999, "to ensure that all data produced under an award will be made available to the public through the procedures established under the Freedom of Information Act" (PL-105-277). Circular A-110 sets out the administrative requirements for grants and agreements between the federal government and institutions of higher learning, hospitals, and other non-profit organizations.

The research community expressed concerns about the potential impact of the Shelby language as soon as its existence became known. OMB published a Notice of Proposed Rulemaking (NPRM) on February 4, 1999, which interpreted the Shelby language narrowly to apply to "data relating to published research findings produced under an award that were used by the Federal Government in developing policy or rules." The notice generated more than 9,000 comments. The majority supported the proposal, in general, and called for a broader interpretation of the Shelby language on the grounds that citizens are entitled to access to research data produced with funds provided by the government. Many of these favorable comments were email messages that had been generated at the last minute by pro-business web sites.

The scientific community, including APS, supported OMB's effort in its February 4 notice to narrow the scope of the provision but continued to voice concerns about the vagueness of key terms. APS noted that if terms such as "data," "published," or "policy or rules" were interpreted broadly, ongoing research might be disrupted, the privacy of clinical research subjects might be violated, intellectual property rights might be nullified, and the door would be opened to harassment of those who do research on controversial topics. (The APS letter of comment on the February 4 notice is posted at http://www.faseb.org/aps/foia.htm)

The concerns of the scientific community comprised the minority of the comments submitted in response to the February 4 notice. Nevertheless, OMB sought to accommodate those concerns in its August 11 notice. According to OMB, its goal was to "further the interest of the public in obtaining the information needed to validate Federally-fun ded research findings, ensure that research can continue to be conducted in accordance with the traditional scientific process, and implement a public-access process that will be workable in practice."

Perhaps the single most important change in the August 11 revision to Circular A-110 was to narrow the FOIA provision to apply only to federal regulations. If implemented in this form, the FOIA disclosure provision would cover to "research data relating to published research findings produced under an award that were used by the Federal Government in developing a regulation." This differs from the earlier version in that it no longer includes federal "policy." The OMB concluded that it was unnecessary and unworkable to cover policies, such as agency guidance, risk assessments, surveys, and reports. The OMB reasoned that since policies are formulated in a less structured fashion than are regulations, "In the absence of a formal record that explains the agency's action, it would be far more difficult for the public and the agencies to determine, in individual cases, whether particular research findings were 'used' by the agency in 'developing' the agency [policy] action." This might result in the need to conduct "a fact-intensive inquiry into the agency's internal deliberations" that would be "burdensome and time-consuming, and would intrude into the agency's deliberative process." Such deliberative processes are normally exempt from FOIA queries.

The August 11 proposal also contained a proposed definition of "research data" as "the recorded factual material commonly accepted in the scientific community as necessary to validate researching findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues." The definition goes on to state that this "recorded'' material excludes physical objects (e.g., laboratory samples)." It further stated that research data also do not include: (A) Trade secrets, commercial

information, materials necessary to be held confidential by a researcher until publication of their results in a peer-reviewed journal, or information which may be copyrighted or patented; and (B) personnel and medical files and similar files, the disclosure of which would constitute an unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study.

The August 11 notice further proposed to define "published" as either when research findings are "published in a peer-reviewed scientific or technical journal" or when "a Federal agency publicly and officially cites to the research findings in support of a regulation." This definition was seen as likely to be helpful in terms of avoiding the premature release of research data.

Although the revised proposal was helpful on several important issues, it was unable to address a fundamental problem: the potential for FOIA requests to be used to harass or intimidate researchers. Since the underlying FOIA statute places no restrictions on how data obtained through FOIA requests may be used, this could easily become another tool to interfere with research in controversial areas. Although OMB sought to produce the best possible language, the effects of this revision to A-110 should be carefully monitored across the government to see how it is used and what problems may arise. ❖

Mass Media Science and Engineering Fellowship Applications Being Accepted

BACKGROUND: Applications are currently being accepted for an APS sponsored American Association for the Advancement of Science (AAAS) Mass Media Science and Engineering fellow. This individual will spend a summer working in the newsroom of a newspaper, magazine, radio or television station, sharpening his or her ability to communicate complex scientific issues to nonscientists and helping to improve public understanding of science.

DUTIES: The APS-sponsored fellow will spend 10 weeks helping to cover science and technology issues. AAAS will arrange placement at a participating media outlet as part of the selection process. The fellowship will include travel to Washington for an advance orientation to journalism and an evaluation session at the conclusion of the assignment, as well as travel to the job site and a weekly stipend based upon local cost of living.

ELIGIBILITY: You must be currently enrolled as a graduate or postgraduate student of physiology or a related discipline.

APPLICATION INFORMATION: Application forms are available from Alice Ra'anan in the APS Office of Public Affairs at the address below. In addition to the completed form, applicants must submit a current résumé, at least one three- to five-page writing sample directed to the general public, transcripts of graduate and undergraduate work, and three letters of recommendation. Two recommendation letters should be from faculty members, and the third should be a personal reference. The selection process is designed to seek out qualified candidates especially from underrepresented communities, including African-Americans, Hispanics, and Native Americans, as well as scientists with disabilities.

DEADLINE & CONTACT: The application deadline is **January 15, 2000**. For more information, contact Alice Ra'anan, APS Office of Public Affairs, 9650 Rockville Pike, Bethesda, MD 20814-3991. Tel: 301-530-7105; fax: 301-571-8305; e-mail: araanan@aps.faseb.org.

Know Your Sustaining Associate Members

Abbott Laboratories

Abbott Laboratories is one of the world's leading health care companies, dedicated to improving people's lives through the discovery, development, manufacture and marketing of health care products. Abbott invests well over $1 billion in internal research each year. The high productivity of this investment reinforces it as the primary component of the company's growth strategy. Some of Abbott's leading products are Biaxin, Depakote, Lupron, Survanta, Ensure, Similac, ProGibb, Ultane, AxSYM, and Precision QID.

ADInstruments

ADInstruments manufactures a range of computer based data recorders for the life and physical sciences. The Maclab and Powerlab systems, comprising both hardware and software, record and display experimental data in real time, and features fast data manipulation, on-line computations, convenient file storage and high resolution data presentation. A range of signal conditioners and transducers extends the use of Powerlab into many specialist fields.

American Medical Association

The American Medical Association promotes and defends the scientific bases for medical practice. Physiology is basic to modern medicine and essential to the growth of understanding necessary to support advances in medical practice. It is the nature of life that there will always be questions to answer regarding its processes.

Axon Instruments, Inc.

Axon Instruments, Inc. designs and manufactures instruments and software for electrophysiology. Axon Instruments produces full-featured amplifiers for single-channel and whole-cell patch clamp and for single- and two-electrode current/voltage clamp applications. These hardware products are supported with PC and Macintosh software and acquisition hardware for the acquisition and analysis of biophysical data. The latest products are the CyberAmp series of general-purpose analog signal conditioners. They provide up to eight channels of computer-controlled adjustment of gain, offset, and low-pass Bessel filtering. Virtually any type of transducer can be adapted for the CyberAmp. The computer can instantly determine the scaling and units of each transducer. Support for the CyberAmps is provided by software from Axon Instruments and others. The CyberAmp used in conjunction with Axotape software and TL-1-125 acquisition hardware makes a complete computer-based chart recorder system.

Berlex Biosciences

Berlex Biosciences is a US subsidiary of the multinational pharmaceutical and chemical firm Schering AG West Germany (not connected with Schering-Plough Corp. or Schering Corp. of New Jersey). It conducts research and markets prescription drug products primarily for cardiovascular, diagnostic imaging, metabolic, endocrine, and central nervous system uses.

Gatorade Company

Expertise in sports nutrition and exercise science is one of the unique and distinguishing attributes of The Gatorade Company. To further this expertise, the Gatorade Exercise Physiology Laboratory was founded in 1985 to fully explore the role of fluid replacement and sports nutrition in athletic performance. Scientific research on a variety of topics in exercise science and sports nutrition is conducted at the Gatorade Laboratory and in cooperation with university researchers. Gatorade employs exercise scientists who specialize in exercise physiology, biochemistry, and nutrition research. The Gatorade Sports Science Institute, serving sports health professionals around the world, supports educational programs in sports science and nutrition. The Gatorade Company is a wholly owned subsidiary of The Quaker Oats Company.

Grass Foundation

The Grass Foundation underwrites the annual Walter B. Cannon Lectureship given at the APS spring meeting. The naming of this lectureship serves two functions: to commemorate the enormous contribution of Cannon to the growth of knowledge of physiology and to pay a tribute to Cannon on behalf of many of the founding trustees of the Grass Foundation who were members of his research group at Harvard Medical School early in their careers.

This lectureship is in accordance with the Grass Foundation's charter mandate to support research and education in neurophysiology. Other programs include funding for other annual and visiting lectureships, summer fellowship support for young students, and occasional relevant course support.

Harvard Apparatus

Harvard Apparatus, since its inception in 1904 at the Harvard Medical School, continues to design, develop, and supply the unique apparatus that has shaped the development of teaching and research in physiology and allied science, including syringe peristaltic and respiration pumps, recording systems, and research accessories.

Sustaining Associates

Janssen Research Foundation

Janssen Pharmaceutica was founded in Belgium in 1953 by Paul Janssen. It is now an international company built on the foundation of research and a bedrock of innovation. The company remains under the direction of Janssen and has an unparalleled record in the successful development and marketing of new pharmaceutical products. According to the Japan Drug Research studies, Janssen was responsible for more significant new drug discoveries during the period 1970-1983 than any pharmaceutical company in the world.

The company currently has approximately 6,000 employees world-wide. It is a world leader in medication used in the treatment of allergies, mental disorders, digestive and intestinal problems, cardiovascular conditions, and worm and fungal infections. Janssen's compounds have also enabled major advances in anesthesia and immunology. In addition, Janssen has also discovered many chemical compounds to identify and characterize receptors in the brain and the periphery that have played a prominent role in advancing our knowledge about neurotransmitters.

Eli Lilly and Company

The Lilly Research Laboratories is dedicated to the advancement of basic scientific research upon which targeted medical breakthroughs may be identified. Eli Lilly and Company is committed to excellence in research as evidenced by a steadily increasing investment in novel "cutting edge" research methods and technology (e.g., genomics, combinatorial chemistry, and high volume screening) as they can be applied to drug discovery. Lilly scientists are focusing on basic research and targeted medical therapy for infectious diseases, cardiovascular disease, cancer, central nervous system disorders and endocrine diseases with an emphasis on obesity, diabetes and osteoporosis.

Merck & Co., Inc.

Merck & Co., Inc. is a worldwide, research-intensive company that discovers, develops, produces, and markets a broad range of human and animal health products and services. Merck's product portfolio includes the cardiovascular drugs VASOTEC and PRINIVIL, and the cholesterol lowering drugs MEVACOR and ZOCOR, the gastrointestinal drug PEPCID, and for symptomatic benign prostate enlargement PROSCAR. Merck has recently introduced the antihypertensive drugs COZAAR and HYZAAR, the anti-glaucoma drug TRUSOPT, the HIV protease inhibitor CRIXIVAN for AIDS, the vaccines VARIVAX (protection against chickenpox and VAQTA (protection against hepatitis A), the osteoporosis drug FOSAMAX, and the over-the-counter antacid PEPCID AC.

Pharmacia and Upjohn, Inc.

Human health care is at the heart of Pharmacia and Upjohn's endeavors. Pharmacia and Upjohn, Inc., a multinational corporation and one of the largest research-based pharmaceutical manufacturers in the world, has research, production, and warehousing facilities in more than 45 countries, and its products are sold in more than 150 countries.

