



*Integrating  
the Life Sciences  
from Molecule to  
Organism*

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**EXPERIMENTAL BIOLOGY 2002  
ABSTRACT DEADLINE  
NOVEMBER 7, 2001**

# The Physiologist

Volume 44, Number 5

October 2001

## Collaborating With Industry: The Rules of the Game

Organized by Glenn Reinhart  
Liaison With Industry Committee Chair

The LWIC was pleased to present a workshop at Experimental Biology 2001 in Orlando, FL entitled "Collaborating With Industry: The Rules of the Game."

In an era characterized by increasing overlap between academic and commercially driven life science research, the process of establishing productive research collaborations between industry and academia has become more clearly defined and increasingly complex. As a result, the university investigator may expend considerable effort trying to reconcile the regulatory demands of both the University Technology Transfer Office and the corporate entity of interest. This workshop was designed to delineate the rules and processes of establishing a variety of successful collaborations and included presentations from representatives of both the University and Industry setting.

The following presentations were made:

"Life Science Research: What is Industry Looking For?" Joan Keiser, PhD.

"Initiating the Collaboration: From First Contact to Contract," Robert Penhallow, PhD.

"Working With Your Technology Transfer Office: An Insider's Perspective." Mark Bloom, Esq.

"Strategies for Successful University Collaborations: One Company's Perspective," Carol H. Stephens, PhD.

*This symposium was held at Experimental Biology and was organized by Glenn A. Reinhart, Liaison With Industry Committee Chair, and Group Leader, Cardio-Renal Pharmacology, Global Pharmaceutical Research and Development, Abbott Laboratories, Abbott Park, IL.*

### Life Science Research: What is Industry Looking For?

*Joan A. Keiser, Executive Director of Cardiovascular Pharmacology, Pfizer Global Research and Development, Ann Arbor, MI*

To put into perspective the mission of life science research in the pharmaceutical industry, it is valuable to consider how we do our business. The pharmaceutical industry is an interdisciplinary endeavor. Our responsibility is to discover, develop, and commercialize safe and effective drugs. These words are purposefully selected. I cannot over-emphasize the interdisciplinary nature of our work. Scientists with diverse skills from bioinformatics to medicinal chemistry to physiology work together in teams to move a project from concept to compound and beyond. Along the way several individuals will participate in the effort; some in minor ways, others for large portions of their career.

The work we do can often be described as a *dialogue* between biologists and chemists that stems from the understanding of biological structure and function and is centered on biochemical or molecular mechanism of action. The participation of both biologists and chemists gives rise to the creation of novel chemical structures that are the commerce of the pharmaceutical industry. The value of a crystal structure of a protein cannot be overemphasized. The binding of a small molecule co-crystallized with a target protein provides the medicinal chemists with key structural information and provides the insights that can give rise to novel chemical structures.

The language of drug discovery is peppered with terms that mark the evolution of a project.

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## Matter of Opinion

### View From The Street



APS Executive Director Martin Frank directly confronts an animal rights demonstrator on the streets of Christchurch, New Zealand.



APS Member Brian Duling confronts an animal rights activist holding a sign asking, "What have animals done to you?"

As I began planning for my trip to the IUPS Congress in Christchurch, my anxiety level was raised by an announcement in the NABR newsletter that ALF, the Animal Liberation Front, was targeting two meetings of vivisectionists scheduled for Christchurch, NZ during the summer of 2001. This could not be viewed as a hollow threat, because ALF had already demonstrated violent tendencies in the US and Europe. However, there was hope that their impact would be less prone to violence in a country like New Zealand which does not have a long history of animal rights demonstrations. The Congress organizers announced that

they were working with security services in the country to ensure that the efforts of ALF and demonstrators would not impact the Congress.

While I expected to see animal rights demonstrations at the Congress, I was not prepared for the coverage the demonstrators received from the local newspaper. When I arrived at the Congress, I was greeted with fairly positive front-page coverage of the demonstrators and their issues. The response of a leading research scientist was buried on an inside page of the newspaper. It appeared that the media was taking the side of the demonstrators and there was no attempt to engage the

demonstrators in discussion. The challenge for me was what could I do so far from home in order to respond to the efforts of the demonstrators.

Well, I found a way! Remembering that I had some materials in my arsenal, or at least in my suitcase, I dug out my "I'm Alive Thanks to Animal Research" tee shirt and a Medical Alert card that had been distributed by Coulbourn Instruments about 10 years ago (it definitely helps to save things in one's appointment book, something that I could not have done with a PDA). The card states, "I believe that animals should not be used in scientific or med-

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Animal rights activists placed their thoughts on the sidewalk outside of the building where the IUPS Congress was being held.



Brian Duling and Martin Frank confront demonstrators in front of Christchurch's Town Hall.

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ical research. If I am unable to speak for myself in a medical emergency, do NOT treat me using any medical or surgical device, procedure, or drug which was developed using animals as experimental subjects.”

If the animal rights demonstrators were serious in their views, they would gladly accept and sign the cards and carry them in their wallets and purses.

As one walked around Christchurch, one noticed handbills plastered onto light poles decrying the use of animals in research. Similarly, stuffed animals gutted, stained with red dye, and impaled with wires could be found hanging all around Cathedral Square. Would there be efforts to do the same to one of the scientists attending the Congress?

The activists' demonstration schedule was readily available in the newspaper and in handbills distributed around the city. Noon each day was the time for the demonstrators to gather at the convention center, to start shouting slogans, to carry their signs, and to beat their drums. Apparently, the security forces were told not to confront the demonstrators unless they caused trouble, meaning the destruction of property or violence. It was apparent that both the demonstrators and the security forces did not want direct conflict, allowing the demonstrators to express their views without generating police action.

As a result, it appeared safe enough for me to go out amongst the demonstrators to engage them in discussion during their demonstrations. Fortunately, I was able to convince some of my colleagues attending the Congress to do the same. To them, let me express my sincere appreciation, because unless we engage the demonstrators, the only message that will be heard will be the message of the demonstrators.

Did I accomplish anything by talking to the demonstrators? Probably not in the short term, but possibly at some time in the future one or more of them might actually realize what I had to say

had merit. A standard mantra was “Nothing has ever come from animal research.” No matter how hard I tried to explain the role of animals in the development of

cures and treatments for disease, the activists had an example that in their minds proved me wrong. Even if it were okay to use animals, they wouldn't buy it, “...because we are not like animals.” The fact that over 90% of our genetic material is the same as lower species and that anatomically we are very similar to other mammalian species meant nothing to them.

When I asked a 20 year-old if she had been vaccinated, she responded that she had, “...but it was at a time when she could not speak for herself. Had she been able, she would have refused the vaccines.” A 15-year old told me “we are all going to die anyways, so why do we have to kill animals to develop cures for humans,” cures that she had no desire to benefit from. I told her about my father who had triple bypass surgery when he was 69 and 82 years old and explained how coronary bypass surgery had been developed through research on dogs. I then made the mistake of telling her that my father died when he was 91 years old. She quickly replied, “See, he died anyways.” She dismissed my argument that he had 22 years of life that allowed him to see grandchildren born, see them graduate and even marry.

The most successful aspect of my interactions with the demonstrators involved their willingness to accept the Medical Alert card. In a September 6th article published by Tom DeWeese on the Cybercast News Service, he wrote “The next time you are in a discussion



**Animal rights activists display their sentiments across the street from the IUPS Meeting.**

with an animal rights advocate, ask them if, before entering a hospital, they will sign a release that says they will not accept any medical procedures or cures that were obtained from animal research? See if they have the guts to put their own lives on the line for their irrational blathering.” Much to my surprise, the animal rights advocates that I met in Christchurch were more than glad to accept the Medical Alert cards, and even willing to sign them when I urged them to do so. The good news, as I said to the security forces witnessing the demonstrators signing their cards, was that through my efforts and those of the others who distributed the cards to the demonstrators, the medical care cost for the New Zealand government should be reduced in the coming years. However, that assumes that the demonstrators didn't tear up the cards after the demonstrations.

When I returned to the convention center after my encounters with the demonstrators, Congress attendees would ask me what it was like talking to them. While I was uncertain how best to describe the encounters, I decided to respond, “It's like talking to your teenager.” I guess the description was not too far off the mark. After talking to a 15-year old vegan for about 10 minutes, she looked at me and said, “You sound like my father!” ❖

*Martin Frank*

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Drug companies maintain “libraries” of hundreds of thousands to millions of molecules (compounds) that are tested (screened) in relevant biological assays using high throughput formats. These high throughput formats might consist of 96 well enzymatic assays of 384 well cell-based assays, but, importantly, are readily executed with robotics. These assays of the chemical library will result in identification of chemical structures with biological activity referred to as “hits.” Medicinal chemists will then modify these molecules in an interactive fashion to improve in vitro potency, absorption, distribution, metabolism, and other pharmacology. The patent-ability of these molecules will be explored as well. This work results in chemical structures with improved biological properties that are referred to as leads. Lead molecules will then be further tested for chemical stability and large-scale chemical synthesis, safety in animals, pharmacokinetic (PK) and pharmacodynamic (PD) profiles in animals, and potency with projected clinical pharmacology in humans. The goal of this effort is to identify a drug candidate for further development. Drug candidates are initially tested for safety in healthy volunteers under the oversight of government authorities. These are called Phase I trials. In the US, the Food and Drug Administration (FDA) has this responsibility. If the compound has the desired pharmacokinetics and is safe, the pharmaceutical company will proceed to establish the efficacy of the compound in a disease setting (Phase II and III). A successful Phase III program culminates with a regulatory filing (in the US, a New Drug Application) to the FDA for approval to market the drug.

The process of drug discovery and development is expensive and time-consuming. To appreciate the scope of drug discovery at any major pharmaceutical company one has only to look at the attrition rates (see Table 1). Roughly 50% of the ideas discussed by discovery

scientists never reach the stage of actual bench exploration. Discovery programs that initiate screening of the chemical library fail at the rate of roughly 19 out of 20. The attrition rate from drug candidacy through the approval to commercialize a new drug is roughly 13 of 14.

Thus, a company needs to muster a large number of discovery programs to guarantee a successful pipeline of products in the marketplace. The process can take up to 12-15 years and cost roughly \$500-\$700 million dollars. Patents last for 20 years. By the time many drugs reach the marketplace the window of profitability is small. However, many innovations in biology are changing the drug discovery process. The business opportunity in the pharmaceutical industry is promising for young scientists. Present day therapies are based on only 400-500 molecular targets. The human genome project may provide an estimated 10,000 novel targets. New technologies such as robotic ultra high throughput screening make it possible to test up to 500,000 compounds/day. Combinatorial chemistry efficiently produces millions of new chemical structures for testing. Evolving concepts of signaling pathways, in-silico biology, disease biomarkers, genetically engineered animal

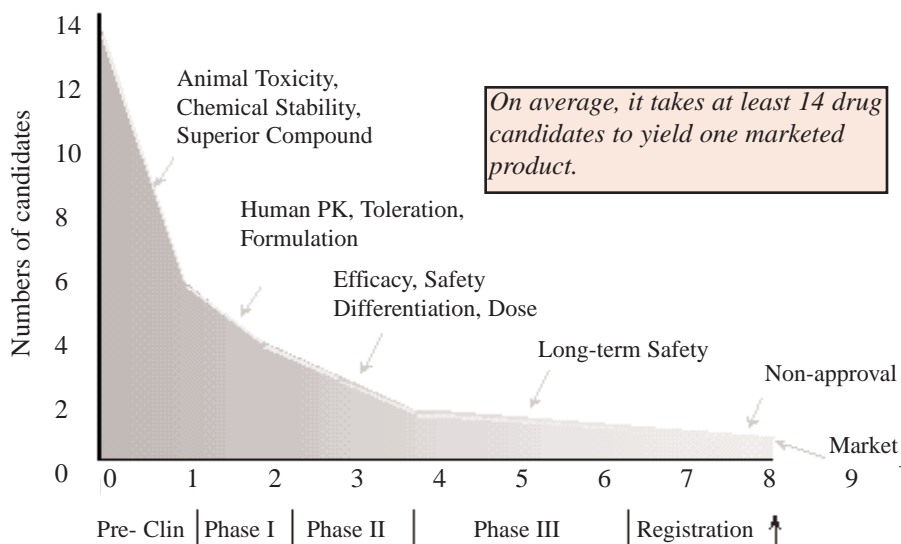
models, gene profiling, and miniaturization open new horizons to rapid validation of novel drug targets. The industry is avidly seeking new ideas, new assays, new screens and opportunities to interact with academic scientists to fulfill their mission.

Like most other organizations today, pharmaceutical companies organize their drug discovery and development efforts around highly focused, self-managed, goal-oriented, multidisciplinary teams whose members work in parallel towards collectively agreed team goals and objectives. A project team configures a group of people around a defined piece of work for a defined span of time. Some will work exclusively on the project throughout its life cycle while others will contribute on as-needed basis at different stages of the project's development. Effective project teams come together quickly and disband just as rapidly when the work is done.

What does industry have to offer an academic scientist? To answer that question first let me say it is very important to dispel the myth that industrial scientists are “second class” or “out of touch.” The reality today is that some of the most innovative new scientific technologies reside in private

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**Table 1. Development Attrition-The Reality.**



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industry. The job of drug discovery is so enormous that major pharmaceutical companies cannot afford not to invest in the best new technologies and often conduct the beta testing of equipment and ideas. The pharmaceutical industry has maintained core expertise in animal models of disease as a means of evaluating drug efficacy. Companies often mount multifaceted attacks at a complex problem to reduce risk and save time. So what does industry have to offer an academic scientist? The list is long but includes technologies, bioinformatics, and reagents—including small molecule pharmacological probes for exploring physiologic processes. An example of a pharmacologic probe would include compounds like PD 123319. PD 123319 is a selective angiotensin AT<sub>2</sub> receptor ligand. Although the molecule was deemed to be uninteresting as a drug candidate for a number of reasons, this compound remains the most requested compound ever from the Parke-Davis chemical library because of its value to the academic community as a reference agent.

What is industry looking for in a collaborator? Remember that the timely execution of projects is crucial in the industry. Industrial scientists are looking for highly specialized expertise, complex model systems that would be difficult to reproduce for single project, assay technologies and ideas. I urge each of you to consider if there is value for you in this arena.

### Initiating the Collaboration: From First Contact to Contract

*Robert Penhallow, PhD Manager, Technology Licensing, External Science & Technology, Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, NJ.*

The explosion of information and technological developments available to Biotechnology and Pharmaceutical companies as we enter the 21st century is dramatic, and challenges these entities to keep pace with this progress.

Perhaps the most visible example of this explosion of information is evidenced by the completion of the human genome project. This information, once the raw sequence data is distilled into a useful set of validated drug target proteins, will change the face of drug discovery.

No single organization could reasonably hope to capture and utilize the available information and technology utilizing internal resources. Collaborations and alliances are increasingly important mechanisms to leverage the expertise of outside parties and the flexibility to apply manpower on a particular project or program area without making a large commitment to internal infrastructure.

The goal of this discussion is to examine the early stages of establishing a technology collaboration. Most examples are between an industry entity involved in biomedical research and an academic institution, but are generally relevant to the early stages of interaction of any parties.

### Marketing an Invention

Once an investigator and technology transfer office believes that a technology is at a mature enough stage to benefit from collaboration, a description of the technology is developed and shared with potential corporate partners. The list of potential partners can be developed from information obtained from conventional sources including attending meetings and reading news articles, and refined by visiting the web pages of companies suspected to be working in a particular area.

A non-confidential summary of the invention or technology should be composed for use in marketing the invention to potential partners. The non-confidential summary that is disclosed to companies for review should be concise, but should capture the attention of a company, and contain enough information for the company to make a reasonable assessment of the technology. The summary should contain a concise description of the technology, as well as an

assessment of the potential applications of the technology and a mention of the distinctive characteristics of the technology outlining how it is superior to similar technologies. A copy of publications describing the technology would be useful to those wishing to research the scientific background more completely, as well as a list of pending publications. The patent status of the technology is usually important to the company and should be included in the summary. Finally, a mention of the preferred method of interaction might be useful.

### The Confidentiality Agreement

If, after the initial review of the non-confidential information related to an invention or technology, the potential licensee retains interest in pursuing a license or collaboration, the next step is frequently to execute a confidentiality agreement. These documents are commonly referred to as a Confidential Disclosure Agreement (CDA), a Non-Disclosure Agreement (NDA) or a Secrecy Agreement. The purpose is to protect and contractually limit exposure of confidential information that is disclosed to the reviewing party in the course of evaluation. The CDA may be in a letter format or a more formal style agreement. The CDA may be “one way,” where only one party is disclosing information, or a mutual or “two way” agreement, where both parties are disclosing and receiving information. Either the disclosing or receiving party may generate the document.

The first section of the CDA generally concerns itself with identifying the Parties, and in defining confidential information, and the subject matter to be disclosed. Confidential information can be defined, for example, as all written, visual, oral and electronic information that might be disclosed. To prove what was actually furnished, a stipulation is frequently made that written information must be marked or designated as confidential at the time of disclosure. Verbal disclosure can be summarized in writing, marked as confiden-

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tial and submitted as confidential disclosure within some defined time frame. The subject matter is simply a description of the invention or technology, e.g. "protein X expressed in cardiac cells, pertaining to University Docket #12345."

The scope, purpose and limitations of use of the disclosure should also be defined. If the intended purpose of the information is to evaluate possible interest in acquiring rights to an invention, this should be stated. Further, the disclosure could be limited strictly to this evaluation role.

The CDA will also contain a number of exceptions that could disqualify information from confidential status. In simple terms, the common exceptions to holding information in confidential status include: 1) the information being in the public domain at the time of disclosure, 2) the information becoming part of the public domain after disclosure, 3) the information was already in the receiving party's possession at the time of disclosure, 4) the information is received by the receiving party legally and without restriction from a third party, or 5) the information is independently developed by the receiving party without use or access to the confidential information.

A number of additional provisions may be included in the confidentiality agreement. Some parties will request that all written materials, documents and other things made available for the purpose of the CDA be returned. In this case the receiving party is entitled to retain one copy of the material to determine its obligation under the agreement. Other sections may pertain to further rights and obligations, the former indicating that there is no implied license. This makes it clear that by signing the CDA that there are no obligations beyond providing confidential information. No further obligation means that there is no obligation to negotiate or enter in a licensing agreement.

### *Types of Agreements*

There are several common types of "technology transfer" mechanisms available to the academic researcher. These include consulting, sponsored research, materials transfer, licenses and participation in consortia. When entering into negotiations for one of these agreements, it is usually preferable to address the non-financial issues first. Defining the scope of research and the non-financial terms first will help to assign the value of the agreement. These non-financial issues include confidentiality concerns, publication rights, ownership of data, performance of research and rights to improvements, as well as the more legal concerns of indemnification and warranty. Once these terms have been negotiated it is appropriate to address, as applicable, dollar amounts assigned to license fees, IP costs and research funding.

The goal of the agreement negotiation for both parties is a win-win situation. The first step should be to determine what the other party needs and wants to achieve from the collaboration or deal, and try to accommodate these needs. In many instances money is not the key, and creativity in deal structure can help to get both parties what they need.

### **Working with Your Technology Transfer Office: An Insider's Perspective**

*Mark Bloom, Esq., Manager of Technology Licensing and Sponsored Programs and Chief Patent Counsel, The Cleveland Clinic Foundation, Cleveland, OH.*

### *Genesis of Non-Profit Organization (NPO)/University Technology Transfer Activities*

Prior to 1968, NPO's/Universities, on a case-by-case basis, had to petition the specific federal agency that funded the development of the technology in question to obtain the ability to commercially market that technology; however the ownership of the technology remained

with the federal government. From 1968 to 1980, several NPOs/Universities signed agency-specific agreements that allowed for the uniform treatment of commercialization efforts for technologies funded by those specific agencies; however, as before, the ownership of the technology remained with the federal government. Finally, in 1981, with the passage of the Bayh-Dole Act, NPOs/Universities were able to own outright all technologies that they developed with federal monies. The Bayh-Dole Act was a watershed event in the explosive growth of NPO/University technology transfer activities that has continued to the present day.

### *Most Important Academic Technology Transfer Issues*

Of the myriad technology transfer issues addressed by NPO/University technology transfer professionals when working with industrial partners, there are four of particular importance, namely: 1) Ensuring that their researchers have the freedom to publish the results of their research. 2) Ensuring that their researchers are given proper attribution regarding future technology developments associated with their original research efforts. 3) Ensuring that the role of their NPO/University in the development of a technology is recognized in an equitable manner. 4) Ensuring that their NPO/University shares equitably in the revenue generated from the commercialization of their technologies.

### *Biggest Academic Technology Transfer Perils*

The conduct of technology transfer activities is not without risk to NPOs/Universities. Examples of such risks include an industry partner: 1) Placing unreasonable restrictions on a researcher's right to publish research results, i.e., seriously impinging upon or outright preventing the exercise of academic freedom; however, short publication delay for patentability or confi-

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dentiality review is usually an acceptable compromise. 2) Requiring some level of control over researcher-based publications resulting from sponsored research efforts, e.g., editorial or publication pre-approval. 3) Demanding a perpetual, worldwide, royalty-free license (with the right to sublicense) to all inventions, discoveries, ideas, etc., developed using sponsored research dollars. In many circumstances, such a royalty term is viewed as demeaning and inequitable and often slows or prohibits sponsored research contract negotiation.

### *Licensee Due Diligence*

Potential licensees of a NPO/University-developed technology will conduct a due diligence review of not only the technical nature of the technology, but also the commercial and other legal rights that they might receive via a license agreement. Such important due diligence issues that will be investigated by an industry partner include: 1) Has the NPO/University filed patent applications in all of the relevant markets for the technology? The filing of domestic and foreign patent applications is very expensive and such filing costs are a serious budget issue at many NPOs/Universities. 2) Have the NPO/University inventor(s)' published their ideas prior to the filing of appropriate patent applications? If yes, how long ago? This inquiry is important because most countries, with the exception of the US, have an "absolute" novelty requirement, i.e., no patent protection is available if a publication or other public disclosure precedes a patent application filing. 3) Has a patent validity analysis been conducted to determine whether the patents that have been applied for by the NPO/University are likely to issue? 4) Is the technology properly the subject of patent protection, or are there other forms of intellectual property protection that would be more appropriate, e.g., copyrights or trademarks? 5) Have all of the inventor(s) assigned all of

their respective rights to the technology to their institutions? If there are inventor(s) from different institutions, then an Inter-Institutional Agreement (IIA) between institutions will be required to address issues such as technology co-ownership and control of licensing activities. 6) Does the project require access to materials or information not covered by the technology license, e.g., biological materials or software? 7) Will the licensee exploit the technology in combination with other technologies, and how will that affect the distribution of royalties? 8) Besides a traditional consulting arrangement or institutional royalty-sharing policies, there may be other financial incentives a licensee can offer an inventor or their institution, e.g., equity or stock options. Note that fixed or annual fees/equity/stock options are a better choice for personal compensation than variable payments, i.e., payments tied to some specific outcome; and, recognition of conflict-of-interest or -commitment issues are of paramount importance.

### *Researcher Due Diligence*

There are several key proactive steps that NPO/University researchers can take to ensure that their involvement in the technology transfer "process" is positive and rewarding: 1) Becoming familiar with their institution's technology transfer-associated policies and procedures, e.g., patent, copyright, and trademark policies; conflict-of-interest or -commitment policies; equity/royalty distribution policies; sponsored research policies; IRB/MRB (human subjects) and animal care and use policies; clinical trial policies; and invention disclosure and processing procedures. 2) Learning more about confidential disclosure agreements or non-disclosure agreements (CDAs or NDAs) and material transfer agreements (MTAs). Researchers should not be afraid to use them in the appropriate circumstances. 3) Contacting their technology transfer office before publicly disclosing their potential cure for cancer! It is important

to realize that a public disclosure broadly means either a non-confidential communication between two non-associated parties or information that is made accessible to the general public by any means. 4) Actively assisting their technology transfer office in protecting their and their institution's interests. For example, not signing contracts that affect or involve intellectual property terms without the proper legal review. 5) Anticipating that their technology transfer office will always want "everything in writing." 6) Giving their technology transfer office sufficient time to react to their needs. 7) Allowing their technology transfer office to conduct negotiations on their behalf.

### *Final Thoughts*

For-profit companies view NPOs/Universities as a rich source for cutting-edge technologies. As a result, these companies will be exploring all means of NPO/University technology transfer, e.g., licenses, options, sponsored research, start-ups, SBIR & STTR grant programs, etc. It is vitally important to the success of an NPO/University's technology transfer activities for their researchers to know their NPO/University's technology-associated policies and procedures. Finally, all NPO/University researchers are strongly encouraged to be a proactive participant in their institution's technology transfer activities!

### **Strategies for Successful University Collaborations: One Company's Perspective**

*Carol H. Stephens, PhD, Alliance Manager, Eli Lilly and Company, Indianapolis, IN*

Since the 1920s when Eli Lilly and Company joined with Fred Banting and Charles Best at the University of Toronto to make the first insulin for treating diabetes, alliances between Lilly and academia have resulted in critical breakthroughs for patients around the world. Collaborations with industry provide funding for academic research,



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and when the research results in leads for new drugs, the pharmaceutical company has the organization and experience to take a molecule through development, clinical trials, and regulatory approval so that patients have access to new therapies. In collaborations with industry, academia brings breakthrough research and insights into disease biology and therapy.

In the 80 years since the University of Toronto alliance, Lilly has been involved with hundreds of collaborations and continues to see academia as a key partner in developing new approaches to unmet medical needs. Today Lilly has over 140 collaborations in research and development, many of which are with universities in the US and abroad. They range in size from a few thousand dollars to fund experiments to a \$10 million five year agreement involving multiple laboratories at a major university and at Lilly. Most of the non-university alliances are with smaller research companies, including biotechs, and several are with large pharmaceutical companies for the purpose of late stage clinical development and co-marketing of new therapies. Lilly often selects alliances in its key areas of research—neuroscience, endocrine, oncology, infectious disease, bone, inflammation, and nuclear receptors—but also looks for promising science in areas outside of those research groups.

Given the importance of alliances to Lilly, the company for the past 18 months has engaged in a significant effort to ensure that alliances have the support, processes, and leadership to reach their potential, so that all partnerships achieve their goals. This effort has resulted in revised methods for bringing in alliances, a new alliance management organization, tools and feedback methods for continuing improvement, and training for greater understanding of the ingredients of successful collaborations. These efforts have yielded significant results for many Lilly-university collaborations.

### *Process for Acquiring New Alliances*

Lilly's method for adding new alliances is now divided into three stages. The Research Acquisition department initially locates and then evaluates new opportunities. At Lilly's US corporate center, a department of PhDs and associates spend full time looking for and reviewing new scientific approaches with the potential to become alliances. In addition, several Research Acquisition employees work out of Europe and Japan to do the same for many of the opportunities in their countries. The areas of greatest interest for Lilly are new drug targets, target validation, synthesis or purification of potentially therapeutic molecules, analysis of targets and molecules, and the interface between targets and molecules, often called screening. The Research Acquisition group evaluates approximately 1,000 potential alliances per year. University personnel or departments with an alliance proposal should submit it through the Lilly web site at <http://www.lilly.com> under the alliances tab.

The second stage, managed by Corporate Business Development, negotiates terms and contracts, and the third part, implementation of the alliance, involves a new organization for Lilly, the Office of Alliance Management (OAM). OAM's job is to ensure the success of its alliances not just for Lilly, but for its partners as well. An alliance manager from OAM is assigned to each alliance to act as an ombudsman so that the needs of all parties are considered and addressed continuously. From the scientific area at Lilly, each alliance has an alliance champion, usually a senior executive, who is responsible for the overall support and oversight of the alliance. In addition, an alliance leader, usually a scientific expert or project manager with an intimate knowledge of the therapeutic area, is responsible for the week to week leadership of the alliance and communication with the partner.

### *Training*

As any university knows, education should be the foundation of any new program with the intent to succeed, and Lilly has recently developed and taught a new set of courses for everyone involved in alliances. The first course covers research on the factors affecting alliance success and failure as well as the Lilly alliance management process. The second course focuses on application, using case studies, Lilly's alliance management tools, and learnings from past and current alliances. Experienced alliance managers teach the courses. All Lilly employees who work with partners are required to take the classes, and to date over 450 people have completed them.

### *Organizational and Feedback Tools*

In the last 18 months, OAM has developed processes, guides, and surveys to help each alliance reach its potential. For example, in the initial start up phase, there are tools to help each alliance team gain consensus on the strategic intent of the alliance and identify, align and best use the capabilities of both partners. In addition, Lilly developed two tools to assess the ongoing health of each alliance. A web-based survey available in several languages and administered annually focuses on what the research indicates are critical success factors in partnerships, including compatibility of values, goals, clarity of roles, leadership, communication, trust and fairness, and flexibility. For smaller alliances with fewer than ten members at each partner organization in which a large scale survey would not be statistically meaningful, Lilly developed a focus group feedback guide and protocol which allows the alliance manager to probe these same factors. Alliance teams uses feedback provided by these tools to identify and implement plans for improvement.

### *Results*

The feedback and measurement tools in particular have made a significant

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## Collaborating With Industry

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difference in many alliances, which are experiencing improvement in communication, coordination and ultimately in scientific outcomes. For example, Lilly and a leading medical school jointly decided to add two alliance leaders, radically revise the process of data management, and institute monthly face to face meetings of key people to coordinate efforts. The results include a 96% reduction in the time needed for data management and an 18,000% increase in productivity of output. The medical

school met its alliance goal for the year in two months, allowing the partners to significantly increase the scope of the collaboration.

Overall, Lilly has found that this combination of a new organization, required training, and new tools for organization and feedback work together to ensure that partners' needs and desires are heard and addressed from the initial discussions to the ongoing relationship. Recently, these efforts have earned Lilly the Quality Award for alliance management programs from

the Association of Strategic Alliance Professionals, as well as recognition by PricewaterhouseCoopers-surveyed pharmaceutical companies as one of the top-ranked strategic alliance partners. And Lilly was noted as one of the top two pharmaceutical partners in the most recent issue of *Forbes* magazine. Alliances with universities continue to be critical collaborations for Lilly as they to help us all meet our goal of breakthrough understanding and treatment of major medical needs. ❖

## Careers

### Making the Transition Between Academia and Industry

Nansie A. McHugh

Senior Scientist, Schering-Plough Research Institute

When I was invited to speak at this symposium, I thought of how I could best serve the graduate and postdoctorate community with my limited experience in industry. I am rather new to industry, having made the transition less than two years ago. I thought about what I would have wanted to know the few short years ago that I was in your place. So I will tell you what influenced my decision to move to industry and my experiences in making the transition from academia to industry with respect to:

- preparing a Curriculum Vitae
- the job search process (resources available)
- preparing for the interview
- my job responsibilities as a PhD in Research and Development
- Industry vs. Academia
- the skills that will make you an attractive candidate to Industry

**Why would you want to go into Industry?** It's an unfortunate fact but

*Nansie McHugh, Schering-Plough Research Institute, presented this Careers Symposium at the Experimental Biology 2001 meeting held in Orlando, FL, in April 2001.*

true that unless you are in a hot area of research, the funding and salaries of academia just cannot match those of industry. But it is not all about money; and hopefully, the information that you take home from this symposium will help you to weigh the pros and cons and make your personal decision clear.

**My background.** I received my PhD in Physiology and Neurobiology in 1996 and began my postdoctorate in the Pulmonary and Critical Care Department at the University of Medicine and Dentistry of New Jersey. I spent a good portion of my first postdoctoral year writing grants in order to fund my position. Luckily, I was awarded a very nice two-year grant from the American Lung Association and eagerly began my research. The first year flew by. I wrote my first year status report and realized it would soon be time to start writing grants so that my funding would continue uninterrupted. I took stock of my situation. My research was going well, I enjoyed my job, but I did not look forward to spending so much of my time in search of funding for my projects. I began to look at what

I really enjoyed about my job and whether I would be satisfied in industry. I knew that I would be expected to follow a set agenda in industry, that is, the one that I was hired to do, but I also realized that if I applied for only those positions that required setting up animal models of disease for research purposes (which is my main interest), that I could be happy in Industry or Academia. My decision was made and I began sending my CV to every job opening that was in my field (about two–eight each month).

**Optimizing your Curriculum Vitae.** Your CV is the first chance to make a lasting impression at a company. I went through many revisions of my CV before I began seeing results (i.e., getting a response other than a “notice of receipt” postcard). After reading booklets on the subject, asking for candid opinions of my peers and mentors, I found that the following basic advice will make your CV more visible and memorable: 1) Make sure that your CV is easy to read by using concise statements and bullet points to describe your previous work and skills. 2) You must be sure that your CV is “scan”-able, as

many companies use software to scan CVs for keywords that match the job description. This means that you should use only standard fonts and use the terminology used in the job advertisement to describe your skills (i.e., if the ad states that they are looking for someone to set up *in vivo* assays and your CV states that you can set up animal models, change your CV so that a match will be made if it is scanned by a machine or pre-screened by a person in human resources with no scientific background).

*Resources for the Job Search.* The most powerful tool available for searching for a job today is the Internet. There are major websites that are devoted to job searches (<http://www.monster.com>) and several that are specific for jobs in science (<http://www.biomednet.com> and <http://www.sciencejobs.com>). Most large companies also have their own webpage or site that has job listings, as well as the ability to apply for a job online. The internet adds a new dimension to the term “networking.” Older versions of networking such as signing up for interviews at job fairs sponsored by conferences such as FASEB, or working with your mentor to network with his or her former students who may have jobs in industry are still very good resources. Most companies still have large job listings in the major scientific publications. In fact, the two jobs for which I did get offered interviews had been advertised in *Science* magazine and I applied for them by email. It took over a year before I had my first interview.

*Preparing for the Interview.* Your interview is your first contact with your future prospective employer. Besides making sure that you are prepared with your slide presentation of your work and that your socks match, you must also do your “homework.” You should research the company and find out who the major officers are, where their headquarters are located and, most importantly, what areas of research do they target and what are their major prod-

ucts. All of this information is available to you on the internet. My favorite website for this type of research is <http://www.monster.com>. When you come to an interview armed with this information, you are more prepared to answer questions that may be asked such as, “How do you see yourself fitting in this company?” or “What made you choose our company?”

**My job responsibilities as a PhD in Research and Development.** When I started my job in industry, many of my friends in academia asked me what I did at the PhD level in industry. As an entry level PhD I still do a lot of bench work. I set up animal models of disease so, just as in academia, I write up my protocols and have them approved by my institution’s Animal Care and Use Committee. I then characterize the model and work out the different assays that will be used to fully develop the model. My technician works with me and when the model is ready to be used, she takes over the daily work of the model and reports the data to me on a spread sheet. My responsibilities include crunching the numbers, writing the results into a report and presenting this information to management. When a study is worth reporting at a scientific meeting, I prepare abstract submissions on the data and eventually write a manuscript for publication.

**Industry vs. Academia.** I had learned from my experiences in academia that research is very “grant-driven.” You need grant funds to support yourself. You can have your own agenda but you must find funding for that research. In industry, research is for obvious reasons very “product-driven.” The company obviously must have a solid income from at least one “block-buster” drug in order to support the ongoing research. I have learned, however, that as long as you satisfactorily do the “bread and butter” research, the company has no problem if you want to explore an aspect of basic research that you are interested in. It is to their advantage if you find a new target for drug therapy. In academia

your time is definitely more flexible. As long as you have met your teaching duties, you can arrange your research and grant writing to suit your needs. Although companies are very understanding and most companies have flex hours, there are certain “core hours” when you are expected to be on-site and meetings that must be attended. One of the biggest myths about industry is that you will not be able to publish. Since I have been at my company, I have been encouraged to publish my work. The only difference between academia and industry is that in industry you may be working on a project that contains privileged information and may have to hold off on publishing until that information becomes public. Also, every abstract and publication that is written while working for the company must be screened by the legal department prior to release. This is to ensure that no privileged information is unknowingly released that will jeopardize the company’s future drug discovery efforts. The biggest difference that I have found between academia and industry is in the benefits programs. Most academic institutions have the basic benefits such as medical and dental and savings plans. In industry, you have these basic benefits as well as bonus plans, tuition remission, profit sharing and stock options and, in some instances, “finders fees” for recommending someone for a job opening. There are many other incentives depending on the company, such as “instant recognition awards.”

**The skills that will make you an attractive candidate to industry.** Since this symposium is sponsored by the American Physiological Society, I know that many of you are physiologists. There is a great need for physiologists in industry! Pharmaceutical companies are looking for candidates that have the ability to set up solid animal models of disease that can be used to rapidly screen drugs. If you have most of the skills that they are looking for, most companies will be willing to train you in any additional skills that they

## Careers

may need. However, there is one skill that is most necessary at the PhD level and that is the ability to communicate effectively. Good oral and written communication skills are essential.

I would like to thank Dr. Belloni for inviting me to speak to you about my experiences in industry. I hope that I have been able to help guide you in

making your career choices. I think that as long as you are willing to be flexible in your research, you can find a place where you will be happy in industry. I know that making the move to industry was the right choice for me. I thoroughly enjoy my job and never have a day that I dread going to work. I cannot speak for all companies as I have only

worked at Schering-Plough, but the people that I work with are courteous, respectful of others opinions and our management treats us very well. There are also many people who have been with the company for 15, 20 and 30 years and that says a lot for job satisfaction at Schering-Plough. ❖

## APS News

### Hall Thanks APS Staff

APS President **John E. Hall** hosted a staff appreciation reception for the Society's 70 employees at the Beaumont House on the FASEB campus in Bethesda, Maryland. Together with Executive Director Martin Frank, Hall thanked the staff for their efforts over the past year. He pointed out that during his membership he had served as the Chair of a Section, the Chair of the Section Advisory Committee, an Editor of an APS journal, a member of Council, and now President; he could testify to the overall excellence of the staff. Because of the efforts of the staff, APS continues to provide its members with the quality of service, 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, Hall presented 20-year certificates to Linda Allen (Meetings and Membership Department) and Penny Kirby (Business Office); 15-year certificates to Melinda Lowy (Executive Office), Krysia Moore (Publications Department), and Santa Vadala (Executive Office); and 5-year certificates to Penelope Cochran (Peer Review Department) and Marsha Sanders (Publications Department).

Hall expressed Council's appreciation for their years of service.

In addition, Hall recognized Jean Shao, Assistant Business Manager, for 22 years of service to the Society on the occasion of her August 1 retirement.

Martin Frank also recognized the contributions of Linda Allen, Membership Services Manager, for her outstanding and dedicated efforts in ensuring that the scientific sessions and program for the Experimental Biology 2001 meeting were a reality despite the

problems associated with the electronic submission of abstracts.

Hall conveyed the gratitude of the Society's leadership for the efforts of all the staff in helping to implement the actions of the Council, the committees, and the editors and remarked that, with the staff's help, APS would continue to serve the needs of the physiology community through the implementation of the Society's APS Strategic Plan. ❖



APS President John Hall and Executive Director Martin Frank presented recognition certificates to Melinda Lowy, Santa Vadala, Krysia Moore, Linda Allen, Marcia Sanders, and Penny Kirby.

## Council Meets in Bethesda

The APS summer Council meeting was held in Bethesda, MD, at the APS Headquarters Office on July 13-15, 2001. During the summer meeting, Council meets with 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*.

One of the most exciting developments this year was the establishment of a public relations effort. The Task Force on Communications/Public Information spearheaded this effort. The Society has selected a tri-fold approach to its initiative to improve communication with the general public. First, in June, a public relations firm, the Krupa Company, was selected after a general "Call for Proposals" to work with the Society to develop a public relations effort on behalf of APS meetings, journals, and awards. Second, a Communications Specialist was hired on staff to begin coordinating efforts between the Krupa Company and the Society. Third, at this Council meeting, a new committee, the Communications Committee, was established and Council approved nominations for the initial group of Committee members. This Committee will act to formulate the Society's policies for the promotion of physiology and the Society's activities; work with the Communications Specialist, communications firm, and appropriate committees to help identify media-appropriate elements of the Society's journals, meetings, awards, and other activities to promote; work with the Association of Chairs of Departments of Physiology to determine the best means of promoting physiology; and develop methods for early identification of journal articles appropriate for promotion, utilizing reviewers and/or editors of APS journals.

This same Task Force on Communi-

cations/Public Information also has been working on a Consensus Conference on Training Programs in Integrative Physiology/Pharmacology. Participants in the conference would include leaders in the genomics/proteomics/bioinformatics fields and representatives from industry, academia (both human and veterinary medical schools), and funding agencies. These people would work to help define the problem, review relevant data to determine whether concerns about the lack of qualified people were valid, discuss the impact it would have on the future of biomedical research, and develop potential solutions to the problem. The conference would culminate in the formulation and dissemination of a White Paper.

Other Task Forces currently meeting include a Task Force on Sections and Groups and a Task Force on Translational Medicine. The Task Force on Sections and Groups proposed and Council endorsed the concept of having the funds for the Distinguished Lecturer activities and the Featured Topics deposited into discretionary accounts

for each section, which can be carried over from year to year. This will allow the sections flexibility in dealing with events associated with the Distinguished Lecturer or the Featured Topics. A new award, the David S. Bruce Undergraduate Research Poster Award, was approved by Council in memory of David Bruce, former Chair of the Teaching of Physiology Section. Up to four awards will be made to undergraduate students presenting research posters at the Experimental Biology meeting, starting most likely in 2003.

New task forces initiated at the summer Council meeting include a Task Force on Awards, a Task Force on Foundations/Fund Raising, and a Task Force on Trainees. Council will be working to identify appropriate Chairs and members for these task forces this fall.

The Publications Committee continues to capitalize on the latest in technology to better disseminate the research published in the Society's journals. Immediate publication of accepted

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**APS Council: back row (l to r): Dale Benos, Judith Neubauer, Steven Hebert, Jo Rae Wright, Robert Carroll, Douglas Eaton, and Mordecai Blaustein. Front row (l to r): Celia Sladek, Hannah Carey, Gerald DiBona, Barbara Horwitz, John Hall, Kim Barrett, and J.R. Haywood**

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research articles began in August with the initiation of Articles in Press. Authors will be asked to allow their accepted articles to be placed online immediately, allowing for primacy of publication. Articles will be citable as online publications and that citation information will be included in the final published version. Council also approved a new service called S-Proofs that will allow authors to receive their page proofs electronically as an Adobe PDF file. This will help to decrease the time from acceptance to final publication. An option will exist to allow authors to receive hard copy page proofs with color figures, but there will be a charge for that service. The Society's last 10 years of legacy data are scheduled to be scanned and placed online this year, with another 10 years each succeeding year. The cost to do this has risen substantially, but Council remained adamant about the importance of making the journals and the research contained within them available to the world. Council also approved a business plan that will be used to manage an online text book entitled *Cell Physiology: Molecular Dynamics* that was donated to APS by its author,

Henry Tedeschi. This model will be used for future online books. A new committee, the Book Advisory Committee (made up of the former Handbook Committee, Technical Book Committee and History Book Committee), has been instituted to deal with online books and especially to develop an online *Handbook of Physiology*.

