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Integrating the Life Sciences from Molecule to Organism

The Physiologist

INSIDE

Through the Looking Glass: The Future of Physiology. Passion, Responsibility and Morality in Science

81st President of APS Irving H. Zucker

Irving H. Zucker

"Cheshire Puss, would you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to get to," said the Cat.

"I don't much care where," said Alice.

"Then it doesn't matter which way you go," said the Cat.

"—so long as I get S O M E W H E R E ," Alice added as an explanation.

"Oh, you're sure to do that," said the Cat, "if you only walk long enough."

From Alice in Wonderland by Lewis Carroll (5)

Physiology as a discipline has often been called the basis for medical practice. This statement is probably true, but somewhat limiting. Two great things about the discipline of physiology are that it is always evolving and it encompasses a broad range of sub disciplines. The American Physiological Society (APS or the Society) is home to human physiologists, cellular and molecular physiologists, biophysicists, comparative physiologists, etc. Like a beautiful mosaic, the Society's approach to our discipline and, indeed, to life science in general, has been multi-dimensional. If one just examines our web site, it points to the multitude of programs the Society is involved in. The list grows every year. This is the sign of a dynamic and vibrant society. But you know this. That fact that you are reading this article indicates you are involved and concerned about APS.

The Society's future and indeed the discipline of physiology depend critically on our ability to adapt, change, and grow and on the active participation of our membership. The Society's goal is to become even more multi-dimensional than we are now. In this address I wish to focus on several aspects of our Society's growth. I also wish to promote a philosophy targeted to enhancing the quality of science and to motivate our

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membership to become active participants in science policy. This further relates to our adaptability and to our role as scientists, teachers, mentors, and spokespersons for physiology and for science.

Growth and Change

Three years ago, under the leadership of Douglas Eaton, the Society undertook the laborious job of developing a strategic plan to help us focus on our future. I doubt that there is one of you that has not been involved in the process of strategic planning either at your home institutions, in industry, or for other societies. Effective strategic planning is difficult. The process of evaluating where the society is, including its strengths and weaknesses can be laborious and gut wrenching. While we all extol the importance of physiology as a pivotal discipline in the life sciences, everyone has their own niche to promote and protect. Importantly, strategic planning is a process of building consensus and compromise. Certainly this can be contentious in many areas but the dedication and hard work of our membership allowed us to develop a "living document" that all members should embrace. It has been published in *The Physiologist* (1) and is available on our web site. While our strategic plan may not include everything that all members wish, it embraces growth and change in

Introducing Irving H. Zucker

Irving H. Zucker is the Theodore F. Hubbard Professor of Cardiovascular Research and Chairperson of the Department of Cellular and Integrative Physiology at the Univ. of Nebraska Medical Center (UNMC) in Omaha, NE. Zucker is also a professor in the Department of Internal Medicine in the Division of Cardiology. Hailing from New York City, he received a BS from The City College of New York in 1965, an MS from The Univ. of Missouri at Kansas City in 1967 and a PhD in Physiology from New York Medical College in 1972 where he held an NSF pre-doctoral fellowship. Zucker's early PhD training with Gabor Kaley in the area of renal function and volume regulation led him to an NIH postdoctoral fellowship with Joseph P. Gilmore at UNMC from 1972-1973. Zucker joined the faculty in the Department of Physiology and Biophysics at UNMC as an Assistant Professor in 1973. Zucker rose through the ranks and was appointed Professor in the Department of Physiology and Biophysics in 1983. Following the retirement of Dr. Gilmore, Zucker was appointed Chairman of the Department in 1989. The Theodore F. Hubbard Endowed Chair was awarded in 1998.

Zucker's primary area of research interest is neurohumoral regulation of the cardiovascular system in health and disease. He has focused on regulatory cardiovascular reflexes in heart failure models. His early work characterized the electrophysiological properties of cardiovascular sensory endings in the heart and blood vessels in experimental heart failure. His work has more recently concentrated on the central mechanisms that are responsible for alterations in autonomic tone in the setting of chronic heart failure and the role of exercise training in modulating neuronal changes in autonomic control areas of the brain. The mechanisms for the alterations in reactive oxidant species and angiotensin II in the CNS has been the focus of the laboratory for several years.

Zucker has authored 137 original papers, 35 reviews, book chapters and editorials, has edited one text on the reflex control of the circulation and has published close to 200 abstracts. Zucker's laboratory has been continuously funded by NIH, The American Heart Association and industry since 1975. This included a MERIT Award from the NHLBI from 1992-2002 and a PPG from 1999 to the present. Zucker has supervised 10 graduate students, 16 postdoctoral fellows, 20 medical students and 16 undergraduate students.

In 1977, Zucker received an Established Investigatorship from the AHA and a Research Career Development Award from the NIH. Other awards and honors over the years have included The University of Nebraska Merit Award in 1983, the Outstanding Research and Creative Achievement Award from the University of Nebraska in 1993, Fellow of the Circulation Council and of the American Heart Association from 1980, Fellow of the Council on High Blood Pressure Research from 1993. Zucker received the Wiggers Award from the Cardiovascular Section of APS and has received the Scientist Laureate Award from the UNMC, both in 2008.