Some of Pharmacia and Upjohn's most promising research has been in the fields of oncology, peptide hormones, cataract surgery, nutrition, and allergy diagnostics.

Procter & Gamble Co.

Procter & Gamble is a multinational consumer products and health care company committed to world-class research and product development. It has major technical centers in Cincinnati, Ohio; Norwich, New York; Hunt Valley, Maryland; Mexico City, Mexico; Caracas, Venezuela; Brussels, Belgium; Egham and Newcastle, UK; and Kobe, Japan.

The worldwide PhD population of Procter & Gamble is 1,200, divided about equally between life scientists and chemists. Total employees number 100,000.

Sales in the health care/pharmaceuticals, beauty care, cosmetics and fragrances, food and beverage, laundry and cleaning, and paper products make Procter & Gamble one of the largest companies in the US. *Fortune* magazine consistently recognizes Procter & Gamble as one of the "Most Admired US Corporations."

Rhone-Poulenc Rorer

Rhône-Poulenc Rorer is an international company dedicated to health. RPR is the first pharmaceutical company in France, the third in Europe, with a turnover in 1994 of $4.5 billion: a research driven company with 14% reinvested in Research and Development ant 3,000 employees in R&D.

With Research Centers located in France, USA and UK, Research & Development is focused on seven main therapeutic areas: oncology, cardiovascular diseases, infectious diseases/AIDS, rheumatology/bone metabolism, central nervous system disorders, respiratory diseases/allergies, plasma proteins.

To invest in new technologies, gene and cell therapies, is the RPR's commitment to the future.

Schering-Plough

Born out of a 1971 consolidation of two companies (Plough, Inc. and the Schering Corporation), Schering-Plough is dedicated to the discovery, development, and marketing of novel therapeutic entities. The company focused its research in the fields of anti-inflammatory, antiallergic, cardiovascular, and anti-infective disorders. The company has also attained a leading position in immunology and recombinant DNA technology.

G.D. Searle & Co.

The physiologic and scientific directions of Searle are primarily in areas related to arthritis and inflammation, cardiovascular disease, and oncology with an emphasis on adjunctive therapy and opportunistic infections. In these three major therapeutic areas, the emphasis is on defining new molecular targets that are likely to elicit a dramatic shift in therapeutic efficacy with a true ultimate enhancement of therapeutic benefit.

Research employs high throughput robotic screening to define chemical or protein leads, medicinal chemistry and protein biochemistry, including protein mutagenesis, to maximize the properties of the chemical or protein lead, and extensive animal testing to determine proof of concept. Molecular and cell biology are utilized extensively to support screening efforts and to define the molecular targets underlying a particular disease, including the use of differential display PCR. The approach is to integrate expertise across scientific disciplines to rapidly determine proof of concept underlying a disease target.

SmithKline Beecham

SmithKline Beecham is one of the world's leading health care companies. Its principal activities are the discovery, development, and marketing of both human and animal pharmaceuticals, over-the-counter (OTC) medicines, health-related consumer brands, and clinical laboratory testing services.

Position Wanted

Position Wanted: MD, PhD Molecular Biologist with extensive research and teaching experience both at the undergraduate and graduate level seeks a suitable position in academia or industry. Excellent communication skills. Publication record includes 26 peer-reviewed publications. Peer reviewer for two journals. Currently an NIH fellow in molecular biology at the Medical College of Virginia. US permanent resident. Available immediately and willing to relocate. Tel: 804-675-5000, X3660 or 804-921-2999; fax: 804-364-2264; email: spremara@hsc.vcu.edu.

Positions Available

Postdoctoral Position: A new NIH-supported postdoctoral position is available immediately to study mechanisms involved in functional down-regulation of pulmonary endothelial sensitivity to injury after heart failure and pulmonary hypertension. This collaborative research effort will focus on alterations in P450-mediated regulation of endothelial calcium entry and barrier permeability using both cell culture and isolated lung approaches. Candidate must be a US citizen or a permanent resident and have a PhD and/or MD degree, with a strong background in physiology, cell biology, pharmacology, or a related field. Prior experience in microvascular function in vivo or in vitro, endothelial cell biology, or patch clamp techniques is desirable. Salary will depend upon experience according to NIH scale. Qualified and highly motivated individuals should send a curriculum vitae; summary of prior research experience; and names, addresses, and phone numbers of three references to: Mary Townsley, PhD, Department of Physiology, MSB 3024, University of South Alabama College of Medicine, Mobile, AL 36688. Tel: 334-460-6815; fax: 334-460-6464; email: mtownsley@usamail.usouthal.edu.

Assistant Research Scientist: The Humboldt-University of Berlin (Germany), Institute of Anatomy, Department of Nephrology and Vascular Research, is seeking an Assistant Research Scientist. Areas of research are: NOS isoforms and their regulation; NO receptor proteins and their regulation; kidney; cardiovascular system, central nervous system. Methods required include histochemistry, electron microscopy, and molecular biology. A person in this classification has the academic knowledge of a discipline that is generally associated with a PhD (or Medical Degree with very good examination marks) or the professional equivalent is required. In addition, the person will have demonstrated the ability to plan and execute a research study through some progressively responsible independent research work. High priority is assigned to publication of results. A beginning publication record is desirable. Please send resume and cover letter to: Prof. Dr. Sebastian Bachmann, A.G. Anatomie der Charité, Standort Charlottenburg, Haus 31, Spandauer Damm 130, D-14050 Berlin, Germany. Email: sbachm@charite.de.

Postdoctoral Research Position, Nephrology: A postdoctoral research position is available at Charité, Nephrology/Anatomy, Humboldt-University of Berlin, Germany. Start date is November, 1999. The funding for the position is provided for 18 months (2250. DM net monthly, approximately $1,209/month). Studies will focus on areas including the role of NOS and NO-depending signal transduction in the kidney and other organs. Methods include histochemistry, biochemistry, and molecular biology. Experience in animal preparations and ability to improve operation techniques are welcome. Successful results could lead to a prolongation of the position. Please send application to: Prof. Dr. Sebastian Bachmann, A.G. Anatomie der Charité, Standort Charlottenburg, Haus 31, Spandauer Damm 130, D-14050 Berlin, Germany. Email: sbachm@charite.de.

Faculty Position in Cardiovascular Biology: The Department of Physiology, Michigan State University, invites applications for a full-time tenure-track appointment at the Assistant/Associate Professor level. The successful candidate will be expected to develop an independent research program in an area of cardiovascular biology. Individuals whose research exploits modern molecular, transgenic, and/or spectroscopic imaging methods to investigate angiogenesis or other cardiovascular adaptations to disease are particularly encouraged to apply. Candidates must hold a PhD or equivalent doctoral degree, have postdoctoral experience, and demonstrate potential for developing a vigorous externally-funded research program and outstanding teaching in the department's educational program. Interested individuals should provide a complete curriculum vita, a brief statement of research interests, and copies of key publications. Applicants should also request letters of recommendation from three individuals who can evaluate their accomplishments and future potential for research and teaching. Review of applications will begin Oct. 15, 1999 and continue until the position is filled. Applications should be sent to: Ronald A. Meyer, PhD, Chairperson, Cardiovascular Physiology Search Committee, Department of Physiology, Michigan State University, East Lansing, Michigan 48824-1101. [EOE/AA]

Positions Available

Assistant Professor: The Stephen F. Austin State University is looking to fill a tenure-track position in Animal Physiology is at the Assistant Professor level. Candidate must have a PhD with expertise in animal physiology and be qualified to teach human anatomy and physiology, comparative animal physiology, introductory biology and advanced courses in specialty of interest. Post-doctoral experience preferred. Must participate in graduate program and establish a modest research program. Salary $35,500 for nine months. Review of applicants will begin immediately, with a deadline of October 5, 1999 or until position is filled. Starting date: August, 2000. Applicants should request application form at address below or access the forms at www.math-science.sfasu.edu/biologypositions.html. Send completed application, curriculum vita, transcripts, three letters of recommendation and a statement of teaching and research philosophies and career objectives to: Dr. Don A. Hay, Chair, Department of Biology, Box 13003, Stephen F. Austin Sate University, Nacogdoches, TX 75962-3003. Phone: 409-468-3601. Email: dhay@sfasu.edu. EO/AA Employer. Applications subject to disclosure under Texas Open Records Act.

Assistant/Associate Professor Exercise Physiology: The Department of Kinesiology seeks an outstanding researcher/teacher for a tenure-track position. A person who first and foremost presents a strong background in integrative physiology of exercise and/or the work place. This individual is expected to show additional post-doctoral training in the tools of modern mechanistic physiology including molecular techniques or pharmacodynamics that will allow for development of a strong competitive research program. The successful candidate will show the ability to integrate with existing faculty expertise in the areas of cardiorespiratory, skeletal muscle and metabolic physiology. Duties include research, teaching at the undergraduate and graduate level and supervising graduate students. Candidates are expected to compete for grants and contracts to support their research program and graduate students. Salary is commensurate with qualification and experience. The Department of Kinesiology offers a 4 year undergraduate program (BSc) as well as a graduate program offering MSc and PhD. Research in the department has been supported for many years by NSERC, MRC, Heart & Stroke Foundation, Canadian Diabetes Association, etc. Further information about the department can be found at http://www.ahs.uwaterloo.ca/kin/kinhome.html. Applicants should send a cover letter, three names of references, and a curriculum vitae to Dr. Arend Bonen, Chair, Department of Kinesiology, University of Waterloo, Waterloo, Ontario, Canada, N2L 3G1 or by FAX: 519-746-6776 or E-mail: abonen@healthy.uwaterloo.ca. Applications will be accepted until the position is filled. In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian Citizens and Permanent Residents. The University of Waterloo encourages applications from all qualified individuals, including women, members of visible minorities, native peoples and persons with disabilities. This appointment is subject to the availability of funds.

Assistant/Associate Professor in Biomechanics/Ergonomics/Human Factors: The Department of Kinesiology at the University of Waterloo invites applications for a tenure-track faculty position, at the rank of Assistant Professor or Associate Professor, in the field of biomechanics/ergonomics/human factors. We are searching for expertise to extend our program in new directions. Candidates should have demonstrated research and teaching ability. The candidate must have a PhD with research training in biomechanics/ergonomics/human factors or a cognate discipline. Duties will include research, teaching at undergraduate and graduate levels, and supervising graduate students. Salary range will be commensurate with qualifications and experience. The Department of Kinesiology offers the only undergraduate program in ergonomics in Canada in conjunction with the Department of System Design Engineering and other departments on campus. The Department of Kinesiology is an inter-disciplinary department with expertise spanning the social to biological study of human movement. The Department offers BSc, MSc, and PhD degrees in kinesiology. Further information about the department can be found at http://www.ahs.uwaterloo.ca/kin/kinhome.html. Applicants should send a covering letter, three names of references, and a curriculum vitae to Dr. Arend Bonen, Department of Kinesiology, University of Waterloo, Waterloo, Ontario, Canada, N2L 3G1. Fax: 519-746-6776; email: abonen@healthy.uwaterloo.ca. Applications will be accepted until the position is filled. In accordance with Canadian Immigration requirements priority will be given to Canadian Citizens and Permanent Residents of Canada. The University of Waterloo encourages applications from all qualified individuals, including women, members of visible minorities, native people and persons with disabilities. This appointment is subject to the availability of funds.