The Career Opportunities in Physiology, Education, Liaison with Industry, and Women in Physiology Committees are also planning to make good use of web technology in the coming year. The Career Opportunities in Physiology Committee is working to update the careers portion of the APS web site and the careers brochure. Plans include having information available on graduate programs in physiology, potential career paths available to physiologists, and awards and fellowships for students. The Education Committee will be focusing this fall on the development of the APS Archive of Teaching Resources as part of the BioSciEd Net, a project sponsored by NSF as part of the National Digital Library. BioSciEd Net is a multi-society project that involves AAAS, American Society for Microbiology, Signal Transduction

Knowledge Environment (STKE), National Association of Biology Teachers, and Ecological Society of America, as well as APS. In addition, the Education Committee is working to develop plans for a series of web-based, self-directed mini-tutorials for graduate and postdoctoral students. Ideas for tutorials include seminar preparation and delivery, poster development and presentation skills, mentoring and being mentored, and writing and reviewing skills. The latter two tutorials will be developed with the aid of the Women in Physiology Committee, which held and will hold Mentoring Workshops at the Experimental Biology meeting on these topics. The Liaison with Industry Committee will be assisting in developing the appropriate material regarding careers in industry for each of these projects.

The Animal Care and Experimentation and Public Affairs Committees have also been working to revise their portions of the APS web site. The new site will provide a "Legislative Action Center" with timely information on issues related to research funding and animal research, as well as general information on contacting members of Congress. A commercial software package will be installed to enable APS members to generate a personalized letter to a member of Congress using a message prepared by the appropriate Committee or public affairs staff. This should enable members to more easily let their representatives on Capital Hill know their positions on issues of importance.

Additional details of the Council's actions during the July meeting will be communicated to the membership at the next APS Business Meeting and can be found in the committee reports included in this issue of *The Physiologist*. ❖



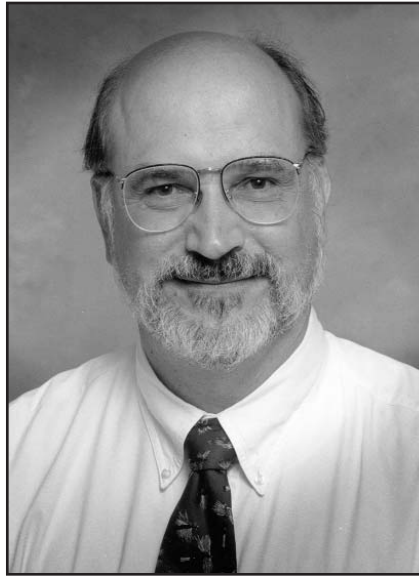
**Committee Chairs:** back row (l to r): Thomas Peterson, Glenn Reinhart, William Talman, Mordecai Blaustein, and Thomas Herzig. Front row (l to r): Dale Benos, Celia Sladek, Judith Neubauer, John Stallone, Susan Barman, Hector Rasgado-Flores, and Robert Carroll.

## Section News

### Introducing William M. Chilian

**William M. Chilian** was elected Chair of the Cardiovascular Section and assumed duties in April 2001, succeeding **Kathleen Berecek**. Chilian has previously served the Cardiovascular Section as Secretary Treasurer, as a member and Chair of the Nominating Committee, as Chair of the NHLBI Liaison Committee and on the Steering Committee. Chilian has also served on the APS Education Committee and on a working group to evaluate APS sections and groups. Chilian is presently an Associate Editor of the *AJP: Heart and Circulatory Physiology*, and had previously served as an Associate Editor from 1993 through 1995. Chilian is also active in the American Heart Association where he is on the Executive Committee on the Council for Basic Cardiovascular Sciences, and a member of the Marcus Award Selection Committee.

Chilian is presently a Professor in the Department of Physiology and Associate Director of the Cardiovascular Center at the Medical College of Wisconsin. Previous to his appointment at the Medical College of Wisconsin in 1996 he was on the faculty at Texas A&M University from 1987 through 1995. Chilian received his PhD from the University of Missouri in 1980, and did postdoctoral work at the University of Iowa. Chilian's research focuses primarily on acute and chronic regulatory mechanisms involved in the control of the coronary circulation. The acute aspects of regulation focus on regulatory mechanisms involved in the control of coronary resistance and coronary vasomotion. This research blends a variety of physiological approaches with electrophysiology and mathematics. The study of chronic regulatory mechanisms focuses on molecular mechanisms underlying coronary collateral growth. These efforts have allowed identification of key growth factors involved in the development of



**William M. Chilian**

coronary collaterals and the elucidation of anti-angiogenic factors as hindrances to collateralization in models of endothelial dysfunction. The goal of these efforts is the development of genetic therapies designed to mimic the natural program for coronary collateral growth.

As the newly elected Chair of the Cardiovascular Section, Chilian has several goals for the next three years. The first goal is to invigorate existing sub-sections of the Cardiovascular Section, and evaluate the need to create new ones. Since 1981 there have been two sub-sections of the Cardiovascular Section: Splanchnic Circulation Group and Cardiac Mechanics Group. However, cardiovascular science has changed significantly during the last two decades, integrating molecular biology, genetics, imaging, biophysics and mathematical modeling (to name a few) with physiology. Thus, the Section will consider formation of new sub-sections to reflect these new directions in cardiovascular sciences.

A second goal of the chair is to improve the quality of programming for the Experimental Biology meeting.

During the last several years, much cardiac and vascular physiology and pathophysiology has drifted away to other groups and meetings, e.g., International Society for Heart Research, North American Vascular Biology Organization, and this trend must be reversed. New venues and initiatives must be entertained to strengthen the content of the Experimental Biology Meeting. To do this effectively, we must work with other APS Sections for jointly programmed symposia, and embrace contributions from societies outside of FASEB as guests to the Experimental Biology meeting.

Chilian believes it is important to increase the voice of the Cardiovascular Section within APS. The third goal is to increase the participation of the Cardiovascular Section on APS committees. The Cardiovascular Section is the largest section, but currently there are no officers (president, councillor) in the APS who are primarily affiliated with our section. Thus, the voice of the largest section of APS has not been evident in the recent past. To reverse these trends, the chair asks all members and fellows to volunteer time, efforts, and to vote and nominate members of our section to APS offices and committees.

A fourth, and perhaps the most critical, goal is to increase the involvement of young scientists in the section. The Cardiovascular Section will look to all of its members to help recruit young scientists, and for suggestions as to how to increase the involvement of young scientists. We are planning on asking for the involvement of graduate students and postdoctoral fellows on some sectional committees, and will have reduced ticket prices for fellows and students at the annual banquet. We have recently initiated a Featured Topic session that is to be organized by the previous winner of the Section's Young Investigator Award. The 2001 winner,

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## Section News

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**Jefferson Frisbee** of the Medical College of Wisconsin, is programming a featured topic entitled, "Parallel Mechanisms Regulating Vascular Tone"

for the 2002 Experimental Biology Meeting.

Chilian and the Steering Committee of the Cardiovascular Section are committed to these initiatives. The collec-

tive goal is to invigorate the section, and establish a template for the active involvement of scientists engaged in cardiovascular research. ❖

### Introducing Charles H. Lang

Effective April 2001, **Charles H. Lang** succeeds **David H. Wasserman** as Chair of the Endocrinology and Metabolism Section of the APS. As a member of the APS since 1983, Lang has served the past three years as the Section's representative on the Joint Programming Committee. He also currently serves on the Membership Committee and is chair of the Book Advisory Committee. He also served on the editorial board of the *American Journal of Physiology: Endocrinology and Metabolism* from 1994 through 2000. Lang has also been involved in the Shock Society serving as a Basic Science Councilor, Chair of the Membership Committee, and member of the editorial board for the society's journal *Shock*. Lang has served on the Surgery, Anesthesiology and Trauma Study Section at NIH, and been a member of the NIGMS Special Emphasis Panel (SEP) for Large-Scale Collaborative Projects as well as the SEP for Research Training in Trauma and Burn, Systems and Integrative Biology, and Pharmacological Sciences.

Lang was appointed as professor and vice-chairman of Cellular and Molecular Physiology, and professor of Surgery at the Pennsylvania State College of Medicine in Hershey in 1997. He completed his undergraduate degree in Biology from Westminster College (PA) and received his Master's and PhD degree from Hahnemann Medical College in Philadelphia in 1979 and 1981, respectively. His dissertation research investigated the effects of bacterial endotoxin on carbohydrate and lipid metabolism in the canine small



**Charles H. Lang**

intestine. After his graduate studies Lang was a NIGMS-funded postdoctoral fellow in the Department of Physiology at the Louisiana State University Medical Center in New Orleans under the guidance of John J. Spitzer, MD. During this time he developed one of the early animal models of chronic bacterial infection. Using this model he focused on elucidating the mechanisms mediating sepsis-induced alterations in hepatic and muscle glucose flux and insulin resistance. Lang was promoted to Assistant Professor of Physiology at LSUMC in 1985, and in 1989 was promoted to Associate Professor with tenure at the same institution. In 1992 he moved to the Department of Surgery at the State University of New York (SUNY) at Stony Brook where he assumed the position of professor and director of Surgical

Research. While at Stony Brook the direction of his research shifted and began to focus on the regulatory role of insulin-like growth factor (IGF)-I and the various IGF-binding proteins, and the interaction between this system and various proinflammatory cytokines in mediating the sepsis-induced changes in muscle protein metabolism. Also, at this time he collaborated on several clinical investigations whose goal was to unravel how various endocrine disturbances influenced the IGF system. This general area of research continues to be the focus of the Lang laboratory at the Penn State College of Medicine and has been expanded in recent years to also include investigation of the IGF system and translational control of muscle protein synthesis in response to chronic alcohol abuse.

This is an exciting time for those involved in programming and section leadership. Over the past several years the Joint Programming Committee (JPC) has overseen the transition from a "top-down" to a "bottom-up" mode of programming. The various sections now have complete control over program content, but also increased responsibility and accountability. This new programming philosophy must be viewed as the beginning and not the end. It is now the responsibility of the JPC and individual sections to meet this challenge by providing the ideas for the continued growth of EB. As such, it is the responsibility of each section to be proactive in matters related to EB programming and APS conferences. Our programming effort and hence the EB meeting itself is only as strong as the



## Section News

level of commitment and enthusiasm of the sections' members. Your input and participation are important and valued in the Endocrinology and Metabolism Section. In keeping with the emphasis of the APS on young investigators and translational research, we are looking to expand the membership of our Steering Committee to include a more junior level investigator and a scientist involved primarily in human investigations. It cannot be over emphasized that our Section will only continue to grow and prosper if we maintain our membership's commitment to the Section. The Steering Committee's goal is to provide all of our members an opportunity to participate. In order for the Section to be responsive to the needs of its members, we need your participa-

tion. If you would like to be considered for APS committee assignments or the section Steering Committee, or have ideas for future symposia at EB please contact any of the Steering Committee members at [http://www.the-aps.org/sect\\_groups/endo/steering.htm](http://www.the-aps.org/sect_groups/endo/steering.htm).

The Endocrinology and Metabolism Section is fortunate to have outstanding individuals on the Steering Committee. David H. Wasserman, past-chair, has provided the Section with superior leadership during the past three years during which time the sections have been given more control over programming the EB meeting; Virendra B. Mahesh, new representative to the Joint Programming Committee, has been instrumental in developing innovative symposia and featured topics of interest to our section;

Owen P. McGuinness, Secretary/Treasurer, has done an extraordinary job of keeping our section members informed of APS happenings through the section newsletter and has helped develop our first web site; Jacob (Jeb) E. Friedman, Councilor, who chairs the committee responsible for selecting the Berson Awardee and the various student awards; and Johnny R. Porter, our representative to Committee-on-Committees, who has worked tirelessly to place section members on the various APS committees. Finally, we would like to welcome our newest Steering Committee member Amy E. Halseth, Liaison with Industry, who will help us bridge the gap between academia and industry.



## Chapter News

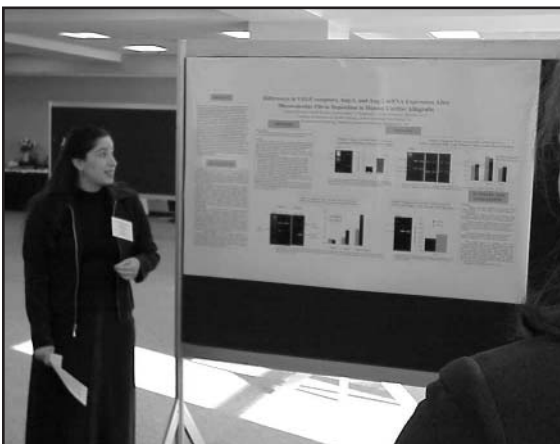
### Iowa Physiological Society Annual Report

The sixth annual meeting of the Iowa Physiological Society (IPS) was held on Friday and Saturday, April 20-21, 2001 at the Hotel Fort Des Moines in Des Moines, IA, in conjunction with a meeting of the Iowa Academy of Science (IAS). The concurrent meeting format allows students, teachers, and

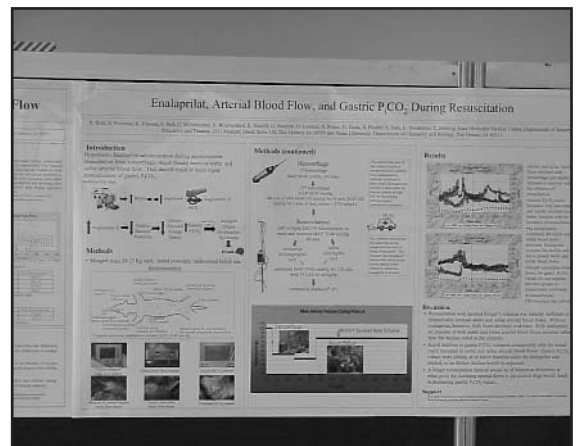
researchers at various educational levels (high school through university) and with varying interests to interact.

**Irving Zucker**, Chairman of the Department of Physiology and Biophysics at the University of Nebraska Medical Center, gave the keynote address, "Reflex control of

sympathetic nervous system in heart failure." A generous Lectureship Award from the American Physiological Society supported this presentation. A brief talk was also given by **Martin Frank**, Executive Director of the American Physiological Society, concerning the Society. Oral presentations



A poster presentation at the Iowa Physiological Society meeting.



A poster presentation at the Iowa Physiological Society meeting.

## Chapter News

concerning the 1918-1919 influenza pandemic, current trends in tuberculosis, and mechanosensitive channels in sensory neurons were given.

Eleven posters made up the remainder of the presentations. On Friday, April 20, posters were placed on display and the abstracts were distributed. That allowed time for question development for the formal poster discussions that

occurred on Saturday April 21.

Separate business meetings of the IPS and the Physiology Section of IAS were held on Saturday, April 21. The new president of the Iowa Physiological Society is **Ron Torry**, associate professor of Pharmacology, Drake University, Des Moines, IA; Email: ron.torry@drake.edu. Our treasurer is Mark Chapleau, Internal Medicine, Universi-

ty of Iowa, Iowa City, IA; Email: mark-chapleau@uiowa.edu). Our president-elect is Thomas J. Schmidt, professor, Physiology and Biophysics, University of Iowa, Iowa City, IA ; Email: thomas-schmidt@uiowa.edu.

*Piper Wall*  
*Past President*

*Iowa Physiological Society*

## Education

### Summer Research Teachers Attend Professional Development Workshop

Sixteen 2001 APS Summer Research Teachers (SRTs) participating in the *Frontiers in Physiology* and *Explorations in Biomedicine* programs gathered at the Airlie Center in Warrenton, VA, July 23-29 to attend a week-long professional development workshop for the exploration of inquiry-based teaching strategies, use of animals in teaching, teaching students from diverse backgrounds, instruction in developing hands-on, inquiry-based science activities, and integration of technology into science education. SRTs participated in numerous hands-on laboratory and web-based activities,

shared summer research experiences, evaluated their current teaching techniques, and collaboratively developed strategies to implement teaching methods and use of technology promoted by the National Science Education Standards (NSES).

*Frontiers in Physiology* and *Explorations in Biomedicine* are American Physiological Society (APS) programs designed to build connections between science instructors and the biomedical research community through summer research experiences. Both programs promote the adoption of the NSES standards for K-12 in content and

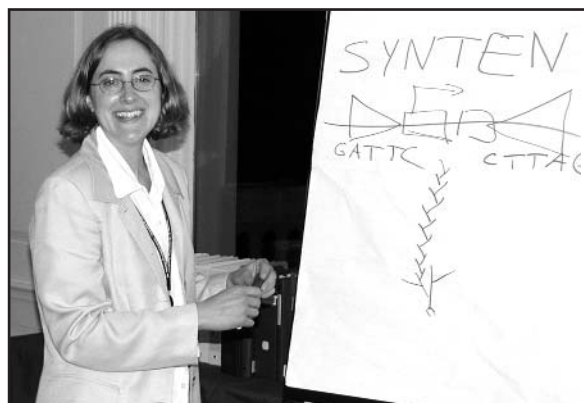
teaching pedagogies among science teachers.

*Frontiers in Physiology* is a program of APS, and is sponsored by APS, the National Center for Research Resources (NCRR) Science Education Partnership Awards (SEPA), and the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) at the National Institutes of Health. *Frontiers* SRTs teach at middle and high schools across the US.

*Explorations in Biomedicine* is sponsored by APS and the National Institute of General Medical Sciences (NIGMS)/Minority Access to Research



CD-SRT Team: Cathy Box, Tahoka High School, Tahoka, TX, and Nancy Kellogg, Brawley Union High School, Brawley, CA.



Susan Glueck, Brigham & Women's Hospital, and deputy editor of *Physiological Genomics*, presents information on current genomics research findings to the 2001 Summer Research Teachers.

## Education

Careers (MARC) Program. *Explorations* SRTs teach primarily Native American students at middle and high schools, and tribal colleges on Montana reservations.

Each year, SRTs spend a major portion of their summer conducting research in APS-member host laboratories to experience “science-in-action” and learn how the research process works. The APS has partnered with many of the nation’s leading biomedical academic, private, and government research facilities in providing local research opportunities for over 250 *Frontiers* and *Explorations* teachers during the last 11 years.

SRTs will also attend the Experimental Biology (EB) 2002 Meeting in New Orleans, LA, to further their science experiences and learn about the latest life-science research findings. Many SRTs will present their research findings and/or activities at EB poster sessions.

### Curriculum Development Summer Research Teachers Present Web-Based, Interactive Science Activities

In 2001, the *Frontiers* and *Explorations* programs expanded to include Curriculum Development

Summer Research Teacher (CD-SRT) fellowships. These fellowships are designated for selected past SRTs, and offer teachers the opportunity to further develop their mentoring, educational technology, and curriculum development skills. This year, three teams of CD-SRTs are developing web-based science activities in collaboration with Project WISE, of the University of California-Berkeley. Project WISE (Web-based Inquiry Science Environment) is an online science learning environment for students in grades 4-12, supported by the National Science Foundation.

CD-SRTs, **Cathy Box**, of Tahoka High School, Tahoka, TX, and **Nancy Kellogg**, of Brawley Union High School, Brawley, CA presented their unit, *The Organic Food Controversy*, focusing on the bacterial contamination of organically vs. traditionally grown foods. The interactive online unit asks students to address their assumptions, participate in web-based activities and discussions, conduct hands-on lab



Physiologist-in-Residence, Andrew Lechner, St. Louis University School of Medicine leads a discussion on developing science activities with Summer Research Teachers: Tanja Horvat, Oregon Episcopal School, Portland, OR; and Melinda Hausenfluke, Barbara Bush Middle School, San Antonio, TX.

experiments, and research specified Internet resources. The online unit also integrates background information for teachers and online student assessment tools.

CD-SRT teams **John Nishan**, Manchester High School, Manchester, CT, and **Lesli Adler**, T.S. Wootton High School, Rockville, MD; and **Barbara Arrowtop**, Heart Butte School, Heart Butte, MT, and **Kathy Knudson**, Polson Middle School, Polson, MT, are also developing project WISE units. All



Nelene Harris, Fouke High School, Fouke, AR, and Varnessa Dorsey, Mansfield High School, Mansfield, TX explore factors which affect blood flow and pressure in Physiology of Fitness, an APS Physiology Learning Cycle Unit.



Summer Research Teachers explore *The Organic Food Controversy*, a web-based, interactive unit for middle and high school students developed collaboratively by APS CD-SRTs and Project WISE, of UC-Berkeley.

## Education

CD-SRTs serve as mentor/instructors for SRTs throughout the fellowship.

### APS Members Serve as Physiologists-in-Residence

**Susan Barman**, Michigan State University, **Rayna Gonzales**, University of New Mexico School of Medicine, and **Andrew Lechner**, St. Louis University School of Medicine served as Physiologists-in-Residence during the workshop, where they fielded numerous questions related to science content, use of animals in research, and classroom equity issues. Barman, Gonzales, and Lechner provided assistance to teachers as they began developing science labs and activities to use in their classrooms.

**Susan Glueck**, Brigham & Women's Hospital, and deputy editor of the APS journal, *Physiological Genomics*, presented a lively discussion on genomics. Glueck presented information on the Human Genome Project and current genomics research findings in government and private sectors. She also fielded numerous questions about the genomics field, and presented participants with a "hotlist" of related Internet resources.

Applications for the 2002 Summer Research Programs are available on the APS website at [http://www.the-aps.org/education/edu\\_k12.htm](http://www.the-aps.org/education/edu_k12.htm). For additional information about the summer research programs, email the APS Education Office at [educatio@the-aps.org](mailto:educatio@the-aps.org), or call 301-530-7132.

## Porter Physiology Development Program

### APS Porter Physiology Fellows 2001-2002

The APS and Porter Physiology Development Committee congratulate the 2001-2002 APS Porter Physiology Fellows:

Wendy Brisbon, Meharry Medical College  
Marcelo Febo-Vega, Univ. of Puerto Rico  
Jorge Gonzalez-Perez, Univ. of Puerto Rico  
Lisa Hernandez, Univ. of California, Davis  
Adrienne Hicks, Meharry Medical College  
Sonia Houston, Univ. of Missouri Medical School  
Carmen Padro, Univ. of Puerto Rico  
Annelyn Torres-Reveron, Ponce School of Medicine  
Maurice Williams, Univ. of N. Texas Health Sciences Center

The Porter Physiology Fellowships for minorities are 1-year fellowships that provide a stipend of \$18,000. The fellowships are open to underrepresented ethnic minority applicants (African Americans, Hispanics, Native Americans, Native Alaskans, or Pacific Islanders) who are citizens or permanent residents of the United States or its territories. Applicants must have been accepted into or currently be enrolled in a graduate program pursuing an advanced degree in the physiological sciences. For more information, see the APS website at [http://www.the-aps.org/education/minority\\_prog/porterfell.htm](http://www.the-aps.org/education/minority_prog/porterfell.htm) or contact the APS Education Office at [educatio@the-aps.org](mailto:educatio@the-aps.org) or 301-530-7132.

## Moving?

If you have moved or changed your phone, fax, or email address, please notify the APS Membership Office at 301-530-7171 or fax to 301-571-8313.

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

# Membership

## New Regular Members

### \*transferred from Student Membership

**Abdul Akham Al-khalidi**

Univ. of Birmingham

**Carlos Ernesto Amorena**

ININCA, Argentina

**James Melvin Anderson**

Yale Univ.

**Serena M. Bagnasco**

Emory Univ.

**Jabbar R. Bennett**

Meharry Medical College

**Daniel Robert Biemesderfer**

Yale Univ.

**Mark Burnley**

Univ. of Brighton, East Sussex, England

**Thierry Busso**

Groupe De Recherche, Paris, France

**Anne Victoria Cameron**

Christchurch School of Medicine,  
New Zealand

**Douglas J. Casa\***

Univ. of Connecticut

**Peter Andrew Cattini**

Univ. of Manitoba

**Anthony Grame Catto-Smith**

Royal Children's Hospital, Parkville,  
Australia

**John Philip Chang**

Univ. of Alberta

**Peng -Sheng Chen**

Cedars Sinai Medical Center

**Youngran Chung**

Univ. of California, Davis

**Teresa A. Davis**

Baylor College of Medicine

**Heather A. Drummond\***

Univ. of Mississippi Medical Center

**George Richard Dubyak**

Case Western Reserve Univ.

**John Grenville Edwards**

New York Medical College

**Jan Eggermont**

K U Leuven, Leuven, Belgium

**Tabatha Annette Elliott\***

Univ. of Texas Medical Branch

**Karlhans Endlich**

Univ. of Heidelberg

**Paul Joseph Fadel\***

Univ. of Texas Southwestern Med. Ctr.

**Harold A. Franch**

Emory Univ.

**Francis W. Flynn**

Univ. of Wyoming

**Claudia Gonzalez-Espinosa**

NIH/NIAMS

**Kristin L. Gosselink**

The Salk Institute

**Steven S. Gross**

Cornell Univ.

**Qihai Gu**

Univ. of Kentucky

**Brent Justin Fong Hill\***

Augustana College

**Joachim Hoche**

Freie Univ, Berlin, Germany

**David Paul Hostler\***

Univ. of Pittsburgh

**Kerry Lynn Hull**

Bishop's University, Lennoxville,  
Canada

**Lionel F. Jaffe**

Marine Biological Laboratory,  
Woods Hole, MA

**Bhanu Pratap Jena**

Wayne State Univ.

**Baoan Ji**

Univ. of Michigan

**James Daniel Johnson\***

Washington Univ.

**Richard J. Johnson**

Baylor College of Medicine

**Promsuk Jutabha**

Kyorin Univ., Tokyo, Japan

**Morvarid Kabir**

Univ. of Southern California

**Mitsuko H. Kanamaru**

Showa Univ.

**Marquerite L. Kearney**

Johns Hopkins Univ.

**Robert S. Kellar\***

Advanced Tissue Sciences Inc.

**Dmitry O. Kozhevnikov**

VA NY Harbor Health Care System

**Mary Pat Kunert**

Medical College of Wisconsin

**Jay Kuo**

Univ. of Mississippi

**Ira Kurtz**

Univ. of California, Los Angeles

**Yifan Li**

Univ. of Nebraska Medical Center

**Chin Jia Lin**

Univ. of Sao Paulo

**Muhammad A. Lodhi**

SurModics, Inc., Eden Prairie, MN

**Michael M. Mueckler**

Washington Univ.

**Randy J. Nelson**

Ohio State Univ.

**William C. Okulicz**

Univ. of Massachusetts Med. School

**Aushik Paethasarathi**

Columbia Univ.

**Ramprasad Ramakrishna**

Physiome Sciences, Princeton, NJ

**Marvin Ellsworth Reid\***

Univ. of the West Indies

**L. Michael Romero**

Tufts Univ.

**Harry Bartlett Rossiter\***

St. George Hospital Medical School,  
Tooting London, England

**Matthias Andreas Salathe**

Univ. of Miami

**C. Max Schmidt\***

Indiana Univ.

**Ronald L. Seaman**

McKesson HBOC Clinical/Biol Serv.,  
San Antonio, TX

**Hanna E. Sidorowicz**

Finch Univ. of Health Sciences

**Narong Simakajornboon**

Tulane Univ.

**Greta Sokoloff\***

Indiana Univ.

**Yeija Song**

Univ. of Florida

**Peter Salem Spector**

Univ. of Oklahoma Health Science  
Center

**Jagdeeshan Sunderram**

Univ. of Medicine and Dentistry, NJ

**Chun-kuei Su**

Academia Sinica, Taiwan

**Xingwu Teng**

Johns Hopkins Univ. School of Med.

## Membership

### **Niu Tian**

Univ. of Mississippi Medical Center

### **James G. Tidball**

Univ. of California, Los Angeles

### **Victoria Velarcle**

Pontificia Univ. Catolica De Chile

### **Michael Turner**

Univ. of North Carolina, Charlotte

### **Zunyi Wang**

Univ. of Wisconsin

### **Bruns Arnold Watts\***

Univ. of Texas Medical Branch

### **Bruce Weekley**

Merck Research Labs

### **Frank A. Witzmann**

Indiana Univ.

### **Alan S.L. Yu**

Brigham and Women's Hospital

### **Xiangyi Zhao**

Louisiana State Univ. Health  
Science Center

### **Zhen-hong Zhou**

Univ. of Alabama, Birmingham

## New Student Members

### **Bruce Adams**

Univ. of Victoria, Canada

### **Nasser Al-Daghri**

Birmingham Univ., England

### **Makini Alleyne**

Xavier Univ. of Louisiana

### **Jason Alan Bailey**

Indiana Univ.

### **Marie-Claude Battista**

Montreal Univ.-Res Ctr Hosp Ste-  
Justine

### **Mona Yashpal Bhabia**

Ajman Univ., Dubai, United Arab  
Emirates

### **Laura Melissa Brockway**

Univ. of Alabama, Birmingham

### **Jose Luis Garcia Cardenas**

Univ. Nacional De Trujillo, Peru

### **Kristina Csukly**

Univ. of Montreal

### **My N. Dang**

Dartmouth College

### **Polly Ann Dornette**

Univ. of Cincinnati

### **Amy Louise Dugan**

Univ. of Cincinnati

### **Bjarne Faurholm**

Univ. of Cape Town, South Africa

### **Michelle Tranace Foster**

Georgia State Univ.

### **Justin Edward Jagger**

Univ. of Western Ontario

### **Nichole M. Joseph-Jones**

New York City Technical School

### **Sonnet Sky Jonker**

Oregon Health & Science Univ.

### **Kala Marie Kaspar**

Univ. of Wisconsin, Madison

### **Candace Ann Litwin**

Medaille College, Checktawaga, NY

### **Brandon M. Meyers**

York Univ., Toronto, Ontario, Canada

### **Josephine C. Mubiru**

Univ. of Edinburgh

### **Craig S. Nunemaker**

Univ. of Virginia

### **Jason Robert Pfeiffer**

Dartmouth College

### **Davecia Nicole Ragoonath**

Barry Univ., Miami, FL

### **Chad A. Reed**

Indiana Univ.

### **David William Rodenbaugh**

Wayne State Univ.

### **Marcie Alayne Roche**

Dartmouth Medical School

### **Kristen Ann Roseberry**

Purdue Univ.

### **Peter Mark Sadow**

Univ. of Chicago

### **Juan Carlos Ramirez Saldzar**

Univ. Nacional De Trujillo, Peru

### **Mona Hassan Sedeek**

Univ. of Mississippi Medical Center

### **May Simaan**

Univ. of Montreal

### **Usha Sivaprasad**

Rutgers Univ.

### **Lane McNeil Smith**

Virginia Commonwealth Univ.

### **Nancy M. Steimel**

Univ. of South Florida

### **Jun Sun**

Univ. of Illinois, Urbana-Champaign

### **Nathan Cole Sundgren**

Oregon Health & Science Univ.

### **Rodney Allen Velliquette**

Case Western Reserve Univ.

### **Ceceile Ann Wight**

Florida A&M Univ.

### **Rohan B. H. Williams**

St. George Hospital, Kogarah, Australia

### **Zakia Renay Williams**

Florida A&M Univ.

### **David Walter Wray**

Univ. of North Texas Health Sci Ctr

### **Jing Zhao**

Boston Univ.

### **Wei Zhou**

Univ. of Missouri, Columbia

## New Affiliate Members

### **Michael David Cuomo**

Warner Southern College

### **Zeenat Safdar Hasan**

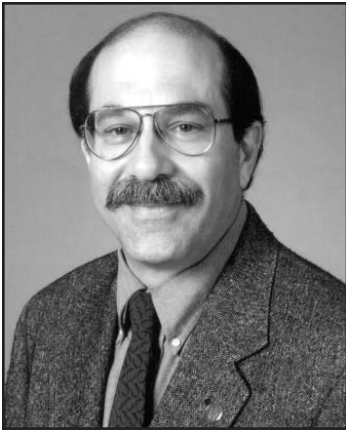
St. Luke's Roosevelt Hospital

### **Susan Kay Steck**

Minnesota State Univ.

## Committee Reports

### Animal Care and Experimentation Committee



The Animal Care and Experimentation Committee (ACEC) is charged with overseeing all matters and policies related to the procurement, use, and care of animals for research and teaching and advising the Council of actions to be taken or recommended. The ACEC has been particularly busy during the past year, not only dealing with ongoing concerns related to

the use of animals in research and teaching, but also developing new programs that will contribute to the APS Strategic Plan. An important goal of the Strategic Plan is the development of a dynamic advocacy program to educate and inform the public, government, and other key audiences about the importance of physiology and the critical role of animal research.

The most important ongoing issues being addressed by the Committee are whether the USDA will undertake regulation of rats, mice and birds and whether it will add new regulations concerning pain and distress in research animals. The pain and distress proposal was initiated by the USDA in response to a request made by the Humane Society of the United States (HSUS). Because of the potentially far-reaching impact of duplicate USDA regulatory oversight of rats, mice and birds on regulatory burden, the APS organized a series of Capitol Hill meetings between key members of the Senate Agriculture Appropriations Subcommittee (Senators Kohl (D-WI), Harkin (D-IA) and Cochran (R-MS)) and APS members who are constituents of these senators (**Hannah Carey** and **Joseph Kemnitz-WI**; **John Hall-MI**; and **Bill Talman-IA**). Some of our group also met with key members of the USDA staff involved with the regulation of research animals. The objective of our "Advocacy Day" meetings was to thank these senators for their support of the current one-year moratorium (which blocked funding for USDA inclusion of rats, mice, and birds as covered species), and to discuss animal research oversight and request the senators' support for animal research in the coming year. At the time of writing, we are unsure of the regulatory status of rats, mice, and birds and we continue to work with key members of congress to prevent the addition of burdensome and redundant regulatory requirements.

The ACEC has also worked during the past year to develop several new programs that will contribute to the APS Strategic Plan, particularly the development of a dynamic advocacy program on the importance of physiology and the

critical role of animal research. First, ACEC is organizing a Public Affairs Symposium at EB 2002 that will provide training for scientists who serve on IACUCs. The goal of this course is to provide APS members and other scientists with training to improve their performance on IACUCs. Given the recent criticism of IACUC function, particularly the apparent lack of uniformity among IACUCs in protocol evaluation, this course will address such criticism and may help APS members to avoid additional regulation of animal research by governmental agencies.

Another important ACEC project, in conjunction with the APS Public Affairs Committee, is the redesign of The Public Affairs pages of the APS website to provide a "Legislative Action Center" with timely information on issues related to research funding and animal research. The goal of this project is to enhance the ability of APS members to make their voices heard on Capitol Hill by providing timely information on the issues and by streamlining the process of letter-writing to Congress. With the new software available, APS members could go from a link on the APS website to the software website, enter a home zipcode, and generate a personalized letter to the appropriate Representatives and/or Senators with messages prepared by APS Public Affairs Staff. The importance of direct, frequent contact with Congress to support the cause of research became vividly apparent after our recent experiences on the Hill during Advocacy Day.

In the coming year, the ACEC will continue to work on ongoing concerns related to the use of animals in research and teaching. The committee strongly urges APS members to become involved individually by expressing their support for the use of animals in research and teaching, and their opposition to excessive regulatory burden to their state and national government leaders. ♦

*John N. Stallone, Chair*

- Council accepted the report of the Animal Care and Experimentation Committee.
- Council approved support for the Public Affairs Symposium at the Experimental Biology 2002 Meeting that will provide IACUC training to APS members.
- Council approved support for the Public Affairs Legislative Action Center on the APS website, to facilitate letter writing to Congress by APS members.
- Council approved a revised plan for the distribution of the APS brochure, *Questions People Ask About Animals in Research*, which would enhance its distribution for educational outreach purposes.
- Council approved the continued support of the American College of Laboratory Animal Medicine Foundation by making a donation of \$1,000, to underscore the Society's interest in quality care of research animals.

# Committee Reports

## Awards Committee



Investigator Award and the Lazaro J. Mandel Young Investigator Award.

### 2001 Awardees

This was a very good year for the APS Awards Programs in that the total number of applications for the different awards was 60% higher than the year before. The increased level of announcements in *The Physiologist*, the APS News Update on the APS Home Page, and the all-APS email messages about the awards programs appeared to have a definite impact on the number of applications being submitted.

There were 37 applications for the three Postdoctoral Fellowship Awards in Physiological Genomics, a 37% increase from last year, continuing the trend of this award becoming better known and very attractive and competitive. The Committee recommended that the awardees be **Jennifer C. Sullivan**, Medical College of Georgia; **Ryan M. Fryer**, Medical College of Wisconsin; and **Sheereeni Veerasingham**, University of Florida.

The following ten individuals were recommended for funding of Research Career Enhancement Awards: **Gordon Reid**, University of Bucharest; **Douglas L. Bovell**, Glasgow Caledonian University; **Chris Doumen**, Xavier University, New Orleans; **Itzick Vatnick**, Widener University; **Javier E. Stern**, Wright State University; **Jeffrey T. Potts**, Wayne State University; **James P. Porter**, Brigham Young University; **J. Timothy Lightfoot**, University of North Carolina-Charlotte; and **Robert C. Basner**, Columbia University College of Physicians and Surgeons.

The Committee recommended that the following four individuals be awarded Teaching Career Enhancement Awards: **Sherell K. Byrd**, Fort Lewis College (Colorado); **John D. Griffin**, College of William and Mary; **Sven Kurbel**, Osijek Medical Faculty (Croatia); and **Daniel E. Lemmons**, City College of New York.

The APS has three special Young Investigator Awards: the Arthur C. Guyton Award for Excellence in Integrative Physiology, the Shih-Chun Wang Award and the Lazaro J. Mandel Young Investigator Award.

This year the Awards Committee reviewed applications for six different awards: the APS Postdoctoral Fellowship Award in Physiological Genomics, the Research Career Enhancement Award, the Teaching Career Enhancement Award, the Arthur C. Guyton Award for Excellence in Integrative Physiology, the Shih-Chun Wang Young

The Guyton Award is presented to an investigator who has demonstrated outstanding promise in research that utilizes quantitative and integrative approaches and feedback control system theory for the study of physiological function. The recipient cannot hold an academic rank higher than assistant professor. This year's awardee was **Steven J. Swoap** from Williams College, Massachusetts.

The Wang Award is for an investigator with academic rank no higher than assistant professor who has demonstrated outstanding promise in research in any area of the physiological sciences. This year's awardee was **Hunter C. Champion**, Johns Hopkins University School of Medicine.

The Mandel Award is to be given to an individual demonstrating outstanding promise in the research area of epithelial or renal physiology and holds an academic rank no higher than assistant professor. This year's awardee was **Daniel C. Devor**, University of Pittsburgh.

### Postdoctoral Stipend Levels

The Awards Committee suggested that APS should monitor NIH's plans for increasing the level of postdoctoral stipends and begin to plan financially for increasing the APS postdoctoral stipends to the same level. This would ensure that stipends for the Society's postdoctoral program could be adjusted appropriately such that the programs remain attractive and competitive.

### Task Force on Awards

The Awards Committee recommended that a Task Force on Awards be established to assess the status of the current Awards Program and Awards Committee. This Task Force will determine whether awards are needed in new areas, whether the existing committee is functioning in an optimal manner, and how best to provide feedback to award applicants. ❖

*Thomas V. Peterson, Chair*

- Council accepted the report of the Awards Committee.
- Council agreed that the Awards Committee should monitor postdoctoral stipends and present Council a proposal to increase the Society's fellowship stipend as necessary.
- Council agreed that a Task Force on Awards was needed and took steps to establish such a Task Force.

## Career Opportunities in Physiology Committee Careers in Physiology Symposium

At the recent EB meeting in Orlando, the Career Opportunities in Physiology Committee sponsored a Careers Symposium entitled "Careers in Physiology: Opportunities in Industry." Four scientists from a variety of industrial sectors—large pharmaceutical companies, a product safety testing division, and a physiological monitoring device manufacturer—spoke to an audience of about 150 pre-doctoral students and postdoctoral fellows. They gave an overview of



## Committee Reports



their positions and responsibilities and also spoke about the personal factors that led them toward these positions. There was much discussion about the major advantages and disadvantages of being a scientist in these various industrial settings. The program was very well received. The format of this session was changed somewhat from that of previous years, primarily by being shifted from a lunch format requiring pre-registration to a late afternoon session. If anything, attendance was enhanced by this change.

### **Undergraduate Summer Research Fellowship Program**

The APS Undergraduate Summer Research Fellowship program is entering its second year. Last year's awardees attended the Orlando EB meeting, with several presenting posters on their research from last summer. This year, another large number of excellent applications were received, and a new class of 12 awardees found research opportunities for this summer. Many of the fellows are leaning towards a career in research, and it is hoped that the research experience afforded them by this program will stimulate their interest and commitment to this path.

### **Careers in Physiology Brochure/ PowerPoint Presentations**

This year, the Committee is focusing on completing development of a new APS Careers Brochure to replace the current version, which is several years old. Also, we are trying to develop one or more PowerPoint presentation files that would incorporate a variety of illustrations and informational slides about career opportunities in physiology and the importance of animal research. The concept is that these files would contain slides appropriate for different age groups, so that individual APS members could select the items relevant for the specific topic and audience they were addressing. These will be made available to APS members via the APS Web site.

### **Careers Web Site**

The Career Opportunities in Physiology Committee is also planning to develop the APS Careers Web site as a resource for students (from middle school right on through graduate school) and recent graduates from physiology programs who are seeking to learn more about educational programs and career opportunities in the physiological sciences. APS members are encouraged to keep an eye on this page as it develops and to recommend it to their students.

### **Fall Meeting and Additional Committee Member**

Because of the high priority and time-consuming nature of

the projects being undertaken by the Career Opportunities in Physiology Committee, the Committee requested an additional Committee member and an additional two-day fall Committee meeting in order to be able to accomplish them in a timely fashion. ❖

*Francis L. Belloni, Chair*

- Council accepted the report of the Career Opportunities in Physiology Committee.
- Council approved the Careers in Physiology symposium at EB 2002.
- Council approved the continuation of the Summer Undergraduate Research Fellowship Program for 2001 and agreed to fund another 12 fellowships in 2002.
- Council approved the additional Committee member and a separate two-day fall Committee meeting to allow the Committee time to develop the new brochure and revised web pages.

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

\*The vacancies projected for each committee for next year

## Committee Reports

are shown in parentheses above.

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

The committee also recommended individuals to fill vacancies on the Experimental Biology Board, FASEB Finance Committee, AAAS, and Council of Academic Societies of AAMC.

The APS members nominated to fill vacancies had the following sectional affiliation: Cardiovascular Section, 5; Cell and Molecular Physiology Section, 5; Central Nervous System Section, 1; Comparative Physiology Section, 1; Endocrinology and Metabolism Section, 3; Environmental and Exercise Physiology Section, 4; Gastrointestinal Section, 3; Neural Control & Autonomic Regulation Section, 6; Renal Section, 4; Respiration Section, 0; Teaching of Physiology Section, 3; and Water and Electrolyte Homeostasis Section, 8.