Zucker has or currently serves on the editorial boards of numerous journals including *The American Journal of Physiology: Heart and Circulatory Physiology; The American Journal of Physiology: Regulatory, Comparative and Integrative Physiology; Circulation Research; Hypertension; Basic Research in Cardiology; Heart Failure Reviews; The Journal of Biomedical Science; Drugs Under Clinical and Experimental Research; The Journal of Cardiac Failure* and others.

Zucker has served on several national, regional and local committees for research organizations. These include the National Research Committee of the American Heart Association, Chair of the Great Plains Regional Review Committee of the American Heart Association; the National Scientific Advisory Board of the International Academy of Cardiology and the Publications Committee of the Heart Failure Society of America. He has also served on various review panels including The NIH Cardiovascular and Renal (CVB) Study Section from 2002-2003; the NIH Clinical and Integrative Cardiovascular Sciences Study Section from 2003-2006 both as permanent members and The Pathophysiology Study Section of the American Heart Association from 2000-2002 and several other study sections for both NIH and AHA.

Zucker has served in a leadership capacity at several levels. He was a member of the council for the Society for Experimental Biology and Medicine from 1998-2002. He was the founder and served as the first President of the Nebraska Physiological Society from 1998-2000. He was President of the Association of Chairs of Departments of Physiology in 2003. He has served on the APS Animal Care and Experimentation Committee and was Chair of the Public Affairs Committee. Zucker served on the Executive Committee of the Council on Basic Cardiovascular Sciences of the American Heart Association from 2000-2002.

Zucker has presented 160 invited lectures throughout the world. He was a visiting scientist of the National Science Council of Taiwan in 1991 and a visiting scientist at the Heibei Medical College in the People's Republic of China in 1987 and 1997.

the major programs of our Society. Strategic plans can be long and arduous or brief and to the point. Pepsi Cola's strategic plan consists of two words, "BEAT COKE"! Most likely Pepsi will have to expand this a bit.

"The establishment of local chapters will help foster the discipline of Physiology, create a venue for undergraduate students to present the results of their research, and be incredibly useful in providing rapid responses to scientific policy issues that arise at the state levels."

While we are the American Physiological Society we are also a global society. In 1991, when L. Gabriel Navar was the 65th President of APS, the Society abolished the category of corresponding member, which was reserved for members outside North America. All corresponding members became full regular members. At that point our regular membership increased and we became a much more international society. This was the correct thing to do. Our meetings have always attracted participants from many countries. Our strategic plan incorporates expansion of our global outreach in several areas. Efforts are underway to expand the involvement of the international community in our meetings and conferences. A significant step forward was taken this year when Navar represented APS at the Mexican Physiological Society meeting. Council has discussed the possibility of providing financial incentives (in the way of registration rebates) to our sister societies for participating in the Experimental Biology meetings. APS will be providing support for the first ever joint meeting of APS and the Chinese Association of Physiological Sciences. This meeting, to be held in Beijing in October 2008, will also include representation from the physiological societies in the United Kingdom, Australia, Canada and Taiwan. These international interactions are incredibly important for a variety of reasons. First, a large number of graduate students, postdoctoral fellows and faculty are nationals of countries other than the United States. If our programs are to evolve, we will have to incorporate the special qualities of the international community. This includes our educational, publications, public affairs, animal use, communications, meetings and membership programs. As an example of how our ability to become more international will benefit our society, I turn to our publications. The *American Journal of Physiology* and the other journals we publish are highly regarded world-wide. However, we can do more to extend the reach of our journals in other countries, especially in Asia. It is critical that we take a forward step to provide our journals to the global scientific community.

One of the great strengths of our society has been the vibrancy and appeal of our meetings and conferences. These are major issues in the current strategic plan. The Task Force on Meetings recommended that sessions at EB include more presentations by trainees. Trainee sessions will be widely publicized and the Society will encourage featured topics to be organized and chaired by trainees. In addition, attempts are being made to increase the number of trainee awards. Similarly, our conferences will be more focused and directed to the most important physiological issues of the day. Conference suggestions will still come from you, the membership, but the process will be simplified so that your ideas can come to reality more quickly.

The future of our Society is in the hands of our trainees. It is critically important that we make a concerted effort to involve and engage trainees at several levels of our Society. This means participation on committees, in section activities, as well as participants in meetings, conferences, etc. Let them see how the governance of APS works. I call upon you to include participation in APS activities as part of your mentoring activities of students and fellows. One way to insure participation of young scientists in APS is to insure that they are members of the Society from an early stage. In our department at the University of Nebraska Medical Center every graduate student automatically becomes a student member, paid for by departmental funds. I know some other departments also do this; however, I fear that most do not. I urge the chairs of departments of physiology to provide the funds for all graduate students to become student members.