Positions Available

Assistant Professor: The University of Iowa invites individuals with training in the general area of biomechanics, including molecular, cellular, and tissue aspects to apply for a tenure-track faculty position commencing in August 2000. Duties will include development of a strong independent research program and teaching of undergraduate and graduate courses in the broad area of biomechanics. Submit a letter of application, curriculum vitae, selected reprints, a 5-year research plan, and three letters of reference to: Warren G. Darling, PhD, Department of Exercise Science, 526 FH, The University of Iowa, Iowa City, IA 52242. Email: Internet: http://www.uiowa.edu/~exsci/. Minorities and women are especially encouraged to apply. [AA/EOE]

Research Associate: Two Research Associate positions are available immediately in the Department of Physiology and Biophysics at Case Western Reserve University, School of Medicine, to study the mechanisms underlying gene regulation and signal transduction on pathways, (protein kinases, in particular) during environmental stress, such as hypoxia. The individuals should have expertise in basic molecular biological and biochemical techniques and be proficient in English. Interested applicants are invited to submit their curriculum vitae, a cover letter describing their research interests in the proposed areas of expertise, and three to four letters of recommendation to Nanduri R. Prabhakar, PhD, DSc, Case Western Reserve University, School of Medicine, Department of Physiology and Biophysics, 10900 Euclid Avenue, Cleveland, OH 44106-4970. [EOE]

Assistant Professor: The Department of Human Biology and Nutritional Sciences at the University of Guelph invites applications for a tenure-track position at the Assistant Professor level in the area of physiology. Applicants should have a PhD or equivalent, with postdoctoral experience being an asset. The successful candidate's responsibilities will include effective undergraduate teaching in physiology, advising on undergraduate projects and graduate theses, and the development of an externally funded research program on cardiovascular and/or contractile cell function. Applications for this position should include a curriculum vitae, two representative publications, documentation of teaching abilities, and the names of three references. Applications will be accepted until the position is filled. Electronic versions of application materials may be submitted on a 3.5" diskette (IBM) in WordPerfect or email to awilliams.ns@aps.uoguelph.ca. Applications or requests for further information should be sent to: Chair of the Search Committee, Department of Human Biology and Nutritional Sciences, University of Guelph, Guelph, Ontario, Canada N1G 2W1. Fax: 519-763-5902. Review of applications will commence October 31, 1999. In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian citizens and permanent residents of Canada. This appointment is subject to final budgetary approval. The University of Guelph is committed to an employment equity program that includes special measures to achieve diversity among its faculty and staff. We therefore particularly encourage applications from qualified aboriginal Canadians, persons with disabilities, members of visible minorities, and women. We thank all applicants for their interest but wish to advise that only those selected for an interview will be contacted.

Assistant Professor: The Department of Human Biology and Nutritional Sciences at the University of Guelph invites applications for a tenure-track position at the Assistant Professor level in the area of endocrinology. Applicants should have a PhD or equivalent, with postdoctoral experience being an asset. The successful candidate's responsibilities will include effective undergraduate teaching, advising on undergraduate projects and graduate theses, and the development of an externally funded research program investigating the hormonal regulation of metabolism. Applications for this position should include a curriculum vitae, two representative publications, documentation of teaching abilities, and the names of three references. Applications will be accepted until the position is filled. Electronic versions of application materials may be submitted on a 3.5" diskette (IBM) in WordPerfect or email to awilliams.ns@aps.uoguelph.ca. Applications or requests for further information should be sent to: Chair of the Search Committee, Department of Human Biology and Nutritional Sciences, University of Guelph, Guelph, Ontario, Canada N1G 2W1. Fax: 519-763-5902. Review of applications will commence October 31, 1999. In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian citizens and permanent residents of Canada. This appointment is subject to final budgetary approval. The University of Guelph is committed to an employment equity program that includes special measures to achieve diversity among its faculty and staff. We therefore particularly encourage applications from qualified aboriginal Canadians, persons with disabilities, members of visible minorities, and women. We thank all applicants for their interest but wish to advise that only those selected for an interview will be contacted.

Positions Available

Assistant Research Scientist: The Pulmonary, Critical Care, and Occupational Medicine Division, Department of Internal Medicine, University of Iowa Health Care, has an opening for an Assistant Research Scientist to perform basic independent research in molecular genetics. This will involve state-of-the-art techniques, and the research will be performed in a collaborative scientific environment. A person in this classification has the academic knowledge of a discipline that is generally associated with a doctoral degree or an equivalent professional degree, i.e., MD, DDS, or DVM. In addition, the person will have demonstrated the ability to plan and execute a research study through some progressively responsible independent research work. Reasonable (1-3 years) experience in molecular genetics is desired. Please send resume and cover letter indicating #39324 to: Carol Wehby, Human Resources, Internal Medicine, E400 GH, 200 Hawkins Drive, Iowa City, IA 52242-1081. Women and minorities are strongly encouraged to apply. [AA/EOE]

Research Associate: A Research Associate position is available immediately in the laboratories of molecular physiology and gastroenterology in the School of Medicine at Wright State University. The research involves studies of H. pylori infection and bacterial strains in gastric ulcer and cancer patients and H. pylori infection-induced gastric mucosal cell proliferation and signaling pathways leading to cell apoptosis. A PhD or MD/PhD degree with training in digestive physiology, cellular and molecular biology, and understanding of gastric ulcer diseases is required. Also, special skills in detection of cell apoptosis, immunoassays, immunohisto/cytochemistry, tissue culture, preparation of fusion proteins, RNA isolation, and recombinant DNA are required. Previous research experience in culturing gastric epithelial cells and isolation of H. pylori bacterium is preferred. Please send a curriculum vitae and the names of three references to: Dr. Luo Lu, c/o Department of Physiology and Biophysics, Wright State University School of Medicine, 3640 Colonel Glenn Highway, Dayton, OH 45435-0001. Applications must be received by September 22, 1999. [AA/EOE]

Doris Duke Charitable Foundation Names Elaine Gallin Program Director for Medical Research

The Doris Duke Charitable Foundation has name Elaine K. Gallin, a widely respected physiologist, as its first Program Director for Medical Research.

Gallin brings to the Foundation extensive experience both in the laboratory and in public policy settings. She has worked on the scientific research agenda on Capitol Hill, led a team of researchers studying white blood cells, authored numerous scientific articles, and managed international health studies.

"We are proud to welcome a talented scientist-administrator with intimate knowledge of the triumphs and pitfalls of the research process as both a hands-on investigator and an administrator," said Joan E. Spero, President of the Foundation. "Her expertise will be indispensable to our goal of advancing medical research targeted toward preventing and curing diseases such as cancer and heart disease."

Most recently, Gallin has served as a consultant to Downstate Medical Center in Brooklyn (Downstate) and the American Association for the Advancement of Science (AAAS). At Downstate, she consulted on women's health, helping to create a "Brooklyn Women's Health Newsletter," and to establish a Health Education and Literacy Partnership (HELP) with the Brooklyn Public Library. At the AAAS she worked with the International Directorate to plan and execute science writing workshops for scientists in Eastern Europe. Gallin is also an Adjunct Faculty member at Sarah Lawrence College. Previously she served as a science advisor to the Deputy Assistant Secretary for Health Studies of the US Department of Energy.

From 1995 to 1997, Gallin was the Deputy Director of the Energy Department's Office of International Health Studies, overseeing studies on radiation health effects and risk assessment in Eastern Europe and other locations.

From 1981 to 1994, Gallin headed the Cellular Physiology Division of the Armed Forces Radiobiology Research Institute (AFRRI). She led a team of scientists carrying out both basic and applied research in the physiology of leukocytes, endothelial cells and epithelial cells. During that period she did the first studies describing the electrophysiological properties of white blood cells. In the late 1980s, Gallin spent a year as a Congressional Science Fellos, working in the US House of Representatives Science, Research, and Technology Subcommittee.

Gallin received a BS degree from Cornell University, an MA degree from Hunger College, and a PhD from the City University of New York.

The Doris Duke Charitable Foundation currently supports two major grant programs: the Clinical Scientist Awards and the Distinguished Clinical Scientist Awards. The Clinical Scientist Award program enables promising young scientists conducting research in cancer, heart disease, AIDS, and sickle cell anemia and other blood disorders to pursue careers in clinical investigation. The first grants under the program were awarded last year.

The Distinguished Clinical Scientist Award is a $12 million initiative to fund the research teams of four eminent scientists in the same fields as the aforementioned program. The Foundation expectes to name award recipients later this year.

Doris Duke, a lifelong philanthropist, distributed nearly $400 million, often anonymously, to a variety of charitable causes. When she died in 1993, she left her fortune, including her properties, to the Doris Duke Charitable Foundation.

The mission of the Foundation, which was established in 1997, is to improve the quality of people's lives by protecting and restoring the environment, seeking cures for diseases and nurturing the arts. With more than $1.4 billion in assets, the Doris Duke Charitable Foundation is among the largest philanthropies in the United States. The Foundation awarded approximately $48 million in grants in 1998.

Dora E. Angelaki has affiliated with the Department of Anatomy & Neurobiology, Washington University School of Medicine, St. Louis, MO. Prior to her new affiliation, Angelaki was with the Department of Surgery, University of Mississippi Medical Center, Jackson, MS.

Having left the Department of Anesthesiology and Critical Care Medicine, Children's Hospital, Philadelphia, PA, **William M. Armstead** has joined the Department of Anesthesiology, University of Pennsylvania, Philadelphia, PA.

Scott C. Baraban has joined the Department of Neurological Surgery, University of California, San Francisco, CA. Prior to his new assignment, Baraban was affiliated with the Department of Pediatrics and Neurology, Case Western Reserve University, Cleveland, OH.

Sanjay Batra recently became the Associate Director of Clinical Development, Bracco Diagnostics Inc., Princeton, NJ. Prior to his new association, Batra was affiliated with the Department of Experimental Biology, Alliance Pharmaceutical Corporation, San Diego, CA.

Recently, **Barrie Patrick Bode** joined the Department of Biology, St. Louis University, St. Louis, MO. Prior to his move, Bode was with the Department of Surgical Oncology Research, Massachusetts General Hospital, Boston, MA.

People & Places

Kevin J. Canning has joined the Department of Cell Biology and Anatomy, University of Alabama, Birmingham, AL. Previously, Canning was in the Department of Physiology, The University of Western Ontario, London, Ontario, Canada.

Joining the Department of Physiology and Biophysics, University of Alabama, Birmingham, AL, **Siriporn Chaisin Chathipakorn** has moved from the Department of Oral Biology, University of North Carolina, Chapel Hill, NC.

Alex F. Y. Chen, formerly an Assistant Professor, Department of Anesthesiology, Mayo Clinic, Rochester, MN, has joined the Physiology Faculty at the University of North Dakota School of Medicine, Grand Forks, ND.

Having accepted a position with the Department of Physiology & Internal Medicine, University of Manitoba, Winnipeg, Manitoba, Canada, **Andrew John Halayko** has left the Pulmonary Critical Care Department, University of Chicago, Chicago, IL.

Bing Han has affiliated with the Department of Pathology, Baylor College of Medicine, Houston, TX, as a Postdoctoral Fellow. Prior to his new affiliation, Han was with the Department of Biological Sciences, SUNY-Buffalo, Buffalo, NY.

Affiliating with the Department of Cell Biology, Parke-Davis Pharmaceutical Research, Ann Arbor, MI, **Polly A. Hansen** recently left the Section of Applied Physiology, Washington University School of Medicine, St. Louis, MO.

C. Terrance Hawk has moved from the Division of Animal Resources, Duke University Medical Center, Durham, NC, to become Assistant Director, SmithKline Beecham Pharmaceuticals, King of Prussia, PA.

Recently, **Allison A. Hegarty** joined ADInstruments, Mountain View, CA. Hegarty was formerly with the Department of Internal Medicine, University of Iowa, College of Medicine, Iowa City, IA.

Gerard Huchon, Professor of Medicine, has accepted a new appointment in the Division of Pulmonary and Resuscitation, Hotel-Dieu of Paris, France. Previously, Huchon was Professor of Medicine, Pulmonary Department, University of Rene Descartes, Boulogne, France.