There were 12 members less than 45 years of age nominated for committee vacancies and 16 women nominated.

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 that are presented for approval by the APS Council at their summer meeting. Approved nominees begin their term of appointment in January.

In addition, the Committee on Committees developed a committee description for the new Communications Committee and nominated individuals to serve on that Committee. ❖

*Hannah V. Carey, Chair*

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

### Education Committee

The goal for the education component of the APS was to promote awareness, understanding, and education in physiology at all levels. The activities of the Education Committee



are coordinated and closely intertwined with the activities of the APS Education Office.

#### Student Education

The Education Committee is developing plans for a series of web-based, self-directed mini-tutorials for graduate and postdoctoral students. Topics for these professional development tutorials include seminar preparation and delivery (including using PowerPoint for scientific presentations and effective speaking techniques), poster development and presentation skills, and mentoring and being mentored (what to expect from a mentor and how to use a mentor effectively). The first tutorial is likely to be based on the successful materials developed for the 2001 EB joint APS/ASPET Women in Physiology Committees workshop on writing and reviewing for APS and ASPET journals.

#### Medical Physiology Education

The major current activity is the development of the APS Archive of Teaching Resources. The goal of this project is to develop and populate a web-accessible collection of materials to assist teaching. The database will be fully searchable and include multimedia clinical cases and examination items. Although the initial prototype Archive was developed some time ago, the APS was invited to develop its Archive as part of an NSF-sponsored National Digital Library project. The project—BioSciEd Net—is one of a small number of key digital library projects designed to provide links among science and engineering education resources. BioSciEd Net is a multi-society project, involving the AAAS, American Society for Microbiology, Signal Transduction Knowledge Environment (STKE), the National Association of Biology Teachers, and the Ecological Society of America. These organizations are laying the groundwork for additional life sciences organizations to join the project and link their Archives to the others. As a result of this collaboration, the APS Archives will be linked to each of the key national digital archives now under development, including the large archive being developed at the Institute of Electrical and Electronics Engineers (IEEE) site.

The downside of this collaboration is that the prototype APS Archive has been on hold while the many database and tagging decisions have been made by the digital library projects. However, progress has been made in the following areas. 1) Tags for coding the types of educational materials have been standardized and graphics for the site have been developed. 2) Review procedures for submitted materials were developed by **Barbara Goodman** and approved by the

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Education Committee. 3) Copyright issues have been researched, and the decision made that the copyright for the material will remain with the originator. This means that all materials can be removed from the archive at any time by the originator and that APS will only act as the disseminator of information. 4) Bulletin board software has been added to the APS site; this will be used in online discussion boards for each Archive item. 5) Based on recommendations from members and discussions on the Med-Ed listserv, a considerable number of online resources have been already gathered and are ready for review. 6) With support from the BioSciEd Net grant, APS hired a Higher Education Programs Coordinator in July.

At this point, three major issues remain to be resolved before the full Archive can be activated with a useful database of resources. First, the ability to provide academic credit for material submitted to the archive remains unresolved. The APS journal, *Advances in Physiology Education*, is static; that is, once material is printed it cannot be modified or updated. The Archive is designed to be a dynamic, colleague-to-colleague sharing forum, where material can be modified, with the outdated material deleted and replaced by new information. However, this format does not provide specific academic credit to submitters.

Second, there are still the database structures, database management pages and forms, and search engines that are being developed for the BioSciEd Net hub site. These items can be copied and adapted for other archives, such as the one APS is developing. However, realistically these will not be field-tested and ready for copying until November or December 2001. Waiting for this software would mean the APS Archive would not be up and active until January or February 2002, at best, and would still have to be populated with resources.

Hiring an external consultant to create the APS database, database management pages and forms, and search engine now can shorten this timeline. These tools would allow the regular Education Office staff to manage the Archive, including submissions, reviews, and postings.

The third issue is populating the Archive with educational resources. The Education Committee recommends that, especially for this first push to populate the Archives, it would be appropriate to make a particular effort to hold a training session for the reviewers. As of now, there are approximately, 60 pieces of material in the pipeline waiting to be reviewed before they can be placed in the Archives. This two-day workshop will bring a group of 15 reviewers together to develop and refine the review and submission processes for the archives and to demonstrate the potential of the resource. The only things the reviewers will be vetting are scientific accuracy and animal care issues. There will be discussion pages associated with each section where comments can be made

on the usefulness of the posted materials.

### Undergraduate Physiology Education

*Integrative Themes in Physiology (ITIP)*. **Dee Silverthorn**, University of Texas-Austin, is coordinating a NSF-funded program to enhance undergraduate physiology teaching. The program develops and field-tests modules emphasizing common themes in physiology and how to effectively communicate them within an undergraduate course. The first module—*Gradients and Conductance*—was field-tested and is being finalized for publication both in print and on the APS web site. APS hosted the web site with draft field-test materials for the project. This is a collaborative program between the Human Anatomy and Physiology Society (HAPS), the APS Teaching of Physiology Section, the APS Education Committee, the APS Education Office, and the APS journal *Advances in Physiology Education*. The first component of the project was published in the June 2001 issue of *Advances*. ITIP materials will be highlighted in the Archives, as well.

*Strengthening Relations with HAPS*. In addition to the collaborative ITIP program listed above, the APS sponsors a keynote research update speaker at the annual HAPS meeting. This year's speaker was APS member, **Alfred Bove** from Temple University School of Medicine, who gave a featured presentation and a workshop on the physiology of diving at the HAPS annual meeting, June 2-7, 2001 in Maui, HI. The APS display booth at the HAPS meeting has also been effective in recruiting new APS members who have interests in both undergraduate teaching (HAPS emphasis) and in research (APS emphasis).

### Undergraduate Science Research

The Education Committee is working with the Sections on the proposed David Bruce Award for Undergraduate Research, to be presented at EB (see Section Advisory Committee Report, p. 332).

In addition, Committee member **Jeff Demarest** has been working to build working relationships between APS and the Council on Undergraduate Research (CUR). He has proposed a workshop for the June 2002 CUR National Conference in New London, CT, entitled "Promoting an inter-society partnership: CUR and the American Physiological Society." Presentations by the APS Education Officer and members of the Education Committee and Teaching Section of the APS on support for physiology teaching and student research available from the APS are planned. Those discussions will focus on how the APS can serve its members who are at primarily undergraduate institutions and CUR members involved in physiology teaching and research. Council support was requested for the three APS representatives to attend and present at the symposium.

### K-12 Science Education

*APS Summer Research Program for Teachers*. The Summer Research Program continues to work with teachers from

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across the nation, engaging them in biomedical research, building connections at the local level between teachers, students, and researchers, improving the teaching methods and curricular materials used by the teachers, and deepening the understanding of both teachers and students of how biomedical research is done and how animals are used in research.

The outstanding evaluations of this program, now in its 11th year, led to continuation funding being received in Fall 2000 from three NIH institutes: NCRR (three years), NIGMS (five years); and NIDDK (five years). In these new grants, APS will also be developing models to help teachers learn how to integrate web technology in their classrooms; therefore, many more innovative resources will be added to the APS web site. Member support for this program continues to be strong, with many members volunteering to host teachers in their laboratories and to provide the needed laboratory materials and supplies for their research.

The Education Committee, along with several past Summer Research Teachers, selected 14 teachers to participate in this year's program. Most of the teachers' research hosts provided some in-kind support for their stipend and/or travel. APS members and past Summer Research Teachers from the *Explorations in Biomedicine* program selected additional teachers; these teachers are supported by funds from the *Explorations in Biomedicine* program.

The Education Committee requested that Council continue to make its annual contribution for the continuation of the summer research fellowships for high school and middle school science teachers. This is the APS in-kind contribution for the NIH Science Education Partnership Awards grant, *Frontiers in Physiology* and *Explorations in Biomedicine*.

*EB Workshop for Teachers and Students.* This year's workshop was on physiological genomics, organized by **Barbara Goodman**, the former chair of the Education Committee. The workshop was very well-received by both teachers and students and received high marks on the evaluation forms. Education Committee member **Jeff Osborn** will organize the EB 2002 program.

*Local Outreach Team Workshops.* With the continued funding of the program, additional funds are now available for APS members who want to hold workshops for middle and high school teachers in their local communities. The APS currently has 27 Local Outreach Teams (researchers and teachers working together to hold workshops). At EB 2001, several existing teams attended a special workshop to become LOT Trainers. These experienced LOT members will travel to train new LOT teams as they are formed. In addition, due to the enthusiastic work over the past two years, LOT teams have developed six new workshop units on topics such as cell structure and function, physiology of exercise, renal physiology, gastrointestinal physiology, structure and function of the eye, and levers in the human body. These units are being field-tested and will be available on the APS web site.

*Explorations in Biomedicine.* The APS' long-time collaboration with the American Indian Research Opportunities consortium (Montana State University and the Tribal Colleges of Montana) will continue for five more years, thanks to a continuation grant from the NIGMS. *Explorations* will continue to provide opportunities for Montana teachers to participate in the Summer Research Program and for undergraduate students to attend the Experimental Biology meetings. It will also continue the successful fall retreats, bringing together Tribal College faculty and middle and high school teachers from reservations across Montana to learn about both best practices in teaching and the latest in physiology research, especially on issues of particular interest to Native Americans.

*My Health, My World.* The APS is continuing its successful collaboration with Baylor College of Medicine's elementary science and health education program. The APS staff continue to hold field-testing workshops for new materials being developed, most recently a highly successful Kindergarten-Grade 2 unit on "My Body and Me" and a 4th grade unit on brain structure and function. Currently, several of the experienced field-test teachers are running local workshops for day care providers and summer camp instructors; these groups have been especially interested in infusing science into their curricula.

*APS Awards at the International Science and Engineering Fair.* Outgoing Education Committee member, **Andy Lechner**, and new member, **George Ordway**, coordinated the review and award to the best physiology projects at the 2001 International Science and Engineering Fair in May 2001. **Barbara Horwitz** and **John Horowitz**, Univ. of California-Davis, and **Stephen Flaim**, Galileo Laboratories, Santa Clara, CA, also served as members of the judging team. The team made one first place award of \$1,000 and three honorable mention awards of \$500. Council was provided with names and titles of presentations.

### Continuing Education Opportunities

*EB Refresher Course.* The "Endocrinology Refresher Course" at EB 2001 was organized by **Rick Vari** and **Andy Lechner** and included both content-centered and pedagogy-centered presentations. The morning session was followed by an afternoon workshop on problem-based learning. Both sessions received very positive ratings. However, evaluation feedback from the morning session attendees suggested that, while they found the pedagogy-centered presentations useful, they were most interested in the content-presentations that modeled effective pedagogy, rather than discussing it directly. Based on this feedback, the Committee will return to a content-centered morning refresher course program for EB 2002 and hold an accompanying afternoon workshop with a pedagogy focus. **Cheryl Heesch** and **Rick Cunningham** have organized the EB 2002 refresher course around a neuroscience theme. For the future, integrative themes such as

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reproduction and pregnancy, exercise, and aging are under consideration.

While papers from the EB Refresher Courses are typically published in *Advances*, many of the outstanding resources developed for the courses are not accessible to either those who attended or those who did not attend EB. These include PowerPoint slides and additional handouts and images. The Education Committee is considering developing a CD-ROM that would include the original *Advances* papers, PowerPoint slides, and additional handouts, and also links to related research articles published in the APS journals.

*Physiology Insights.* With support from the National Science Foundation, the APS has sponsored a series of undergraduate faculty development workshops. These workshops are particularly targeted at faculty from two- and four-year colleges. Six workshops have been held, starting with EB 2000 in San Diego. This year's workshops included "Online Resources for Undergraduate Life Sciences: Finding Them, Using Them," September 2000 (co-sponsored by the APS and AAAS); "Teaching Physiology: Updating Pedagogy and Content," September 2000 (co-sponsored by APS and Rush Medical College); "Physiology Insights at Experimental Biology 2001," April 2001 (sponsored by APS). Each workshop was evaluated by the participants, and a follow-up study of the impact of the workshops on the participants' teaching is being completed. The NSF grant supporting this project ended in June. Current plans are to continue the "Physiology Insights" workshops at Experimental Biology and, using funding from the BioSciEd Net project, to hold additional workshops focused on utilizing online resources such as the APS Archives to enhance teaching and learning at the undergraduate level.

### Enhancing Prestige of Physiology

*Medical Physiology Learning Objectives.* The *Medical Physiology Learning Objectives* are complete and ready for publication/dissemination. Publicity for the *Objectives* will begin this fall, coupled with a call for submissions of related teaching materials for the APS Archive of Teaching Resources.

*Develop Links from Learning Objectives to Archives Materials.* As the Archive is populated with teaching resources, the Committee will provide links from each of the *Medical Physiology Learning Objectives* to related Archives resources and APS journal articles. Resources developed through the Refresher Courses can be linked, as well.

*Develop Resource Site for Medical Physiology Course Directors.* An online resource site for medical physiology course directors could be developed and placed in the "Members Only" section of the APS web site. Resources would include information on faculty evaluation, course evaluation, curriculum issues and instructional options. ♦

Robert G. Carroll, Chair

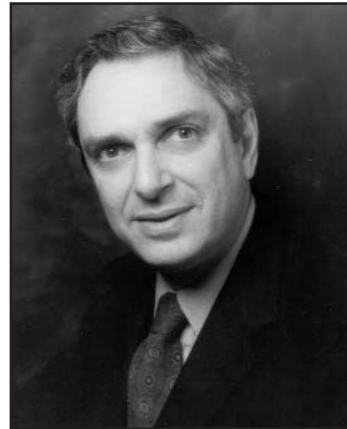
- Council accepted the report of the Education Committee.
- Council approved the hiring of an external web designer and database management person for the APS Archive of Teaching Resources.
- Council approved a two-day training retreat for the section coordinators of the APS Archive of Teaching Resources.
- Council allocated the requested funds for the continuation of the summer research fellowship program.
- Council approved funding for the individuals to attend and present at the Committee on Undergraduate Research conference.

### Finance Committee Report

During the Spring meeting of Council, the Finance Committee Chair reported that the Society continues to be financially strong through sound management and investment practices. As directed by Council, the Society uses up to 4% of the value of its investments annually as operating income. Only that amount required to offset the cost of Society programs, other than the Journal Program, is withdrawn, and the remainder continues in actively managed investment

accounts. The Journal Program, by a 1995 Council mandate, is expected to generate a return of 10% annually; this, too, is available as general operating income for the Society.

The Chair reviewed the 2000 budget versus actual income and expenses and presented the modified 2001 budget based on the 2000 results, as reviewed and approved by the Finance Committee at its



Spring meeting. 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; these include Publications, Membership Services, Education, Public Affairs, Marketing, and the Executive, Information Technology, and Business Offices. For 2000, the year ended with income of \$15,499,840 (including \$1,125,191 allocated from the Society's investment income to supplement operations in accordance with Society policy) and direct expenses of \$12,968,009, plus general and administrative (G&A) costs of \$1,465,757, for total expenses of \$14,433,766. G&A costs (the sum of executive, information technology, and business office expenses) are allocated to other Society offices based on each office's share of total salary expenses. Including the \$1,125,191 investment income allocation, total operating revenue exceeded total

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operating expenses, resulting in an increase in net assets of \$1,066,074. APS invests its liquid assets in short- and long-term investments according to policies set forth by the Council.

The Council approved a 2001 budget of \$15,962,020. To achieve a balanced budget, it is expected that the entire investment allocation of \$1,279,672 from the managed accounts will be needed, plus an additional \$553,595 from Publications net revenue of \$872,412. Including the investment allocation, total APS operating revenue (\$16,280,837) is expected to exceed total operating expenses resulting in a \$318,817 increase in net assets from operations.

Council reviewed the Publications and Finance Committees' recommendations for 2002 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. In 1995, the Council recommended that the journals' prices be set at a point that generates a return of approximately 10% to help defray the costs of the various Society programs. In response to concerns regarding online publishing and its effect on the Society's financial health, a Pricing Task Force was established to recommend a pricing model for the Society's journals.

The Task Force recommended that the Society's journal pricing model consider first the cost of preparing the journals' content (i.e., costs for editorial acquisition, peer review, copy-editing, composition, archiving). Then, the differing costs for delivery method (i.e., print or online) should be added to establish total journal cost. In addition, a sufficient margin should be applied so as to meet the 10% journals program return mentioned above. With these guidelines in mind, the Finance Committee recommended and the Council approved the restructuring of journal prices.

The Task Force also anticipates changes in subscriber habits in the next several years, and they recommended that an additional subscription option be offered. Through 2001, subscribers were given a choice of purchasing the print version of the journals, which included access to the online content at no additional charge (print + online version) or institutional subscribers could purchase the online only version at a rate below the institutional print + online price. For example, an *AJP-Consolidated* subscription, at the domestic institutional rate, costs \$2,570 and \$2,315 in 2001 for the print + online and online only versions, respectively. For 2002, a print only version has been added, and *AJP-Consolidated* prices for 2002 are \$2,725, \$2,855, and \$2,340, for the print only, print + online, and online only versions, respectively.

Nonmember individual subscription prices will continue to be two-thirds of the domestic institutional price. Beginning in 2002, APS members will have online access to all journals at no cost. The 2002 prices for the print only version for members have increased between 5% and 8.6% over the 2001 print + online version, with the exception of *Physiological Genomics*. Through 2001, *Physiological Genomics* (online only) was free to members. Beginning in 2002, the print only version of *Physiological Genomics* will be \$65 for domestic members.

The Finance Committee reviewed the performance of the Society's investment managers. The investments are administered by four managers, and under the direction of our investment consultant, Salomon Smith Barney. As of December 31, 2000, the accounts had the following market values: Operating Reserve I \$9,079,112, Operating Reserve II \$10,246,475, Publication Reserve \$10,477,047, Second Century Program Fund \$2,903,321, Giles F. Filley Memorial Fund \$1,121,404, Caroline tum Suden Fund \$757,920, IUPS

### APS Statement of Financial Position as of December 31, 2000

<b>ASSETS</b>		<b>LIABILITIES</b>	
Cash and cash equivalents	\$ 3,316,250	Accounts payable and accrued expenses	943,654
Investments (net)	40,637,949	Unearned revenue	
Accounts receivable	2,080,892	Subscriptions	6,920,766
Accrued interest receivable	368,394	Dues and other	<u>295,139</u>
Advances to section editors	250,128	Total liabilities	<u>\$ 8,159,559</u>
Prepaid expenses	42,882		
Furniture, fixtures, and equipment	<u>104,449</u>		
Total assets	<u>\$46,880,944</u>		
		<b>NET ASSETS</b>	
		Unrestricted	\$37,681,087
		Temporarily restricted	947,798
		Permanently restricted	<u>12,500</u>
		Total net assets	<u>38,641,385</u>
		<b>Total liabilities and net assets</b>	<b><u>\$46,800,944</u></b>

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### APS Statement of Activities for the year ended December 31, 2000

	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
<b>Operating Revenue:</b>				
Subscriptions—print	\$ 8,458,229	\$	\$	\$ 8,458,229
Subscriptions—online	281,087			281,087
Advertising and page charges	2,099,649			2,099,649
Reprints, single and back issues	1,183,416			1,183,416
Grants and contracts	684,488			684,488
Conferences and meetings	585,411			585,411
Membership dues	279,168			279,168
Contributions	260,952	168,846		429,798
Manuscript handling fees	315,956			315,956
Other income	151,904			151,904
Net assets released from restrictions	176,375	(176,375)		
Total operating revenue	<u>\$14,476,635</u>	<u>\$ (7,529)</u>	<u>                    </u>	<u>\$14,469,106</u>
<b>Operating Expenses:</b>				
Publications	11,414,746			11,414,746
Society general	1,532,471			1,532,471
Education	330,466			330,466
Marketing	180,484			180,484
Society programs	<u>946,041</u>			946,041
Total operating expenses	<u>14,404,208</u>	<u>                    </u>	<u>                    </u>	<u>14,404,248</u>
Operating change in net assets	72,427	(7,529)		64,898
Net realized gains on investments	2,381,211			2,381,211
Net unrealized gains/(losses) on investments	(3,773,118)			(3,773,118)
Interest and dividends	1,736,855			1,736,855
Less: Investment management fees	<u>(526,336)</u>	<u>                    </u>	<u>                    </u>	<u>(526,336)</u>
Change in net assets	(108,961)	(7,529)		(116,490)
Net assets, beginning of year	<u>37,790,048</u>	<u>955,327</u>	<u>12,500</u>	<u>38,757,875</u>
Net assets, end of year	<u>\$37,681,087</u>	<u>\$ 947,798</u>	<u>\$ 12,500</u>	<u>\$38,641,385</u>

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Fund \$534,485, Perkins Memorial Fund \$395,579, Shih-Chun Wang Fund \$179,547, Rife/Guyton Fund \$523,396, and the Lazaro Mandel Fund \$188,876. The return on the managed accounts was -0.19% for the year ended December 31, 2000. The return on equities for 2000 was -14.08%, and the return on fixed income investments was 12.70%. The market value of the managed accounts at December 31, 2000 was \$36,407,162.

Based on a recommendation from the Finance Committee that was approved by Council, the management of the several accounts has been changed. In the past, each of the accounts was managed by a single manager. As of this year, the various accounts are being managed by all four managers, with each account representing an appropriate proportion of the total managed account portfolio. Thus, all of the individual accounts benefit from the same group of management philosophies.

The Finance Committee received the annual audit performed by Grant Thornton, LLP. In the opinion of the auditors, based on generally accepted accounting principles, the financial statements shown below present fairly the financial position of the Society as of December 31, 2000.

At the Spring Council meeting, the Council approved a Finance Committee recommended dues increase from \$90 to \$100 per year with consideration of the fact that dues had not increased since 1996. In 1995, Council recommended that dues increases should parallel increases in the cost-of-living.

At that same meeting the Council also approved funding for a communications and media relations effort to promote the Society's journals, conferences, education and minority outreach activities, and various awards programs. Funding was also approved to add e-commerce capability to the Society's web site, upgrade the Society's financial software, and review the Society's insurance coverage. ❖

*Mordecai P. Blaustein, Chair*

- Council accepted the report of the Finance Committee.

### International Physiology Committee



During the past year the International Physiology Committee (IPC) had three main objectives: 1) to strengthen the "Latin American Initiative;" 2) to establish ties with the International Union of Physiological Sciences (IUPS); and 3) to define the role of the IPC in relation to the international APS-sponsored activities.

The objective of strengthening the "Latin American Initiative" was met by widely advertising this initiative, by reviewing the applications received and by recommending to the APS council, approval of the most meritorious applications. The sources used to advertise the Latin American Initiative were the web page of the APS and by sending the pertinent information to several of the largest Physiological and Biophysical Latin American Societies including the "Sociedad de Biofisicos Latinoamericanos," the "Academia de Ciencias de America Latina," and the "Asociacion Latinoamericana de Ciencias Fisiologicas." The Council of the APS approved and allocated funds for each of the following courses/symposia: 1) "Comparative Aspects of Oxidative Stress in Biological Systems:" this workshop is organized by **Tania Zenteno-Savin** and will be hosted at the Centro de Investigaciones Biologicas del Noreste, La Paz, Baja California Sur, Mexico during October 2001. 2) "Mechanisms of Ion Transport Across Cell Membranes:" a course organized by Reinaldo DiPolo, Gustavo Benaim and Luis Beaugé which will be hosted by the Instituto Venezolano de Investigaciones Cientificas at the Marine Biological Station in Mochima, Venezuela during November 2001. 3) "Molecular Modeling of Macromolecules:" this course is organized by Mario Amzel and will be hosted by the Universidad Nacional Autonoma de Mexico, and will take place in November 2001 in Mexico City. 4) "Stressor-induced Alterations in Sleep:" a symposium organized by **Mark Opp**, which will be hosted by the Universidade Federal de Sao Paulo, Brazil during October 2001.

The objective of establishing ties with the IUPS was initiated by having the IPC review applications for the non-US portion of the APS travel program for the IUPS meeting, which was held in New Zealand in August 2001. The ties between the IPC and the IUPS will be further strengthened by the fact that the Chair of the IPC has recently been named a member of the US National Committee for the IUPS.

Finally, the objective of defining the role of the IPC regarding the support of the APS for international activities has been initiated by drafting a proposal defining the criteria of evaluation of proposals requesting support of the APS for international activities. Council is evaluating this proposal.

In sum, the past year has been both exciting and challenging for the IPC. This Committee has found a new mission within the APS. The importance of this mission is reflected in the fact that the APS, recognizing the cohesiveness of international physiology, now grants full memberships to physiologists living and working outside the US. The members of the IPC look forward to the opportunity of fostering the communication between physiologists of the world to facilitate the scientific impulse and to promote the unity of science. ❖

*Hector Rasgado-Flores, Chair*



## Committee Reports

- Council accepted the report of the International Physiology Committee.
- Council approved the funding of three new Latin American Initiative proposals for 2002.
- Council endorsed the idea of having criteria for evaluating requests for financial support of international meetings but referred the issue to the Long-Range Planning Committee for consideration of final criteria.

### Joint Program Committee



#### Experimental Biology 2001

EB 2001 was held in Orlando, Florida, March 31 through April 4, 2001. All scientific and poster sessions were well attended and overall enthusiasm for the meeting continues to grow. The success of the meeting is generally thought to be due to a number of changes that were recently made to the structure and programming of the meeting. This includes:

1) the creation of Section Program Committees [SPCs; the Chair serving as a member of the Joint Program Committee (JPC)] to solicit and select symposia and featured topics in their section's area of interest; 2) increasing the number of symposia sessions by scheduling three two-hour time slots for oral sessions each day of the meeting; 3) the addition of featured topics to solicit abstracts for oral presentation around coordinated, timely topics; 4) scheduling a three hour unopposed poster session each day; and 5) providing carpeting and signage to the poster exhibit hall. EB 2001 also featured two unopposed Techniques and Technology in Physiology Tutorial/Work-shops on Saturday and four "Cross-Sectional" symposia.

There were seven sponsoring societies at this year's meeting: The American Physiological Society (APS), American Society for Biochemistry and Molecular Biology (ASBMB), 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 six guest societies: the Microcirculatory Society (MCS), the Biomedical Engineering Society (BMES), the American Federation for Medical Research (AFMR), the Society for Experimental Biology and Medicine (SEBM), the Association of Latin American Physiological Societies (ALACF), and the Spanish Physiological Society (SECF).

The meeting attendance was excellent. Out of a total of 7,378 volunteered abstracts submitted, 2,219 (30%) were programmed by APS. There were 11,028 registered scientists, 1,508 exhibitors, as well as 340 "other" registrants, for a total attendance of 12,876 persons. Although attendance at the meeting continues to improve, it 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 2001 was the second year that the meeting was not organized around scientific themes. Themes were eliminated with the understanding that some other process is developed to coordinate "inter-society" programming. The APS program committee has begun to assess ways to address the need for coordinating the program across societies. Some ideas include the development of "cross-society" symposia, plans for physical juxtaposition of posters on related topics (e.g., signal transduction), and cooperative programming with relevant small clinical societies either immediately before or after the EB meeting. Identification of topics that cross society interests would promote a more coordinated meeting. However, the APS program committee felt that two critical changes have to occur before integrated programming can be realized. First, the meeting structure would have to be standardized so that scientific and poster sessions should occur with common timing, and second, abstracts must be in a searchable database.

The development of EB 2001 continued to implement the recommendations of APS Council to allow for the sections to have more responsibility for developing the scientific program. These recommendations have empowered the membership to create meetings within the EB meeting and highlight the best and hottest science. Each section now has an SPC responsible for developing a designated number of Symposia and "Featured Topics." The chairs of the SPCs, together with the Program Committee, comprise a 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 give members of the society an opportunity to work within their sections to develop ideas for the program but some sections are still assessing ways of reaching out to the members to solicit ideas for meetings and conferences. Most sections are making use of their sectional listservs to reach out to their members and would encourage people to contact them if they have not been receiving email notices requesting ideas. EB 2001 also made use of the "Late-Breaking Abstract" submission in February to maximize inclusion of the late-breaking science at the EB meeting. Feedback on the ability to submit abstracts in

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February continues to be generally good.

EB 2001 marked the sixth Physiology InFocus program. Organized by **Gerald DiBona**, the program topic "Neurotransmitters in Cardiovascular Regulation" included four half-day symposia scheduled throughout the meeting. The symposia presented state-of-the-art research on angiotensin, glutamate, nitric oxide, and GABA. 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 2002, both scientifically and in pre-meeting publicity.

EB 2001 was the second year to introduce two new formats into the program: Techniques and Technology in Physiology Tutorial/Workshops and cross-sectional symposia. The intention of the tutorial/workshops is to present current cutting-edge technologies in two half-day sessions addressing "What can be done with the technology" and "How do you use the technology." EB 2001 featured two tutorials: "Experimental Gene Delivery and Therapy" and "Tissue Engineering: Opportunities and Challenges;" and a workshop on "Integrative Approaches for the Study of Physiological Function in Genetically Altered Mice." In addition, there were four "Cross-Sectional" Symposia developed to cut across sections: "Vagal Mechanisms of Visceral Sensation: Emerging Concepts," "Membrane Fusion," "Interplay Between Nitric Oxide and Hemoglobin: Current Concepts," and "The Early Impact of Diabetic Hyperglycemia on Renal and Cardiovascular Function."

Efforts to integrate the APS missions regarding the promotion of the EB meeting and the APS journals by soliciting journal sponsorship of selected oral sessions on the basis of scientific content appropriate for the journal were also pursued. At EB 2001 the *Journal of Applied Physiology* sponsored scientific sessions with the intention of highlighting the scientific topic as a focus of the journal and to encourage participants and attendees to consider the journal for publication of their work. This idea has met with enthusiasm from the program committee and will be explored in greater depth with the publications committee to foster means of strengthening both the meeting and the journals.

### Experimental Biology 2002

EB 2002 will also be sponsored by seven societies: APS, ASBMB, ASPET, ASIP, ASNS, AAI, and AAA. In addition, APS will continue to host six guest societies: MCS, BMES, AFMR, SEBM, ALACF, and SECF.

The Joint Program Committee (JPC) met in December to schedule abstracts for the EB 2001 meeting and develop preliminary plans for symposia and featured topics for EB 2002. These preliminary plans were distributed to the Section Program Committees responsible for soliciting proposals. The JPC met on March 31 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. On May 31, the JPC met again to finalize the recommendations of the SPC's for symposia and featured topics and schedule the sessions by date and time.

The APS continues to be aware 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. In addition, through the efforts of the Liaison with Industry Committee, the JPC understands the importance of including researchers from industry as speakers on symposia and featured topics. The SPCs will be advised to remind applicants of these matters in considering participants for future proposals.

The 2002 Physiology In Focus program will include four sessions and is entitled "Translating the Genome: Physiology and Pathophysiology of Obesity" organized by **John E. Hall**. Sessions will focus on: "Gene-Environment Interactions in Obesity," "Neurobiology of Obesity," "Endocrine/Metabolic Consequences of Obesity," and "Obesity and Cardiovascular Regulation." The Physiology InFocus topic is especially fitting in light of the EB Board's recommendation that EB 2002 be publicized as: "EB 2002-Translating the Genome." Two tutorial/workshops are being planned: "Understanding Organ Function Through Real-Time Fluorescence Microscopy" and "Bioinformatics for the Physiologist." Four Cross-Societal/Sectional Symposia are also planned: "The Sensory Functions of the DEG/ENaC Superfamily of Ion Channels," "Cell-Cell Crosstalk in the Generation of Inflammation," "Translational Research in Preeclampsia and Pregnancy-Induced Hypertension," and "Vascular Consequences of Oxidant Stress." In addition there will be 12 Distinguished Lectureships, the Bowditch, Cannon, and Randall Lectureships. **Pontus B. Persson** will present the 2002 Bowditch Lecture on "Control of Renin, From Cell Lysates to the Conscious Dog." **Allen W. Cowley, Jr.** will present the 2002 Cannon Lecture. The Society will also hold the fourth annual Walter C. Randall Lecture in Biomedical Ethics. APS also has the distinguished honor of hosting the 2002 FASEB Excellence in Science Award Lecture given **Phyllis Wise** from the University of Kentucky who will speak on "Estrogens: Potent Protective Factors in the Adult and Aging Brain."

### APS Conferences

By and large, this program, which was initiated in 1991, has been very successful and is continuing to improve. The Society is striving for a goal in which the vast majority of scientists will consider APS Conferences a premier meeting to attend. APS Council would like to increase the number of APS Conferences from two to four per year. The additional two conferences are to be organized on Physiological Genomics and Physiology in Medicine: Translational

## Committee Reports

Research. The first of the APS conferences on Physiological Genomics has been organized for 2002 and plans have begun to organize an APS conference on Physiology in Medicine: Translational Research for Fall 2003. The APS Program Committee is actively soliciting ideas for future APS conferences in these two targeted areas as well as other timely topics.

Scheduled APS Conferences include:

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

2001 APS Conference. October 17-20, Pittsburgh, PA. "Genome and Hormones: An Integrative Approach to Gender Differences in Physiology," organized by **Virginia M. Miller**.

2002 APS Conference. February 20-23, "Physiological Genomics of Cardiovascular Disease: From Technology to Physiology," organized by **Curt Sigmund, Craig Gelband, Allen W. Cowley, Jr., Steven Gullans, Howard Jacob and Richard Pratt**.

2002 APS Intersociety Conference, August 24-28, "The Power of Comparative Physiology: Evolution, Integration and Applied," organized by **James Hicks**. ❖

*Judith A. Neubauer, Chair*

- Council accepted the report of the Joint Program Committee.

### Liaison With Industry Committee



The Liaison With Industry Committee (LWIC) met at the Experimental Biology 2001 meeting in Orlando, FL. The Committee is chaired by **Terry Opgenorth** and is composed of representatives from most of the Society sections, nominated to serve by their sections. Nearly all Committee members are employed in the pharmaceutical industry. The Committee membership

is a major departure from prior years, enabling the Committee to better facilitate Society relationships with industry at the section level where most of the Society activities are based. The current LWIC membership feels the new Committee composition is a success and will serve the Society better as the committee evolves in this new form.

Committee member **Glenn Reinhart** chaired a workshop at EB 2001, "Collaboration with Industry: Rules of the

Game." Speakers at this workshop were **Joan Keiser** of Pfizer, Robert Penhallow of Bristol-Meyers Squibb, Mark Bloom of the Cleveland Clinic, and Carol Stevens of Eli Lilly. About 150 people attended and the comments received were all positive. Written summaries prepared by each author will be published in *The Physiologist* (see p. 291). This type of workshop is believed to be the sort of topic that is useful in opening up lines of communication between industry and academic scientists. If members have similar ideas for a workshop or symposia, an idea of one or two speakers, and need some help pulling together the rest of the program, please contact the LWIC as ideas are needed for EB 2003.

The Joint Program Committee approved a workshop for EB 2002 entitled, "Physiology and Risk Assessment: Predicting Adverse Effects of New Chemicals on Critical Organ Functions." **Lewis Kinter** of Astra-Zeneca and Alan Bass of Schering-Plough are organizing this workshop. Again, this is a great topic, which demonstrates the unique needs of industry related to an integrative understanding of potential adverse events generated by drug candidates.

At the EB 2001 Committee meeting the following topics were discussed. 1) Currently, there is no good way of tracking attendance and participation of industry members at conferences. Having this information would help the Committee understand how to better target APS initiatives to industry scientists. One suggestion is to collect better APS Conference and EB meeting registration information. Doing so would help APS to tabulate participation of industry scientists in APS-sponsored meetings in terms of how many scientists from each type of industry category attended, the Society affiliation of these scientists, whether the scientist submitted/presented an abstract, and other pertinent information. 2) Better coordination is needed between the LWIC and the Career Opportunities in Physiology Committee. 3) A Task Force on Translational Research has been set up and is being co-chaired by President **John Hall**. Since most industrial research is, by definition, translational, an industry perspective would add value to the work of this group. 4) The LWIC will work to improve its follow-up with the graduate student and postdoctoral fellow who receive the LWIC-sponsored Novel Disease Model Awards, given to the best EB abstracts submitted in this category. There were some additional discussion points related to better coordination with Education and Career Opportunities in Physiology Committees on particular initiatives.

Last year at EB 2001, the LWIC sponsored a Liaison With Industry Mixer for industry scientists. The intent was to broaden exposure and participation of industry scientists in APS by providing this social event. While attendance at the 2001 mixer was poor, it is not unexpected that a new tradition may require some time to establish. Therefore, the LWIC asked to hold another Liaison With Industry Mixer at EB 2002.

## Committee Reports

In conclusion, the LWIC is alive and well. The Committee is energetic and members have a number of good ideas on how to continue to maintain and improve a strong relationship between industry scientists and the APS. If anyone has any specific ideas you wish to see us act on, please submit them to the LWIC. ❖

*Terry J. Opgenorth, Chair*

- Council accepted the report of the Liaison With Industry Committee.
- Council approved including a check-off box for industry affiliation on the APS Conference forms.
- Council noted that several representatives from industry have already been approached and have agreed to serve on the Task Force for Translational Research.
- Council agreed to fund the LWIC mixer for EB 2002.

### Long-Range Planning Committee



At the LRPC meeting during EB 2001, there was a discussion of possible future roles for the Committee. 1) Should the Committee advise Council or take a more broadly based outlook? 2) Should the Committee be more active in more international issues (e.g., animal rights, genomics and gene therapy, meeting security, etc.)? 3) How does the Society prepare for increasing international representation?

Since Council oversees the current Strategic Plan, this should not be the only role of the LRPC. It was decided instead that the Committee should begin pre-planning for the next strategic planning meeting, so that the Society is ready to implement a successor plan when the current plan expires in 2005. In addition, the LRPC, working in concert with Council, should continuously engage in strategic planning for the Society and help develop new initiatives for Council to consider. The LRPC decided to involve representatives from other committees as issues specific to a committee arise with regard to the Strategic Plan.

In addition, the Committee discussed whether it should re-examine the Society's relationship with IUPS to determine what role APS should be playing in international societies and affairs and whether the Society should continue to support a separate international society or work to change the role IUPS plays. ❖

*Allen W. Cowley, Jr., Chair*

- Council accepted the report of the Long-Range Planning Committee.
- Council requested the LRPC to develop a final set of criteria to be used by the International Physiology Committee and Council when considering requests by foreign societies or groups for financial support of meetings.
- Council asked the LRPC to begin considering the issue of the internationalization of the Society at all levels.

### Membership Committee Report



At the July 2000 meeting, the APS Council accepted a recommendation put forth by the Membership Committee that the APS staff be allowed to approve all straight-forward membership applications with the remainder being forwarded to the Membership Committee. Final approval

is granted via a Council email ballot on a monthly basis. Since August 2000 when this procedure was implemented, 509 applications for regular membership have been reviewed by Council. All of these have been approved. This new procedure has greatly expedited the membership application review and approval process.

Of the new members, 367 are male and 131 are female. The degrees held are 350 PhD, 81 MD, 49 MD/PhD, 2 DVM, 3 DVM/PhD, 1 DODont, 3 MS, 1 BS, 1 DMed, 7 DPhil, 2 DSc, 1 DED/EdD, 2 EdD, 1 MD/FRCP, 1 PhD/DSc, 1 MD/DMSc, 1 DSc, 1 DVSc, and 1 BMS. These new members hold a variety of position titles. For example, among the new admissions in September 2000 were 14 Professors, 19 Associate Professors, 36 Assistant Professors, 33 Postdoctoral Fellows/Research Fellows/Research Associates, 4 Senior Scientists/Research Directors, 9 Researchers/Investigators, 4 Instructors/Lecturers, one Dean, one Provost, and one Education Director.

The Membership Committee met at the April EB 2001 meeting. The primary topic of discussion at that meeting was how the Committee might best serve the Society in light of duties that go beyond approval of membership applications. In July 2001, the APS Council approved changes to the APS Operational Guide concerning the Membership Committee duties. As a result, the Committee is now directed to: 1) play an active role in the recruitment of new members to the Society and report its activities to Council; and 2) advise

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Council on member retention strategies, including but not limited to, member career development needs and member participation in programs and activities of the Society.

In terms of recruiting new members to the Society, the Membership Committee is currently working on strategies that will promote APS membership through a marketing approach. This includes using the APS website and other avenues to reach potential APS members, whether they are students or department chairs, academicians, or scientists in industry or government. To this end, the Committee is working with the APS Marketing Department. In addition, the Membership Committee now includes a junior scientist to give voice to the needs of our junior members and to provide more insight on strategies that can be used to attract new junior members.

In addition to recruitment, retention of members is an important goal of the Committee. Every year, a predictable level of membership attrition occurs. To the extent that some of this may be explained by a seemingly growing trend for scientists to attend only small specialty meetings, it is vitally important to identify how the Society may best serve the changing needs of its members. The Membership Committee plans to further develop this aspect of the Committee's duties.

In summary, this is a time of change for the Membership Committee. The duties related to review of applications have been streamlined, freeing up time for the Committee to focus on other important goals, especially those related to recruitment and retention. The Committee members look forward to continuing these important duties with much enthusiasm. ❖

*Martha E. O'Donnell, 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 May 15, 2000 and November 15, 2000 deadlines, the Committee received no applications for the Perkins Memorial Fellowship Award. For the first time in

many years, the funds available for the 2000 awards were not used. The Perkins Memorial Fellowship Committee continues to urge members to nominate foreign scientists for the award who are visiting their laboratories for an extended time with their families.

### Application Revisions

Members of the Perkins Memorial Fellowship Committee met for an informal meeting during EB 2001. No major changes were recommended for the application process. However, some changes were recommended for the wording to both the application forms for the Visiting Scientist and the Application Host. ❖

*Matthew J. Kluger, Chair*

- Council accepted the report of the Perkins Memorial Fund Committee.
- Council approved the wording changes for the application forms for the Visiting Scientist and the Host.

### Porter Physiology Development Program Committee



As of March 20, 2001, the Porter Physiology Development Committee Fund had funds available of \$193,043 with future fellowship commitments of \$33,750. Available funds include new contributions of \$129,803: Merck (\$14,500), William Townsend Porter Foundation (\$62,882), American Physiological Society contribution (\$40,000), voluntary contributions (\$110),

Procter & Gamble (\$5,500) and interest income (\$6,811).

In January 2001, the Committee served as the review panel for the APS Minority Travel Fellowship Awards. Forty-five Travel Fellows were funded to attend EB 2001. Five additional Travel Fellowships were awarded for travel to two APS conferences: two to the "Baroreceptor and Cardiopulmonary Reflexes" meeting, and three to the "Integrative Biology of Exercise" meeting. Because of the small number of applicants for these specialty meetings, selection was based upon a subgroup of committee members.

The annual meeting of the Porter Physiology Development Committee was held during EB 2001. The following agenda items were discussed: current stipend level and duration of support for the Porter Development Fellowship, revision of material related to the Porter Development Fellowship

## Committee Reports

(brochure, APS web pages, and application), guidelines and areas covered under the approved special projects category, generating new sources of revenue to support Committee goals, review of fellowship applications, and naming of the Eleanor Ison-Franklin Fellow and the Merck Fellow.

The Committee continued discussions of the appropriateness of the current Porter Fellowship stipend level of \$15,000, the duration of support (1 year, renewable for a 2nd year) and the current restriction preventing supplementation of the stipend from other sources. The Committee continually monitors the NIH predoctoral stipend levels and comparable fellowships awarded by other government agencies and societies. The current NIH predoctoral stipend is \$16,500 with a planned increase of 10% yearly until a level of \$26,573 is reached in 2005/06. Based upon this information, the Committee recommended increasing the Porter Fellowship stipend to \$18,000. This will also cover the anticipated NIH increase for 2002 to \$18,150.

Considering the present amount available in the Porter Physiology Development Fund, it may be difficult for Porter Fellowship awards to keep pace with the proposed NIH pay line. Allowing Porter Fellows to supplement the award is suggested as one mechanism to help Fellows keep pace with these changes. The Committee recommended a change in the Porter Fellowship award guidelines allowing Fellows to supplement the Porter stipend awards from other sources provided that the requirements of the award do not conflict with the intent and/or spirit of the Porter Fellowship. No changes were recommended with regards to the duration of support.

At EB 2001, one of the Committee Co-Chairs met informally with representatives from Minority Affairs/Outreach/Career Development committees of other FASEB societies. The goal of the meeting was to discuss ways in which FASEB societies can work together to develop and implement programs that will increase participation and visibility of minority scientists and students at EB meetings and other activities. As a first step, the group recommended that a joint symposium be held at the next EB meeting on a topic that provides sufficient scientific overlap to include scientists from all of the FASEB societies. APS Council was asked to officially approve and support these and other interactions among the Minority Affairs/Outreach/Career Development committees of all FASEB societies.

The Porter Physiology Development Committee approved a revised application to facilitate submission of more uniform information from fellowship applicants. A separate application was designed and approved for renewal applications to clarify and streamline the renewal review process.

On the recommendation of the Porter Physiology Development Committee, APS Council approved a special projects category to facilitate consideration and funding requests for projects (in addition to fellowships) related to the goals of the Committee. The Porter Development Physiology

Committee continued discussions of the types of activities included in this area and the development of guidelines for these special awards. The Committee also initiated discussions of additional outreach activities and fund raising to support these new activities. Guidelines are to be developed during the coming year.

The Committee requested additional funds to expand the EB travel fellow reception to include former travel fellows, their mentors, and past and current Porter Fellows. The goal was to strengthen connections between minority students and the larger community of APS scientists, especially minority scientists.

The Committee reviewed two new applications and four continuing applications of fellowships. One new application and all of the renewal applications were approved for funding.

The new 2001 Porter Physiology Development Fellow is **Sonia Houston** (the 2001-2002 Merck Porter Fellow), 5th year PhD student, Department of Physiology, University of Missouri-Columbia, Columbia MO; mentor: **Virginia Huxley**. The renewing Porter Fellows are **Lisa Hernandez**, 3rd year PhD student, Department of Physiology, University of California, Davis, Davis, CA; mentor, **Saul Schaefer**; **Marcelo Febo-Vega** (2001-2002 Eleanor Ison-Franklin Porter Fellow), 5th year PhD student, University of Puerto Rico, School of Medicine, Department of Physiology and Biophysics, Rio Piedras, PR; mentor: **Annabell Segarra**; **Annelyn Torres-Reveron** (2000-2001 Merck Porter Fellow), 2nd year PhD student, Ponce School of Medicine, Department of Physiology, Ponce, PR; mentor: **Gregory Quirk**; and **Adrienne Hicks**, 3rd year graduate student, Department of Physiology, Meharry Medical College; mentor: **Evangeline Motley**.

Final reports were received from **Robert Carter III** (2000-2001 Eleanor Ison-Franklin Porter Fellow), 5th year student, Department of Integrative Physiology, University of Texas, Health Science Center at Fort Worth; mentor: **Michael Smith**; **Orlando Gonzalez**, 5th year PhD, Department of Physiology and Anatomy, Puerto Rico Medical Sciences Campus, Rio Piedras, PR; mentor: **Guido E. Santacana**; and **Paul Gray**, PhD awarded January 2001, Neuroscience Interdepartmental Program, University of CA, Los Angeles; mentor: **Jack L. Feldman**.

The progress reports from the 2000-2001 Porter Fellows clearly attest to the Fellows' high level of achievement. The Committee expresses great pride in the role the Society has played in the development of these outstanding young scientists and its continued support of this goal. ❖

*Pamela J. Gunter-Smith, Co-Chair*

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- Council accepted the report of the Porter Physiology Development Committee.
- Council approved increasing the stipend level of the Porter Physiology Development Fund Fellowship.
- Council approved allowing Porter Fellows to supplement their stipends in line with NIH guidelines for NSRAs.
- Council approved a proposal for members of the Porter Physiology Development Committee to formally interact with representatives of minority affairs committees from other FASEB societies.
- Council approved funding of a reception for current and former Porter Fellows and Minority Travel Fellows.

### Public Affairs Committee



The Public Affairs Committee advises the APS Council on policy issues that the Committee recommends for action by the Society and informs Council of specific initiatives undertaken by the Committee itself. The Committee recognizes the importance of careful integration of its activities with the Animal Care and Experimentation Committee and with the Science

Policy Committee (SPC) of FASEB and has worked closely with both groups to achieve common goals.

The learning curve on the Public Affairs Committee is particularly steep, the pitfalls deep, and the work of the Committee too vital to be left to inexperienced individuals, no matter how well meaning. Therefore, the Committee asked that ways be considered to optimize continuity of expertise on the Committee. Possible actions that could be considered include setting standards for appointment to the Chair of the Committee. To further optimize continuity of leadership, the outgoing Chair of the PA Committee at the end of her or his term could continue on the Committee in the official capacity of "Past Chair."

The Public Affairs Committee has already taken certain steps to address this concern. First, all former members of the Committee continue to receive email updates of public affairs issues and are invited to provide input. Second, the Committee has identified areas of needed action and has assigned one experienced and one new member to each of those areas of concern. As the senior member rotates off the Committee a future new member will join the working group. Third, the Chair has appointed an acting Chair so that, in his absence, business of the Public Affairs Committee will con-

tinue. Similarly, the Chair has appointed a former member who continues to have an active role in Committee considerations and currently participates in SPC affairs for FASEB to be the APS representative to that committee when the Committee Chair is unable to attend.

The second symposium "A Call to Activism" was held this year at EB 2001. The first such symposium, which was held in conjunction with EB '99, addressed how to be effective in carrying a message to Congress. The EB 2001 symposium dealt with "Communicating About Science" to the media and the general public. The hundred attendees were treated to outstanding talks by Mary Hendrix, FASEB President; Kim Cavendish, Director of the Orlando Science Center; **Kawanza Griffin**, former AAAS media fellow and current science reporter for the *Milwaukee Journal Sentinel*; and Hyman Field of the National Science Foundation.

The Public Affairs Committee has begun to consider the next Call to Activism symposium that it will sponsor at EB 2003.

On February 27, 2001, the Bush Administration released its initial budget outline that called for a 13.8% (\$2.8 billion) increase in the NIH budget for the next fiscal year. This budget increase will continue efforts toward the five-year doubling of the NIH budget. However, at the same time, the administration recommended only minimal increases in the NSF and VA budgets that would not keep abreast of cost increases associated with inflation.

In his report to the Council during the Spring Council meeting in Orlando, the Public Affairs Committee Chair emphasized several additional features about the effort to double the NIH budget. First, the preference given to the NIH research was clearly producing a rift amongst the other valued sources of bioscience research funding. Second, it has become increasingly apparent that the percent increases in the NIH budget have not been matched by the percent increases in investigator-initiated grants. Third, there is concern that one of the reasons for the latter discrepancy is the initiation of modular grants during the period of the funding increases.

The Committee members have been assigned areas of responsibility within their own expressed areas of interest. With regard to the first issue above, two Committee members are preparing a letter for Council with a statement of problems being created by the funding disparities, as well as approaches that the Committee would recommend in addressing those problems.

With regard to the second and third issues above, the chair is working through the FASEB SPC and its subcommittee that considers NIH funding and peer review issues. Through those offices FASEB has already presented to the acting NIH director and her staff a list of concerns about the modular budget policy. The chair of the FASEB SPC subcommittee has been appointed by the NIH Director to a committee that will consider the modular budget policy and will seek

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improvements in its implementation if it is maintained. The chair of the Public Affairs Committee will seek to work with the president of APS as advocates to the Institute Directors at NIH so that APS views and concerns are likewise expressed and understood with regard to the need for increased numbers of funded investigator initiated research programs.

In April 2001 the NIH, in response to a report from NAS, issued a call for comments on a policy that it had decided to put into place in an effort to rapidly raise salaries of NIH pre- and postdoctoral fellows. This issue has drawn heated debate, although the policy to rapidly escalate salaries has itself been put into effect by NIH. There are many areas of concern here. Some of these include effects on salaries of other research employees, effects on the number of potential trainees with the marked increased in costs for fewer, effects on between year funds for investigator initiated research programs, absence of any consideration of benefits for the fellows.

The Public Affairs Committee developed a letter to be sent to Walter Schaffer, who is in charge of the extramural NIH fellowship program, to seek an opportunity to work with him as this policy change is implemented and to advise NIH regarding effects of its implementation. Council approval of the letter was requested.

There has been considerable dismay in the APS scientific community regarding procedures of NIH peer review. Two concerns have been paramount. First is the issue of streamlining of grants that are perceived by study sections to fall in the lower 50th percentile and are, by policy, not discussed amongst study section members at the meeting of the study section. The second is of even greater concern and relates to the Boundary Report developed for CSR to begin a reorganization of NIH Study Sections.

The issue of streamlining of grants has been discussed extensively by the Public Affairs Committee Chair, as a member of the FASEB SPC. The SPC recognizes that streamlining is not applied uniformly across all study sections and that in some study sections all grants receive at least some level of discussion while others rigidly apply the 50% rule. As a result of the lack of discussion, applicants whose grants have been streamlined often find that the written comments from reviewers send quite divergent messages that make a scientific revision all the more difficult. It is recognized that streamlining does have the advantage of reducing unnecessary fatigue created by reviewers' having to spend long hours discussing grants that clearly lie outside a level of funding consideration. However, some members of the SPC feel that streamlining, as it currently stands, should be eliminated, whereas others feel it should be changed and still others feel it should never be applied to new investigators but continued without review for seasoned investigators.

The PA Committee chair will continue to work through the FASEB SPC on this issue. The SPC's efforts through the NIH

Acting Director have already shown some effect in that the summer cycle of study sections will have nine designated study sections that commit a brief discussion to all streamlined grant applications.

The Scientific Boundaries Panel Report is available on the NIH web site at URL <http://www.csr.nih.gov/events/summary012000.htm>. That report advocates an organization of the peer review process around organ systems to the exclusion of and organization around approaches. In that systems and integrative physiology are viewed as "approaches," the new study section organization seems headed for disastrous outcomes for systems-based physiological sciences. Exercise physiology has already found itself without a study section that deals with work in that area, but other disciplines are destined for the same fate unless a strong effort is made to bring another perspective to the table. APS has sought from chairs of the various APS sections names of experts who might serve in an advisory capacity to NIH but more must be done.

Committee member **Irving Zucker** has agreed to serve as an APS point of contact with Michael Martin of CSR at NIH. Zucker will work with Martin to optimize the study section reorganization while at the same time protecting peer review of scientific areas of vital interest to APS.

APS staff are currently at work on a redesign of the public affairs pages of the APS website. The new site will provide a "Legislative Action Center" with timely information on issues related to research funding and animal research, as well as information about contacting Members of Congress. These new public affairs web pages should be ready this fall.

The next element needed is to enable APS members to make their voices heard on Capitol Hill. Even though staff can generate the messages, APS members are busy people and the process needs to be made easy for them to make use of the information. There are good commercial software packages that are capable of turning an organization's message points into a finished letter. With such software, the APS member could go from a link on the APS web site to the vendor's site, enter a home zip code, and generate a personalized letter to the appropriate Representatives and/or Senators with the message prepared by the APS Public Affairs staff. The Animal Care and Experimentation Committee also supported the purchase of such software.

The Public Affairs Committee has only begun much of the work that will face it over the coming year(s). As has happened in the past year, priorities may change as issues evolve, but the Committee looks forward to meeting those challenges, fulfilling the expectations of the Strategic Plan, and keeping Council well informed in areas of concern and advised action. ❖

*William T. Talman, Chair*



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- Council accepted the report of the Public Affairs Committee.
- Council requested that the letter to Walter Schaffer of the NIH extramural fellowship program be revised and resent to Council for approval before signing.
- Council approved the purchase of the advocacy software.

### Publications Committee



#### APS Journal Impact

*Impact Factors.* The new Editor of *AJP-Regulatory*, **Pontus Persson**, has offered to hand-calculate individual article impact factors for the APS journals. (He has access to the raw data through a colleague's institution). He will have some information for the Publications Committee (PC) to review in October. The PC can assess at that time whether more

or different data are needed.

*Reports-New Type of High-Impact Article.* At the Editors' Meeting in March the Editors reached a consensus to do away with the category "Rapid Communications." **Dale Benos** asked the Editors to consider publishing a new type of high-impact article, to be called "Reports."

*Physiological Genomics.* The new Deputy Editor, **Susan Glueck**, has put plans into place for soliciting articles, including targeted invited mini-reviews, and has started solicitation of articles from talks given at Harvard and at other meetings.

#### Publication Efficiency

*Articles in PresS.* Immediate publication of accepted research articles will begin shortly with *American Journal of Physiology-Renal Physiology*. Parts of APS Central had to be rewritten in order to perform quality control on the article meta data and in order to get permission from the author before it becomes an Article in PresS. *Physiological Genomics* will be next to be put into the system, and the other journals that are presently using APS Central will follow.

*S-Proof.* The S-Proof process would allow authors of APS journals to view their page proof as an Adobe PDF via e-mail starting in August. This will save time in the production cycle, because authors will no longer have to wait to get their page proof via first-class mail. There is also a potential savings of \$20,000 a year, if authors are comfortable with the electronic proof of color figures. Council approval was requested.

#### Financial Stability and Increased Accessibility

*Subscription Prices.* Subscription prices for 2002 were set using a new pricing model that was approved by the Council

in March 2001. The Pricing Task Force also asked for a quick survey at EB to learn about readers' electronic/print journal usage habits, which was done.

*Legacy Data.* An RFP was mailed in April 2001 to seven companies for the scanning of our legacy data, and a contract is being negotiated. Production is scheduled to begin later this summer. The cost to put the data online has escalated, and Council approval of the increase expenditure was requested.

#### Reducing Member Costs

As was reported at the last meeting, APS members continue to take increased advantage of the free color policy. In 2000, \$182,000 of free color was given to members, up from \$77,250 in 1999.

#### Electronic Handbook of Physiology

*Book Advisory Committee.* An invitation was extended to **Charles Lang** to Chair the new combined Book Advisory Committee and he has accepted. His highest priority will be to develop an online *Handbook of Physiology*.

*Other online books.* The Publications Committee accepted an unsolicited online book entitled *Cell Physiology: Molecular Dynamics*, by **Henry Tedeschi**. Tedeschi will act as the interim Editor until the book is transitioned over to the new Editor, **Robert Gunn**. Editorial Board members are Robert A. Bloodgood, University of Virginia Health System; **Harold L. Atwood**, University of Toronto; Mary Lee Ledbetter, Holy Cross College. The book will need copyediting and art editing and secretarial support to request permission to reprint the figures. Approval of the estimate of costs to publish the chapters already written and a proposed business model for this and other electronic handbooks was requested.

It is anticipated that other proposals for electronic books will be submitted within the next few months.

#### Electronic Supplemental Material

Five video clips are published or in the pipeline so far (<http://jap.physiology.org/cgi/content/full/89/3/1233>, <http://jn.physiology.org/cgi/content/full/85/2/986>, <http://jn.physiology.org/cgi/content/full/84/6/2821>, <http://ajp-heart.physiology.org/cgi/content/full/280/6/H2717>, <http://ajpheart.physiology.org/cgi/content/full/280/5/H2399>). Around two dozen long data tables have been published as supplemental material to articles in *Physiological Genomics*.

#### Translational Research

*Call for Papers.* A Call for Papers on Translational Physiology ran in the June issues of all the APS research journals. This is the first time that a Call for Papers ran in all the journals at the same time. The papers will be published as they are accepted under a special heading in the Journal it was submitted to.

*Physiology in Medicine.* A Task Force on Physiology in Medicine (PIM) met in June to discuss finding a new Editor and perhaps a new venue for PIM. Progress was made towards both those ends.

## Committee Reports

### Joint Physiological Reviews Meeting

Presently, the American Board and the European Committee for Physiological Reviews meet separately every year to present new topics for articles and to review the status of invited articles. The Editor in Chief, **Susan Hamilton**, and Chair of the European Committee, Ulrich Pohl, attend both meetings. Hamilton and Pohl have discussed holding a joint meeting to bring together the two groups to learn from each other and to strategize about future directions for *Physiological Reviews*. Realizing that holding a joint meeting might be too cumbersome, they have requested to have a joint *Physiological Reviews* meeting of representatives from both groups. They suggest that this meeting be held at EB 2002.

### Rockefeller University Press Offer

Rockefeller University Press wrote to APS to offer members a 30% discount on an online subscription to *The Journal of General Physiology*. Council was requested to accept the Rockefeller University Press discount to their journal for APS members and consider a reciprocal arrangement, such as a 30% discount on online subscriptions to APS journals, with a marketing plug for APS membership that includes the online package of journals.

### Ethical Editorial

Benos drafted an editorial to be published in all the research journals about Ethical Conduct in scientific research and publication (*The Physiologist*, 44:4, 2001, p. 152).

### Physiology Taxonomy

APS is participating with HighWire Press to develop the taxonomy that will be used for searches on the HighWire site, which is now the largest collection of online scientific literature.

### PubMed Central

APS pulled back from considering participation in PubMed Central because of their production problems and the hostility of the Public Library of Science Open Letter toward society publishers. An editorial was written by Executive Director **Martin Frank** for the June 2001 issue of *The Physiologist* entitled "No Free Lunch" on this topic (*The Physiologist* 44:3, 2001, p. 109). In the meantime, the governing board of PubMed Central has decided to allow linking to journal content on the journal's own web site, as long as the content files also reside in the background on PubMed Central for searching purposes and content is released from subscription access 12 months after publication. The Publications Committee will continue to monitor their continuing production problems and the experiences of the journals that are participating. ❖

Dale J. Benos, Chair

- Council accepted the report of the Publications Committee.
- Council approved S-Proofs for the journals and agreed that authors requesting hard-copy page proof of their color figures should be charged.
- Council approved the increase in funding needed to scan the last 10 years of legacy data for uploading on the web.
- Council approved the business plan and the estimate of costs for the online cell physiology book.
- Council approved holding a joint *Physiological Reviews* Board meeting for representatives of the American Board and the European Committee at EB 2002, with the Society reimbursing the participants for the additional night's lodging.
- Council approved the request of Rockefeller University Press to offer a discount to their journal for APS members and a reciprocal agreement to online APS journals.

### Section Advisory Committee



The Section Advisory Committee (SAC) met separately and in joint-session with the APS Council prior to the EB 2001 meeting. Topics discussed included: 1) section reports, 2) awards, 3) programming, 4) use of listservs, and 5) activity of the Task Force on Sections.

### Section Reports

All of the sections submitted detailed reports on their activities during the past year. Several interesting aspects of sectional activities were discussed in an effort to share ideas among the sections. These included mechanisms for broadening the composition of section steering committees and sources of support for sectional awards.

Ideas for broadening the composition of section steering committees were to include all members of APS committees that are a member of that section, include a student, and include a "Sage" or past section chair. At least one section is circulating revised section bylaws incorporating these members into their steering committee.

The sections have been successful in developing financial support for the section awards. The sources of support were discussed to give other sections ideas for developing additional resources. For example, many sections have established contacts with agencies that have a particular interest in that sections area of physiology. At least five sections have established relationships with biotech and pharmaceutical

## Committee Reports

companies for support of their activities. Several sections have established awards in memory of outstanding members of their section. Most recently the Central Nervous System, Neural Control and Autonomic Regulation, and Cardiovascular Sections are working together to establish an endowed lectureship and award in memory of Donald J. Reis. The Teaching of Physiology Section has generated funds by selling advertising space in their newsletter.

### Awards

*Undergraduate Research Poster Award.* The Teaching Section presented a proposal to establish a new APS award to recognize undergraduate students presenting research posters at EB. It is proposed that this award be named the David Bruce Undergraduate Research Poster Award.

A sizeable number of undergraduates present research posters each year at the Experimental Biology meetings. APS now sponsors research by 12 students each summer and there are an additional 20-25 NIDDK minority students. Many individual medical schools have summer research programs as well. These undergraduates are a group that should be encouraged as they are likely to become the physiologists of the future. Oversight of these awards could reside in the Education Committee, with support from the Teaching Section, Council, and SAC. Students would apply for the award when they submit their abstracts for the EB meeting. They must be first author on the abstract, the sponsor must be an APS member, and the sponsor must sign a statement that the student deserves first authorship. In addition, the student must submit a one-page letter that discusses his/her role in the research, the significance of the research experience, career plans, and why the student deserves the award. Applicants would go through an initial screening process based solely on the abstract and letter. From this, 12-15 finalists would be selected. At Experimental Biology, all applicants for the awards would be expected to present their posters twice, once at a special poster session/reception held Saturday night. During this special session the 12-15 finalists would be interviewed at their posters by a panel of judges. The session would also provide an opportunity to welcome all the students, orient them to the meeting, and provide them with encouragement to consider physiology as a career. All students who apply for the award would have ribbons on their posters that identify them as "Future Physiologists" or something similar. The awards would be announced at the end of the special session and formally presented at the APS Business Meeting.

A total of four awards of \$500 each are proposed. In addition, a light reception would be held for the participants. The meeting room and poster boards would be part of the normal APS meeting costs. Staff support would come from the Education Office's new Higher Education Programs Coordinator who would assist members of the Education Committee

and Teaching Section. Members of SAC would be asked to help recruit judges each year. The Teaching Section plans to create a David Bruce memorial fund to help endow this award; however, initially, Council must approve most of the funding.

*Multiple Awards at EB.* For several years there has been discussion relative to the appropriateness of students and fellows receiving multiple awards at EB. The consensus has been that since a major goal of the award programs is to encourage young scientists to attend EB, the awards should be spread over as many people as possible. The difficulty in achieving this resides in the involvement of multiple groups and multiple APS offices in selecting the recipients. SAC appointed a subcommittee to propose a review process that would allow better coordination amongst these groups and offices in order to spread the awards over as many individuals as possible. A proposed awards review schedule was developed.

*Female Candidates for Major Awards.* The issue of adequate consideration of female candidates for the major APS awards (e.g., Bowditch and Cannon) was discussed. Each section will make an effort to recommend appropriate women candidates for these awards. The issue was also discussed with Council in the joint meeting.

### Programming

The Section Program Committees are functioning well and it was felt that the programming at EB has continued to be exciting and high quality. Sections are continuing to use their newsletters to advertise their programming contributions to their members. SAC repeats the suggestion made last year that abstracts should be solicited from all symposia participants and distinguished lecturers. This would promote high quality offerings at EB as well as allow efficient scheduling by EB attendees. It is done by some of the other societies at EB.

A proposal was presented to SAC to utilize the Section Program Committees to organize local and regional conferences with sectional themes. These would be short conferences (1-2 days) involving at least two institutions with the goal of involving young scientists in an effort to promote their recruitment as APS members. After considerable discussion, a subcommittee was appointed to finalize a proposal. The subcommittee's proposal was distributed to SAC for comment and finalized for consideration by Council.

### Use of Section Listservs

The appropriateness of using the listserv for the purpose of promoting specific candidates during APS elections was discussed. SAC recommended that the listservs not be used for this purpose.

The idea of converting to use of the listservs for distribution of newsletters and other section communication with members was again discussed. Although its advantages were recognized in terms of savings in time, paper, and postage, there is still a

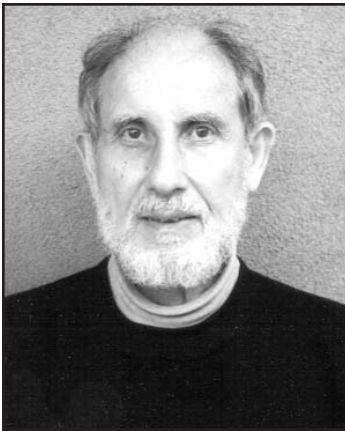
## Committee Reports

substantial portion of the membership that does not use email routinely. SAC will continue to discuss this issue.

*Celia D. Sladek, Chair*

- Council accepted the report of the Section Advisory Committee.
- Council approved the David Bruce Undergraduate Research Poster Award to be implemented by 2003 or earlier, if possible, and referred it to the Education Committee for implementation with the proviso that initially the number of awards be no more than 10% of the applications, with a maximum of four.
- Council forwarded the proposed awards review schedule to the Task Force on Awards for consideration.
- Council declined to approve the establishment of a new conference format to support local, state, or regional sectional meetings and remanded it back to SAC for further discussion/revision.

### Senior Physiologists Committee



A major responsibility of the Senior Physiologists Committee is to correspond with members of the American Physiological Society 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 years old, each with a personal note and a request for a reply to be published

in *The Physiologist*. Approximately 159 members were sent letters. In the past year, 39 responses to these letters have been received and published.

In addition, the members of the committee review any applications received for the Senior Physiologist Awards (formerly the G. Edgar Folk, Jr. Senior Physiologist 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. Last year three applications were reviewed and funded at \$500 each. Names of the recipients are not made public. ♦

*Eugene M. Renkin, Chair*

- Council accepted the report of the Senior Physiologist Committee.

### Women in Physiology Committee



The past year has been a productive year for the Women in Physiology Committee (WPC), highlighted by a successful workshop co-sponsored by the ASPET Committee on Women in Pharmacology at EB 2001. Also, an APS member, **Phyllis M. Wise**

(University of Kentucky), was selected for the prestigious FASEB Excellence in Science Award.

#### Mentoring Program

*Mentoring Workshops.* One of the roles of the WPC is to coordinate activities with other such committees within the FASEB organization. To this end, the WPC took the initiative to plan and co-sponsor a Workshop with ASPET Committee on Women in Pharmacology at EB 2001 entitled "How to Write, Review, and Publish in APS and ASPET Journals." Each of the panelists were women who have served as editors/associate editors of APS or ASPET journals: **Kim Barrett** (Chair), **Kathleen Berecek**, **Sue Duckles**, **Eileen Hassler**, **Judith Neubauer**, Pat Sonsalla, and Mary Vore. The attendance at this session exceeded expectations and included about equal numbers of female and male scientists. Over 130 young (and a few not-so-young) scientists were able to get valuable insight into manuscript preparation, submission, and review in both the oral presentations and the handouts distributed at the session. Plans are underway to make the slides used by the six panelists, as well as the handout material, available on the APS web site. This session not only fulfilled the mission of our Committee to coordinate activities with other such groups within FASEB, but also served as a valuable tool for mentoring young scientists of both genders. Plans are now underway to co-sponsor with the ASPET Committee on Women in Pharmacology a Workshop at EB 2002 in New Orleans, LA, on "How to Be a Good Mentor; How to Be a Good Mentee."

*Mentoring Breakfast.* Key duties of the WPC include promoting the discipline of physiology as a rewarding career for young women and encouraging their active participation in the APS. Because a major barrier to the success of women in scientific careers is inadequate access to mentoring and networking opportunities, in 1993 the Committee established the Mentoring Program for women in physiology, which is administered by the APS Education Office. A senior physiologist (either gender) is paired with a junior physiologist on the basis of common research and/or career interests. Although the most common form of communication between the mentor and mentee is email, the Committee has organized an annual mentoring event at EB meetings to facilitate one-on-one contacts. For the EB 2001 meeting, the Committee

## Committee Reports

hosted a buffet breakfast on Sunday morning. Having the event on the first full day of the meeting was expected to facilitate further interactions of mentees and mentors during the meeting. The highlight of the event was a delightful talk by **Kim Barrett**, Professor at University of California-San Diego, who described events leading to her selection as Editor of *American Journal of Physiology-Cell Physiology* and how this service has impacted on her professional development. The panelists of the workshop that followed this breakfast were also in the audience, allowing the young scientists attending the session to talk with these women who serve as role models of successful scientists. The buffet breakfast included two other important guests: **Bodil Schmidt-Nielsen** (the first woman to serve as president of APS in 1975) and **Barbara Horwitz** (current president-elect and only the second woman to hold this position).

*Changes to Program.* The WPC Mentoring Program is again undergoing changes that should increase the number of participants and enhance the interactions of mentor-mentee pairs. First, each member of the WPC will be contacting 10 senior physiologists of either gender to serve as mentors in this Program. Second, an email message will be sent to all student members of APS twice each year (January and August) to encourage them to join the Mentoring Program. These dates were chosen based on their proximity to EB meetings and fall APS conferences, as the first interaction of the mentor-mentee pair is frequently at a meeting. Third, student participants will no longer be limited to females. The Committee unanimously supported making this program available for young male scientists who also could benefit from strong mentoring. Fourth, members of the WPC will be responsible for selecting mentor-mentee pairs based on information these individuals provide concerning area of research expertise and/or career paths when they sign up for the program. Fifth, each committee member will be assigned as a "champion" of a subgroup of these pairings, and they will be responsible for making periodic (two to three times per year) contacts with the mentor-mentee pairs to see how the relationships are working. Interested senior APS members and junior physiologists should check the web site: <http://www.the-aps.org/education/mentoringprogram> to learn how they too can become active participants in this exciting and still evolving program.

### **Caroline tum Suden/Frances Hellebrandt Professional Opportunity Awards**

One of the truly rewarding roles of the WPC is the selection of the Caroline tum Suden/Frances Hellebrandt Professional Opportunity Awards. These awards provide monetary (\$500) prizes and complimentary registration for 36 graduate students and postdoctoral fellows of either gender who give presentations at the EB Meeting. The Committee selects the award winners on the basis of a critical review of their abstract submitted to EB and a supporting

letter from the applicant. APS members should encourage their students and postdoctoral fellows to apply for these awards. Information about this Award can be found in the annual Call for Abstracts for the EB meeting as well as at: [http://www.the-aps.org/awards/awd\\_student.htm](http://www.the-aps.org/awards/awd_student.htm)

### **FASEB Excellence in Science Award**

One of the most humbling experiences involved in serving as Chair of the WPC is representing the APS on the selection committee for the FASEB Excellence in Science Award. This prestigious award, which carries a \$10,000 cash prize (supported by Eli Lilly), is presented annually to a female member of one of the FASEB Societies. The Award winner is selected on the basis of the outstanding contributions she has made to research, education, service, and mentoring. Three of this year's 12 nominees were APS members, a level of representation that is comparable to that in recent years. It is extremely satisfying to report that one of these women was the finalist for this Award: **Phyllis Wise**, Chair of the Department of Physiology at University of Kentucky. The Chair of the WPC is precluded from coordinating a nomination because of the conflict of interest that this represents. However, all APS members are encouraged to identify potential candidates for this prestigious award, and **Susan Barman** ([barman@msu.edu](mailto:barman@msu.edu)) would be happy to discuss the nomination process with you. APS members are also persuaded to nominate women for APS awards, including The Walter B. Cannon Award Lecture (no woman has received this award), the Bowditch Award Lecture, and Distinguished Lectureships sponsored by the various sections of APS and presented annually at the EB meeting. Less than 10% of the Distinguished Lecturers since 1995 have been women.

### **Committee Service**

One of the designated roles of the WPC is to encourage women to be active members of the APS. One way to be active is to serve on APS Committees and APS Section Steering Committees. At its business meeting, the WPC discussed the process of serving on APS Committees and the pleasant fact that two women were successful in the APS election for president-elect (**Barbara Horwitz**) and Council (**Kim Barrett**). It was also pointed out that one way to be active in APS is to serve on the APS Sections' Steering Committees.

The WPC is always interested in identifying new ways to benefit the women members of the APS. APS members are strongly encouraged to contact committee members with their ideas on how to be effective in this goal. Contact information is available at: <http://www.the-aps.org/committees/members/women.htm>. ❖

*Susan Barman, Chair*

- Council accepted the report of the Women in Physiology Committee.
- Council approved the request of the Women in Physiology Committee for continuation of a mentoring breakfast.

# Experimental Biology 2002

April 20-24, 2002 • New Orleans, LA



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

**Allen W. Cowley, Jr.**  
Medical College of Wisconsin

*"Genomics and  
Cardiovascular Function"*

SATURDAY, APRIL 20, 5:30 PM



HENRY PICKERING BOWDITCH  
AWARD LECTURE

**Pontus B. Persson**  
Humboldt University

*"Control of Renin, From Cell  
Lysates to the Conscious Dog"*

SUNDAY, APRIL 21, 5:30 PM

## Distinguished Lectureships



AUGUST KROGH  
DISTINGUISHED LECTURESHIP OF  
THE COMPARATIVE  
PHYSIOLOGY SECTION

**Albert F. Bennett**  
University of California, Irvine

*"Experimental Evolution:  
Generating Biological Novelty  
for Functional and Genetic  
Analyses"*

SUNDAY, APRIL 21, 8:00 AM



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

**Suzanne Oparil**  
University of Alabama at  
Birmingham

*"The Anterior Hypothalamic  
Area: Gatekeeper in the  
Pathogenesis of Salt-Sensitive  
Hypertension"*

SUNDAY, APRIL 21, 10:30 AM



CARL W. GOTTSCHALK  
DISTINGUISHED LECTURESHIP  
OF THE RENAL SECTION

**Biff Forbush**  
Yale University

*"Regulation of the Na-K-Cl  
Cotransporter in Secretion  
and Absorption"*

SUNDAY, APRIL 21, 2:00 PM



CLAUDE BERNARD  
DISTINGUISHED LECTURESHIP OF  
THE TEACHING OF PHYSIOLOGY  
SECTION

**Penelope A. Hansen**  
Memorial University,  
Newfoundland

*"Physiology's Recondite  
Curriculum"*

SUNDAY, APRIL 21, 3:15 PM

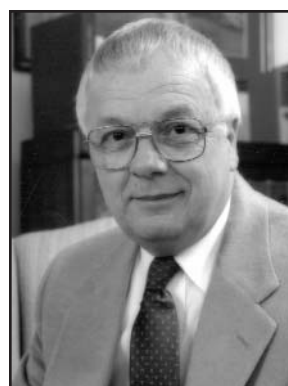


JOSEPH ERLANGER  
DISTINGUISHED LECTURESHIP  
OF THE CENTRAL NERVOUS  
SYSTEM SECTION

**Celia D. Sladek**  
Finch University of the Health  
Sciences/Chicago Medical  
School

*"Regulation of the  
Neurohypophyseal System:  
Neurotransmitter, Neuropeptide  
and Steroid Hormone  
Interactions"*

MONDAY, APRIL 22, 9:00 AM



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

**Norman C. Staub**  
University of California,  
San Francisco

*"Prevention and Treatment of  
Pulmonary and Systemic  
Responses to Endotoxin:  
Whole Animal Physiology  
Redux"*

MONDAY, APRIL 22, 10:30 AM

## Experimental Biology 2002 April 20-24, 2002 • New Orleans, LA



ROBERT M. BERNE  
DISTINGUISHED LECTURESHIP  
OF THE CARDIOVASCULAR  
SECTION

**David G. Harrison**  
Emory University

*"Regulation of Vasomotor Tone  
by Redox Status: Physiological  
and Pathophysiological  
Implications"*

MONDAY, APRIL 22, 2:00 PM



HUGH DAVSON  
DISTINGUISHED LECTURESHIP OF  
THE CELL AND MOLECULAR  
PHYSIOLOGY SECTION

**Harvey F. Lodish**  
Whitehead Institute for  
Biomedical Research

*"ACRP30 and Fatty Acid  
Transport Proteins—New  
Approaches to Obesity and  
Diabetes"*

MONDAY, APRIL 22, 2:00 PM



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

**Bruce M. Spiegelman**  
Dana-Farber Cancer Institute,  
Boston

*"Transcription Regulation of  
Energy and Glucose  
Homeostasis"*

MONDAY, APRIL 22, 3:15 PM



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

**Richard P. Lifton**  
Yale University

*"Genetics, the Kidney and  
Hypertension"*

TUESDAY, APRIL 23, 9:00 AM



HORACE W. DAVENPORT  
DISTINGUISHED LECTURESHIP OF  
THE GASTROINTESTINAL  
SECTION

**John A. Williams**  
University of Michigan

*"Regulation of the Synthesis  
and Secretion of Pancreatic  
Digestive Enzymes by Diet and  
Hormones"*

TUESDAY, APRIL 23, 10:30 AM



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

**Peter D. Wagner**  
University of California,  
San Diego

*"Maximum Oxygen  
Consumption and Its  
Limitation: the Good, the Bad,  
and the Molecular"*

TUESDAY, APRIL 23, 2:00 PM

### Fourth Annual Walter C. Randall Lecture in Biomedical Ethics

Adrian Morrison  
University of Pennsylvania

Tuesday, April 23, 2:00 PM

### **Hypoxia, Ischemia, Na, Ca, and Cytoprotection**

APS Cell & Molecular Physiology Section

**Steve Anderson**

E. Murphy, P. Stys, C. Edelstein, and R. Carini

One of the hallmarks of cell injury is lack of homeostasis in intracellular ion concentrations. Recent improvements in techniques used to measure cytosolic concentrations of sodium ( $[Na]_i$ ) and calcium ( $[Ca]_i$ ) suggest that changes in these ions are antecedent to cell injury, particularly during and after hypoxia/ischemia. Evidence is also mounting that in many cell types flux via the Na/Ca exchanger contributes to these disturbances. This symposium will review recent advances in our understanding of the role of Na and Ca in hypoxic/ischemic cell injury in the heart, nervous system, kidney and liver. Evidence identifying the major transport pathways involved will be included. Interventions aimed at protecting cells from injury by limiting increases in cytosolic Na and Ca will also be discussed.

### **How to be a Good Mentor; How to be a Good Mentee**

APS Women in Physiology and ASPET Women in Pharmacology Committees

**Susan M. Barman, Robin Davisson, Margarita Contreras, Kat Kantak**

R. Davisson, C. Bender, S.M. Barman, L. Villa Komeroff, and S.D. Johnson

One of the roles of the APS Women in Physiology Committee is to coordinate activities with other such groups within FASEB. A second role is to mentor young scientists and promote biological sciences as a valuable career choice. To address these roles, the APS Women in Physiology Committee and ASPET's Committee on Women in Pharmacology will co-sponsor a session designed to provide valuable advice on mentoring and being mentored. Topics to be covered include the following related to being a good mentor: what is a good mentor; mentors as career advisors and role models, and special requirements of mentoring of undergraduate students, graduate students, postdoctoral fellows, and junior faculty members. Topics to be covered regarding mentees include: selecting graduate programs, selecting a mentor, and selecting a postdoc. Other issues will be providing information on getting the most out of your training and getting the most of a scientific meeting. In addition to brief (five-ten minute presentations) by several (four-five) established scientists (mostly APS and ASPET women), the plan is to have four mentees on the panel, representing different stages of development (undergraduate to junior faculty) and include APS and ASPET members. Audience participation includes opportunities to submit questions to the panel mem-

bers. Also panel members will be asked to discuss how they would respond to some particular real-life issues that involve interactions of mentors and mentees. This session fulfills one of the aims of the APS Strategic Plan to increase participation of young scientists at the meeting.

### **Career Opportunities in Physiology: Taking the Next Step**

APS Careers Opportunities in Physiology Committee

**Francis L. Belloni**

The variety of career paths available to individuals with a PhD in the physiological sciences presents both opportunity and challenge to newly trained young scientists. The "traditional" paths of academia and industry are now joined by opportunities in government laboratories, private research foundations, business, law, public policy, and venture science. Moreover, the types of positions available in even the traditional sectors have been greatly multiplied and redefined. While this situation presents unprecedented opportunity for newly trained scientists, it also presents the daunting challenge of deciding how to explore, prepare for, and achieve positions in these various sectors.

This symposium will provide some guidance to PhD students and post-doctoral fellows who are trying to chart their own career journeys. Speakers will discuss opportunities in some of the various employment sectors noted earlier. The emphasis of each presentation will be on (a) the types of careers available, (b) their major benefits and challenges, and (c) how best to prepare for and seek such positions, particularly at the entry level. Ample time will be allotted for addressing questions from the audience.

### **The Sensory Functions of the DEG/ENaC Superfamily of Ion Channels**

APS Cross-Sectional Symposium

**Dale J. Benos and Bruce A. Stanton**

D.J. Benos, P.R. Smith, S.C. Kinnamon, K. Fisher, M.J. Welsh, and B.A. Stanton

The over 30 members of the ever-growing superfamily of ion channels known as DEGenerin–Epithelial  $Na^+$  Channel (DEG/ENaC) have been found in organisms ranging from nematodes to humans, and are expressed in cells and tissues as diverse as kidney, lymphocytes, and tongue. These channels have been implicated in numerous physiological functions, such as taste, hearing, and smell, mechanosensation, pain perception and  $Na^+$  homeostasis. Moreover, these channels have been implicated in several important human diseases (e.g., hypertension, cystic fibrosis, ARDS, brain tumors, and the flu). This two-hour minisymposium is



designed to provide an authoritative update on current research into the physiological sensory functions of this important class of ion channels. First, P. Smith (University of Alabama at Birmingham) will review the general properties of DEG/ENaC regulation, focusing upon regulatory inputs from protein associated with the channels and having a potentially important role in sensory transduction function. Following this overview, S. Kinnamon (Colorado State University) and K. Fisher (Northwestern University) will discuss ENaC's role in taste, olfaction, and voice tonation. Lastly, M. Welsh (University of Iowa) will discuss the role of the neuronal branch of the DEG/ENaC superfamily, namely, the BNaCs or acid-sensing ion channels, in transduction of mechanical stimuli.

### **Cell-Cell Crosstalk in the Generation of Inflammation**

APS Cross-Sectional Symposium

**Jahar Bhattacharya**

S.P. Colgan, L. Lindbom, J. Madara, and J. Bhattacharya

Tissue inflammation, which is fundamental to many pathophysiological conditions, is characterized by leukocyte recruitment at the site of inflammation. In the last twenty years much has been learned regarding specific receptors on leukocytes and on vascular endothelium that subserve leukocyte recruitment and are therefore, essential for the inflammatory response. However relatively little is understood regarding the extent to which intercommunication between different cell types plays a role. Such intercommunication, or crosstalk, is clearly important since the multicellular nature of the inflammation response predicates that different cell types must signal one another to coordinate endothelial barrier changes and other inflammatory consequences. Crosstalk is also critical for conveying defensive signals across epithelial barriers. Pathogens in the airway or intestinal lumen elicit inflammatory responses, although little is known regarding how pathogen-induced proinflammatory signals translocate across the impermeable epithelial barrier. The purpose of the symposium is to bring together some new and exciting research that directly addresses these novel and under-investigated issues. The speakers will discuss crosstalk mechanisms in different systems, highlighting the general nature of this signalling and pointing to new experimental strategies that may be brought to bear in future research. This subject has not been discussed in any meeting, workshop or symposium.