Having accepted a position as Professor, Department of Internal Medicine, University of Texas Southwestern Medical Center, Dallas, Texas, **Peter Igarashi** is no longer with the Section of Nephrology, Yale University School of Medicine, New Haven, CT.

Affiliating with the Department of Kinesiology and Health, Georgia State University, Atlanta, GA, **Christopher Paul Ingalls** has moved from the Muscle Biology Laboratory, Texas A&M University, College Station, TX.

Saleem Jahangeer has taken an assignment with the Department of Biochemistry, Kobe University School of Medicine, Kobe, Japan for one year. Prior to his new position, Jahangeer was with NIH's National Institute of Environmental Health Sciences, Laboratory of Signal Transduction, Research Triangle Park, NC.

Accepting a position with the Vascular Biology Interdisciplinary Research Group with the Department of Physiology and Cell Biology, Albany Medical College, Albany, NY, **David Jourd'heuil** is no longer with the Department of Physiology, Louisiana State University Medical Center, Shreveport, LA.

Sanford Levine is currently Professor of Medicine, MCP Hahnemann School of Medicine, Philadelphia, PA. Levine is also an Adjunct Professor of Medicine affiliated with the University of Pennsylvania School of Medicine and Attending Physician in Medicine, Veterans Affairs Medical Center, Philadelphia, PA.

Ralph Lydic has affiliated with the Department of Anesthesia, University of Michigan, Ann Arbor, MI. Previously, Lydic was with the Department of Anesthesia and Neuroscience Research, Pennsylvania State University College of Medicine, Hershey, PA.

Marina Marjanovic has joined the Department of Biological Sciences, Eastern Illinois University, Charleston, IL. Marjanovic was formerly with the Department of Physiology and Biophysics, University of Illinois, Urbana, IL.

After affiliating with the Department of Physiology, Midwestern University, Downers Grove, IL, **Paul F. McCulloch** is no longer with the Department of Anatomy and Neurobiology, St. Louis University School of Medicine, St. Louis, MO.

Kevin K. McCully recently left the Department of Medicine, Allegheny University Health Sciences, Philadelphia, PA. McCully has now affiliated with the Department of Exercise Science, University of Georgia, Athens, GA.

Leslie C. McKinney has recently accepted a position with the Department of Anesthesiology, Uniformed Services University, Bethesda, MD. Prior to her recent appointment, McKinney was with the Department of Physiology, Armed Forces Radiobiology Research Institute, Bethesda, MD.

People & Places

Gregory S. Nelson has joined the Department of Medicine, Division of Cardiology, Johns Hopkins Hospital, Baltimore, MD. Nelson was formerly in the Department of Physiology & Biophysics, University of Calgary Health Sciences Centre, Calgary, Alberta, Canada.

Having affiliated with the Aultman Health Foundation as Director of Research, Canton, OH, **Karl M. Nelson** has left the Department of Research, Baptist Medical Center-Montclair, Birmingham, AL.

Joining the Department of Medicine, Endo, and Metabolism, University of Pittsburgh, Pittsburgh, PA, **Robert M. O'Doherty** moved from the Department of Biochemistry, Center of Diabetes Research, University of Texas, Southwestern Medical Center, Dallas, TX.

James P. Porter has affiliated with the Department of Zoology, Brigham Young University, Provo, UT. Porter previously was with the Department of Physiology, University of Louisville, Louisville, KY.

Accepting a position with the Noll Physiological Research Center, Pennsylvania State University, University Park, PA is **David Nathan Proctor**. Prior to his new position, Proctor was with Anesthesia Research, Mayo Clinic, Rochester, MN.

Gregory J. Redding has been appointed Chief, Department of Pulmonary Medicine, Children's Hospital & Regional Medical Center, Seattle, WA. Prior to his new appointment, Redding was with the Department of Pediatrics, Division of Neonatal & Research Disease, University of Washington School of Medicine, Seattle, WA.

Having accepted a position with the Circadian Rhythm Laboratory, University of South Carolina, Allendale, SC, **Roberto Refinetti** has left the Circadian Rhythm Laboratory, Birmingham, AL.

Willis K. Samson has joined the faculty in Pharmacological and Physiological Sciences of St. Louis University School of Medicine, St. Louis, MO. Samson has also accepted the position of Director of Core Graduate Programs in Biomedical Sciences at St. Louis University. Samson was formerly Professor and Chairman of Physiology at the University of North Dakota School School of Medicine, Grand Forks, ND.

Affiliating with the Department of Cell and Molecular Physiology, Pennsylvania State University College of Medicine, Hershey, PA, **Charles Maurice Schworer** has left the Department of Physiology and Cell Biology, Albany Medical College, Albany, NY.

Joining the School of Health Sciences, Deakin University, Burwood, Victoria, Australia, **Lawrence L. Spriet** has left the Department of Human Biology and Nutritional Science, Guelph, Ontario, Canada.

Affiliating with the Office of the Dean, College of Health and Human Service, University of Illinois, Chicago, IL, **Charlotte A. Tate** has left the Department of Pharmacology, University of Houston, Houston, TX.

Joining the Laboratory of Biochemical Genetics, National Heart, Lung, and Blood Institute, NIH, Bethesda, MD, **Carol E. Torgan** has moved from the Department of Medicine, Duke University Medical Center, Durham, NC.

Accepting an appointment with the Division of Nephrology, University of Maryland Hospital, Baltimore, MD, **Edward J. Weinman** has left the Department of Medicine, West Virginia University, Byrd Health Science Center, Morgantown, WV.

Jeffrey T. Whittmer, formerly, Executive Director, Medical Safety, COVANCE, CAPS Division Medical Safety and Therapeutics, Yardley, PA, has accepted an appointment as Medical Director, Metabolism and Atherosclerosis Research Center, Cincinnati, OH.

Having moved from the Department of Physiology, Brown University, Providence, RI, **Kay-Pong Daniel Yip** recently joined the Department of Physiology and Biophysics, University of South Florida, Tampa, FL.

Tania Zenteno-Savin has recently affiliated with the North East Center of Biological Investigation of Marine Biotechnology, La Paz, Baja California Sur, Mexico. Zenteno-Savin was previously affiliated with the Department of Physiology, Faculty of Medicine, University of San Luis Potosi, San Luis Potosi, Mexico.

Letter to Ken Zierler

Dave Grob writes: "I became emeritus in 1989, and have tried to continue working in an office of decreasing size and help. In 1982, as sources of research funds declined, we established a foundation which has enabled our staff to continue doing research. Raising money for the foundation has been the toughest part of the task, but we now have a modest principle which has been earning enough interest to keep a limited number of projects going.

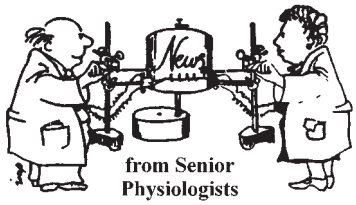
"The Maimonides Research and Development Foundation supports research at the Maimonides Medical Center with income from capital, currently about $600,000 per year, a modest sum, especially when divided into 20 to 30 awards distributed on a competitive basis.

"I have resumed going in daily to work, but I am not yet getting much done. The children have been very supportive. My two sons are psychiatrists, one in Baltimore at the University of Maryland, and the other in Torrance, California at Harbor Hospital. My oldest daughter is a lawyer in Chicago, and my younger daughter is a real estate agent in Long Island. I have four grandchildren, ages eight to 12."

Letter to Arthur Vander

Bernard Fisher writes: "In going through a large file of papers that I collected during the past year, I came upon your card postmarked March 27, 1998. I was chagrined to find that I had missed seeing it and, thus, did not reply.

"I am looking forward to celebrating my 81st birthday and am continuing my efforts toward making progress in the understanding and treatment of breast cancer. I did begin my career in physiology and, from there, became interested in academic medicine and laboratory investigation. I spent the years from 1950-1970 in the laboratory; then, in the 1970s, I began to take my laboratory investigations into the clinic. From



that point I developed an interest in the use of randomized clinical trials for clinical problem solving and began to test, in the clinical setting, the hypotheses that had been generated in the laboratory.

"After numerous publications related to the biology and treatment of breast cancer, it was not until several weeks after my 80th birthday that I published what I consider to be the most important paper of my academic career. I was the senior author of this article and am the originator of the hypothesis that led to the conduct of the trial. (*Journal of the National Cancer Institute* 90:1371-1388, 1998).

"When I began my career, thinking about the possibility of preventing cancer belonged to the realm of science fiction. To have had the opportunity to actually work with data that supported that thesis has been one of the highlights of my life. I am currently writing another paper that I think will also be seminal to another aspect of breast cancer, i.e., the thesis that it is possible to interfere with the progression of noninvasive to invasive breast cancer. I hope that this paper will be published in time for my 81st birthday."

Letter to Michael Bárány

Carl F. Essig writes: "Greetings and many thanks for sending me a birthday card from the Committee on Senior Physiologists. I also appreciate being asked to make an auto-biographical statement for publication in *The Physiologist* on the occasion of my 80th birthday.

"Attaining that age must not be too unusual any more since it is claimed that the over 85 age group is the fastest growing segment of the population. For this to be true the number of people who enter the ninth decade must be "sufficient." If I continue to feel as well as I do now, it would be nice to be part of the "sufficiency" that reaches age 85, but I'm not counting on it.

"A friend once said that becoming old is a matter of growing wiser but weaker. I'm quite sure that my muscular strength has definitely diminished. In contrast, I'm not at all sure that I have become much wiser. I'm inclined to agree with H.L. Mencken who said that the older he grew the more he distrusted the familiar doctrine that age brings wisdom. Perhaps he meant that, his past experiences had less and less relevance to the progressively changing circumstances that occur with the passage of time.

"I would like my autobiographical statement to recognize those colleagues, now deceased, who helped me enter and continue in a career in central nervous system research. I owe a special debt to Harold E. Himwich, who gave me my first research position at the Army Chemical Center, MD. There we studied some of the actions of several anticholinesterase agents on the central nervous system. Next, I must pay tribute to Wade H. Marshall who gave me a position in neurophysiology at the National Institute of Mental Health (NIMH). He also sponsored my membership at the American Physiological Society. The longest and final phase of my career took place at the Addiction Research Center (ARC) which was a separate division of the US Public Health Service Hospital at Lexington, KY. The ARC was sponsored by the NIMH and it was headed by Harris Isbell. I'm indebted to him for rescuing me from full-time clinical work in the hospital and giving me a research appointment in the ARC where he also allowed me a considerable amount of freedom to do my own research. I also am indebted to Abraham Wikler, who gave me much valuable guidance at ARC.

"My work at ARC involved some clinical neurology for the hospital, but there was plenty of time for research in

neuropharmacology. The latter involved the addictive aspects of drugs, such as the barbiturates, some tranquilizers and ethanol. Part of this work involved abstinence convulsions and their underlying mechanisms. These latter studies were only indirectly related to idiopathic epilepsy in man, but they were as close as I ever came to doing research on a human clinical disorder.

"In addition to those colleagues listed above, I am also deeply indebted to the Federal Government for providing the programs that I was able to participate in.

"In view of my lack of a PhD or preliminary training in research methods, I feel very fortunate to have been able to enjoy a career in some aspects of central nervous system function."

Letter to Gene Renkin

Stella Y. Botelho writes: "Thank you very much for your good wishes on the occasion of my 80th birthday. That event this past January was celebrated with a great bash, attended by friends from kindergarten and every era of my life since. There were a number of my pre- and postdoctoral fellows present, not only from nearby, but also from other states and countries. It was gratifying to see that all are now distinguished in their respective fields—physiology, zoology, and various specialties of human, veterinary and dental medicine.

"To answer your questions: No, I am not active professionally. Since I am living a very hedonistic life, I doubt if publication of my present activities in *The Physiologist* would be of interest to the readers. I have no words of wisdom to pass along except to live life to the hilt."

Experimental Biology 2000 Deadlines

November 8, 1999	**Abstract Deadline**
February 18, 2000	**Advance Registration Deadline**
March 6, 2000	**Hotel Reservation Deadline**

Deadlines! Deadlines!

The APS sponsored awards are plentiful, but in order to be considered, don't forget to submit the application information before the deadline!

Award	Next Deadline
Shih-Chun Wang Young Investigator Award	November 1
Arthur C. Guyton Awards in Integrative Physiology	November 1
Giles F. Filley Memorial Awards for Excellence in Respiratory Physiology and Medicine	November 1
Lazaro J. Mandel Young Investigator Award	November 1
Experimental Biology 2000 Registration	November 8
Procter & Gamble Professional Opportunity Awards	November 8
Caroline tum Suden/Francis A. Hellebrandt Professional Opportunity Awards	November 8
John F. Perkins, Jr., Memorial Fellowships	November 15
Liaison With Industry Award for Novel Disease Models	November 16
NIDDK Travel Fellowships for Minority Physiologists for EB Meeting	November 23
Orr E. Reynolds History Award	December 1
William T. Porter Fellowship Awards	January 15
APS Postdoctoral Fellowship in Physiological Genomics	January 15
AAAS Mass Media Science and Engineering Fellowship	January 15
Research Career Enhancement Awards	February 15
Teaching Career Enhancement Awards	April 15

Acute Respiratory Distress Syndrome: Cellular and Molecular Mechanisms and Clinical Management

Sadis Matalon and Jacobs Iasha Sznajder (Editors)
NATO ASI Series A: Life Sciences, Vol. 297.
New York: Plenum, 1998, 432 pp., illus., index, $129.50
ISBN: 0-306-45830-6

This monograph contains contributions of invited speakers and participants in an international conference on "Acute Respiratory Distress Syndrome: cellular and molecular mechanisms and Clinical Management" held in June 1997 in Corfu, Greece. As noted in the preface to the volume, several areas of intense interest were reviewed, debated and presented, including administration of inhaled nitric oxide (iNO) in patients with acute respiratory distress syndrome, the importance of active ion transport in resolving pulmonary edema of ARDS, drug delivery to the injured alveolar epithelium, and optimal ventilator strategies.

Several particularly well done chapters stand out. J.I. Sznajder and K.M. Ridges reviewed factors that modulate clearance of edema fluid during hyperoxic injury. Their data underscore the importance of alveolar epithelial sodium channels and Na, K-ATPases in clearing of hyperoxic induced pulmonary edema. Planes and Clerici demonstrate convincingly that hypoxia downregulates expression and activity of sodium transport proteins in cultured type II cells: amiloride-sensitive sodium flux, oubain inhibitable potassium analog influx, α-, β-, and γ-rENa (sodium channel subunit transcripts) and oubain α1- and β1-Na,K-ATPase subunit transcripts are all decreased by hypoxia. Dean Schraufnagel and colleague's scanning electron microscopic images depicting hyperoxic-induced changes in rat pulmonary lymphatics are striking and perhaps worth the price of this volume by themselves (*The role of lung lymphatics in pulmonary edema clearance*). Sadis Matalon and co-workers provide a good review of mechanisms believed to underlie nitric oxide-induced injury to alveolar epithelium. Ingbar et al. present an excellent discussion of strategies to speed lung healing in ARDS. A number of chapters are short (not reviews) and sometimes without figures but contain interesting and (then) new information. For example, Andrea Cohen et al. describe increased pulmonary expression of ICAM-1 and P-selectin following hypovolemic shock in rats (*The expression of ICAM-1 and P-selectin are increased following hemorrhage and resuscitation in mice*). Tremblay et al. reported increased expression of TNF-α and IL-6 in rats ventilated with high end expiratory *pressures (Effect of ventilation strategy on cytokine expression in an ex-vivo lung model*). The chapters on the role of MAP kinases in airway disease and the discussion of mechanisms of cell death by Martin et al. are refreshing inclusions. Generally, the quality of the discussions and topics chosen reflect the thoughtful approach and excellent investigative skills of the editors, Matalon and Sznajder.

On a less enthusiastic note, contributions from authors and presenters are not in a standard format, so that some chapters are double spaced while others are single spaced, and references are in nearly every conceivable style (some alphabetic order, some not). This "cosmetic" issue is distracting to the reader. Worse, the resolution of some figures is poor. For example, Figure 2, page 104 attempts to show arterial pO2 (on line continuous detection) as a function of time after administration of surfactant in a patient with ARDS, but is hard to resolve. The crucial areas of neutrophil biology and endothelial permeability as they relate to ARDS are only tangentially discussed, perhaps a reflection of the editor's career interests, but also no doubt were curtailed in order to prevent the conference from spilling into the seas off Corfu by sheer size alone. Discussion of the role of lung aquaporins is enlightening but brief, and only by one group (Matthay et al). The chapters regarding mycoplasma infection, asbestos-related lung injury, and exhaled NO measurement during cardiothoracic surgery are well written but could have been left out—their relevance to acute lung injury is distant. The target audience for this monograph is clearly academic pulmonary and critical care basic scientists and some clinicians with interests that center on mechanisms of lung injury. The practicing intensivist will find little in these works to guide him or her. Investigators will be willing to overlook the occasionally spotty presentation of the data in exchange for the comprehensive summary of information, references, and studies in targeted areas.

Inevitably, the clinical management chapters suffer most from presenting "dated" perspectives relative to those covering mechanisms that underlie disease. Whereas one or two large scale clinical trials can change practice patterns and assumptions of efficacy, basic science advances are generally more incremental in nature. For example, the focus of the fourth section of the conference is ventilator strategies in ARDS, and a good deal of time is spent reviewing the data pro and con use of high or reduced tidal volumes. Since publication of this monograph, a large randomized NHLBI trial (10 clinical centers) of ventilator strategies has provided strong evidence that ventilation with small tidal volumes (6 ml/kg) is associated with 25% fewer deaths than that of matched cohorts ventilated with "standard" (12 ml/kg) tidal volumes (see website http://apps.nhlbi.nih.gov/clinicaltrials/design), though peer-reviewed publication of this trial awaits. The

same NIH-sponsored clinical network (ARDSNet) recently reported that neither treatment with lisofylline (anti-inflammatory agent) nor ketoconazole (Tx A_2 synthase and 5-LO inhibitor) is efficacious for patients with established acute lung injury.

The meeting probably furthered the resolve to address questions such as the role of inhaled nitric oxide (iNO) in ARDS. New information regarding the clinical experience with iNO originated from a number of centers, including some represented in this conference, after the 1997 summer on Corfu. However, the chapters centering on NO are generally well done, extensive, and come to much the same conclusions as we hold today: iNO may improve oxygenation in the short term, but it does so at the cost of increasing reactive oxygen species, rebound pulmonary hypertension (upon discontinuation), and without clear evidence of changing mortality in the adult population with ARDS.

However, despite limitations, this collection of works is generally of high quality (with some stand outs) and represents a nice addition to the library of the investigator interested in mechanisms of acute lung injury, particularly in the area of lung epithelial biology. ❖

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Julie Biller
Kenneth Presberg
Elizabeth R. Jacobs
Medical College of Wisconsin

Methods in Neuroendocrinology

Louis D. Van de Kar (Editor)
Boca Raton, FL: CRC, 1998, 236 pp., illus., index, $89.95
ISBN: 0-8493-3363-6

In an era of "kits" for every measure from hormone assays to cloning, it is easy to overlook the old fashioned basics of methodologies. It is satisfying to find a contemporary book that considers questions such as how to validate a method for specific experimental conditions, how to establish reproducibility, or what are the limits of interpretation for a given approach. Although the book focuses on neuroendocrine research, it deals with common principles of experimental design and choice of methodologies. As such, several of the chapters in *Methods in Neuroendocrinology* could serve as primer for new investigators and as refresher course for established experimentalists in many disciplines.

The overall goal of the book, however, is to describe the adaptation, pitfalls, limitations and interpretation of experimental approaches that comprise neuroendocrine research. Importantly, the focus tends to be on the choice of method not on the cookbook aspects. The utility or potential downside of a particular technique is illustrated with experimental results, often including unpublished data from the authors' laboratories. While this strategy is helpful in most cases, the least successful chapters are those in which the data overshadow the methodology. The organization of the book generally is reader-friendly with chapters moving from molecular and cellular approaches, to tissue slice methodologies, to in vivo studies; distracting from this somewhat are the numerous typographical errors and non-standard spellings. On the positive side, the table of contents with page numbers at the start of each chapter is particularly helpful, and many sections have well-structured reference charts to summarize an area.

Urban's lucid chapter on reverse transcriptase-polymerase chain reaction presents a useful guidebook for choice of primers, optimization of conditions, and critical controls. Also included is a helpful section describing a specific application of the technique with a discussion of the adaptations necessitated by peculiarities of the neuroendocrine system. Another strong chapter on basic technologies adapted for use with this system is one on steroid hormone receptors by Handa and colleagues that includes an overview of methods for measurement of steroid receptor protein and gene expression. In addition, the authors provide important caveats regarding the disconnect that can occur between changes in feedback sensitivity and receptor number and a welcome discussion on data interpretation to take into account the complex relationship between receptor mRNA levels and level of receptor protein. Antisense oligodeoxynucleotides in-creasingly are being used as tools in neuroendocrine research; Morris and Li's chapter on their application is a walk-through of the presumed action and the experimental problems and pitfalls associated with their use. Sections on specificity and the importance of appropriate controls for antisense experiments were especially appreciated, although the message tended to be obscured by an overly detailed presentation of results intended for illustration.

Unlike most other areas outside of neurobiology, in vitro approaches are particularly challenging in neuroendocrinology due to, e.g., absence of cell lines or poor performance by adult neurons in primary culture. Recent advances using transgenes composed of an oncogene linked to a promoter of the hypothalamic hormone GnRH have resulted in the generation of immortalized GnRH cell lines. These novel tools have been used in a wide variety of molecular and physiological studies; however, the chapter by Wetsel, Merchenthaler, and Liposits is limited to a description of results of morphological studies of these neurons. I would have appreciated the authors' insight into the pros and cons of using the cell

lines for other neuroendocrine questions. Sladek's comprehensive chapter on hypothalamic explants and dispersed hypothalamic cell preparations is weakened somewhat by the level of detail and description of results from a spectrum of studies. However, the section on rat fetal hypothalamic cultures, particularly the table correlating events with donor age, should be especially helpful for anyone considering this approach.

Appropriately, there are two chapters devoted to electrophysiological approaches in neuroendocrine research. Overall these chapters provide a good jumping-off point for someone entering the arena of neuronal electrophysiology. The chapter by Smith and Dudek centers on in vitro approaches and is a clear, well-structured roadmap covering recording and stimulation techniques in slice and isolated neuron preparations. Particularly welcome are the cogent discussions on situational "why choose this one" and the consequential limitations to interpretations. Also included is a useful section on post-hoc and a priori identification of cell type. The complementary chapter by Lakoski and Smith chapter focuses on in vivo methodology and deals with the special circumstances of recording in conscious, freely moving animals as well as the problems associated with the choice of agent for recording in anesthetized animals. The bulk of the chapter is a detailed description of single-unit analysis and pharmacological assessment of neuronal responses, and although the authors provide a reference table for other methods I would have preferred at least a brief overview of other options available for in vivo recordings.