### **Understanding Organ Function through Real-Time Fluorescence Microscopy**

APS Techniques and Technology Workshop

**Jahar Bhattacharya and Bruce Pitt**

S. Watkins, X. Ying, A. Fisher, and J. Peti-Peterdi

The application of real-time fluorescence microscopy (RTFM) in conjunction with rapid image acquisition and image analysis has provided novel insights into cell function. RTFM is widely used with both wide angle and confocal microscopes for the quantification of second messengers such as intracellular free  $\text{Ca}^{2+}$  concentration ( $[\text{Ca}^{2+}]_i$ ) and reactive oxygen species (ROS), for the determination of enzyme activities and for the detection of protein and gene expression. Although the bulk of this research has been done in cultured cells, recent reports indicate that the application of RTFM to the whole organ is likely to advance the understanding of cell function in situ. The purpose of this workshop is to bring together experts who have developed organ RFTM in order to outline the principles, the advantages and the limitations of the approach for whole organ studies. S. Watkins will outline optical principles underlying light microscopy. X. Ying will discuss equipment strategies. A. Fisher will define the lung model for RTFM, while J. Peti-Peterdi will introduce the 2-photon concept in relation to glomerular imaging. Each talk will last 20 minutes and will be followed by ten minutes of discussion. The workshop should appeal to APS members seeking a novel approach to investigating organ function.

### **Common Brainstem Mechanisms of Cardiovascular and Respiratory Control**

APS Respiration Section

**W.W. (Bill) Blessing and J. Michael Wyss**

W.W. Blessing, M. Denavit-Saubè, J. Paton, and P.A. Gray

While the EB meetings typically host excellent Symposia and Featured Topics on neuronal regulation of both the cardiovascular and the respiratory systems, seldom is there in depth consideration of the common neuronal circuitry by which these systems are regulated/co-regulated. Clearly, there is considerable overlap in the regulatory circuits of these systems, and to maintain homeostasis the two systems must be closely coordinated with each other. This symposium will join together some of the most innovative investigators in both arenas to begin to consider the unified central nervous system mechanisms by which these two systems are functionally linked and their functions are coordinated. The session will link up talks by a senior and junior investigator in each specific area, and thus accentuate how the available data and experimental tools can lead to a better understanding of the co-regulation of these functions. Each talk will address a

specific cellular or molecular aspect of the nervous system regulation and seek out the commonalities. P.A. Gray is an APS 2001 Young investigator awardee and received two other awards at EB 2001. J. Paton is also a young investigator who has developed a potentially very powerful model with which to dissect the role of the nervous system in cardiorespiratory control. Both W.W. Blessing and M. Denavit-Saube are well known for their contributions to the field and will provide both a historical perspective and insights from their recent innovative research. The audience will be encouraged to participate actively in the five-minute discussions following each presentation.

### **Physiology of Physical Inactivity's Induction of Chronic Disorders**

APS Environmental & Exercise Physiology Section

**Frank W. Booth and John Holloszy**

F.W. Booth, J.O. Holloszy, M. Sturek, and D.D. Bikle

The purpose of this symposium is to discuss the physiological basis by which physical inactivity makes an individual more susceptible to specific disorders. Any given individual inherits a particular combination of disease-susceptibility genes that contributes to the relative risk of clinical disorders. When this gene "cocktail" is combined with physical inactivity (categorized as an environmental component), a "threshold" of biological significance is crossed such that the individual is affected with an overt clinical disorder. It is the job of physiologists to determine the identity of these health-disorder-inactivity genes and the mechanisms by which physical inactivity alters their expression and then to translate this basic information to prevent inactivity-induced disorders. In the first talk, F. Booth will consider inactivity-induced declines in physiological function with aging. The presentation will include mechanisms for the physical-inactivity-induced sarcopenia (skeletal muscle loss with aging) leading to physical frailty. In the second presentation, J. Holloszy will describe the known mechanisms by which physical inactivity decreases glucose removal from blood into skeletal muscle, producing skeletal muscle insulin resistance, a forerunner of syndrome X and eventually overt type 2 diabetes. M. Sturek will discuss in the third talk the cellular responses of arterial smooth muscle and endothelial cells to physical inactivity and how this contributes to the development of atherosclerosis. Finally, D. Bikle will present the mechanisms by which unloading of bones during physical inactivity accelerates bone loss and the premature onset of osteoporosis. In summary, the physiology that produces alterations in expressions of genes eliciting chronic disorders will be presented.

### **Sex and Nonsex – Estrogen and the Aging Hypothalamus**

APS Central Nervous System Section

**John T. Clark**

B. Sherwin, J.T. Clark, J.W. Simpkins, and P. Micevych

Estrogen has a well-established role in reproductive processes which involves actions in the hypothalamus. In recent years evidence has accumulated that estrogen is also important in the regulation of non-reproductive, NONSEX, functions. Thus, estrogen status regulates: neuronal functioning (evidenced by neurotropic, neuroprotective, mood and cognitive effects); the central control of blood pressure and cardiovascular function (evidenced by increased incidence of hypertension, cardiovascular disease, and stroke in women after menopause); the central control of ingestive behavior (food and fluid intake); in addition to the central control of reproductive and sexual functions. This symposium will address the current state of knowledge regarding the actions of estrogens in regulating these functions in relationship to aging and reproductive senescence.

### **Incorporating Case Studies in the Physiology Classroom**

APS Teaching of Physiology Section

**William H. Cliff**

D.U. Silverthorn, J.A. Michael, A. Tarnvik, and D.R. Richardson

Case study analysis has been shown to be an effective means for student learning in such disciplines as business, law, medicine, education, and psychology. However, case study teaching has not yet found widespread use in physiology. Even instructors who might be inclined to use case study analysis may be hesitant to adopt such a method if uncertain how best to implement it in the classroom. This workshop will explore strategies for incorporating case studies into the range of physiology courses found in different academic settings (community college, four year undergraduate, graduate/professional). After receiving a short primer on case studies and the ways that they can be employed, the workshop participants will be provided with a representative sample of cases in physiology and arranged in small working groups. Guided by a planning template that identifies a series of issues and concerns central to the effective use of case studies, each group will be encouraged to create a favorable strategy for managing case study teaching in the classroom. After completing this task, each group will be called to make a short report of their plan to the assembled workshop. During this review of individual strategies, four experienced case study teachers will serve as discussants—providing informed

commentary that will facilitate group discussion and draw out general observations and conclusions about successful classroom management of cases in physiology. Participants should expect to leave the workshop better equipped to develop satisfactory approaches to integrating case study teaching into their own courses.

### **The Promise for Therapeutic Intervention in Obesity: The Brain and Beyond**

American Federation for Medical Research

**David D'Alessio**

R. Seeley, P. Havel, G. Barsch, and M. Heiman

This symposium will focus on recent developments in recent advances in understanding the physiology of energy balance and control of food intake. This progress in experimental neuroendocrinology now holds hope for novel treatment strategies for obesity and disturbances of food intake.

### **Bioengineering Approaches to Enhance Gene Delivery**

Biomedical Engineering Society

**Mark Davis**

T. Giorgio, N. Symth-Templeton, A. Kabanov, J. Hagstrom, and M. Davis

Non-viral, nucleic acid delivery systems have exhibited problems such as low gene transfer efficiencies, high toxicity and low in vivo stability. Strategies for overcoming some of the barriers to effective gene transfer have emerged. This session will concentrate on issues of importance to the engineering of the next generation non-viral delivery methods for nucleic acids. Topics will include new materials for nucleic acid delivery, new insights into extracellular and intracellular delivery mechanisms and the rational design of fully formulated vectors.

### **Nanotechnology in Bioengineering and Biology**

Biomedical Engineering Society

**Tejdal Desai**

D. Beebe, M. Mrksich, M. Ferrari, J. Coffey, P. Messersmith, and P. Nealey

Nanotechnology is changing the way we view the biological world. With recent developments in the synthesis, characterization, and application of nanostructures, we have significantly advanced our understanding of biology and medicine. Nanoscale features can mimic the biological world, giving us unprecedented control and manipulation over our environment. From biomimetic materials and biomolecular surface modification to single molecule imaging and drug delivery

systems, nanotechnology will pave the way towards a new biotechnological frontier. This session will examine some of the many aspects of nanotechnology related to biology and medicine.

### **Potential of the Development of Atherosclerosis by Diabetes**

American Federation for Medical Research

**Boris Draznin**

A. Heagerty, K. O'Brien, J.E.B. Reusch, and B. Draznin

This symposium will address the structural changes in the vasculature in response to diabetes, and the molecular changes contributing to these effects.

### **Role of Endothelin ET<sub>B</sub> Receptors in Cardioresenal Function**

APS Water & Electrolyte Homeostasis Section

**Gregory D. Fink**

M. Yanigasawa, D. Pollock, J. Granger, and G.D. Fink

The focus of this symposium will be on the physiological role of the ET<sub>B</sub> subtype of endothelin receptor, particularly in the control of renal function and systemic blood pressure. Yanigasawa will discuss work based on the development of strain of rat with a defect in the expression of functional ET<sub>B</sub> receptors. These rats have marked abnormalities in renal function, and exhibit salt-sensitive hypertension. Pollock will discuss work on the regulation, localization and function of ET<sub>B</sub> receptors in the kidney of rats with experimental hypertension. Granger will describe work on how ET<sub>B</sub> receptors modulate renal responses to changes in salt intake, perfusion pressure and angiotensin II. Fink will describe characterization of a new model of experimental hypertension produced by chronic activation of ET<sub>B</sub> receptors in the rat with the selective agonist sarafotoxin 6c.

The main goal of the symposium will be to reach consensus on the role of the ET<sub>B</sub> receptor in the long-term regulation of renal function and blood pressure. Current data indicate that this receptor subtype has a predominantly antihypertensive function, mediated in particular through facilitation of renal sodium and water excretion. Another goal will be to clarify the importance of vascular versus renal ET<sub>B</sub> receptors in the control of blood pressure. Finally, some emphasis will be placed on ET<sub>B</sub> receptor regulation in response to physiological stimuli such as changes in salt intake, or blood pressure.

Most published work to date has focused on the ET<sub>A</sub> receptor subtype in renal and cardiovascular function. This symposium will offer an opportunity to synthesize current knowledge on the other major endothelin receptor subtype.

Many endothelin antagonists are now in clinical trials for various cardiovascular diseases. This symposium should help establish whether blockade of ET<sub>B</sub> receptors is a desirable long-term therapeutic goal.

### **Endothelial Dysfunction in End Stage Renal Disease**

American Federation for Medical Research

**Michael Goligorsky and Christine Baylis**

C. Baylis, M. Goligorsky, P. Vallance, and S.S. Gross

This symposium will focus on the contribution of endothelial dysfunction to the pathogenesis of end stage renal disease. This will be approached through discussion of specific molecules implicated in this process, including homocysteine, NOS, and endogenous inhibitors of NOS such as ADMA and 1-NMMA.

### **Comparative Models to Understanding Molecular Mechanisms of Solute Transport**

APS Comparative Section

**Greg G. Goss**

Despite the problems of GC rich templates and long sequences required to clone many transport proteins, there has been considerable success of late in cloning the full sequence of many different solute transport proteins from a variety of non-model organisms. The recent success is providing valuable clues to both evolutionary relationships as well as providing unique models to studying structural and physiological regulatory elements within the sequences. The great wealth of information regarding sequence structures and phylogenetic relationship will continue to grow as the full genetic codes for more organisms come online. Prediction and testing of the function of these genes in both a cellular and whole animal context will present a great challenge to the next generation of comparative biologists and biochemists. This symposium will highlight various labs that have been successful in cloning transporters from a variety of organisms, and how they have incorporated a wide variety of techniques to examine and understand the function of these recently cloned sequences. Techniques for expression and analysis of transporter function from the whole animal to single cells, to subcellular biochemical regulation illustrate the integrative approaches that these labs use to understand transport function.

### **Physiology InFocus—Translating the Genome: Physiology and Pathophysiology of Obesity. Endocrine/Metabolic Consequences of Obesity**

**Barbara Horwitz and Barbara Kahn**

B. Kahn, and G. Yancopoulos

### **Mechanisms of Estrogen Effects on the Cardiovascular System**

APS Cardiovascular Section

**David R. Gross**

G.M. Rubanyi, A.M. Lefer, D.J. Lefer, G.J. Gorodeski, R.A. Khalil, and D.R. Gross

The risk of coronary artery disease in women between puberty and menopause is significantly lower than in age-matched men. This gender difference is not found in postmenopausal women. Studies conducted in a man with disruptive mutation in the estrogen-receptor gene showed impaired flow-mediated, endothelium-dependent vasodilation and premature coronary artery disease. Experimental Studies have shown that treatment with estrogen can preserve endothelium-dependent coronary artery dilation, reduce infarct size, decrease the occurrence of ventricular arrhythmias, and protect against global, cardioplegia-protected myocardial ischemia-reperfusion injury. This symposium will review the most recent work and characterize the work that remains to be done to more fully describe and understand the mechanisms by which estrogen exerts its effects on the cardiovascular system.

### **Rhythms in Reproduction**

Association of Latin American Physiological Societies

**Rosalinda Guevara-Guzmán and Robyn Hudson**

R. Paredes, M. Martínez-Gómez, R. Guevara-Guzmán, and R. Hudson

Various forms of rhythmicity are increasingly being found to underlie the behavioral and physiological organization of biological systems. Reproductive processes are no exception. It is our aim in this symposium to provide an overview of the contribution being made by biological rhythms research to understanding reproductive processes by presenting examples of recent work in rabbits and rats across the reproductive cycle; from courtship and mating, through pregnancy and parturition, to the interaction between mother and young. Each speaker will outline the particular contribution of behavioral and physiological rhythms to these processes and consider possible neural and endocrine mechanisms underlying them.

### **Functional Heterogeneity in the Renal Microcirculation**

APS Renal Section

**Lisa M. Harrison-Bernard and Rodger D. Loutzenhiser**

J. Peti-Peterdi, R.D. Loutzenhiser, L.M. Harrison-Bernard, and T.L. Pallone

Optimum control of the determinants of glomerular filtration is dependent on an integrated regulation of renal afferent and efferent arteriolar tone and on the activation of mesangial cells. Blood flow to the medulla is controlled by juxtamedullary arterioles and vasa recta pericytes. The overall goal of this symposium is to present the most recent findings addressing the regulation of renal microvascular function as assessed by direct investigations of afferent and efferent arteriolar and descending vasa recta vascular function and of the distinct intracellular signaling pathways utilized in each vessel segment. Investigation of the complex intraglomerular effects of angiotensin II, determined using two photon microscopy, will be presented. Agonist-induced calcium signaling, assessed by direct measurements of afferent and efferent arteriole myocyte and vasa recta pericyte calcium signaling using electrophysiological approaches and intra-vital dyes, reveals the evolving complexity of calcium signaling events underlying the regulation of smooth muscle function along the renal microvascular network. The newest developments concerning the roles of angiotensin II receptors as regulators of preglomerular and postglomerular function will be presented. The influence of nitric oxide on basal tone and agonist-induced vasa recta pericyte contraction will be discussed. In summary, this symposium will couple hormonal actions with intracellular signaling mechanisms in preglomerular, postglomerular, and medullary microvascular segments using novel experimental techniques.

### **Physiology InFocus—Translating the Genome: Physiology and Pathophysiology of Obesity. Neurobiology of Obesity**

**William Haynes and Michael Schwartz**

M. Schwartz, R. Cone, and B. Levin

### **Refresher Course:**

#### **Topics in Medical Neurophysiology**

APS Education Committee

**Cheryl M. Heesch and Thomas J. Cunningham**

The teaching of neurophysiology represents a significant challenge for physiologists. The field of neuroscience is rapidly developing, and the rapid pace of research causes textbook material to become outdated, often within a few years of publication. The curricular location of neurophysiology material varies greatly between medical schools. Neurophysiology

may be included in a traditional physiology course, it may be combined with anatomy in neuroscience course, or there may be no definable venue devoted to teaching neurophysiology. This refresher course will provide updates on four topics in neurophysiology: the autonomic nervous system, our evolving understanding of cognition, movement, and the hypothalamus.

### **Mechanisms of Vascular Remodelling: Temporal Events from Stimulus to Structural and Functional Changes**

APS Cardiovascular Section and The Microcirculatory Society

**Michael A. Hill and Gerald Meininger**

M.A. Hill, G.A. Meininger, S. Gunst, B.L. Langille, R.L. Prewitt, and E.L. Schiffrin

**Background and Significance:** Vascular remodeling is typically viewed as a process that changes the functional, structural and mechanical properties of the vascular wall. In vascular diseases such as hypertension remodeling is thought to significantly contribute to reduced arterial lumen diameters and consequently, persistent elevation of peripheral vascular resistance. Typically, remodeling is studied following a chronic course of treatment that precipitates the remodeling response. This approach has provided many useful clues by pointing to the involvement of alterations in regulation of the contractile process, stimulus response coupling, cell growth events, cytoskeletal changes and changes in extracellular matrix expression. Lacking is our knowledge of the intermediate transitional events that couple the initial stimulus(i) with the remodeled arterial wall. These intermediate events may hold valuable clues as to the mechanisms of remodeling and help to explain the variety of remodeled states that have been described for the vascular wall. Well-known examples of such states include hypertrophic, atrophic and eutrophic remodeling of the arterial wall.

One conceptual approach is to view progression of events leading to the remodeled vascular wall as a series of intermediate time-frame transitions. In endothelial cells, for example, it has been shown that an increase in shear stress leads to acute events resulting from  $Ca^{2+}$ -dependent release of paracrine factors, alterations in the expression of enzymes, alterations in cell junction communication and finally, changes in cell shape/orientation. Similarly, arterial smooth muscle can respond to an increase in intraluminal pressure with acute vasoconstriction and in the long term by functional and structural changes in the vessel wall. A focus of this symposium will be to examine possible intermediate time frame responses that likely precede the longer-term remodeling changes. These will include alterations in cell-cell junctions, cell-matrix interactions, cytoskeletal changes and the

stimulation of signaling pathways not directly mediating the acute vasomotor responses. A goal will be to provide a framework of understanding upon which the audience can build an appreciation of the complexity of the remodeling process as it involves stimulation of and interactions between multiple cell signaling pathways. This is evidenced, for example, by the generation of signaling molecules that can play dual roles and that the response to activation of one pathway may impact on the involvement of a parallel pathway. Thus, the ability of a vessel to respond to an increase in intraluminal pressure with myogenic vasoconstriction may by decreasing wall tension, alter the stimulus for adaptive structural remodeling.

In summary, the symposium will focus on the temporal aspects of vascular remodeling. Highlighted will be cell signaling within the vascular wall with emphasis on the events that may link the acute vasomotor responses with longer time frame adaptive responses. Coverage will be given, in particular, to the involvement of cell junctions, matrix-integrin interactions and the cytoskeleton. To broaden the interest in the symposium input will be drawn from both the smooth muscle and endothelial fields and responses to both agonist and physical stimuli will be considered.

### **Translational Research in Preeclampsia and Pregnancy-Induced Hypertension**

APS Cross-Sectional Symposium

**Raouf A. Khalil and Phyllis August**

J.M. Roberts, S.J. Fisher, J.P. Granger, R.A. Khalil, and P. August

Normal pregnancy is often associated with reduction in systemic vascular resistance and arterial blood pressure and decreased vascular reactivity to circulating vasoconstrictors. The hemodynamic and vascular changes observed during normal pregnancy have been explained, in part, by increased nitric oxide (NO) synthesis by various cells including vascular endothelial cells. In 5 to 7% of pregnancies, women develop a condition called pre-eclampsia characterized by increased intravascular coagulation, proteinuria, increased systemic vascular resistance and pregnancy-induced hypertension (PIH). Although PIH is a major cause of maternal and fetal mortality, the mechanisms of this disorder have not yet been clearly identified. In addition to performing mechanistic studies in pregnant women, recent research efforts have focused on and have been successful in developing animal models of PIH. These studies have suggested that a reduction in the utero-placental blood flow and the ensuing placental ischemia during late pregnancy is associated with placental release of cytokines, which eventually lead to increased systemic vascular resistance and PIH. However, the cellular

events that initiate the placental ischemia and the intermediary vascular and cellular mechanisms that lead to PIH are still unclear. In this cross-sectional symposium, we will highlight the current issues related to the pathophysiology and the cellular, vascular, renal and endocrine mechanisms of PIH. There will be five presentations, 20 min each, that will focus on: 1) abnormal cytotrophoblast invasion of the uterine microcirculation and the ensuing placental ischemia during PIH, 2) the role of placental cytokines in the pathogenesis of PIH, 3) the changes in cardiovascular and renal hemodynamics associated with PIH, 4) endothelial and vascular smooth muscle cell dysfunction in PIH, and 5) the clinical aspects and new approaches in the management of PIH. This multifaceted cross-sectional symposium should provide a better understanding of the pathophysiological basis of PIH and should help design better ways to manage this serious pregnancy-associated disorder.

### **Physiology and Risk Assessment: Predicting Adverse Effects of New Chemicals on Critical Organ Functions (Workshop)**

APS Liaison with Industry Committee

**Lewis B. Kinter and Alan S. Bass**

L.B. Kinter, D.J. Murphy, J.L. Mattsson, and A.S. Bass

Physiological functions are gaining international recognition as important 'biomarkers' for potential life-threatening effects of new chemicals. Termed "Safety Pharmacology" (perhaps more accurately "Safety Physiology"), this latest non-clinical discipline was recently accepted by the International Conference on Harmonization (ICH) as an integral part of worldwide guidelines for pharmaceutical development. The new guidelines define organ systems and functions to be evaluated, and points to consider for study design and conduct (CPMP/ICH/539/00).

Unanticipated chemical effects on physiological functions can result in medical emergencies. The new ICH guidelines recognize that while in vitro studies of molecular targets (enzymes, receptors, ion channels, etc.) suggest mechanisms by which chemicals might impact critical functions, organ functions are complex, integrative, and most usefully evaluated in their totality in intact (and ideally unanesthetized) animal models. Assessments of physiological functions in animals can elucidate the significance of chemical interactions with molecular targets and provide biomarkers for subsequent clinical studies. Physiological function data also enhances general toxicological endpoints used for risk identification/risk assessment.

These principles are illustrated in a current example:

Drug-associated cardiac arrhythmias:

*medical emergency*

(Torsades de points)

Q-T interval prolongation

*physiological biomarker*

(QTc)

Inward rectifier potassium currents

*molecular target*

(IKr, HERG)

This workshop assembles speakers whose works and concepts have been influential in obtaining ICH acceptance of physiological functions as biomarkers for detecting adverse effects of new drugs, to present and interpret the new guidelines and to provide insight and practical experience for design, conduct, and interpretation of organ function evaluations for risk assessment. The five presentations will focus upon the emergence of applied physiological organ function assessments as a modern discipline in pharmaceutical development, and will discuss the core organ system/function evaluations. The workshop should be of broad interest to academic and industrial physiologists participating in pharmaceutical development, and will specifically underscore the growing need for training in applied organ systems physiology.

### **New Developments in Renal Acid-Base Transport and its Regulation**

APS Renal Section

**Mark A. Knepper and Susan Wall**

L.R. Levin, S.M. Wall, P.S. Aronson, and M.F. Romero

### **Ion Channels and Hypoxia**

APS Hypoxia Group

**Diana L. Kunze**

S. Archer, G. Haddad, K. Buckler, and D.L. Kunze

A reduction in arterial oxygen leads to a variety of physiological adjustments that may occur immediately or, over minutes, hours and days. These adjustments provide compensation that is important in maintaining physiological homeostasis. Alternatively, they may lead to unfortunate pathological states. Recently it has become increasingly clear that ion channels play an important role in the adjustments to reduced oxygen in a variety of tissues. The short-term effects of hypoxia on ion channel activity may involve direct effects of reactive oxygen species on ion channel proteins or "second messengers" whose levels are modulated by oxygen. Furthermore, sustained or repetitive exposure to hypoxia may produce long-term effects on ion channels through changes in the expression levels of the channel proteins. This area is blossoming as a variety of molecular, physiological and biochem-

ical techniques are applied to assess cellular mechanisms that underlie hypoxia-induced changes in a variety of different tissue and organs. The purpose of this symposium is to provide a forum for examining current information on the different mechanisms responsible for modulation of specific ion channels when tissues are challenged by reduced O<sub>2</sub>. The chair will introduce the topic with a short overview and will indicate the contributions of each of the speakers to the field. In this symposium we will address the responses that arise from exposure to reduced O<sub>2</sub> in ion channels in pulmonary smooth muscle (potassium channels), carotid body (twin pore channels), and in two set of neurons (potassium and sodium channels). Most importantly, the speakers will be asked to focus on the functional consequences of these changes in channel activity or expression. They will also be asked to anticipate the future directions of research in this area.

### **Physiology InFocus—Translating the Genome: Physiology and Pathophysiology of Obesity. Gene-Environment Interactions in Obesity**

**Theodore Kurtz and James Hill**

J. Hill, and E. Ravussin

### **Role of Myostatin in Regulating Muscle Growth**

APS Endocrinology & Metabolism Section

**Se-Jin Lee**

S-J Lee, N. Wolfman, R. Kambadur, and M. Sharma

### **Molecular and Cellular Mechanisms of Ischemic Liver Injury**

APS Gastrointestinal Section

**Alex B. Lentsch and Hartmut Jaeschke**

H. Jaeschke, P-A Clavien, M.B. Grisham, L.M. Colletti, and A.B. Lentsch

Ischemia of the liver and subsequent reperfusion occurs during a number of clinical relevant settings, including hepatic resectional surgery, liver transplantation, and hemorrhagic shock with fluid resuscitation. The impact of ischemia and reperfusion on the liver microenvironment includes a biphasic inflammatory injury that consists of an early, oxidant mediated component and a later, neutrophil-dependant component. Experimental models of ischemic liver injury have provided a greater understanding of the events that contribute to the pathogenesis of this syndrome and have prompted several clinical approaches to the prevention and treatment of organ dysfunction due to hepatic ischemia and reperfusion. This symposium is geared to provide comprehensive, multi-disciplinary coverage of this important topic. Research presentations will include the mechanisms of oxidant production

and function, sinusoidal endothelial cell responses, gender-specific responses, role of chemokines in hepatic neutrophil accumulation and liver regeneration, and cytokine regulation of ischemic liver inflammation.

### **Disorders of Sodium Transport and Blood Pressure Regulation**

APS Renal Section

**Stuart Linas**

S. Linas, D. Geller, D. Ellison, and F. Luft

The role of salt in essential hypertension is widely recognized. However, the mechanisms by which the kidneys contribute to sodium retention and how increases in total body sodium result in hypertension remains unclear. Recently, a number of defects in mineralocorticoid production and action as well as abnormalities in the sodium channel, ascending limb and distal convoluted tubule sodium transport have been described. Each of these abnormalities is associated with hypertension or hypotension. The purpose of this symposium is to review molecular and cellular abnormalities in mineralocorticoid receptors and sodium transporters in the kidney and to relate these changes to clinical syndromes associated with changes in blood pressure. Finally, the symposium will attempt to put the above abnormalities in context of the hypothesis originally described by Guyton, which ascribed essential hypertension to renally mediated increases in total body sodium.

### **Cardiac Fibroblasts and Heart Failure**

APS Cardiovascular Section

**Pamela A. Lucchesi and Willa Hseuh**

K. Weber, W. Hsueh, F. Villareal, J. Burnette, and S. Tyagi

The myocardium undergoes a dramatic remodeling in response to hemodynamic stress. A great deal of emphasis has been placed on the role of altered cardiomyocyte function during the progression of heart failure. Recently, a role for cardiac fibroblasts in ventricular remodeling has emerged. Recent studies have indicated that mechanical and neurohormonal changes that occur in response to hemodynamic overload exert a profound effect on cardiac fibroblast function. These changes include increased proliferation, secretion of cytokines and neuropeptides, and dynamic regulation of the extracellular matrix through altered synthesis of not only matrix components, but also enzymes that regulate matrix degradation. The purpose of this symposium is to highlight the recent advances made in characterizing altered fibroblast function during the progression of heart failure. Invited speakers will discuss a variety of topics ranging from the regulation of fibroblast growth and secretion by mechanical stretch and changes in the neurohormonal milieu, to the control of cardiac remodeling and fibrosis by altered fibroblast

secretion of extracellular matrix proteins and matrix metalloproteinases. The potential speakers are currently performing state-of-the art research in this area and future research directions will be included in the presentation. It is hoped that the audience will gain a better appreciation for the dynamic role of the cardiac fibroblast in the regulation of cardiac remodeling.

### **Physiology InFocus—Translating the Genome: Physiology and Pathophysiology of Obesity. Obesity and Cardiovascular Regulation**

**Allyn Mark and John Hall**

T. Kurtz, W. Haynes, and R. Unger

### **Adaptive Responses of Cardiac Muscle**

APS Muscle Biology (MyoBio) Group

**Ruben Mestril**

R. Mestril, I.J. Benjamin, P. Ping, R.C. Kukreja, and R.S. Vander Heide

Myocardial infarction represents one of the most severe stresses to the heart. The ischemia-reperfusion injury resulting from an infarction can seriously limit the contractile performance of the cardiac muscle. In recent years, a number of studies have demonstrated that the cardiac muscle is able to develop adaptive responses to protect itself against the ravages of ischemia-reperfusion injury. The discovery that a short period of reversible ischemia is able to condition the heart to a subsequent damaging ischemic event, a phenomenon known as preconditioning, has created an exciting area of research. The study of cardiac preconditioning has attracted the attention of many investigators in the cardiovascular field. These studies have made us aware that the cardiac muscle possesses a diversity of means in order to adapt to stress. Presently, the search for the cellular agents that trigger preconditioning has resulted in the discovery of many potential candidates for this function, among them adenosine, nitric oxide, protein kinase C, mitochondrial potassium ATPase channels, etc. In addition, to these potential triggers of preconditioning in the heart, a group of proteins known as the stress or heat shock proteins has also attracted much attention for their ability to protect cardiac muscle against ischemia-reperfusion injury. These proteins are known to be responsible for thermotolerance or the ability of the cell to become resistant to thermal stress and have also been found to produce cardioprotection in transgenic mouse models. It is therefore of interest to fully explore and investigate all the potential means by which the cardiac muscle is able to adapt to stresses such as ischemia-reperfusion injury.

This symposium brings together a group of new investigators deeply involved in the present and future search for the mechanisms responsible for this important adaptive response of the cardiac muscle.



### **The Sudden Infant Death Syndrome, Sleep, and Breathing**

APS Respiration Section

**Eugene Nattie**

H. Kinney, B.T. Thach, J.C. Leiter, R. Darnall, E. Nattie, and G. Richerson

Victims of the Sudden Infant Death Syndrome (SIDS) die in sleep, possibly due to disordered breathing and autonomic control. H. Kinney will describe brainstem abnormalities in receptor binding in the arcuate nucleus and medullary raphe of SIDS victims. B. Thach will outline findings in human infants on arousal, sleep, breathing and "programmed learning." Both will relate their data to SIDS epidemiology. Using a chronic newborn piglet model, we will report that disruption of a homologue of the arcuate region by muscimol microdialysis decreases CO<sub>2</sub> sensitivity, enhances the laryngeal chemoreflex (J. Leiter), and disrupts sleep architecture including arousals (R. Darnall). Similar disruption of the medullary raphe decreases CO<sub>2</sub> sensitivity and alters sleep (E. Nattie). G. Richerson will describe physiological properties of raphe neurons studied in vitro. Physiology studies in vivo and in vitro that are targeted by use of human pathological and physiological data can yield insight into the effects of specific neuron group dysfunction on protective reflexes that are possibly involved in the pathogenesis of SIDS.

### **Vascular Consequences of Oxidant Stress**

APS Cross-Sectional Symposium

**Bruce Pitt and Francis Miller**

F. Miller, A. Brzezinska, K. Griendling, H. Ischiropoulos, B. Freeman, and B. Kalyanaraman

The goal of this symposium is to present the latest information concerning the effects of free radicals and reactive oxygen species on vascular function and biology. We have brought together a blend of young scientists (F. Miller and A. Brzezinska) and established names in this field (B. Freeman, K. Griendling, and H. Ischiropoulos) from the American Physiological Society. We have also included B. Kalyanaraman as a speaker. B. Kalyanaraman is not a member of the APS, but is involved in the Oxygen Society and is an acclaimed free radical biologist/biophysicist. The talks will encompass a spectrum of the vascular consequences of free radicals and reactive oxygen species; the cellular sources of free radicals during oxidant stress and disease processes, movement of superoxide and peroxyntirite, both anionic species, through chloride channels; the signaling mechanisms by which reactive oxygen species exert their effects on cellular function and gene expression; the regulation of metabolism by reactive nitrogen species; regulation of oxidant stress by nitric oxide, and finally the biochemical and biophysical

mechanisms by which free radicals and reactive oxygen species modulate protein function.

### **Redox Control of Skeletal Muscle Adaptation**

APS Muscle Biology (MyoBio) Group

**Michael B. Reid and Scott K. Powers**

M. Reid, C.K. Sen, T. Clanton, S.K. Powers, M.B. Reid, and M. Jackson

Numerous studies indicate that redox factors play important roles in many aspects of skeletal muscle biology including the regulation of gene expression, control of numerous signaling pathways, muscle atrophy, and muscle injury. This symposium will focus on redox control of skeletal muscle adaptation. First, C. Sen will discuss redox-sensitive transcription factors and regulation of gene expression. Second, T. Clanton will provide an overview of redox issues related to skeletal muscle adaptation to heat stress and hypoxia. S. Powers will then explore the role that oxidative stress plays in skeletal muscle disuse atrophy. M. Reid will address the topic of muscle wasting associated with inflammatory diseases. Finally, M. Jackson will discuss the role of free radicals in skeletal muscle injury and apoptosis.

### **The Role of Angiotensin and Oxidative Stress in the Development of Hypertension**

Society for Experimental Biology and Medicine

**Juan C. Romero**

J.C. Romero, C. Wilcox, J. Reckelhoff, and L.J. Roberts, III

The mechanisms responsible for maintenance of hypertension in the presence of "normal" plasma renin activity have remained elusive. However, even with normal or decreased levels of angiotensin, blood pressure is normalized after administration of either converting enzyme inhibitors or angiotensin antagonists. Similar responses are observed in rat models of hypertension (i.e., spontaneously hypertensive rats, Dahl salt-sensitive rats, etc.). Most, if not all, of the characteristics of essential hypertension can be generated by infusing subpressor doses of angiotensin II (from 5 to 15 ng/kg/min); these produce a very significant increase of blood pressure on the third day of administration. This "slow response" to angiotensin II, which has been demonstrated in rabbits, dogs, rats, swine, and man, is indicative of a temporal requirement for activation of additional vasoconstrictor(s) process(es). One such process may be oxidative stress. In fact, angiotensin II stimulates production of superoxide via membrane NADH/NADPH oxidase activation. The chemical reaction of superoxide with nitric oxide yields peroxyntirite (OONO), a potent oxidant that could oxidize arachidonic acid and release antinatriuretic vasoconstrictors such as 8-iso-prostaglandin F<sub>2a</sub> (isopros-tane). Angiotensin II may also

stimulate endothelin synthesis (ET) that can be increased further by oxidative stress. The interrelationship between angiotensin II, oxidative stress, and ET could lie at the root of the pathophysiology of essential hypertension and may also explain gender differences in blood pressure since testosterone appears to stimulate angiotensin and oxidative stress. That these effects of angiotensin are specifically activated when tissue or plasma levels become inappropriately high with respect to existing fluid volumes, the clinical data demonstrating that many individuals with essential hypertension exhibit an inability to regulate angiotensin levels in response to volume expansion, and the animal and human studies showing that blockade or inhibition of oxidative stress and/or angiotensin results in normalization of blood pressure provide further evidence for the importance of oxidative stress in the development hypertension. This symposium will discuss these and other data related to this hypothesis.

### **Viruses, Ion Channels and Ion Transporters**

APS Cell & Molecular Physiology Section

**John M. Russell**

J.M. Russell, D. Benos, L.H. Pinto, and B.D. Freedman

Viruses are genetic material surrounded by a protein coat. They must enter host cells where they usurp host cell machinery in order to replicate. Different viruses use different mechanisms to cause the host cell to become an efficient viral incubator. In recent years, it has become increasingly evident that host cell mechanisms of transmembrane ion transport are among the key targets in the viral strategy of replication. The reasons for such targeting remain unknown. Studies of viral effects on host cell transmembrane ion transporters are likely to yield not only the expected information about specific viral effects, but perhaps more interesting (at least to membrane physiologists!) important new insights into mechanisms and functions of normal ion transport mechanisms. This minisymposium will highlight some of these effects of viruses and bring us up to date on what such studies can teach us.

### **Cyclooxygenase-2 and Renal Function**

Spanish Physiological Society and APS Renal Section

**F. Javier Salazar and Jurgen Schnermann**

C. Vio, R.C. Harris, J. Schnermann, and F.J. Salazar

The role of cyclooxygenase-derived metabolites in regulating renal function has been demonstrated in numerous studies performed by many groups. Contrary to other tissues and organs, in which only one cyclooxygenase (COX) isoform is constitutively expressed (COX-1), there is a constitutive expression of both COX isoforms (COX-1 and COX-2) in the kidney. The speakers selected for this symposium are well recognized investigators that have published several interest-

ing papers demonstrating the importance of the COX-2 derived metabolites in the regulation of renal function, in studies performed at multiple levels of investigation. The speakers will summarize the data obtained by their groups, and other groups working in this topic, demonstrating that COX-2 is constitutively expressed in the renal cortex and renal papilla and that COX-2 derived metabolites play an important role in the regulation of renin release, renal hemodynamic and sodium and water reabsorption. Results showing that there is an important interaction between COX-2 derived metabolites and other regulatory mechanisms (nitric oxide, angiotensin II and norepinephrine) in controlling renal function will also be presented.

### **Microcirculatory Society President's Symposium: Signaling in Cells of the Microvascular Wall**

The Microcirculatory Society

**Ingrid Sarelius**

M.J. Davis, J-L Bény, U. Pohl, and B. Duling

This symposium will highlight mechanisms of communication between cells of the microvascular wall and/or between the microvascular wall and the surrounding environment. The goal is to highlight recent advances in our understanding of signal transduction in smooth muscle or endothelial cells in the context of how they are reflected in functional responses of intact vessels.

### **New Paradigms in Neovascularization**

APS Cardiovascular Section and The Microcirculatory Society

**Gina C. Schatteman and Takayuki Asahara**

C. Drake, M. Hendrix, K. Havemann, and D. Bowen-Pope

For a number of years, two models of new blood vessel growth were used to describe all neovascularization in the embryo and adult. The first, angiogenesis, is described as the sprouting of new blood vessels from existing blood vessels through proliferation and migration of endothelial cells. Vasculogenesis is the coalescence of angioblasts into blood vessels in situ. Angiogenesis was generally considered the only process of neovascularization in the adult, whereas both angiogenesis and vasculogenesis are thought to occur in the embryo. Spawned by the re-discovery of angioblasts in adult peripheral blood and the finding that tumor cells can form vascular channels, recent studies suggest that vasculogenic processes occur in the adult. The precise identity of blood-derived angioblasts remains unclear, but it appears that cells capable of acting as angioblasts are ubiquitous in the adult. Concurrently with these studies, investigations in the embryo

also have begun to suggest that the embryonic angioblastic lineage may be far more diverse than originally thought as well. Complicating our earlier simplistic view of neovascularization is new data on the smooth muscle cell lineage, suggesting that after birth, at least some smooth muscle cells and endothelial cells share a related if not common lineage. This goal of this symposium is to outline these new data and suggest new paradigms for blood vessel formation in both the embryo and adult

### **Apoptosis and Organ Injury Mechanisms in Hypertension**

APS Cardiovascular Section and The Microcirculatory Society

**Geert W. Schmid-Schonbein and Matthew A. Boegehold**

G.W. Schmid-Schonbein, D.N. Granger, N.D. Vaziri, M.A. Boegehold, K. Griendling, and P. Hamet

One of the most important unresolved issues in hypertension research are the mechanisms that underlie enhanced organ injury in this disease. Increasing evidence suggests that generation of reactive oxygen species may be one of the central events in the progression of experimental and human forms of hypertension. Oxygen free radical formation may serve as a pro-inflammatory stimulus in addition to its role in the elevation of arterial pressure. Aside from enhancing arteriolar tone via inactivation of nitric oxide and a direct effect on vascular smooth muscle, free radicals may also be involved in the progression of lesion formation, apoptosis and organ injury. There is also compelling evidence for immune suppression with lymphocyte apoptosis.

This symposium will serve to discuss approaches that provide insight into these mechanisms as a basis for treatment modalities that would not only target the abnormal shift in the blood pressure but also alleviate accelerated organ injury and enhanced inflammatory response to vascular challenges.

The symposium speakers are active investigators in this emerging field with a broad perspective on molecular and microvascular approaches.

### **Epithelial Channels: Regulation by Differentiation and Growth Factors**

APS Epithelial Transport Group

**James D. Stockand and Stanley Rane**

S. Rane, F. Verrey, D. Ann, J. Stockand, Y. Marunaka, C-L Huang, and L. King

The activity and expression of numerous epithelial channels are regulated by signal transduction commonly associated with cell growth and differentiation. Recognized modulators of epithelial channels include the mitogen-activated protein kinase (MAPK) and phosphatidylinositol 3-kinase

(PI3K) cascades and signaling factors, such as phospholipids, associated with these cascades. Our understanding of the cellular mechanisms of action and the ramifications of modulation of epithelial channels by such signaling pathways are rudimentary. The current symposium, the first directly focused on exploring regulation of epithelial channel activity by growth and differentiation factors, primarily addresses two critical issues: 1) the cellular mechanisms of action of growth and differentiation signaling cascades on epithelial channels, and 2) the physiological consequence of such signaling events. The goal of this symposium is to increase our understanding of modulation of epithelial channels by signaling cascades not traditionally associated with regulation of channel activity, and to stimulate excitement and research into this emerging area of epithelial biology.

### **Neural Control of the Cerebral Circulation**

APS Neural Control & Autonomic Regulation Section

**William T. Talman**

F. Faraci, E. Hamel, C. Iadecola, M. Moskowitz, and W. Talman

It has been known since Willis's work well over 300 years ago, that the cerebral vasculature is richly innervated. Neural influences on cerebrovascular tone include those from local neurons, from central sites such as fastigial and trigeminal nuclei, and from peripheral sources such as sympathetic and parasympathetic ganglia. The richness and complexity of the innervation to cerebral blood vessels, the potential transmitters involved in modulating cerebral blood flow, the potential integration of neurally mediated physiological functions, and the possible relationships between disturbed physiological functions and human disease have begun to be the topic of great discussion and study over the past twenty years. This symposium will summarize some recent work in the area. Talman will provide a brief overview of the field. Moskowitz will address novel methods for analysis of the integration between cerebral flow and spreading depression and the role played by neural mechanisms in mediating cerebrovascular responses. Hamel will review contributions that her laboratory has made toward a better understanding of the neuroanatomy of the cerebral microcirculation and will discuss functional correlations of that innervation in the context of neurotransmitters released upon cerebral vessels. Faraci will review studies of putative neurotransmitters and other signaling molecules that modulate local cerebral blood flow in genetically altered mice and Iadecola will consider coupling of neural activity and blood flow and implications of that coupling both in health and in diseases such as Alzheimer's disease. At the conclusion of the symposium, audience participants will have experienced a review of the field and a glimpse of promising new directions and new methodologies from experts in the field.

### **Mesenchymal-Epithelial Interactions in Lung Development and Repair—Are Modeling and Remodeling One and the Same Process?**

APS Respiration Section

**John S. Torday**

B. Hogan, J. Shannon, F. DeMazo, and L. Schuger

Lung morphogenesis and repair are characterized by complex interactions between cells of endodermal and mesodermal origins, leading to an alveolar structure that can effectively exchange gases with the circulation. Current knowledge of this complex spatio-temporal process comes from disparate disciplines: developmental biology, immunology, pathology, and genetics. By comparing common cell/molecular changes within the context of development and repair, we may gain a clearer perspective on the underlying mechanisms controlling these processes. One unifying mechanism is the establishment and maintenance of homeostasis by the “attenuated fibroblast sheath” of the lung. We will explore the commonalities between these complementary processes. During the course of this symposium we will provide the developmental basis for cell/molecular control of lung development (Hogan), what is known about stem cells in the lung (DeMazo), and how they behave during lung development (Shannon) and disease (Schuger). The global mechanisms that mediate mesenchymal-epithelial interactions, the plasticity of mesenchymal cells in normal lung development and remodeling, provide a structure-function model which may bring these concepts closer together. At the conclusion of this symposium there will be a sense of the unifying mechanisms of development and repair. Each presenter will suggest future directions relevant to the central thesis.

### **Diagnosis and Treatment with Atrial Natriuretic Metabolism**

American Federation for Medical Research

**David L. Vesely**

J.C. Burnett, Jr., J.R. Dietz, D.G. Gardner, and D.L. Vesely

This symposium will concentrate on translational research of basic science findings of new cardiac hormones for the diagnosis and treatment of clinical disease is characterized by salt and water retention, such as congestive heart failure and acute renal failure. These hormones, synthesized mainly in the heart, consist of a family of peptide hormones that referred to as a group as atrial natriuretic peptides since they are synthesized mainly in the atrium of the heart and have natriuretic (i.e., salt excreted in) properties.

### **Genetic Adaptation to Cold**

APS Environmental & Exercise Physiology Section

**Lawrence Wang**

K.B. Storey, A. Cossins, B. Cannon, and S.L. Martin

The focus of this symposium is to examine and synthesize the phenomenology (ecological, physiological, biochemical and cellular) and regulation (neuroendocrinological, differential gene expression and proteomics thereof) of cold adaptation in animals living under diverse environmental challenges. Selected animal groups that combat against, conform to, or escape from cold will be representatively reviewed and compared. The anticipated outcome is to provide an integrated understanding how physiological homeostasis can be maintained through very different thermal tactics and how these may be supported through molecular manipulations.

### **Cellular Biomechanics in the Lung**

APS Respiration Section

**Christopher M. Waters**

C.M. Waters, R. Hubmayr, P.H.S. Sporn, and M. Liu

The lung is a mechanically dynamic organ, and cells in the lung are subjected to many different types of physical forces. For example, endothelial cells are subjected to shear stress due to fluid flow, and epithelial cells lining the airways and alveoli are exposed to tensile and compressive forces during the respiratory cycle. In the last ten years it has become apparent that most cells throughout the body sense their mechanical environment and respond to changes. Some of these responses include changes in intracellular ion concentrations, cytoskeletal rearrangement, and changes in gene expression. Although there are significant changes in lung mechanics during mechanical ventilation and in airway diseases such as asthma, little is known about how such changes affect cellular functions in the lung. In addition the mechanisms by which cells in the lung transduce mechanical signals into biological signals are not well understood. This symposium will feature talks that explore recent findings in cellular mechanotransduction in the lungs, including state-of-the-art techniques for subjecting cells to physical forces and monitoring functional changes.

### **Estrogen: A Potent Neuroprotective Factor**

APS Endocrinology & Metabolism Section

**Phyllis M. Wise**

M. Sano, P. Maki, P.M. Wise, and D. Brann

Several lines of evidence establishes that estradiol is a potent neuroprotective and neurotrophic factor: it influences memory and cognition, decreases the risk and delays of the onset of neurological diseases such as Alzheimer's disease or

# Experimental Biology 2002

## April 20-24, 2002 • New Orleans, LA

injury such as stroke, and attenuates the extent of cell death that results from experimental injury. Since more women will live a larger fraction of their lives in a postmenopausal, hypo estrogenic state than ever before, it is critical for us to understand the circumstances under which estradiol exerts protective actions and the cellular and molecular mechanisms that underlie these novel, non-reproductive actions. This symposium will discuss the newest findings from studies using diverse approaches that establish the circumstances under which estradiol exerts neuroprotective actions in the adult brain. Sano will discuss data from epidemiological studies that demonstrate that estradiol influences the incidence of Alzheimer's disease. However, the most recent findings warn us that estrogens may not restore cognitive function when neurodegenerative pathology is in progress. Maki will discuss the results of studies that demonstrate the effects of steroid replacement therapy on specific aspects of cognitive function and memory. Wise will discuss the use of an animal model of ischemic stroke in understanding some of the cellular and molecular mechanisms that underlie the protective actions of estradiol. Finally, Brann will discuss data that utilize in vitro methods to decipher the importance of neuron/glia interactions in mediating the protective effects of estradiol.

### Manipulations to Enhance New Tissue Formation

Biomedical Engineering Society

**Frank C-P. Yin**

J. West, M. Shoichet, E. Elson, C. Schmidt, A. Garcia,  
and R. Price

Engineered tissues can be achieved by many different methods. The most commonly used one to date involves using a scaffold on which one grows cells of interest. The scaffolds consist of man-made or natural materials that may or may not reabsorb. The major drawback to this approach is

the lack of control over the resulting mechanical properties of the tissue. As our understanding of cell biology increases, it has become clear that certain physical and chemical manipulations affect cellular morphology, signal transduction pathways, gene expression and the type and properties of extracellular matrix produced by these cells. This symposium explores some of these issues by focusing on the effects of various manipulations on the properties of the resulting tissues.

### Other Symposia

#### Techniques & Technology in Physiology Tutorial: Bioinformatics for the Physiologist

APS Physiological Genomics Group

**Peter Tonellato**

#### Bioinformatics in Physiological Genomics

APS Physiological Genomics Group

**Peter Tonellato**

#### How to Get Published in APS Journals

APS Publications Committee

**Dale Benos**

Dale Benos, M. Reich, A. O'Donnell

#### Microcirculatory Society Landis Award Lecture

The Microcirculatory Society

#### Microcirculatory Society Young Investigator Session

The Microcirculatory Society and APS Cardiovascular  
Section

**David Stepp**

### Public Affairs Symposium

#### "Everything You Ever Wanted to Know About the IACUC But Were Afraid to Ask"

Experimental Biology 2002

Saturday April 20

1-5 PM

Room 213 Convention Center

The quality of the ethical oversight of research involving humans and animals is under challenge as never before. This symposium will provide useful information about the IACUC process for review of animal research protocols. Recommended for both research scientists and IACUC members.

Featured topics include:

- IACUC Function and Responsibilities
- Protocol Review
- Troubleshooting: Where Do We Go From Here?

Co-sponsored by the APS, NIH's Office of Laboratory Animal Welfare, American Society for Pharmacology and Experimental Therapeutics, American Association of Immunologists, and American Association of Anatomists.

Contact Alice Ra'anan at [araan@the-aps.org](mailto:araan@the-aps.org) to register. Resource materials will be provided.

**Section-Sponsored Featured Topics**

*Muscle Fatigue*

**William Ameredes and Thomas M. Nosek**

*Formation of Epithelia in the Embryonic Kidney*

**Jonathan Barasch**

*Insights Into Epithelial Transport Physiology Gleaned From Interactions with Intestinal Pathogens*

**Kim Barrett**

*Signal Transduction Mechanisms for O<sub>2</sub> Homeostasis*

**Barbara S. Beckman and Nanduri Prabhakar**

*Eicosanoids and Fever*

**Clark M. Blatteis and Wieslaw Kozak**

*Energy Metabolism in Skeletal and Cardiac Muscle*

**Marco Cabrera**

*Neural Mechanisms Impacting Sodium Balance and Arterial Pressure in Hypertension and Heart Failure*

**Heimo Ehmke**

*Molecular Bases of Local Calcium Signaling*

**J. Kevin Foskett**

*Regulation of Vascular Tone: Parallel Versus Redundant Control Mechanisms*

**Jefferson C. Frisbee**

*Applications of Physiological Genomics: The Discovery of Novel Genes for Volume and Pressure Regulation*

**Andrew Greene**

*Physiological Genomics: Transgenic Models and Gene Regulation*

**Kenneth W. Gross and Robin L. Davisson**

*Redox Regulation of Vascular Function-Berne Lecture Featured Topic*

**David Harrison**

*Epithelial Calcium Channels: From Identification to Physiology and Pathophysiology*

**Matthias Hediger**

*Interfacing Molecular and Integrative Physiology of the Kidney: Na Transporters and Channels in Complex Disease Models*

**Mark Knepper**

*Microvascular Regulation in Genetic and Acquired E-NOS Deficiency*

**Akos Koller**

*Exercise-Induced Cardioprotection: Unique Insights From Cardiac, Smooth and Skeletal Muscle*

**Donna H. Korzick**

*Physiological Mechanisms of Neuronal Plasticity in the Mature Nervous System*

**Eve E. Marder and J. Michael Wyss**

*Protein Transport Across Lung Air-Blood Barrier*

**Asrar B. Malik**

*Membrane Transport Autoinhibitory Domains*

**Mark Milanick**

*Living at Extreme Temperatures: Genes to Organisms*

**Marina Marjanovic**

*Ventilator Induced Lung Injury: in vivo and in vitro Mechanisms*

**Michael Matthay**

*Helping Students Understand Physiology Through the Use of General Models*

**Harold Modell**

*Cardiovascular and Endocrine Control in Mice: A Mouse is Not a Small Rat*

**Marianna Morris**

*Integration of Volume Regulation and Cardiovascular Function, an Application of Comparative Physiology*

**Kenneth Olson**

*Physiological Genomics: Disease Gene Therapy*

**M. Ian Phillips and Curt D. Sigmund**

*Cardiovascular Genomics*

**Mohan K. Raizada and Kathleen Berecek**

*Oxygen Dependent Signaling in Pulmonary Vascular Smooth Muscle Cell*

**Usha Raj**

*Orthostatic Tachycardia and Hypotensive Syndromes*

**David Robertson**

*Skeletal Muscle Circulation: Neural and Mechanical Determinants-Wiggers Award Featured Topic*

**Loring B. Rowell**

*Chemoreflexes in Health and Disease: Recent Perspectives in Cardiovascular Control*

**Harold Schultz**

*Fetal Programming of Post-Natal Cardiovascular Regulation*

**Jeff Schwartz and Kent Thornburg**

*Gap Junctions in CO<sub>2</sub> Chemoreception*

**Irene C. Solomon and Jay B. Dean**

*Dietary Fat: Physiology and Metabolic Consequences*

**Patrick Tso**

*Proteinases: Novel Signaling Molecules in Gastrointestinal Function and Dysfunction*

**John L. Wallace**

*Sensory Afferents and Cardiovascular Regulation*

**Donna Wang and Steven Mifflin**

*Ontogeny of Cardiorespiratory Mechanisms: An Evolutionary Perspective*

**Stephen J. Warburton**

*History of Gastric Secretion*

**John B. West**

*Emerging Views of Epithelial Chloride Channels*

**N.K. Wills and P. Fong**

*Which Oxidase is the Most Important in Vascular Signaling?*

**Michael S. Wolin**

## Physiology and Experimental Biology 2001

Experimental Biology 2001 was held March 31-April 4 in Orlando, FL and was a joint meeting of seven FASEB societies. This was the first meeting since 1991 that included the American Society for Biochemistry and Molecular Biology (ASBMB) and the first meeting ever to include more than six principle-programming societies: APS, ASBMB, 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 American Association of Anatomists (AAA). The APS hosted six guest societies: The American Federation for Medical Research, Association of Latin American Physiological Societies, Biomedical Engineering Society, the Microcirculatory Society, Society for Experimental Biology and Medicine, and the Spanish Physiological Society.

The meeting was a technological milestone for two reasons: it was the first meeting where all abstracts were submitted via the world wide web and the first meeting to have data projectors in every oral session room to accommodate PowerPoint presentations or the like. As can be expected with the introduction of new technology, there were a few glitches; however, overall, the meeting benefited by these additions and they will be continued at future Experimental Biology meetings.

A total of 7,003 volunteered abstracts were submitted for presentation by the submission deadline, of which 35% (2,464) of the total abstracts submitted were sponsored by APS or its guest societies and 32% (2,219) of the total were submitted to APS topic categories. Additionally, 483 late-breaking abstracts were accepted, of which 20% (97) were from members of APS or its guest societies. Late-breaking abstracts were scheduled as posters on the last

day of the meeting and printed in the program addendum.

Of the 2,219 abstracts programmed by APS, 27% (603) had female first authors (representing a 5% increase over EB 2000) and 25% were received from institutions outside The Americas (representing a 6% increase). Government laboratories represented 4% (85) of the abstracts programmed and only 1% (30) was from industry. Table 1 provides the departmental affiliations of the abstracts programmed by APS and indicates that 18% (401) were from departments of physiology and 3% (63) were from departments of physiology and biophysics.

The APS programmed a total of 304 scientific sessions, including 177 poster sessions, 49 symposia, 46 featured topics, 16 lectures, five workshops, four Physiology InFocus symposia, three poster discussions, two tutorials, one refresher course, and one Public Affairs symposium. The lecture sessions included 12 Section Distinguished Lectureships, the Walter B. Cannon, Henry Bowditch, and Walter C. Randall lectures as well as The Microcirculatory Society's Landis Award Lecture.

The two tutorials were "Experimental Gene Delivery and Therapy" chaired by Craig Gelband and Curt Sigmund and "Tissue Engineering: Opportunities and

Challenges" chaired by Robert Nerem. The five workshops included "Integrative Approaches for the Study of Physiological Function in Genetically Altered Mice" chaired by John Lorenz and David Mattson; "How to Get Published in ASPET and APS Journals" chaired by Kim Barrett; "Peer Review and Publication of APS Journals," chaired by Dale Benos; "Collaborating with Industry: the Rules of the Game" chaired by Glenn Reinhart; and "Clinical Applications of Intravital Microscopy" chaired by Bruce Klitzman and Anthony Harris.

The Physiology InFocus Program, organized by Gerald DiBona, was entitled "Neurotransmitters in Cardiovascular Regulation" and included four symposia: "Neurotransmitters in Cardiovascular Regulation: Angiotensin" chaired by Roger Dampney; "Neurotransmitters in Cardiovascular Regulation: Glutamate" chaired by Frank Gordon; "Neurotransmitters in Cardiovascular Regulation: Nitric Oxide" chaired by David Bredt; and "Neurotransmitters in Cardiovascular Regulation: GABA" chaired by Alan Sved.

The APS Mixer was held on Saturday evening and included sumptuous desserts, dancing, and an opportunity to meet with colleagues in a relaxed, fes-

**Table 1. EB '01 Author Affiliations of Programmed Volunteered Papers**

Department	Number of Papers	% Total
Physiology	401	18%
Medicine	133	6%
Pharmacology	98	4%
Biology	74	3%
Physiology & Biophysics	63	3%
Cardiology Sciences	56	3%
Surgery	52	2%
Biomedical Engineering	32	1%
Pediatrics	32	1%
Neurosciences	26	1%
Anesthesia	26	1%
Biochemistry	24	1%
Anatomy	24	1%

## Experimental Biology

tive atmosphere. The third annual Young Experimental Scientist (Y.E.S.) Mixer, designed to enhance interaction between younger members of the participating societies, was held on Monday and was very well-attended.

The total meeting registration was 12,876 of which 11,028 were scientific registrants. The scientific registrants were represented by 5,211 (47%) members, 121 (1%) retired members, 2,863 (26%) nonmembers, and 2,833 (26%) students. There were 1,508 exhibitors registered, 107 guests of exhibitors, 177 guests of scientists, and 56 press registrants.

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



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### House Votes To Ban Human Cloning

On July 31, 2001, the House of Representatives voted to approve *The Human Cloning Prohibition Act of 2001*. This legislation, sponsored by Representative David Weldon (R-FL), would prohibit the process of human cloning for both reproductive and therapeutic purposes. Additionally, the bill would create civil and criminal penalties, of up to 10 years in jail and \$1 million in fines, for anyone attempting to clone a human being or receiving any embryo produced by human cloning techniques. The final vote of 265-162 came after six hours of debate.

"It is totally inappropriate for scientists to attempt human cloning," Congressman Weldon said in a press statement. "Once cloned embryos are available in the lab, it will be virtually impossible to prevent them from being implanted into a woman's uterus and will open the door to a *Brave New World* and a post-human future."

Members of the biomedical research community were alarmed at the vote and expressed disappointment that Congress acted hastily without considering alternative measures. Many had supported an amendment offered by Representative Jim Greenwood (R-PA). This measure would have banned human cloning but would have allowed private companies to create cloned human embryos and develop therapies from their cells. The House considered the amendment but rejected it on a 216-176 vote.

Most scientists oppose the cloning of a human being as too risky. However, many believe that useful therapies might be derived from cloned human embryos. They worry that banning all human embryo cloning would have a chilling effect on biomedical research. "Today's vote is a step backwards and if enacted will reverse progress that could affect potentially millions of patients," stated Carl Feldbaum, president,

Biotechnology Industry Organization.

Other scientific groups, such as the American Society for Reproductive Medicine, worried that unintended consequences could unfold as a result of this bill becoming law. "The Weldon bill prohibits American scientists from discovering potential cures for diseases like diabetes, Parkinson's and spinal cord injuries. If other countries discover these cures, this bill will make it illegal for American patients to use them," said Sean Tipton, spokesman for the Society.

Supporters of Representative Weldon's bill denounced cloning technology as immoral and grotesque. "By a decisive bipartisan vote, the House has acted to block the creation of human embryo farms, but the biotech firms will begin this ghoulish industry soon unless the Senate also acts," said Douglas Johnson, legislative director of the National Right to Life Committee.

A Senate counterpart to the Weldon bill, sponsored by Senator Sam Brownback (R-KS), has been introduced in the Senate. However, it is not scheduled for action and some insiders predict that it will have a hard time getting attention from the Democratic leadership in the Senate. ❖

### Representative Bilirakis Introduces NIH Revenue Generating Bill

In an effort to raise additional revenue for NIH, Congressman Michael Bilirakis (R-FL) introduced the Biomedical Research Assistance Voluntary Option Act (BRAVO) on April 3, 2001. "To win the war on cancer, AIDS, and other diseases, we must give medical researchers the tools they need," Bilirakis said in a statement. "Passage of the BRAVO Act will speed the day when scientists can find cures for these terrible illnesses and end patients' suffering."

BRAVO would amend the Internal Revenue Code of 1986 to allow taxpay-

ers to designate part or all of their tax refund to be used for biomedical research conducted by NIH. The minimum designation to NIH through this mechanism would be \$1.

The bill specifies that Congress could not reduce NIH appropriations in response to the funds taxpayers provided under BRAVO.

On June 27, 2001, the House Energy and Commerce Committee, Subcommittee on Health held a hearing on a number of bills and resolutions aimed toward advancing the public health, including the BRAVO Act.

On July 7, the Subcommittee on Health held a mark-up hearing where the BRAVO act was approved by voice vote. The bill is now awaiting final approval from the full Energy and Commerce Committee so that it can go to the House floor for a vote. ❖

### NIH Seeks Comments on IRG Plans

The Center for Scientific Review (CSR) at NIH is asking for public comments on proposed guidelines for two new Integrated Review Groups (IRGs): Musculoskeletal, Oral, and Skin Sciences (MOSS) and Biology of Development and Aging (BDA). This request is part of CSR's continuing efforts to reorganize NIH peer review under the framework first proposed in 1999 by its Panel on Scientific Boundaries for Review.

If your research falls within these two areas, you are strongly urged to comment on these proposals before they are finalized on October 17 (MOSS) and November 12 (BDA). If your areas of interest fall outside these IRGs, you are encouraged to follow the links from the CSR home page (<http://www.csr.nih.gov>) to determine when the IRGs for your own research interests come up for consideration.

When the Phase 1 report of the Panel  
*(continued on page 356)*

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on Scientific Boundaries for Review was first published in 1999, the APS wrote a letter of comment expressing concern that “the proposed alignment shortchanges many areas of both basic and applied physiological research.” The APS noted, “The proposed realignment appears to convey a bias toward reductionist approaches to the detriment of integrationist ones.” Despite the boundaries panel’s own statement that it wanted to provide “a home for the review of all science relevant to contemporary biomedical research,” many physiologists concluded that its recommendations failed to provide sufficient emphasis and review opportunities for integrative approaches to biomedical problems.

The CSR is currently involved in Phase 2 of the boundaries panel project, which involves refining the parameters of each proposed integrated review group (IRGs) by defining the research topics to be covered by its study sections. Each IRG will be considered in turn by a steering committee comprised of scientific experts and NIH staff, which will develop specific criteria for its study sections. Further explanation of this process and the order in which the IRGs will be considered is available at <http://www.csr.nih.gov/PSBR/IRGComments.htm>. This page also has information about recommendations currently open for comment:

The Guidelines for the MOSS IRG are open for comment until October 17 at <http://www.csr.nih.gov/PSBR/MOSS/MOSSIntro1.htm>.

The new BDA IRG guidelines are open for comments until November 12, 2001 at <http://www.csr.nih.gov/PSBR/BDA/BDAIntro.htm>.

Given that it has been several years since the CSR study section structure was revised, these proposals may have long-term implications for research opportunities and the NIH peer review process. A report on each proposed new IRG and study section guidelines will

be presented to the CSR advisory Committee, which will in turn make its recommendations to CSR Director Ellie Ehrenfeld. The public comment periods may represent the last opportunity to bring scientists’ concerns to CSR’s attention. ❖

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### Foundation for Biomedical Research Introduces Two New Pamphlets

The Foundation for Biomedical Research has just introduced two new pamphlets which highlight the advances in biomedical research due to the use of animal models and dispel many misconceptions associated with the use of animals in conducting research.

The first booklet, *The Proud Achievements of Animal Research*, offers a brief overview of the remarkable contributions that animal research has made in improving the lives of both humans and animals. In addition to providing poignant examples of the benefits of animal research, the booklet also provides an account of all the promises that would be lost if animal research were stopped or severely limited.

The second booklet, *Animal Research: Fact Vs. Myth*, is a timely document that aims at dispelling many of the myths associated with animal research. Many of the myths that are addressed include lost and stolen pets are sold to labs; there are no laws or regulations that protect research animals; and research animals are kept in pain and researchers are indifferent to the well-being of animals.

Both publications are available in Adobe PDF format on the Foundation’s Web site at <http://www.fbresearch.org> and can be purchased for \$0.25 per copy or the bulk discount price of \$0.10 for orders exceeding 200. Contact the Foundation for more details at (202) 457-0654. ❖

### President Bush Okays Limited Stem Cell Research

On August 10, President Bush made his long-awaited announcement regarding federal funding of research using human embryonic stem cells. Speaking from his ranch in Crawford, TX in his first nationally televised speech since his inauguration, Bush stated that the government would fund research on the 60 or so cell lines that had already been created. Bush also announced the decision to establish a President’s Council on Bioethics to be headed by biomedical ethicist Leon Kass of the University of Chicago to promote continued discussion of the ethical ramifications of this research.

The news of President Bush’s decision was met with mixed reviews from both the scientific community and antiabortion forces.

Many scientists involved in embryonic stem cell research felt that their work would be constrained by the limited number of cell lines they were allowed to work with, while others breathed a sigh of relief that at least for now, the door is open for some research to proceed. FASEB President Robert Rich expressed appreciation for the President’s decision, calling the announcement a positive step. Rich commented that FASEB is “pleased that the President decided that human embryonic stem cell research will be allowed to proceed with federal support and oversight, if only in a limited way.” Other scientists, including former NIH Director Harold Varmus, commented that the research community is “in a more fortunate place than we might have been,” had President Bush banned the technology at the onset of his term.

Other researchers were more critical of the decision. Ben Barres, who studies neural stem cells, said that that the Bush decision was wrong and would cause a brain drain to other countries

with fewer restrictions on stem cell research. One early casualty of the uncertainty over US policy was Roger Pedersen, an embryologist who is considered by many to be one of the foremost experts on stem cell research. Pedersen announced in mid-summer that he would move his laboratory to the UK because of concerns about the US stem cell research policies.

Antiabortion forces were equally divided on the Bush decision. The National Right To Life Committee, the largest anti-abortion group, announced that it was “delighted” with the President’s speech, as did Moral Majority founder Jerry Falwell. Even Pat Robertson, founder of the Christian Coalition praised Bush’s compromise, saying that the decision was “an elegant solution to the thorny issue of stem cell research by firmly protecting the rights of the unborn.”

However, many in the anti-abortion movement were stunned by the decision and asserted that the President had reneged on his pro-life campaign stance. Richard M. Doerflinger, spokesman for the United States Conference of Catholic Bishops, accused the President of sending the nation into an ethical dilemma: “By the time the scientists come forward with the next group of cell lines, that destruction (of embryos) will already have been done, too...where is the moral limit?”

With this policy, the NIH could theoretically start funding grants by as early as 2002. However, a number of problems remain. Some researchers question whether the already-existing cell lines are, in fact, usable, and whether their owners will be willing and able to make them available to other labs. These cell lines may not be suitable for all kinds of research. Furthermore, it will be very difficult to use them to develop therapies because most have been nurtured using embryonic mouse cells, raising the possibility that they are contaminated with murine diseases that might infect humans. ❖

### USDA Initiates Paperless Reporting

The US Department of Agriculture’s (USDA) Animal and Plant Health Inspection Service (APHIS) will this year offer research facilities the option of submitting annual report forms electronically. The annual report of research facility annual use (APHIS form 7023) is required under the Animal Welfare Act (AWA). APHIS was to send registered facilities instructions on how to complete an electronic filing of this form in mid-September.

Reports are due by December 1. According to APHIS Deputy Administrator for Animal Care W. Ron DeHaven, the electronically submitted data will go directly to the APHIS database. “The information will be more accurate and we will be able to save time and money by not using resources to input the data,” DeHaven said in a statement.

The Government Paperwork Elimination Act (GPEA) of 1998 requires federal agencies to make all their forms available for electronic filing no later than October 21, 2003. “We had been working toward electronic filing before GPEA was passed, so we are well ahead of the game,” according to DeHaven.

Animal Care is moving forward on other electronic information projects as well. In FY 2000, it made its web page accessible to the visually disabled, and Animal Care facility inspection reports conducted after October 1 will be made accessible to the public through the APHIS E-FOIA web page. However, in response to concerns raised by the research community, these reports will not be available for a 21-day period while they are processed and approved by the regional offices. The first reports will be available in late October, assuming no technical issues arise. All reports will still be available through the regional offices.

Questions about reporting information or access to inspection data may be addressed to Animal Care regional

offices or directed via email to the national office at [ace@aphis.usda.gov](mailto:ace@aphis.usda.gov). ❖

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### Asking Good Questions is Key to Science and Journalism

Rachel Davis

2001 AAAS/APS Mass Media Science Fellow

Hanging in the central staircase of the Manhattan *Newsweek* building is a three-story mosaic of the magazine’s famous covers—more than 67 years of exceptional journalism. Descending the stairs, you move through history viewing the faces of artists and actresses of the 1930s, military planes and bombers of the 1940s, and the fun colorful covers of the 1970s that took on more topical themes like Fashion and Jazz. It isn’t until the bottom of the staircase that a scientist’s eyes really begin to light up. Ebola, the brain, AIDS and malaria grace the covers of the 1990s. And today, the science stories are more specialized and even news-breaking. It is an exciting time to be a science writer.

When I decided to trade in my lab bench and microscope for a cubicle and telephone and spend the summer as an APS-sponsored AAAS Mass Media Fellow at *Newsweek*, I had no idea what to expect. While I was familiar with *Newsweek*’s exceptional staff of writers, I was not aware of its dedication to science coverage. I quickly discovered that *Newsweek* knows what its readers like and that science on the cover sells. (This was big lesson number one: the magazine is a business, and not an educational journal.) During my 10-week internship, we ran cover stories about an AIDS doctor with a promising new treatment, the design of an artificial heart, the stem cell debate, biological clocks and fertility, and skin cancer.

While reporting on stories that  
*(continued on page 358)*

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included the biology of aging, hybrid engines, angiogenesis, and the physics of wet sand, I interviewed top scientists and CEOs, attended press conferences, and learned to write about the history and story behind the facts. Although demanding, I enjoyed the challenge of learning about new research areas that were unfamiliar to me.

I learned about new demands faced by the writers at a weekly magazine in this era of "24/7" news. *Newsweek* no longer wants to just recap the week's stories since newspapers and TV saturate the public well before the magazine goes to press. Writers and reporters must constantly read and analyze scientific findings, asking interesting questions in order to find unique story angles. As a physiology student, I had learned that the most important thing a research scientist can do is to ask the right questions. I found out that the same is true in science journalism.

The addition of the web site to the weekly magazine has also changed what is expected of a science writer. The *Newsweek*-MSNBC web site hosts a live chat and question and answer session with the cover story writer each week. Since health coverage appears to be the most popular topic among readers, the web page often resembles WebMD more than a weekly news magazine. Readers ask questions that they would normally ask their doctors. Without overstepping boundaries of actually giving medical advice, the science writers provide valuable information and direct readers to a number of the best resources.

With a weekly readership of over 22 million, *Newsweek* is able to reach a mass audience including those who need information such as a new treatment option, good doctors, or simply a personal story they can relate to. Having my first reporting experiences at a major publication gave me the opportunity to witness this immense power of the written word first hand.

It was a bit frightening when I was asked to do one of my first big interviews with Geraldine Ferraro, the former New York congresswoman and vice presidential candidate who has Multiple Myeloma. However, she was very easy to talk to, and, in fact, she made it clear to me just how important good science journalism is. When the *New York Times* did an article on her efforts to raise public awareness about this cancer, it generated more than a half million hits on the Multiple Myeloma Research Foundation web site. "And your article will help get the word out," she told me.

Regardless of whether or not any of the AAAS fellows should decide to pursue science writing after this summer, the experience will enhance our careers as both scientists and teachers. It has made clear the many demands and skills that must be cultivated in order to be successful in this exciting field, and has provided us with a great start. I thank the APS for sponsoring me and hope that this fellowship continues to offer graduate students the same wonderful opportunities. ♦

### APS to Sponsor 2002 Mass Media Fellowship

For the fourth consecutive year, APS will sponsor an American Association for the Advancement of Science (AAAS) Mass Media Science and Engineering Fellow for summer 2002. Applications are due to the AAAS by **January 15, 2002**.

The APS-sponsored fellow will be one of approximately two dozen AAAS Mass Media fellows who will spend 10 weeks during the summer working in the newsrooms of newspapers, magazines, Internet news outlets, or radio or television stations. Fellows will receive a short training course in science journalism prior to the fellowship, and will spend the summer developing their ability to communicate complex scientific issues to non-scientists and improving public understanding of science. The AAAS arranges placements at participating media outlet as part of the selection process. The fellowship includes travel to Washington for orientation and evaluation sessions at the beginning and end of the summer, as well as travel to the job site and a weekly stipend based upon local cost of living.

Individuals must be currently enrolled as a graduate or postgraduate student of physiology or a related discipline to apply for the APS fellowship. The application form is available in the "Awards for Students" section of

the APS website at [http://www.the-aps.org/awards/awd\\_student.htm#AAAS](http://www.the-aps.org/awards/awd_student.htm#AAAS). Additional fellowships are available for students in other scientific and engineering disciplines. Information about the program is posted on the AAAS Education and Human Resources Directorate website at [http://ehrweb.aaas.org/ehr/3\\_4\\_0.htm](http://ehrweb.aaas.org/ehr/3_4_0.htm). A brochure with additional information about the program is also posted on both web sites.

In addition to the application form, applicants must submit a current résumé, a three- to five-page sample of writing directed to the general public, transcripts of graduate and undergraduate work, and three letters of recommendation. Two of the 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 under-represented communities, including African-Americans, Hispanics, Native Americans, and scientists with disabilities.

The application deadline is **January 15, 2002**. For more information or to receive a copy by mail, contact Alice Ra'anani in the APS Office of Public Affairs. (Telephone: 301-530-7105; e-mail: [araanani@the-aps.org](mailto:araanani@the-aps.org).)

# Sustaining Associates

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Expertise in sports nutrition and exercise sciences is one of the unique and distinguishing attributes of The Gatorade Company. To further this expertise, the Gatorade Sports Science Institute was founded in the mid-1980's to fully explore the role of fluid homeostasis and nutrient metabolism in exercise performance. Scientific research is conducted at the Gatorade Sports Science Institute and in cooperation with university researchers around the world. Gatorade employs exercise scientists who specialize in exercise physiology, biochemistry, and nutrition research. (Gatorade thirst quencher is the world leader in the sports drink category, and is made by The Gatorade Company, a wholly owned subsidiary of The Quaker Oats Company.)

### 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.

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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, OH; Norwich, NY; Hunt Valley, MD; Mexico City; Caracas, Venezuela; Brussels, Belgium; Egham and Newcastle, England; and Kobe, Japan.

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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 and 3,000 employees in R&D.

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marily 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 maxi-

mize 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.

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## Book Review

### Symmorphosis: On Form and Function in Shaping Life

Ewald R. Weibel

Cambridge, MA: Harvard Univ. Press, 2000, 256 pp., illus., index, \$45.00  
ISBN: 0-674-00068-4

This slender book is an updated version of the J.M. Prather Lectures delivered by Prof. Weibel at Harvard University in May 1995. It should be read by all serious-minded, thinking integrative physiologists. Whether or not one agrees with the underlying assumptions and the ways in which the central arguments are worked out, the book is an elegantly organized and well written summary of the major results from one of the best long term, synergistic, intensely creative research partnerships in integrative physiology in recent times. This was the partnership between the author and C. Richard Taylor, who unfortunately passed away prematurely in 1995. Weibel, Taylor, and their many collaborators and students over a period of more than 20 years produced both large numbers of excellent papers relating to the central idea of this book, but also the central idea itself. The idea has major heuristic value for physiological researchers.

As stated in the Preface (p. xii) the principle of symmorphosis postulates "that the quantity of structure incorpo-

rated into an animal's functional systems is matched to what is needed: enough but not too much." The book elaborates upon this theme through a detailed description of mammalian respiratory systems at many levels from the subcellular to the organismic. Tests of the validity and utility of the principle are made for these systems without undue amounts of hand waving and over generalizing. The systems are considered as longitudinally integrated series of steps for oxygen and substrate fuel movements from the outside world to the cells. Assessments are made of degrees of matching of the capacities of each of the steps and of possible optimization of the structures and rate processes involved. Interesting issues are raised relating to possible safety factors built into capacities and engineering design principles manifested in the structures of the organ systems involved. The closing chapter summarizes Weibel's personal views as to major open questions remaining and various conclusions he considers justified.

From this reviewer's perspective the concept and the book are both fascinating and provocative for as far as they go, but the book, at least, does not go far enough. This is why I used the term heuristic to describe it. The treatment is less comparative and less evolutionary in its perspectives than it could be. It considers only capacity adaptations of

animals. It does not consider resistance adaptations, the second major category of physiological adaptations that are often critical to animal survival in nature.

A great deal of additional work will be required to determine the extent to which the principle of symmorphosis is truly useful, both theoretically and practically. There are many issues involved. Important critiques considering various of these issues have been written by Dudley and Gans (*Physiol. Zoology* 64:627-637, 1991), Lauder (in Rose and Lauder (eds), *Adaptation*, pp. 55-91, 1996), and Plotnick and Baumiller (in Erwin and Wing (eds), *Paleobiology* 26 (suppl.):305-323, 2000). Many papers have also appeared in which the authors have been stimulated to try to apply the principle to such different subject areas as enzyme compensation in metabolic pathways in tunafish muscle (Fudge et al., *AJP: Regulatory Integrative Comp. Physiol.* 280:R108-R114, 2001) and growth of fish larvae (Osse et al., *Aquaculture* 155:249-258, 1997). These latter efforts have been unevenly successful.

This is one of the more stimulating and thought provoking books about animal physiology that has appeared in many years. Read it. ♦

Malcolm S. Gordon  
University of California, Los Angeles

### The Osteoporosis Primer

Janet E. Henderson and David Goltzman (Editors).

New York: Cambridge Univ. Press, 2000, 372 pp., illus., index, \$64.95  
ISBN: 0-521-64446-1

As late as the 1970s osteoporosis was one of those rare diseases of bone metabolism of which medical students were taught practically nothing and textbooks devoted no more than a line or two. The lay public, of course, had hardly heard of this disease, let alone

worry about its socioeconomic impact. What a huge difference 30 years have made. Osteoporosis is now recognized as one of the leading causes of morbidity and mortality among the aging populations of the western world, affecting 18 million North Americans. Warnings of its dire consequences, if untreated, flash across the television screens several times every day and are a common topic of daytime talk shows.

Justifiably so, osteoporosis has attracted major attention by researchers and clinicians alike. Thousands of sci-

entific papers are now published every year dealing with all aspects of the disease from the genetic, cellular and molecular mechanisms of its pathogenesis to its clinical features, epidemiology, diagnosis, prevention, and treatment. This rapid evolution of the topic has undoubtedly created the need for an *Osteoporosis Primer*: an introductory textbook for medical students, house-staff officers, general practitioners, geriatricians, rheumatologists, gynecologists, and endocrinologists.

The *Osteoporosis Primer*, edited by

## Book Review

Henderson and Goltzman, promises to provide such a text in a way that will relate the clinical presentation of the disease to its molecular and biochemical basis. It consists of 25 chapters that have been divided into four sections: 1) molecular and cellular environment of bone; 2) determinants of peak bone mass; 3) pathophysiology of the aging skeleton; and 4) clinical aspects of osteoporosis. For a small size volume, 372 pages, the book covers many topics. They range from the basic biology of the specialized bone cells, the osteoblast and osteoclast, to the role of local factors (e.g. cytokines and growth factors) and the systemic hormones involved in the regulation of these cells, to the genetic and nutritional determinants of bone mass acquisition during childhood and adolescence, to cellular and biochemical mechanisms, to the radiologic and biochemical means of diagnosing the disease, and finally the commonly used drugs for its treatment: estrogens, selective estrogen receptor modulators, bisphosphonates, and parathyroid hormone peptides.

The majority of the authors are Canadians and most of them are well recognized experts in the field. I found several of the chapters (especially chapters 11, 12, 13, 14 and 15) well written, informative and useful even for afi-

cionados. This is the strength of this textbook. However, the *Osteoporosis Primer* as a whole does not deliver on its promise to provide a cohesive and integrated presentation of osteoporosis for the uninitiated. In fact, most of the authors of the basic chapters do not even mention the word osteoporosis, whereas the authors of some clinical chapters seem unaware of the recent basic science developments. It is widely accepted that irrespective of the specific cause, be it sex hormone deficiency, old age, or the adverse effects of glucocorticoid excess, the disease results from a derangement in the physiologic regeneration of the skeleton by the process of bone remodeling. Yet, the essential features of remodeling and its relevance to the pathophysiology of osteoporosis are for the first time mentioned in chapter 15. The exciting new discoveries of the receptor activated nuclear factor  $\kappa$ B (RANK) and its ligand (RANKL) are repetitively addressed in several chapters but there is no attempt to link them to pathophysiology, except in chapter 15. A few chapters are completely unrelated to osteoporosis and the one dealing with biochemical markers of bone turnover provides information that, in my opinion, is uncritical and confusing. Finally, the review of the various therapeutic

agents, as a whole, deals with the topic unevenly. The book devotes two chapters on vitamin D analogs and fluoride, which are no longer considered useful therapies for osteoporosis, while completely ignoring non-pharmacologic modalities and very useful lifestyle changes.

The general reader will find useful information in the *Osteoporosis Primer*, and those familiar with the topic will enjoy several of the minireviews provided by the individual chapters. However, this is hardly the teaching tool or, as the title implies, the *primer* that will introduce the reader smoothly into the essential principles and concepts one needs to appreciate in order to understand this multifactorial disease of the skeleton. If the uninitiated reader looks for a concise textbook integrating the molecular biochemical basis of the disease to its clinical presentation and its management, he will not find it here. However, all in all, the *Osteoporosis Primer* represents a useful addition to the ever-expanding literature on the basic and clinical aspects of osteoporosis, and, as such, is recommended. ♦

Stavros C. Manolagas  
University of Arkansas for Medical Sciences

## Books Received

*Advances in Insect Physiology*, Vol. 28.  
P.D. Evans, (Editor).  
San Diego, CA: Academic, 2001, 339 pp.,  
illus., index, \$109.95.  
ISBN: 0-12-02424228-1.

*Gravity and the Lung. Lessons  
from Microgravity.*  
*Lung Biology in Health and Disease*, Vol. 160.  
G. Kim Prisk, Manuel Paiva, and John B.  
West. (Editors)  
NY: Marcel Dekker, 2001, 383 pp., illus.,  
index, \$175.00.  
ISBN: 0-8247-0570-X.

*High Altitude: An Exploration of Human  
Adaptation.*

*Lung Biology in Health and Disease*, Vol. 161.  
Thomas F. Hornbein and Robert B.  
Schoene (Editors).  
NY: Marcel Dekker, 982 pp., illus., index,  
\$235.00.  
ISBN: 0-8247-0313-8.

*Optical Mapping of Cardiac Excitation  
and Arrhythmias.*

David S. Rosenbaum, and José Jalife,  
(Editors).  
NY: Futura, 458 pp., illus., index, \$99.00.  
ISBN: 0-87993-481-6.

*Respiratory Physiology of Newborn  
Mammals: A Comparative Perspective.*

Jacopo P. Mortola.  
Baltimore, MD. Johns Hopkins Univ.  
Press, 344 pp., illus., index, \$89.95.  
ISBN: 0-8018-6497-6.