Pulsatile hormone release is a central dogma of neuroendocrine research. The complex kinetic behavior of a hormone in the extracellular compartment resulting from rhythmic secretion with ultradian, circadian, or monthly components is the subject of Veldhuis' chapter. On its surface this section could scare off the mathematically challenged, but there is something in it for everyone. The author lays out a comprehensive discussion of the various methodologies for analyzing in vivo secretion data, but he also provides thought-provoking caveats regarding assumptions upon which the techniques and the data interpretation are made, particularly in regard to spontaneous vs. manipulated secretion. For those who primarily work at the cellular or molecular level or for those who teach endocrinology/homeostasis, I recommend Veldhuis' chapter as an enlightening revisit to the arena of pulsatile hormone secretion.

Neuroendocrinology is a peculiar hybrid of disciplines and no where is this more evident than in the chapters on roles for biogenic amines and behavior. What are the behavioral consequences of neurohormone secretion following activation and how does behavior directly or indirectly affect the set point of the neuroendocrine system? The effect of a measurement on the system under investigation is a conundrum in many disciplines, but especially so in behavioral studies. Select methodologies to examine these questions as well as the complex issues of data interpretation are detailed in Bagdy's chapter on biogenic amines, Bohus' chapter on the neurobiology of stress, and Cowen's chapter on assessment of neurotransmitter pathways implicated in human psychiatric illness. In general these sections lack the crispness and focus of most of the other chapters and tend to be presented more as reviews or catalogs of results rather than insights into the choice of methodologies. Also it is surprising with three chapters devoted to behavioral considerations that the emphasis is on perturbations in the CRH/ACTH/glucocorticoid axis with no attention to methodologies in the exploding field of obesity and eating behavior and their neuropeptide/neurotransmitter substrates in the hypothalamus.

The editor, Louis van de Kar, and a broad spectrum of researchers in neuroendocrinology have produced a useful handbook for those new to the field as well as neuroendocrinologists searching for novel approaches to old questions.

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Physiology and Pathophysiology of Temperature Regulation

Clark M. Blatteis (Editor)
River Edge, NJ: World Scientific, 1998, 294 pp., illus., index, $32.00
ISBN: 981-02-3172-5

This book culminates the efforts of the Commission on Thermal Physiology and the International Union of Physiological Sciences to produce a monograph on temperature regulation for medical students and students in the paramedical professions. It does an excellent job of facilitating the learning process by providing learning objectives and key concepts at the beginning of each chapter, and subsequently highlighting within the chapter where each key concept is addressed. In addition, it provides self-study questions at the end of each chapter, and select references to obtain additional information when desired. The different chapters are written by experts in the field and include the most recent and accepted concepts in thermoregulation. The authors have done a superb job of presenting the basic physiology required to understand applied concepts and clinically relevant material. The chapters average only 15 pages, thus each topic is covered in concise fashion.

The book is separated into two parts, physiology and pathophysiology, and includes two appendices: one that covers methods of body temperature measurement and one that lists temperature symbols. Chapter One of Part I presents a brief history of thermoregulation and

provides a perspective that subsequent chapters build upon. Chapter Two provides a framework of the temperature regulatory system. Pertinent definitions and symbols are presented, and the importance of body heat is reviewed. Chapter Three presents the biophysics of heat exchange and is crucial to understanding all subsequent material. Although it includes numerous mathematical equations, it provides the reader with an understanding of what limits thermoregulatory control. Chapter Four is subdivided into shivering and non-shivering thermogenesis. Shivering occurs in virtually all skeletal muscles and can increase heat production five-fold in humans. Its activation, localization, recording, and metabolic efficiency are reviewed. The section on non-shivering thermogenesis (NST) distinguishes between obligatory, thermoregulatory, and diet-induced NST, its dependence on uncoupling protein, its significance in newborn infants vs adults, and the consequences of altering its capacity. Chapter Five focuses on heat loss mechanisms, especially evaporative cooling. The concept that thermoregulation competes with other homeostatic mechanisms and that a hierarchy exists among control systems is introduced. Chapter Six discusses neural thermal reception. It presents a neuronal scheme for the integration of peripheral and central thermal information. The reader learns that central thermoreceptors are not only responsive to temperature, but non-thermal inputs such as osmolality, glucose concentration, sex hormones, and the body's circadian clock. The most crucial responses of humans to hostile environments are not autonomic, but behavioral. This is the focus of Chapter Seven. Seeking a pleasant temperature is a thermoregulatory response and plays an important role in achieving thermal homeostasis. Chapter Eight discusses temperature regulation during exercise, which produces competition among temperature, fluid, and circulatory control systems. This chapter discusses the effects of thermal (acclimation, exercise in water) and non-thermal (hydration, fitness, energy substrate, age, menstrual cycle, etc.) factors that influence exercise thermoregulation. The final chapter in Part I addresses the topic of thermoregulation in the neonate and the elderly. It discusses the fall in body temperature at birth, when heat loss mechanisms are activated in the newborn, how Alzheimer's disease can produce either hypothermia or heat illness, and the evidence for the increased incidence of thermoregulatory impairments among the elderly.

Part II of the book, the Pathophysiology of Thermoregulation, begins with a chapter on fever. It distinguishes between fever and hyperthermia, exogenous and endogenous pyrogen, and whether fever is good or bad. The second chapter addresses the thermoregulatory consequences of prolonged exposure to heat or cold. The section on heat focuses on the acquisition of heat acclimatization including cellular strategies in addition to the integration of sweating, metabolic, and cardiovascular responses. The section on cold discusses the adaptive mechanisms responsible for survival in the cold, including behavioral as well as autonomic adjustments. Furthermore, it addresses brain mechanisms that underlie cold tolerance. The next chapter presents the pathophysiological consequences of exposure to thermal extremes. Section one addresses the continuum of heat disorders that range in severity from those manifesting temporary and mild consequences to those producing heat stroke. The latter is a medical emergency with systemic and fatal consequences. Factors predisposing to heat stroke (exercise, hypohydration, pregnancy, aging, drugs, illness) and those that reduce it's susceptibility (acclimation, physical fitness, heat shock protein) are presented. Section two of this chapter deals with hypothermia and cold injury. It not only presents the effects of hypothermia on the different organ systems, but also discusses the role of alcohol as a primary cause of death in urban hypothermia, how cold influences the risk factors for cardiovascular disease, and how aging compromises the physiological responses to cold. The final chapter in Part II discusses temperature regulation in special situations. These include the sleep-wakefulness cycle, the menstrual cycle, high altitude, and how drugs affect the maintenance of core body temperature. The key concept in these discussions is that homeostasis depends upon the interaction of numerous regulatory systems. When challenged by concurrent stressors, a hierarchy of importance among regulatory systems is manifested. In this regard, the thermoregulatory system is vulnerable because it shares effector mechanisms with several other systems and is not at the top of the hierarcial scheme. This chapter does an excellent job of illustrating how the combination of two or more stressors, that share the same defense mechanisms, affect the regulation of body temperature.

In summary, this book is an excellent resource. It provides the reader with basic, applied, and clinically relevant material on the most pertinent aspects of thermal physiology. The index provides speedy access to specific questions the reader may have about numerous aspects of temperature regulation such as anhidrosis, age, acclimation, anesthesia, arthritis, arousal, altitude, and anapyrexia. It requires a fundamental knowledge of physiology to fully comprehend and appreciate the material presented, but even a neophyte will find aspects of this book fascinating and understandable.

Carl V. Gisolfi
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High Life: A History of High Altitude Physiology and Medicine

John B. West
American Physiological Society, Oxford University Press, 1998, 493 pages, $79.50.
ISBN: 0-19-512194-5

This volume combines several of West's major interests, namely physiology, history, and high altitude. Regarding physiology, Society members are likely aware of the several books he has authored or edited on pulmonary physiology and pathophysiology. Regarding the history of physiology, he edited *Respiratory Physiology: people and ideas* (American Physiology Society, Oxford University Press), which was published in 1996, and which combined history and respiratory physiology. Regarding altitude, he has been particularly active in field research at high altitude, having participated in the seven-month long 1960-1961 Silver Hut expedition to the Mingbo Glacier in Nepal, having organized the 1981 American Research Expedition to Everest (AMREE), and having consulted frequently on the problems of miners at high altitude in Chile. In addition he, with Milledge and Ward, have written a text on high altitude medicine, now in its second edition. Thus he comes to his subject with a long personal experience.

His current book, *High Life*, is organized into 12 chapters, of which the initial two are strictly chronological. First is the chapter from antiquity to Malphigi's discovery of the pulmonary capillaries in 1661, and the second is from the 18th Century to the great Frenchman, Paul Bert ending about 1880.

For Chapters 3 through 9, as the time line approaches and enters the 19th century, the subject matter becomes more topical and less chronological. The third chapter centers on European high altitude stations and field studies, beginning with Joseph Vallot on Mont Blanc in the late 1800s, Angelo Mosso and the Capanna Margherita on Monte Rosa in 1893, and the studies by Nathan Zuntz during balloon flights and at the Alta Vista station on Tenerife around the turn of the century. The fourth chapter concerns oxygen transfer. Most of the chapter is concerned with the controversy surrounding Haldane's unfortunate belief that he had proven "oxygen secretion" on Pikes Peak, Colorado. His opponents were August and Marie Krogh of Copenhagen and Joseph Barcroft of Cambridge. The chapter describes the latter's 1921-1922 Peruvian expedition to Cerro de Pasco, which effectively replaced the lung oxygen secretion theory with that of diffusion. The fifth chapter, beginning with the earliest days and going up to the present, describes the history high altitude diseases, primarily pulmonary and cerebral edema, both of which remain poorly understood. The sixth chapter describes the early expeditions to Mt. Everest (1921-1924). The seventh chapter describes work done in the permanent residents of high altitude from the time of the Incas to the International Expedition to Chile of 1935 and includes particularly the pioneering work in Peru by Carlos Monge Sr. and Jr. and Alberto Hurtado. Chapter 8 concerns World War II, and the work done by American and German scientists. Chapter 9, on the first ascents of Mt. Everest covers climbing expeditions beginning with 1933, including the successful ascent of 1953, and concluding with the solo ascent of Reinhold Messner in 1980.

The final three chapters are concerned with recent studies. Chapter 10 on studies in the 1960s and 1970s, describes primarily the Silver Hut expedition, the Mt. Logan Studies, and those on White Mountain, California, and Pikes Peak, Colorado. Chapter 11, "Studies at Extreme Altitude," describes and compares AMREE and Operation Everest II. Chapter 12, "Other Recent High-Altitude Studies" describes the literal explosion of altitude activity at the Capanna Margherita, the Pyramid Laboratory, Observatoire Vallot, Mt. Sajama, and at other sites around the world.

There are three, really four, very useful appendices listing important dates, listing general sources of information and high altitude laboratories, listing important books in the history of altitude, and what might be considered a fourth appendix, the extensive notes on each chapter. The book is readable and richly illustrated with maps, quotations, photographs, and drawings. It will be a resource for physiologists, physicians, climbers, students, and others who are concerned with activity at altitude.

What are the book's deficiencies? They are few. One might like more attention to certain areas—altitude research in women, reproduction, and children, and perhaps more emphasis on the Peruvian heart catheterization studies. While having all references listed at the end of the book sometimes makes difficult tracing the sources of information, that potential disadvantage is more than offset by the advantages of increased readability and the ease of examining the whole list of authors.

A most interesting aspect of the book is that it represents West's own perspective on these historical events. He has been a major player in altitude research over the last four decades, has personally known the researchers in this period, and has carefully researched his subject. While others may have somewhat different interpretations on some of the events or findings, this book will stand as a benchmark to the end of this century for the history of high altitude physiology and medicine.

John T. Reeves
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Books Received

Endothelium, Nitric Oxide, and Atherosclerosis: From Basic Mechanisms to Clinical Implications.
Julio A. Panza and Richard O. Cannon III. (Editors).
Armonk, NY: Futura, 1999, 336 pp., illus., index, $75.00.
ISBN: 0-87993-436-0.

Patterns of Human Growth. Second Edition.
Barry Bogin.
Cambridge Studies in Biological Anthropology 23.
New York: Cambridge University Press, 1999, 455 pp., illus., index, $39.95.
ISBN: 0-521-56438-7.

The Expressiveness of the Body and the Divergence of Greek and Chinese Medicine.
Shigehisa Kuriyama.
Cambridge, MA: MIT Press, 1999, 340 pp., illus., index, $29.50.
ISBN: 0-942299-88-4.

Molecular and Cellular Physiology of Neurons.
Gordon L. Fain.
Cambridge, MA: Harvard University Press, 1999, 693 pp., illus., index, $65.00.
ISBN: 0-674-58155-5.

Announcements

NIGMS Announces Programs for Minority Opportunities in Research

The following announcements from the current issue of the NIH Guide relate to activities of the National Institute of General Medical Sciences (NIGMS) Division of Minority Opportunities in Research (MORE). The MORE Division administers research and research training programs aimed at increasing the number of minority biomedical scientists. Support is available at the undergraduate, graduate, postdoctoral, and faculty levels.

Initiative for Minority Students: Bridges to the Baccalaureate (RFA-GM-99-010)
This Request for Applications (RFA) solicits new applications for partnership programs involving two-year colleges awarding the Associate's degree and institutions awarding the Baccalaureate degree. http://www.nih.gov/grants/guide/rfa-files/RFA-GM-99-010.html.

Initiative for Minority Students: Bridges to the Doctorate (RFA-GM-99-011)
This RFA solicits new applications for partnership programs involving institutions awarding the MS degree and universities awarding the PhD degree. http://www.nih.gov/grants/guide/rfa-files/RFA-GM-99-011.html.

NIGMS MARC Predoctoral Fellowship Awards (PAR-99-142)
MARC Predoctoral Fellowships will provide up to five years of support for research training leading to the PhD, MD/PhD, or other combined professional degree/PhD in the biomedical or behavioral sciences, including mathematics. These Fellowships are for selected students who are graduates of the MARC Honors Undergraduate Research Training (HURT) or MARC Undergraduate Student Training in Academic Research (U*STAR) programs. http://www.nih.gov/grants/guide/pa-files/PAR-99-142.html.

MARC Undergraduate Student Training In Academic Research (U-STAR) Program (PAR-99-150)
Awards are made to colleges and universities that offer the baccalaureate degree. The awards provide support for minority students who intend to pursue postgraduate education in the biomedical sciences. The program can also support efforts to strengthen the faculty, science course curricula, and biomedical research training programs and infrastructure at institutions with significant enrollments of minority students. http://www.nih.gov/grants/guide/pa-files/PAR-99-150.html.

MBRS Research Initiative For Scientific Enhancement (RISE) (PAR-99-151)
The RISE Program seeks to increase the interest, skills, and competitiveness of students and faculty in the biomedical sciences at minority-serving institutions. The program offers support for faculty and student development activities, such as workshops, specialty courses, travel, and evaluation activities. The RISE Program also offers support for institutional development, including renovation or remodeling of existing facilities, limited equipment purchases, and the development of research courses. http://www.nih.gov/grants/guide/pa-files/PAR-99-151.html.

MBRS Support Of Continuous Research Excellence (SCORE) (PAR-99-152)
The purpose of the SCORE Program is to develop biomedical research faculty at minority-serving institutions. The program supports faculty-initiated research projects, including pilot research projects, salaries for faculty and technicians, limited administrative support, consultant fees, equipment, research supplies, scientific seminar series, travel, support for evaluation activities. Limited funds are also available for laboratory alterations and renovations. http://www.nih.gov/grants/guide/pa-files/PAR-99-152.html.

Announcements

Annual Endowed Lectureship

The Department of Physiology of Wayne State University School of Medicine has established an annual endowed "Piero P. Foa Lectureship in Endocrinology." The first lecture, entitle "A Skeptic's Voyage Through the Pancreatic Archipelago," was delivered by Dr. Foa himself in January 1999.

Twenty-Third Annual Bristol-Myers Squibb Award for Distinguished Achievement in Cancer Research

The Bristol-Myers Squibb Award for Distinguished Achievement in Cancer Research is an annual award of $50,000 given to a scientist who has made an outstanding contribution to progress in cancer research. Criteria for evaluating nominees and selecting recipients are solely determined by the Selection Committee.

A nomination may be made by an officer of a medical school, freestanding hospital, or cancer research center. Each nomination should include *1*) a biographical sketch of the nominee, *2*) a list of major publications, *3*) an explanation of the work in understanding, prevention, control and/or cure of cancer, and *4*) an evaluation by the nominator as to specific accomplishments of the nominee (limited to 1,000 words).

In addition, two letters of reference from individuals outside of the nominating institution must be provided. These letters should be a consideration of the nominee's work and should be mailed directly to the Secretary of the Award Committee.

Twelve copies of the nomination should be furnished. Twelve copies of the 150-word abstract, typed on the printed nomination form, should accompany each nomination.

Up to five representative reprints may be included (12 copies of each). Books should not be included. However, short abstracts are acceptable. Nomination materials should be in English; reprints can be in the original language.

Recipients are chosen by majority vote of the Selection Committee. Announcement of the award recipient will be made in April 2000.

At the discretion of the Selection Committee, scientists and clinicians with special expertise may be consulted during the selection process. The chairman of the Selection Committee, who serves for no more than three consecutive years, is elected by the committee from its membership.

Please send nominations and supporting documents to Secretary, Bristol-Myers Squibb Award for Distinguished Achievement in Cancer Research, 345 Park Avenue, Room 21-5, New York, NY 10154-0037, USA. For inquiries or requests for additional nomination forms, please write to Secretary, Award Committee, at the above address, or call 212-546-5013.

The nomination and supporting documents must be received no later than November 22, 1999.

Summer 2000 Research Opportunities in Japan, Korea and Taiwan for US Graduate Students in Science and Engineering

The National Science Foundation, National Institutes of Health/Fogarty International Center, and US Department of Agriculture/Agricultural Research Service offer the Summer Programs in Japan, Korea, and Taiwan. The Summer Institute in Japan, the Monbusho Summer Program, the Summer Institute in Korea, and the Summer Institute in Taiwan provide graduate students in science and engineering first-hand experience in Japanese, Korean, and Taiwan research environments, an introduction to the science and science policy infrastructure of the respective countries, and language and cultural training. The primary goals of the programs are to introduce students to Japanese, Korean, and Taiwan science and engineering in the context of a research laboratory and to initiate personal relationships that will better enable them to collaborate with foreign counterparts in the future. The programs will last approximately eight weeks from mid-June to August. Applicants must be US citizens or permanent residents.

Summer Programs support includes international travel costs to and from Japan, Korea, or Taiwan; in-country living costs (accommodations, food and professional travel); and an allowance of $2,500 for each participant.

For more information, visit http://www.twics.com/~nsftokyo/ [Select "Summer Programs" at the opening screen menu bar] or contact:

East Asia and Pacific Program, Room 935
Division of International Programs
National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230
(703) 306-1701
E-mail: EAPinfo@nsf.gov

DEADLINE: Application deadline is December 1, 1999 (postmark).

Announcements

New Slide Units in Clinical and Undergraduate Teaching Projects

The American Gastroenterological Association announces the release of new slide unts in both the Clinical and Undergraduate Teaching Projects. The new units are *Acute Gastrointestinal Bleeding, Second Edition, Neurogastroenterology and Motility,* and *Development of the Human Gastrointestinal System*.

Acute Gastrointestinal Bleeding, from the Clinical Teaching Project, has been completely redone for this second edition. This long-awaited unit contains 112 new slides covering both upper and lower GI bleeding and completely rewritten text and references. The cost is $150.

Neurogastroenterology and Motility is the first of three planned units on this topic, from the Undergraduate Teaching Project. This release includes 112 slides covering current concepts and principles of neurogastroenterology in relation to motor functions of the specialized organs and muscle groups of the digestive tract. It is currently available for $135.

Development of the Human Gastrointestinal System includes 83 slides covering the development of form and function of the human GI tract from the time of conception until birth.

To order any of the slide units, contact the distributor, Milner-Fenwick, Inc. at 800-432-8433.

PRAT Fellowships For Postdoctoral Scientists at NIH

The Pharmacology Research Associate (PRAT) Program at the National Institute of General Medical Sciences (NIGMS) sponsors postdoctoral fellows conducting research at the NIH in the pharmacological sciences. This can include research in the areas of signal transduction, drug metabolism, immunopharmacology, chemistry and drug design, structural biology, endocrinology, neuroscience, clinical pharmacology, among other areas. Potential fellows make an application together with a preceptor to the PRAT Program. Selected fellows receive a two-year appointment, salary, supplies, and travel funds from the NIGMS to support research in the preceptors' laboratories. Candidates may apply prior to coming to NIH or FDA, or they may have started postdoctoral research at NIH or FDA within the 12-month period prior to the application receipt deadline. Applications are due on or before January 5, 2000 for fellowships starting in October of that year. Only US citizens or permanent residents are eligible. Contact the PRAT Program Assistant at Tel: 301-594-3583, Fax: 301-480-2802, or Email: prat@nigms.nih.gov to request a PRAT Fact Sheet and an application kit, or visit the NIGMS home page at http://www.nih.gov/nigms/about_nigms/prat.html to view the PRAT Fact Sheet.

Completed applications are due January 3, 2000.

Announcements

New Web Addresses for NIH Office of Extramural Ressearch

The URLs for the Office of Extramural Research (OER) Grants and Training Opportunities Web sites will change as shown below. As a general rule, bookmarks may be updated by substituting "grants." for "www." The change was effective August 17, 1999.

New Web Address for Grants main page:
<http://grants.nih.gov/grants/oer.htm>
New Web Address for Training main page:
<http://grants.nih.gov/training/>

All Web pages located under this site will have a similar address change. Such pages include OER Funding Opportunities, Grants Policy and Guidance, Award Data, NIH Electronic Research Administration, NIH Forms and Applications, Human and Animal Protection, News Flashes & Archives, NIH Guide for Grants and Contracts, Peer Review Policy and Issues, NIH Reinvention Activities, NIH Research Training Opportunities, Small Business Funding Opportunities, and OER Sites of Interest.

In addition, the path and file names of some older NIH Guide files will also be changed.

During a six-month transition period, re-director pages from the original site will be available for top-level and secondary pages. Once the new site is fully operational, all but the re-director pages will be deleted from the original site.

The complete NIH Guide announcement describing the change is available at http://www.nih.gov/grants/guide/notice-files/not99-137.html.

Another announcement in the NIH Guide reminds grantees to provide the Federal Government with all financial, performance, and other reports as required by the terms and conditions of the awards.

The announcement is posted at http://www.nih.gov/grants/guide/notice-files/not99-136.html.