*Visible and Near Infrared Absorption  
Spectra of Human and Animal  
Haemoglobin: Determination and  
Application.*

W.G. Zijlstra, A. Buursma, and O.W. van  
Assendelft.  
Boston, MA: VSP, International Science  
Publishers, 368 pp., illus., index, \$124.00.  
ISBN: 90-6764-317-3.



## Positions Available

**Director of Research Training:** The Research Programs at Children's Hospital of Philadelphia is expanding training opportunities for faculty, research staff, and others in areas related to research conduct, clinical trials, and other compliance areas. The increasing emphasis on issues of compliance within the research enterprise has resulted in the need to deliver and ensure effective training. Training will be across a variety of delivery modalities and to a number of constituencies in a variety of areas. As Director of Research Training, you will manage the assessment of needs and facilitate the design, delivery, and evaluation of hospital-wide education and training programs in research-related areas. You will also serve as a senior faculty member by delivering training or providing content area experts—physicians, researchers, study coordinators, and staff—with training in instructional methods and delivery. You will work with content area staff to develop training materials, curriculum, and evaluation methods. You will also provide internal consulting services to leadership to meet strategic learning and effectiveness needs of the research enterprise and to create publications, reports, and other supporting documents to advertise, evaluate, and report on educational activities. Finally, you will also ensure record keeping and support services to training function. A Graduate Degree in adult learning, organizational psychology, or related areas or an advanced degree in biomedical area with extensive experience in training is required. You should also have demonstrated experience with adult training in areas of research ethics or have an advanced degree in biomedical or health care. A minimum five years experience in design, facilitation, and implementation of training programs to faculty, staff, students, and postdoctoral fellows in relevant areas is essential. You will enjoy our excellent health, vision, and dental benefits; tuition assistance; employer contribution retirement plan; public transportation and parking subsidy; as well as extensive training and staff development. Apply online at <http://careers.chop.edu> or fax your resume to 215-590-3184. Use reference ID 52. [EOE]

**Investigator/Senior Investigator:** Sound judgment and leadership will be required for the person in this position to establish and manage in vivo pharmacological/physiological evaluations and measurements, as well as establish and identify new in vivo screens related to disease. The candidate will assume an increased leadership role in the study of genetically modified rodents and their phenotypes and will build multidisciplinary research collaborations. In addition to a PhD in physiology or pharmacology, we are looking for individuals with backgrounds in the effects of drugs in cardiovascular or genital-urinary systems or in oncology and bone/metabolism. One to four years of industrial or academic postdoctoral experience is also required. (Job Code: 01-0716) Contact: Lisa DiMidio, GlaxoSmithKline, One Franklin Plaza, PO Box 7929, Philadelphia, PA 19101. Phone: 215-751-3591; Email: [Lisa.A.DiMidio@gsk.com](mailto:Lisa.A.DiMidio@gsk.com).

**Research Investigator 1:** The opportunity to make extraordinary advances in pathophysiology awaits you. As a Research Investigator, you will work as part of a multi-disciplinary team to identify and evaluate potential drug discovery targets. You will also establish and validate in vitro and in vivo assays/models in the study of the pathophysiology of muscle loss/body composition change. You will be responsible for conducting studies, collecting and analyzing data, and preparing oral presentations and manuscripts for publication. Requirements include a PhD in physiology, pharmacology, biochemistry, or other related biological science. You must have a minimum of two years postdoctoral work research experience in skeletal muscle biology, in vivo and in vitro skills, and broad computer skills. Experience in nuclear receptor biology is a plus. Excellent communication skills and the ability to work well as a member of a team are highly recommended. GlaxoSmithKline, located in Research Triangle Park, NC, is dedicated to an innovative workplace and supports you with career-long opportunities and learning. We offer a competitive benefits and compensation package designed to attract and retain the very best. For confidential consideration and efficient processing, please visit our website at <http://www.gsk.com>, indicating Job Code #12003. Principals only, no agencies please. Developing talent through equality of opportunity, M/F/D/V.

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

Ads are accepted for either positions available or positions wanted under all categories. The charge is only \$75. All ads are also posted on the APS Career Opportunity Web page immediately upon receipt until the deadline has past.

If you would like to have your ad listed in *The Physiologist* or on the APS Career Opportunities Web page,

the following items are needed: a copy of the ad, the name of a contact person, and either a purchase order number, credit card number (with expiration date and name of cardholder), or billing address. Send the information to Linda Comley (Email: [lcomley@The-APS.org](mailto:lcomley@The-APS.org); phone: 301-530-7165; fax: 301-571-8305).

## Positions Available

**Associate Scientist/Scientist/Senior Scientist:** Along with conducting studies in cardiovascular, genital-urinary, bone and metabolic, and oncology systems, the candidate will conduct and analyze in vivo studies in rodents, including microsurgical techniques and pharmaceutical manipulations. The person in this position may be called to develop and independently validate new neurological/physiological/phenomic endpoint measurements. A BS/MS degree in pharmacology, neuroscience, biology, or an equivalent field with 1-10 years of experience performing in vivo laboratory experience is necessary. Familiarity and/or demonstrated hands-on expertise with biochemistry, blood flow methodology/electrophysiological techniques, fluoroscopy, microPET, microCT, MRI, and/or ultrasound is highly desired. (Job Code: 01-0717). Contact: Lisa DiMidio, GlaxoSmithKline, One Franklin Plaza, PO Box 7929, Philadelphia, PA 19101. Tel.: 215-751-3591; Email: Lisa.A.DiMidio@gsk.com.

**Biological Science Assistants:** The US Army Research Institute of Environmental Medicine (USARIEM) in Natick, MA has multiple positions available for qualified Biological Sciences Assistants. USARIEM conducts basic and applied research concerning optimization of performance under stressful conditions and avoidance of associated medical problems. The positions require enlistment into the US Army for six years with the assignment at USARIEM, which is in the Boston suburbs. Educational requirement is a Bachelor's or Master's Degree in biology, physiology, microbiology, exercise science, nutrition, biomechanics or biochemistry. Applicants should have a history of high academic achievement and be highly motivated. Previous experience as a research technician employing procedures related to either human, animal, tissue and/or molecular research is desired. Benefits include student loan repayment of up to \$55,000, housing, medical care, graduate educational opportunities, as well as excellent research experiences in a variety of scientific disciplines, including environmental and exercise physiology, nutrition and metabolism, pathophysiology, genomics, and molecular biology. The open positions are located in the Military Performance Division, Military Nutrition Division, and Thermal and Mountain Medicine Division. Candidates can obtain further information by sending a letter of interest and resume or CV to: Dr. Kent B. Pandolf, Senior Scientist, US Army Research Institute of Environmental Medicine, Natick, MA 01760-5007. Tel.: 508-233-4832; Email: Kent.Pandolf@na.amedd.army.mil.

**Research Associate:** The Cardiothoracic Surgery Research Laboratory in the Department of Surgery at the University of Kentucky College of Medicine is seeking a Research Associate to conduct in vivo studies of myocardial stunning and infarction. Applicants should have a PhD, MD, or DVM degree and 1-2 years of experience with in vivo models. Special consideration will be given to candidates with surgical experience in large animals and experience in measuring regional ventricular function. Mechanistic studies will also be performed in isolated hearts and myocytes. The qualified candidate should be self-motivated and able to work independently and contribute to experimental design. The position is available immediately. Candidates should send a curriculum vitae to: Robert D. Lasley, PhD, Director of Research, Department of Surgery, University of Kentucky College of Medicine, MN276 Chandler Medical Center, 800 Rose Street, Lexington, KY 40536-0298. Fax: 859-323-8141; Tel.: 859-323-3372; Email: rlasley@pop.uky.edu. Email applications are encouraged. [EOE/AA]

**Bioanalyst:** The Joseph Stokes Jr. Research Institute of The Children's Hospital of Philadelphia currently has a Bioanalyst position available to work in our Metabolic Diagnostic Laboratory. Position requires a PhD degree in biochemistry or chemistry, preferably with two years post-doctoral experience. Knowledge of biochemical techniques such as gas chromatography/mass spectrometry, tandem mass spectrometry, enzyme-substrate analysis and metabolite/analyte determinations and familiarity with mitochondrial procedures is emphasized. The Metabolic Diagnostic Laboratory serves as the reference laboratory in the Mid-Atlantic region for the diagnosis of inborn errors of metabolic/genetic diseases. These include inherited organic acid, amino acid and carbohydrate disorders, as well as lysosomal storage diseases (lipidosis and mucopolysaccharidoses), peroxisomal diseases and mitochondrial abnormalities. Contact Michael J. Palmieri, PhD, Technical Director at 215-590-3394. We offer competitive compensation packages: medical, vision, dental and life insurance; discounts on public transportation and employee parking; tuition assistance; training and staff development; generous paid time off; employer contribution retirement plan; and work/life benefits. You may also apply online at <http://careers.chop.edu> or fax your resume to 215-590-3184. Reference ID 53 and be sure to indicate position(s) of interest. Join one of the leading pediatric research facilities in the nation. With over \$65 million in research grants each year, The Joseph Stokes Jr. Research Institute of The Children's Hospital of Philadelphia is a pioneer in pediatric medicine.

## Positions Available

**Exercise Biologist:** The Division of Biological Sciences, University of California, Davis, invites applications and nominations for a position in exercise biology. This is a tenure-track faculty position at the level of Associate Professor or Professor, as appropriate to the candidate's qualifications. The position will be in the Exercise Biology Program with a joint appointment in the Section of Neurobiology, Physiology & Behavior. A PhD (or equivalent) and postdoctoral experience is required. The candidate must have an outstanding record of research achievement and a strong independent research program in exercise biology. Particular attention will be afforded candidates who have an integrative perspective and employ mechanistic approaches to address important issues in exercise biology, such as skeletal muscle physiology/development, muscle adaptation to exercise, or aging. The successful candidate will be expected to teach undergraduate and graduate level courses in exercise biology/exercise science and participate fully in the teaching and advising programs coordinated by the Divisions of Biological Sciences and Graduate Studies. A senior appointee would also be expected to take a leadership role within the Exercise Biology Program. Applications should include: 1) curriculum vitae (with email address), 2) statement of current and proposed research interests, 3) three relevant reprints, 4) statement of teaching experience/interests, and 5) names, telephone numbers, and addresses (postal and email) of at least three references. Candidates should also arrange to have their reference letters mailed directly to the Committee Chair. All materials should be sent to: Charles A. Fuller, Chair, Exercise Biology Search Committee, Exercise Biology Program, University of California, One Shields Avenue, Davis, CA 95616-8674. Closing date: open until filled, but all materials must be received by **September 28, 2001** to be assured of full consideration. The University of California, Davis, is an affirmative action/equal opportunity employer with a strong institutional commitment to the development of a climate that supports equality of opportunity and respect for differences.

**Assistant Exercise Biologist:** The Division of Biological Sciences, University of California, Davis, invites applications and nominations for a faculty position in exercise biology. This is a tenure-track position at the level of Assistant Professor. The position will be in the Exercise Biology Program with a joint appointment in the Section of Neurobiology, Physiology & Behavior. A PhD (or equivalent) and postdoctoral experience are required. Candidates must have an outstanding record of research achievement and will be expected to develop a strong independent research program in exercise biology. Particular attention will be afforded candidates who have an integrative perspective and employ mechanistic approaches to address important issues in exercise biology, such as skeletal muscle physiology/development, muscle adaptation to exercise, or aging. The successful candidate will be expected to teach undergraduate and graduate level courses in exercise biology/exercise science and participate fully in the teaching and advising programs coordinated by the Divisions of Biological Sciences and Graduate Studies. Applications should include: 1) curriculum vitae (with email address), 2) statement of current and proposed research interests, 3) three relevant reprints, 4) statement of teaching experience/interests, and 5) names, telephone numbers, and addresses (postal and email) of at least three references. Candidates should also arrange to have their reference letters mailed directly to the Committee Chair. All materials should be sent to: Charles A. Fuller, Chair, Exercise Biology Search Committee, Exercise Biology Program, University of California, One Shields Avenue, Davis, CA 95616-8674. Closing date: open until filled, but all materials must be received by **September 28, 2001** to be assured of full consideration. The University of California, Davis, is an affirmative action/equal opportunity employer with a strong institutional commitment to the development of a climate that supports equality of opportunity and respect for differences.

**Physiologist:** The Department of Exercise Science at The University of Iowa invites applications for a tenure-track faculty position commencing in August 2002. The position will be filled at the assistant professor level (beginning or advanced). Applicants must have a PhD or equivalent degree and a strong potential to attract external funding. Postdoctoral training and teaching experience are highly desirable. Applications are invited from candidates investigating areas broadly related to integrative and exercise physiology. Research approaches can range from the cellular to the system level. Duties will include the development of a

strong independent research program and participation in the teaching of undergraduate and graduate courses in the broad areas of integrative and exercise physiology. Review of applications will begin in October 2001 and continue until the position is filled. Submit an application letter, curriculum vitae, selected reprints, a statement of research interests, and the names and contact information of three references to: Dr. Kevin C. Kregel, Department of Exercise Science, 532 FH, The University of Iowa, Iowa City, IA 52242. Minorities and women are especially encouraged to apply. [EOE/AA]

## Positions Available

**Faculty Position in Molecular Imaging:** The Departments of Physiology and Radiology, Michigan State University, invite applications for a full-time tenure-track appointment at the Assistant/Associate Professor level. The successful candidate will be expected to develop an independent research program that exploits physiological or molecular imaging methods. Individuals whose research exploits modern NMR for study of chronic diseases, e.g., detection of brain function, tumors, metabolic and/or cardiovascular disorders, are encouraged to apply. Candidates must hold a PhD, MD, or equivalent doctoral degree; have postdoctoral experience; and demonstrate potential for developing a vigorous externally funded research program and outstanding teaching in the department's educational program. Interested individuals should provide a complete curriculum vitae, 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 **December 1, 2001** and continue until the position is filled. Applications should be sent to: Ronald A. Meyer, PhD, Chairperson, Molecular Imaging Search Committee, Department of Physiology, Michigan State University, East Lansing, Michigan 48824-1101. Email: [rmeyer@pilot.msu.edu](mailto:rmeyer@pilot.msu.edu); web page: <http://www.psl.msu.edu>. Handicappers have the right to request and receive reasonable accommodation. [EOE/AA]

**Douglas L. Gordon Endowed Chair In Diabetes & Metabolism:** The Pennington Biomedical Research Center, a research facility of Louisiana State University, invites qualified applications for an academic/research position. The successful candidate will have an MD or PhD, an extensive research background in diabetes and metabolism, and a minimum of 10 years of experience with a strong publication record. The candidate will have independent grant support, leadership ability, and an established national and international reputation in the field of diabetes and metabolism. The successful candidate will be appointed as Professor and holder of the Douglas L. Gordon Chair in Diabetes and Metabolism. Applications, including cover letter, curriculum vitae, bibliography, and the names, addresses, and telephone numbers of three references, will be accepted until **October 30, 2001**. Send applications to: Claude Bouchard, PhD, Executive Director, Pennington Biomedical Research Center, 6400 Perkins Road, Baton Rouge, LA 70808. Tel.: 225-763-2513; Fax: 225-763-0935. [EOE/AA]

**Canada Research Chair in Kinesiology:** The School of Kinesiology at Simon Fraser University (SFU) invites applications from outstanding researchers for a Canada Research Chair. The Chair may be awarded at the Senior (tier 1) or Junior (tier 2) level. The Canada Research Chairs (CRC) Program has been established to enable Canadian universities to foster research excellence and enhance their role as world-class centers of research. More information about the Canada Research Chairs, SFU's strategic plan and research funding support is available at: <http://www.chairs.gc.ca>. The School has identified three research areas that it would like to strengthen: human factors/ ergonomics; exercise physiology (clinical or environmental); and musculoskeletal injury/neuromuscular rehabilitation. Applicants from other areas with a vision of how they will enhance the School's research profile are also encouraged to apply. There is an expectation that the successful candidate will have a strong research profile at the international level, evidence of creativity, impact and leadership in research, and an interest in teaching at the graduate and undergraduate levels. SFU has created an Institute for Health Research and Education (IHRE) in which kinesiology will have a central role. SFU is committing considerable resources to facilities and personnel for this Institute to support the development of health-related research. In addition, the School is currently advertising two assistant professor positions to support research in the identified areas. The School takes a scientific approach to the study of human structure and function and their relation to health and movement, has over 20 faculty, and is committed to excellence in research and teaching. There are well-established research programs and excellent research facilities available within the School and the University. Further information about the School of Kinesiology may be found at <http://fas.sfu.ca/kin>. Priority will be given to applications received by **October 15th, 2001**, but additional applicants may be considered until the position is filled. To apply, please submit a curriculum vitae, five publications that provide an overview of your lifetime contributions to research, a letter outlining your vision for future research in our School, and the names and contact information of five referees who can comment on your scholarly activities, creativity, leadership, and record of research trainee supervision. Send applications in confidence to: J. Morrison, PhD, Director, School of Kinesiology, Faculty of Applied Sciences, Simon Fraser University, Burnaby, British Columbia, V5A 1S6, Canada. Simon Fraser University is committed to the principle of equity in employment and offers equal employment opportunities to qualified applicants. Canadians and non-Canadians are eligible for this position. All appointments are subject to budget authorization.

## Positions Available

**Research Assistant—Endocrinology:** The Joseph Stokes Jr. Research Institute of The Children's Hospital of Philadelphia, one of the leading pediatric research facilities in the nation, has a position available for a Research Assistant. As a Research Assistant, qualifications should include a Master's degree with research laboratory experience or a Bachelor's degree in a Biological Science plus a minimum of two years experience. A candidate's background should also include a working knowledge of biochemical assays, enzyme kinetics, and bioinformatics. Specific studies include enzyme expression in *E. coli*, site-directed mutagenesis, enzyme kinetics and allostery, and protein purification. For references relevant to the research project, please see *N. Engl. J. Med.* 338: 1352-1357, 1998 and *J. Clin. Endocrinol. Metab.* 86(4): 1782-1787, 2001. The Children's Hospital of Philadelphia offers competitive salaries, comprehensive medical, vision, dental, and prescription plans; life insurance; employer contribution retirement plan; work/life benefits; and a firm commitment to staff development and education. Apply online at <http://careers.chop.edu> or fax your resume to 215-590-3184. Use reference ID 50 in all correspondence. You may also forward your information to [laraio@email.chop.edu](mailto:laraio@email.chop.edu). [EOE]

**Postdoctoral Positions.** Postdoctoral positions are immediately available for structure/function studies on a new family of chloride ion channels. Experience in patch-clamp methodology as applied to epithelial and transfected cell types is essential. You will join an active research group with a strong record of publication that is investigating structure/function relations in ion channels employing a variety of electrophysiological, biochemical, and molecular biological techniques. Facilities are excellent and opportunities exist for the individual to learn molecular and cell biology if desired. The specific project will focus on the characterization of several members of a newly identified family of putative epithelial chloride channels regulated by Ca<sup>2+</sup>. This family of ion channels has been implicated in respiratory diseases (asthma, cystic fibrosis) and in carcinogenesis. The successful candidate(s) will hold a PhD in physiology or a related discipline, will be capable of working independently, and must be motivated and enthusiastic. Please direct applications (curriculum vitae and 3 letters of reference) and/or informal inquiries to: Dr. C. M. Fuller or Professor D. J. Benos, Department of Physiology and Biophysics, MCLM 830, 1530 3rd. Avenue S., Birmingham, AL 35294-0005. Email: [fuller@physiology.uab.edu](mailto:fuller@physiology.uab.edu) or [benos@physiology.uab.edu](mailto:benos@physiology.uab.edu). [EOE/AA]

**Postdoctoral Training Opportunity:** Applications are invited for a mentored, integrated research and teaching postdoctoral fellowship (80% research, 20% teaching) that is available to study the interaction of cardiovascular, renal, and endocrine risk factors in the development of hypertension. The research uses techniques from whole animal (radiotelemetry) to molecular (DNA microarray). This position requires a PhD or equivalent degree and excellent communication skills. Salary will be commensurate with qualifications. Submit a curriculum vitae and the names of three references to Ms. Carleen McNeely, CV Postdoctoral Search, Division of Basic Biomedical Sciences, The University of South Dakota School of Medicine, 414 E. Clark Street, Vermillion, SD 57069-2390. Review of applications will begin August 24, 2001 and continue until the position is filled. Information about the Division can be found at <http://www.usd.edu/biomed/>. [EOE/AA]

**Postdoctoral Position in Toxicoproteomics:** AFOSR-funded Proteomics Laboratory in the Department Cellular and Integrative Physiology at the Indiana University School of Medicine is conducting proteomic studies on jet fuel toxicity and in vitro toxicoproteomic test system development for predictive toxicology. We are looking for qualified candidates with a recent PhD or equivalent degree in chemistry, biochemistry, cell biology, or a related field, with experience in electrospray MALDI-TOF MS and LC-MS/MS, as well as protein purification, fractionation, and affinity enrichment to conduct protein profiling of chemical effects in these studies. This position is available immediately. Send or fax resume and contact information for three references to: Frank Witzmann, PhD, Dept. of Cellular and Integrative Physiology, Indiana University School of Medicine, 635 Barnhill Drive, MS405, Indianapolis, IN 46202-5120. Fax: 317-274-3318; Email: [fwitzman@iupui.edu](mailto:fwitzman@iupui.edu). Email applications are encouraged. [EOE/AA]

**Postdoctoral Positions in Cardiac Electrophysiology-Stretch-Activated Channels:** Postdoctoral/research associate positions are available immediately to study stretch- and swelling-activated channels (SACs) in heart, regulation of SACs by signal transduction pathways, and role of SACs in CHF. PhD or MD and significant experience and publications using patch clamp are required. Experience in signal transduction and good writing skills preferred. Submit a complete curriculum vitae and the names of three references to: Dr. Clive M. Baumgarten, Department of Physiology, Medical College of Virginia, Virginia Commonwealth Univ., Box 980551, Richmond, VA 23298-0551. Email: [clive.baumgarten@vcu.edu](mailto:clive.baumgarten@vcu.edu). Women, minorities and individuals with disabilities are encouraged to apply. [EOE/AA]

## Positions Available

**Postdoctoral Position— Enzyme Structure-Function:** The Joseph Stokes Jr. Research Institute of The Children's Hospital of Philadelphia, one of the leading pediatric research facilities in the nation, has an NIH-funded postdoctoral position available immediately to study the structural basis of glutamate dehydrogenase allosteric regulation. Methods will include enzyme expression in *E. coli*, site-directed mutagenesis, enzyme kinetics, and protein purification for x-ray crystallography (see *J. Clin. Endocrinol. Metab.* 86: 1782-1787, 2001). The Children's Hospital of Philadelphia offers competitive salaries, comprehensive medical, vision, dental, and prescription plans; life insurance; employer contribution retirement plan; work/life benefits; and a firm commitment to staff development and education. Email your curriculum vitae and the names, addresses, phone numbers, and email addresses of three references to: Charles A. Stanely, MD, Division of Endocrinology, Children's Hospital of Philadelphia. Email: hyperinsulin@email.chop.edu. You may apply online at: <http://careers.chop.edu> or fax your resume to 215-590-3184. Use reference ID 50 in all correspondence. [EOE]

**Postdoctoral Positions in Hematology:** Postdoctoral positions are available at the Joseph Stokes Jr. Research Institute, part of The Children's Hospital of Philadelphia, to investigate the enzymology and physical biochemistry of the membrane-dependent proteolytic reactions of blood coagulation. The major areas of interest in the laboratory relate to the specificity and function of the enzyme complex (prothrombinase) that catalyses thrombin formation and the regulation of the initiation of coagulation by the extrinsic Xase complex. A principal focus in the laboratory is to resolve the contributions of discrete macromolecular interactions to enzyme assembly and function. These positions provide an opportunity to be trained and make contributions in protein chemistry, molecular biology/protein expression, thermodynamic measurements using steady state fluorescence and isothermal titration calorimetry and kinetic measurements including fluorescence stopped flow and rapid chemical quench. The successful candidate is expected to have a PhD in biochemistry or related discipline with a strong interest in protein chemistry, enzymology, physical biochemistry, and/or macromolecular interactions. Those interested should send a curriculum vitae with contact information for three references to: S. Krishnaswamy, Joseph Stokes Research Institute, Children's Hospital of Philadelphia, 3516 Civic Center Boulevard, Philadelphia, PA 19104. Tel.: 215-590-2320, Email: skrishna@mail.med.upenn.edu. You may also apply online at <http://careers.chop.edu> or fax your resume to 215-590-3184. Use reference ID 55. We offer competitive compensation packages. [EOE]

**Postdoctoral Position:** Applications are invited for a NIH-funded postdoctoral position to study the developmental expression of the sodium/hydrogen exchanger in Malpighian tubules (*Am. J. Physiol.* 279: R1996-R2003). The postdoctoral fellow will be responsible for designing and performing measurements of intracellular pH, Na/H mRNA expression, and protein expression in Malpighian tubules during the larval, pupal, and adult stages (pre- and post-blood meal) of the mosquito life cycle. The postdoctoral fellow will interact with a physiologist, a developmental biologist, and a molecular biologist. A PhD with training in molecular biology, confocal microscopy, pH fluorescence, and/or immunohistochemistry is encouraged to apply. The position is available August 1, 2001 and will remain open until filled. For consideration, please send a curriculum vitae, a brief summary statement of research interest and goals, and the names and addresses of three references to: David Petzel, PhD, Department of Biomedical Sciences, Creighton University School of Medicine, 2500 California Plaza, Omaha, NE, 68132. Email applications are encouraged: [dpetzel@creighton.edu](mailto:dpetzel@creighton.edu). Creighton University encourages applications from women and minorities. [EOE/AA]

**Postdoctoral Position:** A postdoctoral fellowship is available immediately in the laboratory of Dr. Evelyn Satinoff at the University of Delaware. Work in the laboratory focuses on homeostatic and circadian changes that occur with aging in rats, with particular attention to the thermoregulatory system. We work on this from an endocrinological (stress) and immunological perspective. Postdoctoral fellows will participate in laboratory research and any courses that might be of interest to them. The ideal candidate would be someone with a good understanding of either homeostasis or biological rhythms, and experience with various techniques such as immunocytochemistry, cytokine measurements, and small-animal surgery. Please send a curriculum vitae, a description of research experience and interests, and the names of three references to: Dr. Evelyn Satinoff, Psychology Department, University of Delaware, Newark, DE 19716. Tel.: 302-831-2271; Email: [satinoff@udel.edu](mailto:satinoff@udel.edu). The University of Delaware is located in a small community within 45 minutes to 2.5 hours from Washington, DC; Baltimore; Philadelphia; and New York. To learn more about the University, please visit our website at <http://www.psych.udel.edu>.

## Positions Available

**Postdoctoral Fellow Positions in Hematology:** The Joseph Stokes Jr. Research Institute, part of The Children's Hospital of Philadelphia, is seeking several postdoctoral fellows in gene therapy. Projects include treatment of hemophilia by viral gene transfer, molecular biology, and immunology of AAV (adeno-associated virus)-mediated gene transfer to muscle and liver, and characterization of novel (transgenic/knock-out) mouse models for gene transfer in hemophilia B. Examples of publications: *Gene Ther.* 8: 354, 2001; *Nature Genetics* 24: 257, 2000; *Mol. Ther.* 1: 225, 2000; *Nature Med.* 5: 567-63, 1999; *Proc. Natl. Acad. Sci. USA* 94: 5804, 1997. Candidates with MD or PhD and 0-1 year of postdoctoral experience should apply. Requirements include a strong molecular biology or immunology background and the ability to work in a team. Tissue culture and/or small-animal experience is useful. Applicants please send curriculum vitae (including email and references), reprints, and two letters of reference to Dr. Katherine A. High, Roland W. Herzog, or Valder R. Arruda, The Children's Hospital of Philadelphia, Abramson Research Center, 310, 34th Street and Civic Center Blvd., Philadelphia, PA 19104. Email: [rwherzog@mail.med.upenn.edu](mailto:rwherzog@mail.med.upenn.edu); Tel.: 215-590-3660. You may also apply online at <http://careers.chop.edu> or fax to 215-590-3184. Use reference ID 55. We offer competitive compensation packages. The Joseph Stokes Jr. Research Institute, part of The Children's Hospital of Philadelphia, has opportunities available to work with the latest technologies and leading personnel. [EOE]

**Postdoctoral Fellow Position:** A postdoctoral fellowship is available immediately in NIH-funded Cardiothoracic Surgery Research Laboratories in the Department of Surgery at the University of Kentucky College of Medicine. The successful applicant will be responsible for studying compartmentation of G protein-coupled signal transduction in cardiac ventricular myocytes, with specific emphasis on adenosine receptors, nitric oxide synthase, and membrane microdomains. Special consideration will be given to applicants with experience in subcellular fractionations, immunocytochemistry, and immunoblotting. Candidates should have a PhD in the biological sciences, be self-motivated, and able to work independently and contribute to experimental design. The position is available immediately. Email applications are encouraged. Candidates should send a curriculum vitae and the names of three references to: Robert D. Lasley, PhD, Director of Research, Department of Surgery, University of Kentucky College of Medicine, MN276 Chandler Medical Center, 800 Rose Street, Lexington, KY 40536-0298. Tel.: 859-323-3372; Fax: 859-323-8141; Email: [rlasley@pop.uky.edu](mailto:rlasley@pop.uky.edu). [EOE/AA]

**Administrative Director–TraumaLink:** The Children's Hospital of Philadelphia, a pediatric healthcare network, has a position available for an Administrative Director of TraumaLink. TraumaLink is responsible for conducting all phases of an injury (pre-event, event, post-event) in order to identify modifiable risk factors for poor injury outcome. The responsibilities of this position include overall TraumaLink management, including the management of administrative staff; the development and administration of operational policies and procedures; human resources; space; and other infrastructure administration. The person will also serve as a resource for research projects, recruitment and retention of qualified TraumaLink staff, and the coordination of strategic planning. Skills and abilities required include interpersonal and organization skills, the ability to interact and develop excellent professional relationships, excellent written and verbal skills, multi-task oriented, and the ability to handle confidential information. Educational requirements are a Master's degree in Health or Business preferred; however, a Bachelor's degree and 8 years of experience may be substituted for the Master's degree. Experience in office/program is desired. Supervision and staff development experience are essential. Children's Hospital of Philadelphia offers competitive compensation packages. Apply online at <http://careers.chop.edu> or fax your resume to 215-590-3184. Reference ID 52. [EOE]

**Assistant Professor of Physiology:** The Department of Physiology in the School of Medicine of the Texas Tech University Health Sciences Center has a state-funded, tenure-track position for an Assistant Professor. Exceptional candidates may be considered for more senior positions. Responsibilities will include participation in medical and graduate education. Preference will be given to those who are most likely to develop and maintain an extramurally funded research program and whose interests complement those of the department. Our faculty use molecular and cellular techniques as well as whole animals to investigate questions in cardiovascular, respiratory, renal, and neurophysiology. These research programs and our contributions to graduate and medical education can be reviewed on the department's web page (<http://physiology.ttuhsu.edu>). Applicants should submit a brief summary of research interests and future goals, a curriculum vitae, and the names of three references to Dr. Richard D. Nathan, Search Committee Chair, Department of Physiology, Texas Tech University Health Sciences Center, 3601 Fourth Street, Lubbock, TX 79430. Qualified women and minorities are encouraged to apply. [EOE/AA]

## Positions Available

**Research Assistant Professor (non-tenure track):** Two positions are available to study signaling pathways and neuropeptide receptors in mammalian gut smooth muscle. A minimum of two years training and experience in molecular genetics, transfection of mammalian cells, site-directed mutagenesis, and cellular biochemistry is essential. The candidate should have an MD or PhD degree or the equivalent. Please submit a complete curriculum vitae, a statement of research interest, and the names of three references to: Dr. Jack Grider, Department of Physiology, Box 980551, Medical College of Virginia Campus, Virginia Commonwealth University, Richmond, VA 23298-0551. Fax: 804-828-2500; Email: jgrider@hsc.vcu.edu. Deadline: **September 10, 2001**. Women, minorities, and persons with disabilities are encouraged to apply. [EOE/AA]

**Postdoctoral positions:** Two postdoctoral positions are available in the Cardiothoracic Research Laboratory (CTRL), Carlyle Fraser Heart Center of Emory University School of Medicine, Atlanta, Georgia. The CTRL is federally funded and focuses on mechanisms of a) myocardial ischemia-reperfusion injury, b) myocardial infarction and contractile dysfunction, and c) apoptosis. Therapeutic approaches based on pathophysiological mechanisms are developed to attenuate post-ischemic injury. In addition, methods and mechanisms of myocardial protection for cardiac surgery are developed. The candidate would be involved in experimental studies but would also be exposed to clinical studies involving laboratory participation and would therefore gain experience and an appreciation for translational research as well as basic science. There is close interaction between the research laboratory clinical cardiologists and cardiac surgeons, as well as scientists in cardiovascular disciplines. Experience in cell culture, molecular biology, vascular biology, inflammation, and large and small animal research are desired. The candidate will be expected to gain experience in recruiting grants during his/her tenure. Contact J. Vinten-Johansen, PhD (jvinten@emory.edu) or Zhi-Qing Zhao, MD, PhD (zzhao@emory.edu), or send resume to Cardiothoracic Research Laboratory, Carlyle Fraser Heart Center, Crawford Long Hospital of Emory University, 550 Peachtree Street NE, Atlanta, Georgia 30308-2225. [EOE/AA]

**Postdoctoral Training in Cardiovascular Research:** Both NIH training grant and foundation-supported positions are available. Opportunities exist to study cardiovascular biology and disease in the laboratory of an NIH-funded investigator at the Mayo Clinic in Rochester, MN. Candidates with an MD or PhD may apply. American citizenship or permanent residency is required for the NIH training grant positions. Outstanding foreign applicants with previous research experience will be considered for foundation-supported positions. The faculty and research areas include: J.C. Burnett, Jr., MD—The natriuretic peptides and other humoral factors in heart failure and atherosclerosis; M.M. Redfield, MD—Diastolic heart failure and humoral control of ventricular function in hypertension and heart failure; R.D. Simari, MD—Vascular biology and gene transfer for cardiovascular diseases; Lerman, MD—Endothelial function, coronary physiology and imaging; T.M. Olson, MD—Genetic basis of cardiovascular diseases; V.L. Roger, MD—Population studies of coronary disease; R.J. Rodeheffer, MD—Epidemiology of heart failure; A. Terzic, MD, PhD—Ion channel biology, bioenergetics and nuclear transport in the heart; V.K. Somers, MD, PhD—Neurohumoral, vascular and metabolic mechanisms linking normal and disordered sleep to cardiac and vascular disease. Salary is determined by the successful candidate's experience. An attractive benefit package is offered. Mayo Clinic Rochester is a non-profit, physician-led, clinical practice with education and research in a unified multi-campus system. Application, including curriculum vitae and bibliography, summary of past accomplishments, and the names of three references should be sent to: M.M. Redfield, MD, Cardiorenal Laboratory, Guggenheim 9, Mayo Clinic, 200 First Street, SW, Rochester, MN 55905. Internet: <http://www.mayo.edu/research/>. [EOE/AA]

**Postdoctoral fellowship:** A postdoctoral fellowship position (2-3 years) is available at Wake Forest University School of Medicine to study the effects of exercise training, dietary intervention and gene polymorphisms on body composition, energy expenditure, and risk factors for cardiovascular disease, diabetes and physical disability in the elderly. The research focus is on the integration of basic, biological and genetic research with clinical, behavioral intervention trials. Applicants must have received a PhD, an MD, or a comparable doctoral degree from an accredited domestic or foreign institution and be interested in pursuing an academic research career involving laboratory-based, clinical investigation. Salary is commensurate with experience according to NIH stipend levels. Send cover letter and curriculum vitae to: Dr. Barbara Nicklas, J. Paul Sticht Center on Aging, Wake Forest University School of Medicine, Medical Center Boulevard, Winston-Salem, NC 27103; bnicklas@wfubmc.edu; (Tel.: 336-713-8569; Fax: 336-713-8588).



## Positions Available

**Tenure-Eligible Faculty Position:** A tenure-eligible faculty position at the rank of Assistant Scientist is available in the Division of GI/Hepatology, Indiana University School of Medicine, Indianapolis, IN, which is ranked top 14th nationally in the *US News & World Report* of 2000. Qualified applicants must have a PhD with over 2 years of post-doctoral research experience. Competitive compensation and start-up package are commensurate with experience. Candidates with expertise in ion transport, membrane trafficking, electrophysiology, signal transduction, and/or molecular biology are preferred. Candidates should submit a curriculum vitae and three letters of recommendation to: Won Cho, MD, Indiana University, Division of GI/Hepatology (111G), 1481 W. 10th St., Indianapolis, IN 46202. Tel.: 317-554-0000, X4553; Email: [wkcho@iupui.edu](mailto:wkcho@iupui.edu).

**Faculty Position, Physiological Ecology:** The Department of Biological Sciences at the University of Alaska Anchorage seeks an Assistant (tenure-track) Professor with strengths in physiological ecology and molecular techniques (PCN 301439A). We are interested in candidates who use molecular approaches to investigate physiological adaptations of animals to extreme and highly seasonal environments, such as those at high latitudes. We will also consider applicants who use laboratory and field techniques to investigate the complex processes that shape animal evolutionary and ecological physiology. Candidates whose research areas complement those of existing programs are strongly encouraged to apply. Applicants must have a PhD in biology or relevant scientific field, postdoctoral research experience, a strong publication record, and relevant teaching experience. The successful candidate is expected to establish an independent, externally funded research program in the area of animal physiology, participate in graduate student education, and contribute to the service activities of the department. Primary teaching responsibilities include human anatomy and physiology and one upper division and/or graduate class in area of expertise per year. Further information about the department can be found at <http://www.uaa.alaska.edu/biohome/biology.html>. Contact Dr. Jennifer Burns at [afjmb4@uaa.alaska.edu](mailto:afjmb4@uaa.alaska.edu) for additional details. Visit <http://www.finsys.uaa.alaska.edu/uaahrs> for benefit information. To apply, submit a cover letter noting the PCN number, curriculum vitae, statements of teaching and research goals, and all contact information for three references to: University of Alaska Anchorage, Human Resource Services, 245 Administration Building, 3211 Providence Drive, Anchorage, AK 99508-8136. <http://www.finsys.uaa.alaska.edu/uaahrs>. Review of applications will begin September 15th. [EOE/AA]

**Assistant Professor:** The School of Kinesiology at Simon Fraser University (SFU) seeks junior scientists to fill two tenure-track positions at the level of Assistant Professor. We seek to appoint persons with expertise in human factors/ergonomics, exercise physiology (clinical or environmental), or musculoskeletal injury/neuromuscular rehabilitation. The successful candidates will be expected to establish independent, externally funded research programs and teach courses in their area of expertise at the undergraduate and graduate level. The School takes a scientific approach to the study of human structure and function and their relation to health and movement. The School has over 20 faculty and is renowned for its commitment to excellence in research and teaching. There are well-established research programs and excellent research facilities available within the School and the University. Faculty are also actively involved in the new Institute of Health Research and Education at SFU. Our undergraduate teaching program includes concentrations in Active Health, Health and Physiological Science, and Human Factors/ Ergonomics. In addition to our regular Masters and Doctoral program in Kinesiology, the School plans to develop specialist programs in Human Factors/ Ergonomics and Health Sciences at the graduate level. Further information about the School of Kinesiology may be found at <http://fas.sfu.ca/kin>. Tenure-track appointments are for an initial probationary period of five years and include an excellent benefits package, a mortgage assistance package, and a generous moving allowance. The intended start date is as soon as possible. Priority will be given to applications received by **October 15th, 2001**, but additional applicants may be considered until the position is filled. To apply, please submit your curriculum vitae, three publications that you consider most important, a cover letter outlining your anticipated research directions and your philosophy and commitment to teaching, and the names and contact information of three referees to: J. B. Morrison, PhD, Director, School of Kinesiology, Faculty of Applied Sciences, Simon Fraser University, Burnaby, British Columbia, V5A 1S6, Canada. Simon Fraser University is committed to the principle of equity in employment and offers equal employment opportunities to qualified applicants. Preference will be given to Canadians and permanent residents, but non-Canadians are encouraged to apply. All appointments are subject to budgetary authorization.

## Positions Available

**Assistant Professor:** The University of Kentucky College of Medicine, Department of Surgery, Section of Vascular Surgery, seeks applications for a faculty position at the rank of Assistant Professor. The position is a 12-month tenure track appointment. The appointee will be expected to maintain a vigorous research program and participate in the teaching activities of the department. Applicants must have a PhD in biochemistry, physiology, or a related field and experience or focus in vascular biology. The ideal candidate will have research experience in vascular wall biology, specifically as relates to the endothelial or smooth muscle cellular response to injury and formation of myointimal hyperplasia. The appointee should have current research funding or will be expected to obtain NIH funding within 3 years of appointment. Candidates should send a curriculum vitae, a statement of research interests and the names of three references to: Robert D. Lasley, PhD, Director of Research, Department of Surgery, University of Kentucky College of Medicine, MN276 Chandler Medical Center, 800 Rose Street, Lexington, KY 40536-0298. Tel.: 859-323-3372; Fax: 859-323-8141; Email: [rlasley@pop.uky.edu](mailto:rlasley@pop.uky.edu). Email applications are encouraged. [EOE/AA]

**Assistant Professor:** Luther College invites applications for a tenure-track appointment at the rank of Assistant Professor beginning September 2002. Teaching responsibilities include, but may not be limited to, "Introduction to Human Physiology" (for non-majors), an advanced course in specialty area, and participation in a team-taught "Principles of Biology" course. A PhD degree is required; teaching and postdoctoral experience are desirable. The candidate will be expected to direct undergraduate students in physiology research and to seek external funding for research. We are seeking faculty committed to undergraduate teaching and research in the context of a liberal arts college; visit our department homepage for more information <http://biology.luther.edu>. Other information about the College and the community of Decorah is available by visiting the college website <http://www.luther.edu>. We expect to complete the review of applications by **October 15, 2001**. Send letter of application, curriculum vitae, three letters of recommendation, and transcripts of undergraduate and graduate work to: Dr. Jim Eckblad, Head, Department of Biology, Luther College, Decorah, IA 52101-1045. Email: [eckblad@luther.edu](mailto:eckblad@luther.edu). [EOE]

**Biomedical Research and Development Engineer:** Biomedical research and development engineer is sought by world-renown medical research institute. The NIH-funded Institute of Critical Care Medicine in Palm Springs, California, in association with the University of Southern California Keck School of Medicine, is a developer of novel monitoring and measurement devices for the bedside of the critically ill and injured. The Institute also has more fundamental interest in the biology of cardiac and respiratory failure. It is conducting studies on ventricular function and ischemia-reperfusion injury in in vivo and in vitro models. Applicants should have a Masters or Doctoral degree in engineering. Both pre- and postdoctoral candidates would be welcomed. Applicants should send a curriculum vitae and references to: Max Harry Weil, MD, PhD, President and CEO, Institute of Critical Care Medicine, 1695 N. Sunrise Way, Building 3, Palm Springs, CA 92262. Tel.: 760-323-6867; Fax: 760-323-6167; Email: [weilm@aol.com](mailto:weilm@aol.com); Internet: <http://www.911research.org>. Email applications are encouraged. [EOE/AA]

**Tenure-Track Faculty Positions:** Applications are invited for tenure-track faculty positions in the Department of Physiology and Biophysics at the University of Mississippi Medical Center. Applicants will be considered for ranks of Assistant, Associate, or full Professor and must have a PhD and/or MD degree with appropriate postdoctoral research experience. Special consideration will be given to candidates with strong backgrounds in genomics and molecular and/or cellular physiology, imaging, and research interests that complement existing areas of excellence in cardiovascular, renal, and neuroendocrine physiology, or the pathophysiology of kidney disease, hypertension, obesity, diabetes, and vascular disease. The successful candidate is expected to develop a nationally recognized research laboratory supported by extramural funding and to contribute to the teaching and service missions of the department. The large group of cardiovascular scientists in the Department and in the Center of Excellence in Cardiovascular-Renal Research (CECR) offers excellent opportunities for collaboration at genomics, molecular, cellular, or systems levels of integration. For more information, the Physiology Department and CECR websites can be accessed at <http://phys-main.umsmed.edu> and <http://cecr.umsmed.edu>, respectively. Applicants should send a curriculum vitae, a statement of research interests, previous and current extramural research funding, career goals, and the names of at least three references to Dr. John E. Hall, Department of Physiology and Biophysics, University of Mississippi Medical Center, Jackson, MS 39216-4505. [EOE][M/F/D/V]

## Positions Available

**Assistant Professor. (Tenure Track):** The Department of Exercise and Sport Science is seeking a faculty member with an earned doctorate in exercise and sport science or closely related field beginning July 1, 2002. The candidate should have an established line of research with documented scholarly productivity related to metabolism, demonstrate potential for attracting extramural funding, and exhibit a strong commitment to excellence in teaching exercise physiology. The position will entail teaching undergraduate courses in exercise science with regard to disease processes and exercise prescription as well as graduate courses related to the candidate's research agenda; being involved in the graduate exercise physiology program including directing master's and doctoral theses; publishing in scholarly journals; and securing extramural funding. Salary is competitive and commensurate with qualifications. Deadline for applications is **October 15, 2001**, or until a qualified candidate is identified. Candidates should submit a letter of application, curriculum vitae, reprints of up to three recently published articles, and three letters of reference to: Janet M. Shaw, Chair of Search Committee, Dept. of Exercise and Sport Science, Univ. of Utah, 250 S. 1850 E., Rm. 241, Salt Lake City, UT 84112-0920. [AA/EOE] (9/12/01)

**Assistant Professor, Biology:** Alfred University, Alfred NY, seeks assistant professor in tenure-track position in animal physiology beginning fall semester 2002. Candidates with a PhD and a strong commitment to teaching and research in a liberal arts setting are encouraged to apply. Primary responsibilities include courses in comparative and human physiology and a research program involving undergraduate students. See website <http://bio.alfred.edu> for details and application requirements. Formal review of applications will begin **October 15, 2001** and continue until position is filled. AA/EOE

## People & Places

### AAAS Elects APS Members as Fellows

The American Academy of Arts and Sciences has announced the election of fellows and foreign honorary members. The following APS members were among the individuals so honored:

**Maurice B. Burg**, NIH  
**Sid Gilman**, University of Michigan  
**John D. Hildebrand**, University of Arizona  
**Jon Kass**, Vanderbilt University

**Eve Marder**, Brandeis University  
**John B. West**, University of California, San Diego

**Jordi Altimiras** has joined the Department of Health Sciences, University of Beira Interior, Covilhã, Portugal. Prior to his new assignment, Altimiras was with the Department of Biology, University of Göteborg, Göteborg, Sweden.

**Jaques Belik** has accepted a position with the Department of Pediatrics, University of Toronto, Toronto, Ontario, Canada. Prior to his new appointment, Belik was with the Department of Pediatrics, University of Calgary, Calgary, Alberta, Canada.

Joining the Department of Biology, Syracuse University, Syracuse, NY, **Gerda E. Breitwieser** recently moved from the Department of Physiology, Johns Hopkins University School of Medicine, Baltimore, MD.

Having joined Global Research Development, Mead Johnson Nutritionals, Evansville, IN, **Joshua C. Anthony** has left the Department of Cell and Molecular Physiology, Pennsylvania State University College of Medicine, Hershey, PA.

Moving from the Department of Pulmonary and Critical Care Medicine, University of Washington VA Medical, Seattle, WA, **John Townsend Berg** has joined the Department of Pharmacology, University of Hawaii, Honolulu, HI.

**Stanley Paul Brown** was previously affiliated with the Department of Physical Therapy, Southwest Baptist University, Bolivar, MO. Brown is presently Department Head, Department of Kinesiology, University of Louisiana, Lafayette, LA.

## People & Places

**Jon A. Buras** has joined the Department of Emergency Medicine as Principal Investigator, Beth Israel Deaconess Medical Center, Boston, MA. Buras formerly was with the Department of Emergency Medicine, Brigham and Women's Hospital, Boston, MA.

Affiliating with the School of Nursing, University of North Carolina, Chapel Hill, NC, **Dennis J. Cheek** has moved from the School of Nursing, Duke University, Durham, NC.

**Peter J.S. Chiu** has joined Discovery & Preclinical Department of MDS Pharma Services, Bothell, WA. Chiu was formerly with General Pharmaceutical and Groton Labs, Pfizer Global Research and Development, Groton, CT.

**Scott Francis Davis** has joined the Department of Cell and Molecular Biology, Tulane University, New Orleans, LA. Previously, Davis was with the Department of Cell Biology and Anatomy, Louisiana State University Health Science Center, New Orleans, LA.

**Gregory E. Demas** has moved from the Department of Psychology, Georgia State University, Atlanta, GA to the Department of Biology, Indiana University, Bloomington, IN.

**Harveen Dhillon** has affiliated with the Division of Endocrinology, Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, MA. Previously, Dhillon was associated with the Department of Physiology and Neuroscience, University of Florida, Gainesville, FL.

Recently, **Daniel I. Edelstone** has joined the Department of OB/GYN, University of Louisville, Louisville, KY. Prior to his new position, Edelstone was with the Department of OB/GYN, Albany Medical College, Albany, NY.

**Daniel P. Ferris** has moved to the Department of Movement Science, University of Michigan, Ann Arbor, MI. Previously, Ferris was with the Department of Electrical Engineering, University of Washington, Seattle, WA.

Appointed Lundell Professor and Head of the Department of Molecular and Cell Biology, University of Texas, Dallas, Richardson, TX, **Steven R. Goodman** recently moved from the Department of Cell Biology and Neuroscience, University of South Alabama College of Medicine, Mobile, AL.

Joining the Department of Physiology, West Virginia University School of Medicine, Morgantown, WV, **Pingnian He** was previously affiliated with the Department of Human Physiology, University of California-Davis School of Medicine, Davis, CA.

Affiliating with the Department of Exercise Sciences & Physical Education, Arizona State University, Tempe, AZ, **Kimberly Ann Huey** has moved from the Department of Physiology and Biophysics, University of California, Irvine, CA.

Formerly **Mutsuhiro Ikuma** was with the Department of Internal Medicine, University of Iowa, Iowa City, IA. Recently, Ikuma joined the Department of Internal Medicine, Hamamatsu University School of Medicine, Hamamatsu, Japan.

Appointed Director of the NMR Laboratory and Physiological Chemistry, Brigham & Women's Hospital, Boston, MA, **Joanne S. Ingwall** has moved from the NMR Laboratory, Harvard Medical School, Boston, MA.

**James Eric Jordan** has joined the Department of Physiology and Pharmacology, Center for Experimental Therapy and Repair, Wake Forest

University School of Medicine, Winston-Salem, NC. Prior to his new assignment, Jordan was with the Department of Anesthesia, Brigham and Women's Hospital Center for Experimental Therapy and Repair, Boston, MA.

Affiliating with Advanced Tissue Sciences Inc., La Jolla, CA, **Robert S. Kellar** has moved from the Department of Physiology, University of Arizona Health Science Center, Tucson, AZ.

**Lewis B. Kinter** has recently been appointed Senior Director with the Department of Preclinical Science, Astra Zeneca LP, Wilmington, DE. Kinter has moved from the Department of Medical and Scientific Affairs, Astra Zeneca, Wayne, PA.

Accepting the position of Professor, Department of Kinesiology, University of Connecticut, Storrs Mansfield, CT, **William J. Kraemer** has moved from the Department of Human Performance Laboratory, Ball State University, Muncie, IN.

Affiliating with the Department of Zoology of the National Taiwan University, Taipei, Taiwan, **Hsinyu Lee** has moved from the Department of Medicine, University California, San Francisco, CA.

Joining the Department of Medical Education, Ingenix Pharmaceutical Services, Basking Ridge, NJ, **Alex L. Loeb** recently moved from the Advanced Technology Group, Cytometrics, Inc., Philadelphia, PA.

Recently, **Wenjun Z. Martini** joined the Department of Nutrition, Case Western Reserve University, Cleveland, OH. Martini had been affiliated with the Metabolic Unit, Department of Surgery, University of Texas Medical Branch, Shriners Burns Institute, Galveston, TX.

## People & Places

Joining the Department of Physiology, Northeastern Ohio University College of Medicine, Rootstown, OH, **Joseph Gary Meszaros** has moved from the Department of Pharmacology, University of California, San Diego, La Jolla, CA.

Affiliating with the Department of Medicine, University of Toronto, Ontario, Canada, **Janna Leigh Morrison** has moved from the Department of Reproductive and Developmental Sciences, University of British Columbia, Vancouver, BC, Canada.

Recently, **Surya M. Nauli** joined the Department of Medicine Renal Division, Harvard Institute of Medicine, Boston, MA. Nauli previously was affiliated with the Department of Pharmacology, Loma Linda University School of Medicine, Loma Linda, CA.

**Timothy R. Nurkiewicz** has joined the Department of Physiology, West Virginia University, Morgantown, WV. Prior to his new position, Nurkiewicz was associated with the Department of Medical Physiology, Texas A&M University Health Science Center, College Station, TX.

Formerly associated with Hypertension and Vascular Research Department, Henry Ford Hospital, Detroit, MI, **Craig Frederick Plato** is currently Senior Research Pharmacologist, Department of Cardiovascular Safety and Integrative Pharmacology, Abbott Labs, Abbott Park, IL.

Accepting a position as with the Department of Pharmaceutical Sciences, Medical University of South Carolina, Charleston, SC, **Rick G. Schnellmann** has moved from the Department of Pharmacology and Toxicology, University of Arkansas Medical Science, Little Rock, AR.

**Margaret Arlene Schwartz** has joined the Department of Surgical Sciences, UMDNJ-Robert Wood Johnson Medical School, New Brunswick, NJ. Schwartz was previously with the Department of Pediatrics, Childrens Hospital, Los Angeles, CA.

Previously connected with the Department of Medicine and Physiology, Ohio State University School of Medicine, Columbus, OH, **Uma Sundaram** has affiliated with the Gastroenterology Department, University of Rochester, Rochester, NY.

**Sheila J. Thornton** has joined the Department of Biology, University of Otago, Dunedin, New Zealand. Prior to her new assignment, Thornton was affiliated with the Department of Zoology, University of British Columbia, Vancouver, BC, Canada.

Accepting an appointment with the Department of Pathology, University of Chicago, Chicago, IL, **Jerrold R. Turner** has moved from the Department of Pathology, Wayne State University School of Medicine, Detroit, MI.

Formerly Professor of the Department of Molecular and Integrative Physiology, University of Illinois, Urbana, IL, **Tony G. Waldrop** is presently Vice Chancellor, Research and Graduate Studies, University of North Carolina, Chapel Hill, NC.

**Timothy Cragin Wang** has joined the Division of Gastroenterology, University of Massachusetts Medical School, Worcester, MA. Prior to his new appointment, Wang was with the Gastrointestinal Unit, Massachusetts General Hospital, Boston, MA. ❖

## Gift Planning Opportunities

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

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

- ❖ **Immediate Gifts:** Cash, gifts of appreciated securities, gifts of closely

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

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

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

- ❖ **Designated Gifts:** Gifts given to honor or memorialize an individual or an organization and can include schol-

arships, programs, etc., which are specified for support and named for individuals.

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

For more information on gift giving to the APS, please contact Martin Frank, Executive Director (Tel.: 301-530-7118, Email: mfrank@The-APS.org), or Robert Price, Director of Finance (Tel.: 301-530-7160, Email: rprice@The-APS.org).

## News From Sr. Physiologists

### Letters to Karl Wasserman

**B. Theodore Cole** writes: "I appreciate very much your greeting apropos the big 80th anniversary of day one for B. Theodore Cole. Mrs. Cole (Leona) and I also celebrated our 58th wedding anniversary this year. Thus, we have been doubly blessed.

"I retired from teaching physiology to nurses, pharmacists and pre-meds for 41 years; first at LSU in Baton Rouge and then here at the University of South Carolina. I served as Head of the Department of Biology here at USC for 8½ years and retired in June 1987. I continued to teach one course each semester until 1995.

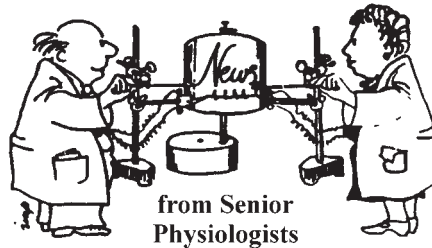
"It is difficult to give up teaching. I continue to teach any group, small or large, that will sit and listen, reflecting on how "fearfully and wonderfully made" (Psalm 139:14) we are. Among those anxious to listen are a group of seniors who assemble for several weeks in the winter quarter at a Methodist Church locally. Like many seniors, these at the Shepherds Center are anxious to continue learning. Occasionally I have a retired physician in the class who never heard of Dr. William Beaumont and Alexis St. Martin, Fred Banting and Charles Best.

"I also spend five hours on Monday each week as a volunteer at Providence Hospital here in Columbia. My time is spent with clients in the Cardiac-Rehab Center, elaborating one on one concerning the cardiac cycle, coronary circulation and its role in a healthy heart. They love it and get a few questions answered that their busy physicians had no time to hear.

"Thanks again for the birthday greetings and I hope that all continues to go well with you, your family and the Senior Physiologists Committee."

**Michael Barany** writes: "Thank you for your birthday greeting and invitation to write a letter to *The Physiologist*.

"When I first wrote to *The Physiologist* I was optimistic. I thought



retirement is nothing else; just a change in the source of my salary from the State of Illinois' payroll to that of the State Universities Retirement System. This idea was working for two years, when the continuation of my 18-year NIH grant was declined. Soon it turned out that I can not get grants from various agencies, including my own Graduate College, which kept me as a full professor. In the absence of funds, I edited the book *Biochemistry of Smooth Muscle Contraction*, 30 chapters, published by the Academic Press. The book got good reviews in *Science* and *Nature*, and it is considered as one of the textbooks in smooth muscle research. I was happy when Dr. John Barron, my previous postdoctoral associate, currently Associate Professor of Cardiology in the adjacent Rush Medical College, invited me to work with him on smooth muscle metabolism. I devised a method for measurement of 3H-H<sub>2</sub>O produced from 3H-labeled sugars and fatty acids in muscle, and we published a few papers and abstracts. This happy time was interrupted when Kate had to be hospitalized with endocarditis and soon thereafter her retina got detached. I have spent the last three years with Kate at home.

"During this time, we prepared a home page, near to 100 pages, on "Biochemistry of Muscle Contraction" that contains selected topics from our class teachings, 1985-1995. This home page rapidly has spread over the Web; on average 500 files are being transferred per day to various countries all around the world. The home page became also part of the Biophysics Textbook OnLine, and I was asked to be the editor of the Muscle section of this

textbook. Between 1997-2000, I was a member of the Senior Physiologist Committee, and enjoyed speaking and corresponding with physiologists of my age. Unexpectedly, I was reelected to the Committee and now I am serving my second term. Also while staying home, I organized the symposium of Muscle Research in the 20th Century that took place at the 2000 spring meeting of APS. Hugh Huxley, myself, John Gergely, and Clara Franzini-Armstrong were the speakers.

"In the middle of 2000, I returned to the laboratory, to work on actin in smooth muscle. The Edgar Folk, Jr. Foundation for Senior Physiologists donated me \$500, my department helps by giving supplies from the storeroom on a long-term payment basis, but my personal money is the main support of my research. Fortunately, throughout my life I was working in the lab with my own hands; thus, I have no difficulty carrying out the research virtually alone.

"At the end of the 1990s, Kate and I were invited to write our autobiography to the *Selected Topics in History of Biochemistry: Personal Recollections VI*, an Elsevier series within *Comprehensive Biochemistry*. We described our 50-year marriage and scientific collaboration under the title, "Strife and hope in the lives of a scientist couple." The message that we want to send to the new generation of physiologists is: Strife and hope, and never give up. The day will come when life smiles on you. Serve science and humanity."

### Letters to Doug Stewart

**H. Ted Hammel** writes: "Thank you for your query about my state of being and *raison d'être*. When my friends inquire, 'How are you?' my usual response, in jest, has been, 'Worse than ever.' At 80 years of age, getting better than ever is unrealistic. More recently, my response to, 'How are you?' has become, 'Apoptotic.'

## News From Sr. Physiologists

“Until your letter, I had supposed that I had become persona non grata. Anyone daring to declare that Starling’s osmotic force is fiction, as I have done, must also know that the wagons of physiology will form the circle in defense against the ingnoramus. Of course, I know with certainty that Starling’s osmotic force cannot return ISF to the plasma of the capillary. This hypothetical force presumes that the colloidal proteins in plasma attract ISF, according to Starling, or they lower the concentrations of water in plasma, according to physiologists. Proteins do not act this way in plasma or in an osmometer. For more, see several of my articles on how solutes alter water in an aqueous solution. For example, 1) Hammel, H.T. (1994) “How solutes alter water in aqueous solutions. *The Journal of Physical Chemistry*. 98:4196-4204. 2) Hammel, H.T. (1998) ‘Replacing Lewis’s theory with Hulett’s theory of altered chemical potentials of reacting constituents in solution.’ *Recent Research Developments in Physical Chemistry*: 2, 77-111. (Pandalai, S.G., Ed.) Transworld Research Network, Trivandrum, India. 3) Hammel, H.T. Boltzmann’s principle depicts distribution of water molecules between vapor and liquid for pure liquid and for aqueous solutions. *The Journal of Physical Chemistry*. 99:8392-8400, 1995. 4) Hammel, H.T. (1999) Evolving ideas about osmosis and capillary fluid exchange. 5) Hammel, H.T. and Brechue, W.F. (2000). Plasma-ISF fluid exchange in tissue is drive by diffusion of carbon dioxide and bicarbonate in presence of carbonic anhydrase. *FASEB J*. 14: Abstract 315.3.

“I have written a monograph entitled ‘Better Understanding of Solutions: How Solute Alters Water and More.’ The monograph is in three parts. Part I is based on Hulett’s theory of osmosis and covers the period when Pete Scholander and I were collaborating. Part II is autobiographical and tells how I came to collaborate with Scholander.

Part III covers the progress made during the last 20 years since collaboration with Scholander ceased at his death in 1980. At this time, the monograph has not been published and does not have a publisher. Maybe later.

“I have had engraved on my gravestone the following declaration: ‘A physiologist who measured xylem and phloem sap pressures in trees; who embraced Hulett’s theory of osmosis and who recognized the diffusion of bicarbonate ions as the principal osmotic effect in Starling’s hypothesis.’

“When Scholander and I finished our monograph on ‘Osmosis and Tensile Solvent’ in 1976, I said to him, ‘Pete, you will never know the day when our ideas about osmosis become widely accepted.’ Twenty-five years later, I repeat the same statement, now applied to myself. I feel obliged, therefore, to engrave our views in granite.”

### Letter to Eugene Renkin

**Frank Craig** writes: “Thanks for your favor of May 21. I always enjoy the letters from Senior Physiologists and admire the ones who keep up with the field. At Edgewood they reorganized the laboratories every few years and after the last one I was unable to adjust to the new priorities and retired in 1978 to enjoy the generosity of the tax-payers in my Civil Service Annuity—much nicer than a pension, don’t you think? Having been brought up in a strict school of Publish or Perish, I was casting about for something to do when I ran across a book called *Ancetral Roots of Sixty Colonists* and recognized a few of my ancestors. This opened a new field of research and thanks to the kindness of the editors, I was able to add a few more publications to my bibliography.”

### Letter to Michael Barany

**Sidney Schreiber** writes: “I am honored to be requested to contact my colleagues on the occasion of my 80th

birthday by reporting on my current activities for *The Physiologist*.

“Five years ago I considered myself the most fortunate of men. At the age of 75, after a career as a physician and basic biochemistry research scientist, I was able to continue my work on a part-time basis, which left me time to garden, paint in oils, and see my children and grandchildren more often. However, macular degeneration changed my life’s plan. But, after a brief period of painful adjustment being legally blind, I find I still consider myself a fortunate man. After all, I survived three years in the 82nd Airborne Division in World War II, including D-Day, my marriage was a happy one, my daughter became a clinical neuropsychologist, my son became a physician also doing research, and my grandchildren are a joy.

“Only my lifelong avocation of painting was in trouble! My paintings hang in London, New Zealand, San Francisco, Cleveland, Boston, and many other places. It was so important to me that I continue. Obviously, my present vision did not permit me to paint in the same manner as before, but after many trials I learned a way to paint and create emotion on the canvas without the detail I once used. I still find joy and excitement every time I pick up a paintbrush. The results on the canvas are not quite as they exist in my mind, but there is always the pleasure of creating something. I am now entered in a show in Massachusetts showing per- and post-macular degeneration paintings.

“As for my scientific career, it continues as well. I now serve as Scientific Advisor for the American Macular Degeneration Foundation, which will support research in this field. A peer review committee is in place and grant requests are carefully examined.

“To my younger colleagues, I say your happiness in later life lies in aggressively continuing your life’s interests.”

## News From Sr. Physiologists

### Letter to Martin Frank

**Habeeb Bacchus** writes: "Two years ago when I reached the age of 70 years, I received a letter from Robert Berne requesting information on my career at that time. I did not respond to that query as I preferred to wait until another landmark time in my career. I now respond as, at the time of the annual meetings of the American Physiological Society, I will have been a full member of the Society for 50 years. I am certain that if records of the Society are correct, you will find that I was the youngest person to be made a full member of the Society, at the age of 22 years. Perhaps I deserve a few paragraphs in the journal wherein I describe my professional history, both as a physiologist and later as a clinician who has never forgotten his physiological discipline.

"My earliest independent research conducted in the Department of Physiology at George Washington University School of Medicine related to adrenal physiology. By that time it was becoming clear that there is a functional significance to the morphological zonation of the adrenal cortex. My contribution at that time was to show that "potassium chloride flooding" of rats (2.5% solution of KCl as the only aqueous source) was followed by hypertrophy of the zona glomerulosa of the adrenal, with no significant change in the inner zones. At that time also I found that this regimen resulted in a decreased heart size and weight compared to control animals. Since it was difficult to obtain reliable blood pressure measurements at that time, I used heart size and weight as an index of blood pressure. I thus concluded that potassium chloride reduced blood pressure. This was published in *AJP* in 1951. Animals with experimental hypertension (using heart weight as index) from sodium excess, or with exogenous mineralocorticoids) were protected from cardiac hypertrophy

when given high potassium intakes. However, the hypertension secondary to experimental renal ischemia (induced by the Grollman operation, figure of eight ligation of one kidney, and removal of the contralateral kidney) was not relieved by the potassium chloride flooding. Adrenal morphological and cytochemical changes were also studied in those animals.

"Another series of studies involved the role of ascorbic acid (Vitamin C) in the adrenal cortex. George Sayers had shown that stimulation of the adrenals was followed by discharge of ascorbic acid from the adrenal cortex. I studied this by cytochemical methods. But the most significant outcome of such studies indicated that ascorbic acid affects several steps in the biosynthesis of adrenocortical hormones, 'stimulating' or supporting the early steps (hydroxysteroid dehydrogenase, 11  $\beta$  hydroxylase) but suppressing the last step in the synthetic pathway. It is this step that is enhanced by discharge of ascorbic acid from the adrenal. I also studied the mutual interactions of the state of oxidation of ascorbic acid on adrenal hormone synthesis. My graduate students and I also studied the effect of ascorbic acid nutrition on degradation of adrenal hormones in vivo, and in vitro studies using liver slices; ascorbic acid protects these steroids from hepatic degradation. While studies with ascorbic acid excess employed rats, we had to use guinea pigs to study ascorbic acid deficiency (as only primates, guinea pigs and fruit-bats cannot synthesize ascorbic acid Vitamin C.

"The effect of ascorbic acid on carbohydrate metabolism was also studied. The most significant finding was that ascorbic acid deficient guinea pigs developed a most severe form of insulin resistance, compared to pair-fed control animals. This study employed a primitive glucose-insulin clamp technique. We also showed that the process of

lipolysis is significantly affected by Vitamin C and its deficiency.

"My subsequent work related to more clinical research (done while I was at NIH). I participated with Donald Tschudy in studies on protein and amino acid turnover in health and disease. I also participated in Don Tschudy's studies on porphyrin metabolism. After I left NIH, my major emphasis, in addition to clinical medicine, was in clinical investigations on glycoproteins and acid micopolysaccharides in cancer, as well as in other disorders. I was invited to write review articles and book chapters on many of these topics.

"I served as Chief of Medicine at Riverside General Hospital (in California) and as Professor of Medicine at Loma Linda University School of Medicine. In these roles, I taught thousands of medical students and medical residents. In those roles I was named Teacher of the Year more than once, but I am proudest of being named Lifetime Educator by my trainees at Loma Linda University in 1994. I retired from those activities in 1994, but was invited to serve as Department Chairman at Riverside County Regional Medical Center (formerly RGH), and to visit my old institution once week every other month to give lectures and conduct teaching rounds. This involves traveling 420 miles each way, as I now live in the Monterey Bay area.

"Throughout these years of research and clinical activities, I maintained a strong interest in the APS, and have always emphasized the physiological and metabolic basis of clinical problems. I expect that I shall be requesting retired status from the Society in the near future, and to be spending more time with my grandchildren, currently eight in number." ♦



## Announcements

### Louis and Artur Lucian Award for Research in Circulatory Diseases

Each year McGill University confers the Louis and Artur Lucian Award for outstanding research in the field of circulatory diseases. The purpose of this Award is to honor an outstanding scientific investigator or group of investigators whose contribution to knowledge in the field of circulatory diseases is deemed worthy of special recognition.

The successful recipient is invited to spend a short period of time at McGill to have interchanges with members of the McGill community and to give a formal Lucian Lecture.

It is hoped that through this Award, collaborative research in the field of circulatory diseases can be established between McGill University and research centers elsewhere in Canada, the United States and other countries of the world.

The awardee or awardees receive \$50,000 (Can.) as a prize.

The Louis and Artur Lucian Award was established in 1978 under the will of the late Olga Leibovici through a bequest to McGill University to honor the donor's two brothers.

A Committee of the McGill University Faculty of Medicine chooses the investigators to be honored by this Award. The Committee is assisted in its task by an international panel of Consultants who are distinguished scientists in the field of medicine, pathology, physiology, pharmacology and surgery.

The Award will be conferred upon the individual or individuals nominated, who in the opinion of the Award Committee, have made the most outstanding contribution towards research in the field of circulatory diseases. The Award Committee recognizes no geographical limitations and nominations are invited without distinction as to gender or

nationality. Preference will be given to work done in the recent past.

In addition to the nomination form, available on the internet (see below), proposers should submit the following information on prospective recipients:

1. A summary, preferably less than 500 words, of the research on which this nomination is based and its significance in the field of circulatory diseases.
2. A brief biographical sketch of the nominee.
3. A complete listing of the nominee's publications.
4. An indication of up to ten of the nominee's most significant publications related to the research.
5. An outline of the proposed research and/or academic activities to be carried out at McGill and the names of potential McGill correspondents and host laboratories.

For information on the deadline and requests of nomination forms, please check the following website: <http://www.mcgill.ca/LucianAward>

You may also contact:

Dr. René P. Michel

Secretary, The Louis and Artur Lucian Award Committee  
McGill University

Department of Pathology

3775 University Street

Montreal, Quebec, Canada H3A 2B4

Tel.: 514-398-7192, Ext. 00502

Fax: 514-398-7446

Email: [rene.michel@mcgill.ca](mailto:rene.michel@mcgill.ca)

### Howard Hughes Medical Institute Predoctoral Fellowships in Biological Sciences 2002

Administered by the National Research Council, the Howard Hughes Medical Institute will award at least 80 five-year fellowships for full-time study toward a PhD or an ScD degree in the biological sciences.

#### Eligibility

The fellowships are intended for students who have completed less than one year of graduate study toward an MS, a PhD, or an ScD degree in the biological sciences. Students who hold or are pursuing medical or dental degrees (MD, DO, DVM, DDS) may also be eligible to apply for fellowship support for study toward a PhD or an ScD.

The program is open to both US citizens and foreign citizens. Students with US citizenship may take the fellowship abroad. Non-US citizens must study in the United States.

Fields of Study: biochemistry, bioinformatics, biophysics, biostatistics, cell biology, developmental biology, epidemiology, genetics, immunology, mathematical and computational biology, microbiology, molecular biology, neuroscience, pharmacology, physiology, structural biology, virology.

#### Fellowship Award

The award consists of an annual stipend of \$21,000, an annual fellow's allowance of \$2,500, and an annual institutional allowance of \$13,500.

**Application Deadline:** November 13, 2001

#### How to Apply

This international fellowship competition is administered by the National Research Council. Applicants are expected to apply via the Web. The program announcement, instructions, and sample application materials will become available in mid August.

For additional information, contact Hughes Predoctoral Fellowships, The Fellowship Office, National Research Council, Tel.: 202-334-2872, Email: [infofell@nas.edu](mailto:infofell@nas.edu).

The Howard Hughes Medical Institute, an Equal Opportunity Employer, welcomes applications from all qualified candidates and encourages women and members of minority groups to apply.

## Announcements

### Physiologists Are Great Teachers!

(Your chance to reward the best!)

The Teaching Section of the American Physiological Society invites you to take the initiative to nominate a fellow physiology educator for the Tenth Annual **Arthur C. Guyton Physiology Teacher of the Year Award**.

Nominees must be full-time faculty members of accredited colleges or universities and members of the American Physiological Society. The Selection Committee will look for independent evidence of: 1) excellence in classroom teaching over a number of years at the undergraduate, graduate, or professional levels; 2) commitment to the improvement of physiology teaching within the candidate's own institution; and 3) contributions to physiology education at the local community, national or international levels.

Each nominee must be nominated by a member of APS. The nominator is responsible for completing the application materials and forwarding six (6) copies of the application materials listed below to the Chairman of the Award Selection committee, postmarked no later than Friday **December 7, 2001**.

1. A letter from the nominator.
2. Letters of support from three other colleagues familiar with the nominee's contributions to physiology education. If possible, one letter should be from the nominee's chairperson. One letter must be from a colleague outside of the nominee's institution.
3. Letters of support from up to five current and/or former students.
4. Scores on standard student evaluations (with normative data if possible).
5. Details of all teaching honors received (i.e. Golden Apple, Teacher of the Year, etc.).

6. Evidence of education-related activities outside the classroom for which the nominee has received national or international reputation. This could include (but is not limited to):

publication of teaching innovations or educational research

development and publication of laboratory exercises

development and distribution of teaching software

authoring of textbooks

presentation and/or publication of educational research

conducting seminars, workshops, conferences, etc. on physiology education

a copy of the nominee's curriculum vitae

any additional documentation that would assist the selection committee in evaluating the nominee's contribution to physiology education.

The person selected will receive the award during the APS business meeting at the April 2002 annual meeting of the American Physiological Society (Experimental Biology 2002, April 20-24 in New Orleans, LA). 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 \$600 to attend the meeting. The awardee is requested to write an essay on his/her philosophy of education for publication in *The Physiologist*.

The Chairman of the Guyton Award Selection Committee is Daniel Richardson, Department of Physiology, University of Kentucky, College of Medicine, MS 508 UKMC, Lexington, KY 40537-0298. Tel.: 859-323-5649, Fax: 859-323-1070, Email: drichar@uky.edu

### APS Member Obituaries on Web

The Society wishes to acknowledge deceased Society members with expanded obituaries on our Web site. Obituaries for publication on the Society's Web page should be submitted via Email to the APS Webmaster

(webmaster@aps.faseb.org) or by mail to Dr. Martin Frank, Executive Director, The American Physiological Society, 9650 Rockville Pike, Bethesda, Maryland 20814. Please include the individual's full name, date

of birth and death, education and professional affiliations, and any other details in remembrance of the individual you wish to acknowledge, along with a photo, if available.

# CALL FOR NOMINATIONS FASEB EXCELLENCE IN SCIENCE LECTURE AND AWARD 2003

## Purpose

To recognize outstanding achievement by women in biological science.

## Eligibility

1. All women who are members of one or more of the societies of FASEB will be eligible for nomination.
2. Nominations recognize a woman whose research has contributed significantly to further our understanding of a particular discipline by excellence in research.

## Nominations

1. Nominations may be made only by members of the FASEB Societies.
2. A call for nomination of candidates for the Excellence in Science Award will be posted in the newsletters of the individual Societies as well as the FASEB Newsletter and The FASEB Journal.
3. The call for nominations will be made each year in November. **The nomination deadline is March 1, 2002.** The nomination will be transmitted to the FASEB Board before its Spring meeting.
4. Nominations must be made in the form of a letter, original and fourteen (14) copies, setting forth in detail:
  - \$ the contribution(s) to the field that represents the nominee=s outstanding achievement in science
  - \$ leadership and mentorship
  - \$ evidence of national recognition
  - \$ honors and awards
5. Fifteen (15) copies of the curriculum vitae and brief selected bibliography of the nominee, as well as fifteen (15) copies of no more than five (5) reprints, must accompany the nomination.
6. Additional letters of support (fifteen (15) copies each) for the nominee are encouraged, especially from former students.
7. The nominations and supporting letters are to be sent to:

Ms. Tia B. Poole  
FASEB Excellence in Science Award  
Federation of American Societies for Experimental Biology  
9650 Rockville Pike, Bethesda, Maryland 20814-3998  
Telephone: (301) 530-7090  
E-mail: tpoole@execofc.faseb.org

## Selection

1. The Excellence in Science Award Committee, comprised of a member from each Society of the Federation, will receive the nominations and recommend an awardee based on an evaluation of scientific accomplishments.
2. The awardee must agree to present an Excellence in Science Lecture.
3. The name of the awardee and a summary of the candidate=s qualifications will be sent to the FASEB Board for approval at the Spring meeting.

## Award Presentation

The award will be presented before presentation of the Excellence in Science Lecture by the awardee. The award will be presented by the Chair of the Excellence in Science Award Committee or her representative in conjunction with a member of the FASEB Board. The award includes a \$10,000 unrestricted research grant, funded by Eli Lilly and Company, travel expenses, complimentary registration at the meeting, and a plaque in recognition of the award.

## Announcements



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## Institutions Awarding Academic Degrees with a Major in Physiology

► **Online Listing of Institutional Addresses, URLs, and Contact Persons**

► **Download the List of Institutions and Specific Sub-Field Categories as an Adobe™ PDF document**

[www.the-aps.org/education/instgrnt/InstitGrant.html](http://www.the-aps.org/education/instgrnt/InstitGrant.html)



The American Physiological Society, Education Office  
9650 Rockville Pike, Bethesda, MD 20814-3991  
301-530-7132, Fax: 301-530-7098  
Email: [educatio@the-aps.org](mailto:educatio@the-aps.org)  
<http://www.the-aps.org/education.htm>

photo source: photodisc.com

## 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

Shih-Chun Wang Young Investigator Award  
 Arthur C. Guyton Awards in Integrative Physiology  
 Giles F. Filley Memorial Awards for Excellence in  
     Respiratory Physiology and Medicine  
 Lazaro J. Mandel Young Investigator Award  
 Procter & Gamble Professional Opportunity Awards  
 Caroline tum Suden/Francis A. Hellebrandt  
     Professional Opportunity Awards  
 Liaison With Industry Award  
 Minority Travel Fellowship Awards

### Next Deadline

November 1  
 November 1  
  
 November 1  
 November 1  
 November 7  
  
 November 7  
 November 7  
 November 13



# MEMBERSHIP APPLICATION FORM

## THE AMERICAN PHYSIOLOGICAL SOCIETY

### Tphys10.01

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
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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 \_\_\_\_\_

#2 Sponsor Name \_\_\_\_\_

Mailing Address \_\_\_\_\_

Mailing Address \_\_\_\_\_

Phone \_\_\_\_\_

Phone \_\_\_\_\_

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Fax \_\_\_\_\_

E-mail \_\_\_\_\_

E-mail \_\_\_\_\_

Sponsor Signature\* \_\_\_\_\_

Sponsor Signature\* \_\_\_\_\_

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

► Please turn over for 2 more questions...and mailing instructions.

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

**OCCUPATIONAL HISTORY** [ Check if student  ]

**Current Position:**

Dates	Title	Institution	Department	Supervisor
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**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 now:** You will receive a dues statement upon approval of membership.

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

**Questions? Call: 301-530-7171 ■ Fax: 301-571-8313 ■ E-mail: [members@aps.faseb.org](mailto:members@aps.faseb.org) ■ Web: [www.the-aps.org](http://www.the-aps.org)**

## Scientific Meetings & Congresses

*November 10-15*

**Society for Neuroscience 31st Annual Meeting, San Diego, CA.** *Information:* Society for Neuroscience, 11 Dupont Circle, NW, Suite 500, Washington, DC 20036. Tel.: 202-462-6688; Internet: <http://www.sfn.org/am2001>.

*November 8-11*

**The Cytokine Odyssey 2001, Maui, HI.** *Information:* Joint meeting of the International Cytokine Society (9th Annual Meeting) and the Society for Leukocyte Biology (35th Annual Meeting). Internet: <http://www.biosci.ohio-state.edu/~slb> or <http://www.bioinformatics.weizmann.ac.il/cytokine>.

*December 6-7*

**Gene Delivery Systems: Improving Pathways, Efficiency and Stability, Washington, DC.** *Information:* The Knowledge Foundation, Inc., 18 Webster Street, Brookline, MA 02446. Tel.: 617-232-7400; Fax: 617-232-9171; Email: [custserv@knowledgefoundation.com](mailto:custserv@knowledgefoundation.com); Internet: <http://www.knowledgefoundation.com>.

*December 8-12*

**41st Annual Meeting of the American Society for Cell Biology, Washington, DC.** *Information:* The American Society for Cell Biology, 8120 Woodmont Ave., Suite 750, Bethesda, MD 20814-2755. Tel.: 301-347-9300; Fax: 301-347-9310; Email: [ascbinfo@ascb.org](mailto:ascbinfo@ascb.org); Internet: <http://www.ascb.org>.

*December 14-17*

**Second International Huaxia Congress of Endocrinology, Hong Kong SAR, China.** *Information:* Ms. Veronica Cheng, C/O PC Tours & Travel, B128, The Royal Garden Hotel, 69 Mody Road, Tsimshatsui East, Kowloon, Hong Kong. Tel.: 852-2369 9052-4; Fax: 852-2723 9044; Email: [pc@pctourshk.com](mailto:pc@pctourshk.com); Internet: <http://www.endocrine-hk.org/huaxia2001>

**2002**

*February 2-6*

**The Genome and Beyond—Genomics and Structural Biology for Medicine, Miami Beach, FL.** *Information:* MNBWS Office, P.O. Box 016129 (M823), Miami, FL 33101-6129. Tel.: 305-243-3597; Fax: 305-324-5665; Email: [mnbws-biochem@miami.edu](mailto:mnbws-biochem@miami.edu); Internet: <http://www.med.miami.edu/mnbws>

*February 23-27*

**46th Annual Meeting of the Biophysical Society, San Francisco, CA.** *Information:* Biophysical Society, 9650 Rockville Pike, Bethesda, MD 20814. Tel.: 301-530-7114; Fax: 301-530-7133; Email: [society@biophysics.org](mailto:society@biophysics.org); Internet: <http://www.biophysics.org>.

*February 23-28*

**SPIE International Symposium on Medical Imaging, San Diego, CA.** *Information:* Society of Photo-Optical Instrumentation Engineers (SPIE), PO Box 10, Bellingham, WA 98227-0010. Tel.: 360-676-3290; Fax: 360-647-1445; Email: [spie@spie.org](mailto:spie@spie.org); Internet: <http://www.spie.org/info/mi>.

*February 23-March 1*

**Genome 2002 Triconference.** Includes 5th Annual Genomic Partnering: Emerging and Early-Stage Companies (February 23-24), 9th Annual Human Genome Discovery: Commercial Implications (February 25-27), and 6th Annual Gene Functional Analysis (February 28-March 1), Santa Clara, CA. *Information:* Cambridge Healthtech Institute, 1032 Chestnut Street, Newton Upper Falls, MA 02464. Tel.: 617-630-1300 or 888-999-6288; Fax: 617-630-1325; Internet: <http://www.healthtech.com>.

*March 24-26*

**The Amygdala in Brain Function: Basic and Clinical Approaches, Galveston Island, TX.** *Information:* New York Academy of Sciences, 2 East 63rd Street, New York, New York 10021. Tel.: 212-838-0230 ext. 324; Fax: 212-838-5640; Email: [conference@nyas.org](mailto:conference@nyas.org); Internet: <http://www.nyas.org/scitech/contents/amyg/index.html>.

*May 5-10*

**The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting, Fort Lauderdale, FL.** *Information:* ARVO Offices, 12300 Twinbrook Parkway, Suite 250, Rockville, MD 20852-1606. Tel.: 240-221-2900; Fax: 240-221-0370; Internet: <http://www.arvo.org>.

*May 18-24*

**International Society for Magnetic Resonance in Medicine—Tenth Scientific Meeting and Exhibition, Honolulu, HI.** *Information:* International Society for Magnetic Resonance in Medicine, 2118 Milvia Street, Suite 201, Berkeley, CA 94704. Tel.: 510-841-1899; Fax: 510-841-2340; Email: [info@ismrm.org](mailto:info@ismrm.org); Internet: <http://www.isrm.org>.

*May 14-18*

**29th Annual Meeting of The International Society for the Study of the Lumbar Spine, Cleveland, OH.** *Information:* The International Society for the Study of the Lumbar Spine, 2075 Bayview Avenue, Room MG323, Toronto, Ontario, Canada, M4N 3M5. Tel.: 416-480-4833; Fax: 416-480-6055; Email: [shirley.fitzgerald@swchsc.on.ca](mailto:shirley.fitzgerald@swchsc.on.ca)