Nominations Are Invited For The Eighth Annual Arthur C. Guyton Physiology Teacher Of The Year Award

The Teaching of Physiology Section of the American Physiological society is again sponsoring the "Arthur C. Guyton Physiology Teacher of the Year" Award. This award is supported by the W. B. Saunders Company. Nominees must be full-time faculty members of accredited colleges or universities and members of APS. They must be involved in classroom teaching and not exclusively the teaching of graduate students in a research laboratory,

Each proposed person must be nominated by an APS member. The nominator is responsible for providing the following application materials and forwarding three copies to the Chairperson of the Award Selection on committee, **postmarked no later than November 30, 1999**:

1. A letter of nomination from the nominator.
2. Letters of support from three other colleagues familiar with the nominee's teaching career, one being the nominee's chair person if possible.
3. Letters of support from up to 10 current and/or former students.
4. Scores on standard student evaluations of teaching effectiveness.
5. Competitive teaching honors received, such as the Golden Apple.
6. Evidence of educationally related activities outside the classroom, such as developing laboratory exercises or teaching software, authoring textbooks or educational research articles, education-related presentations at professional meetings, educational committees within the institution, education consultation with other organizations, public appearances, etc.
7. A copy of the nominee's curriculum vitae.
8. Any additional documentation that the nominee wishes to include, such as number of graduate students trained, number of undergraduate students pursuing careers in physiology, teaching innovations introduced, etc.

The person selected will receive the award at the banquet of the Teaching of Physiology Section during the next APS annual meeting during EB 2000 in San Diego, CA in April 2000. The Arthur C. Guyton Physiology Teacher of the Year will receive a framed, inscribed certificate, an honorarium of $1,000 and expenses of up to $750 to attend the meeting. The awardee is requested to write an essay on his/her philosophy of education for publication in *The Physiologist* and is expected to deliver this essay as an address at the annual Section Dinner.

Send nominations to: Laura Malloy, P.O. Box 236, Clinton, NY 13323 (Tel: 315-853-3686; email: lmalloy@abacus.bates.edu).

Scientific Meetings and Congresses

1999

October 7-10

Society for Advancement of Chicanos and Native Americans in Science National Conference, Portland, OR. *Information:* SACNAS, PO Box 8525, Santa Cruz, CA. Tel: 831-459-0170; fax: 831-459-0194; email: info@sacnas.org; Internet: http://www.sacnas.com.

October 9-13

Annual Congress of the European Respiratory Society, Madrid, Spain. *Information:* European Respiratory Society, Lausanne Headquarters, 1, boulevard de Grancy, CH-1006 Lausanne, Switzerland. Tel: +41-21-613-0202; fax: +41-21-617-2865; email: scientif@ersnet.org.

October 14-16

4th International Congress of the World Muscle Society, Antalya, Turkey. *Information:* Haluk Topaloglu, MD, Local Organizer of the 4th Meeting of the WMS, Department of Child Neurology, Hacettepe Children's Hospital, 06100 Ankara, Turkey. Tel: +90-532-234-1226; fax: +90-312-310-6262; email: htopalog@gen.hun.edu.tr.

October 23-28

29th Annual Meeting of Society for Neuroscience, Miami Beach, FL. *Information:* Society for Neuroscience, 11 Dupont Circle, NW, Suite 500, Washington, DC 20036. Internet: http://www.sfn.org/.

December 11-15

39th Annual Meeting of The American Society for Cell Biology, Washington, DC. *Information:* American Society for Cell Biology, 9650 Rockville Pike, Bethesda, MD 20814-3992. Tel: 301-530-7153; fax: 301-530-7139; email: ascbinfo @ascb.org; Internet: http://www.ascb.org/ascb.

2000

February 12-16

44th Annual Meeting of Biophysical Society, New Orleans, LA. *Information:* Biophysical Society, 9650 Rockville Pike, Bethesda, MD 20814. Tel: 301-530-7114; fax: 301-530-7133; email: society@biphysics.faseb.org; Internet: http://www.biophysics.org/biophys.

March 27-30

International Conference on Physiological and cognitive Performance in Extreme Environments, Canberra, Australia. *Information:* Dr. Tony Lau. Tel: +61-3-9626-8475; fax: +61-3-9626-8410; email: ExPhyConf200@dsto.defence.gov.au

May 13-16

Pediatric Academic Societies and American Adacemy of Pediatrics Joint Annual Meeting, Boston, MA. *Information:* Debbie Anagnostelis, APS-SPR Central Office, 3400 Research Forest Drive, Suite B-7, The Woodlands, TX 77381. Tel: 281-419-0052; fax: 281-419-0082; email: info@aps-spr.org

July 17-21

Millennium Congress of International Society for Autonomic Neuroscience, London, UK. *Information:* ISAN Congress Secretariat, Congress House, 65 West Drive, Cheam, Sutton, Surrey SM2 7NB, UK. Tel: +44-208-661-0877; fax: +44-208-661-9036; email: info@conforg.com; Internet: http://www.conforg.com.

July 30-August 4

9th International Conference on Environmental Ergonomics, Ruhr-University Bochum, Germany. The integrative physiological, biomedical, & engineering approach. *Information:* Prof. Werner. Tel: +49-234-7005442; fax: +49-234-7094117; email: icee2000@bio-med.ruhr- uni-bochum.de; Internet: http://www.biomed.ruhr-uni-bochum.de/icee2000.html.

September 6-10

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

September 7-13

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

October 11-15

Frontiers in Modelling and Control of Breathing (8th Oxford Conference), Cape Cod, MA. *Information:* Chi-Sang Poon, PhD, Division of Health Sciences and Technology, Harvard University- Massachusetts Institute of Technology, Rm. 20A-126, Cambridge, MA 02139. Tel: 617-258-5405; fax: 617-258-7906; email: cpoon@mit.edu

October 22-26

REGPEP 2000: 13th International Symposium on Regulatory Peptides, Cairns, Queensland, Australia. *Information:* ICMS Pty Ltd, 84 Queensbridge Street, Southbank, Victoria, Australia 3006, Tel: +61 3 9682 0244, Fax: +61 3 9682 0288, email: regpep@icms.com.au; Internet: http://www.icms.com.au/regpep.

PROPOSED COMMITTEE_____
NOMINEE'S LAST NAME_____
SECTION AFFILIATION_____
DATE_____

Nomination Form
APS Committee Appointments

(Use this form for yourself or another individual)

NAME OF NOMINEE_____
First **Middle** **Last**

POSITION/TITLE_____

MAILING ADDRESS_____

_____

TELEPHONE NO:_____ **FAX NO.**_____

E-MAIL ADDRESS:_____

Is the Nominee an APS member who actively participates in APS meetings?

Have you personally verified that the Nominee is willing to devote the time and effort to carry out the Committee's charge?

What special expertise qualifies the Nominee for the Committee specified above? (Please be as detailed as possible with regard to the specified committee. There are many other qualified individuals being considered for this Committee.)

With which Section is the Nominee affiliated?

NOMINATOR (please print)_____ **SELF**
NOMINATOR'S INSTITUTION_____
ADDRESS_____
_____
_____

MAIL COMPLETED FORM TO:
American Physiological Society
9650 Rockville Pike
Bethesda, MD 20814-3991
TELEPHONE: 301-530-7165; FAX: 301-571-8305

_____
Signature

How to Apply for Membership...

One application form serves all membership categories. There are however, specific sets of instructions for each category. Therefore, it is essential that sponsors and applicants carefully follow the specific instructions in their desired category.
Send no money now. You will receive a dues statement upon election to membership.

General Instructions

Check the box indicating the category of membership for which you are applying. Type the requested information on the application. Fill out all applicable spaces. Only completed and signed applications will be reviewed. Do NOT include a curriculum vitae or reprints.

The Bibliography should be submitted in the form found in the American Journal of Physiology. Applications with incomplete bibliographies will be returned. An example of the current form is:

JONES, A.B., and C.D. Smith. Effect of organice ions on the neuromuscular junction in the frog. Am. J. Physiol. 220:110-115, 1974.

Deadline Dates

Completed applications for Regular membership are considered for nomination by the Council three times per year. Affiliate and Student applications are accepted monthly upon approval of the Executive Director of the Society. Applications are not complete until all materials are received.

Qualifications for Regular Membership

The following categories are used when evaluating an application:

1. **Education.**
Applicants who possess an advanced degree (Ph.D., D.V.M., M.D., etc.); however individuals who hold a masters degree will be considered on a case-by-case basis.

2. **Occupation.**
Applicants should have a full-time position in physiology or related area, in an academic department, or industrial or government laboratory. The applicant may be an independent investigator, postdoctoral or clinical fellow, or research scientist.

3. **Contributions to Physiological Literature.**
The applicant's bibliography is evaluated on the basis of publications in major, refereed journals. Emphasis is given to papers published as the result of original research on topics judged to be primarily physiological in nature.

4. **Special Considerations.**
This category permits the Membership Committee to acknowledge an applicant's unique accomplishments and scholarly contributions to physiology outside of research. The accomplishments should result from the applicant's talents, interests or background. In such instances, a sponsor should submit a letter reviewing any special considerations.

In general, persons who qualify for **Regular membership** will have a doctoral degree in physiology or related area and will have published at least one paper in a peer-reviewed journal.

Qualifications for Affiliate and Student Membership

In general, applicants will be considered for **Affiliate membership** if they have an interest in fostering the mission and aims of the Society, but do not have evidence of scholarly work in the physiological sciences.

Applicants will be considered for **Student membership** if they are actively engaged in physiological work. No individual may remain in this category for more than five years, without reapplying.

Sponsors

Primary responsibility for membership rests with the two sponsors who must sign the form and be Regular members of the Society (an Honorary Member may substitute for one Regular member). Sponsors should discuss the appropriateness of the class of membership with prospective applicants.

Two sponsors must sign an application form. A letter concerning the candidate's qualifications is optional, and perhaps best suited to those instances when a sponsor wishes to document an applicant's independence or unique accomplishments.

Mailing Address

Applicants for Regular membership should mail the original application signed by two sponsors, plus 7 copies to:

Membership Secretary
The American Physiological Society
9650 Rockville Pike
Bethesda, Maryland 20814-3991

Applicants for Student or Affiliate membership should mail the original application only to the Membership Secretary at the address shown above.

Send no money now. You will receive a dues statement upon election to membership.

MEMBERSHIP APPLICATION FORM

THE AMERICAN PHYSIOLOGICAL SOCIETY

Tphys10.99

Check membership category you are applying for: ❑ Regular ❑ Affiliate ❑ Student

Do you currently hold membership in the APS? ❑ Yes ❑ No

If you answered yes to above, what is your category of Membership?_____Year elected?_____

Name of Applicant: _____/_____/_____
Last Name or Family Name *First Name* *Middle Name*

Date of Birth_____/_____ /_____Optional: Male ❑ Female ❑
Month *Day* *Year*

Institution Name_____Department_____

Institution Street Address_____

_____

City/State/Zip/Country_____

Phone_____Fax_____

E-mail_____

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

Dates*	Degree*	Institution	Major Field	Advisor

DOCTORAL DISSERTATION TITLE (if applicable):_____

_____

POSTDOCTORAL RESEARCH TOPIC (if applicable):_____

_____

SPONSORS (Sponsors must be APS Members. If you are unable to find sponsors, mail or fax this form to the address on the back of this form and we will locate them for you.)

Check this box if applicable: ❑ Please locate sponsors on my behalf.

#1 Sponsor Name_____

Mailing Address_____

_____

_____

Phone_____

Fax_____

E-mail_____

Sponsor Signature*_____

#2 Sponsor Name_____

Mailing Address_____

_____

_____

Phone_____

Fax_____

E-mail_____

Sponsor Signature*_____

**signature indicates that sponsor attests applicant is qualified for membership.*

▶ **Please turn over for 2 more questions...and mailing instructions.**

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

OCCUPATIONAL HISTORY [Check if student ❒]

Current Position:

Dates	Title	Institution	Department	Supervisor

Prior Positions:

Dates	Title	Institution	Department	Supervisor

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

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

IMPORTANT INFORMATION:

Do not include a curriculum vitae or reprints.

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

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

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

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