The Finance Task Force was charged with bringing forth ideas that will improve and diversify our revenue stream. As most of you know, APS relies on journal subscriptions for the bulk of its revenue. A congressional mandate to implement an open access policy for all publications that emanate from federally funded research has the potential to reduce income from subscriptions. Any shortfall in income from this source can be temporarily offset by charging authors the true cost of publishing, estimated to be approximately $3,000 per article. In fact, APS has implemented an "Author Choice" option for all of the Society's research journals. Authors electing the Author Choice Option will have their final published article made available as an open access article, freely available to all readers. In addition, the final published article can be uploaded to PubMed Central after it is published by the journal. The cost for this is $2,000 plus traditional page charges and color figure fees. Hopefully, this option will point out to the membership the real cost of publishing and its impact on their research grants and ultimately to the entire research enterprise. In addition to lost revenue, there is a long range potential for authors that normally publish in APS journals to choose other journals in which to publish. So what are we to do about this issue and how can we diversify our income to be less reliant on publication revenue? These are difficult questions with which the task force on finance and the leadership are currently struggling. I call on you, the membership, to provide ideas that will help solve these issues. We desperately need your help. Please don't be passive on this issue: it affects all of us (more on this later).

The sectional structure of APS has been in place for many years and is really a structure that sets us apart from many other academic societies. Sections based on research interests provide for more vibrant programming at meetings and allow for a more diverse input into the council and other committees of APS. The task force on governance found little to change in our current structure. One recommendation was to establish a Chapter Advisory Committee (CAC) in order foster the development of state and regional societies. This effort is unique among most academic societies.

The establishment of local chapters will help foster the discipline of Physiology, create a venue for undergraduate students to present the results of their research, and be incredibly useful in providing rapid responses to scientific policy issues that arise at the state levels. The CAC has been formed and will provide Council with ideas for bolstering and expanding this system.

Expansion of our educational programs is a key element of our strategic plan. Most of you who are familiar with the educational programs of APS know that our philosophy has been to provide mechanisms for disseminating knowledge in the physiological sciences from kindergarten all the way up to the postdoctoral level. The APS web site is filled with information for students, science teachers and for course directors who teach medical and undergraduate physiology. A novel project, which is now in its third year of implementation, is the Physiology Understanding Week or PhUn Week. The history of this project is summarized in a paper published in *Advances in Physiology Education* in 2006 (10). In brief, PhUn Week is a national program targeting grades preschool-12 and held annually over a week in November. Faculty volunteers speak with small and large groups of students (20-500) and introduce them to basic physiological concepts. The response to this program has been gratifying and it appears to be growing in scope. In 2007, 32 individual sessions were held at 29 different locations. It is critically important that the membership take part in this and other aspects of the APS education program. Many of you have school-aged children and have probably talked about science in your child's classroom. PhUn Week helps provide structure for your visit and contributes to a national effort to promote the physiological sciences. Because we all play various roles in our profession we should all be concerned about the future of our discipline. We have an obligation to transmit the excitement about science and physiology to students at all levels of education. PhUn Week is a great opportunity to become involved.

Be passionate about what you do and tell everyone!

An area of extreme importance to APS, to science and to your careers is the issue of public policy and advocacy for research. Direction 3 of the strategic plan states: "APS will drive understanding of and appreciation for physiology and strengthen public and private support." Everyone is well aware of the current funding crisis in biomedical science in the United States. Advances in health care are destined to stagnate without adequate funding for both basic and clinical research. The careers of new investigators depend on the federal government investing in training programs that will meet the needs of an explosion in new information and technology. These statements would appear to be intuitively obvious. However, very few of us actually take the time to be advocates for our discipline.

"The careers of new investigators depend on the federal government investing in training programs that will meet the needs of an explosion in new information and technology. These statements would appear to be intuitively obvious. However, very few of us actually take the time to be advocates for our discipline."

In a recent commentary by Mark Whittington published on a web site called Associated Content (7), it was revealed that 18- to 25-year-olds are apathetic toward space exploration and NASA. Many organizations such as "Research America!" have conducted surveys indicating that the American public strongly supports research, especially biomedical research. The public also feels strongly that the federal government should fund research as a high priority. However, it appears that the public is less enthusiastic about personally advocating for enhanced federal funding. One can understand that the general public does not lobby Congress. It's not an easy process. However, it's more difficult to understand why scientists, whose very existence depends on funding, are apathetic when it comes to advocating and lobbying for their discipline.

Every academic society and especially the APS has an Office of Science Policy or Public Affairs, whose job is to help their members write, email, fax, call and visit their congressional delegation. In fact, FASEB has a web site that will tailor your response on a state by state basis. The email addresses and phone numbers of your congressional delegation are available on the FASEB web site. All one has to do is click on a name and voilà, a ready-made letter appears that you can personalize. There is really little excuse not to contact Congress. Yet, few do. I've heard the argument that people are so busy writing and reviewing grants and manuscripts, doing research, and teaching that they have little time to pay attention to requests to contact Congress. "After all, we get these requests from many societies as well as from our own institution," they say. Well, in my opinion this argument is a cop out. It doesn't hold water because there are countless examples of extremely busy individuals who are ardent supporters of research and more. Today, it's not enough just to do research. It's important to show your passion for the profession by becoming a zealot. How many of you write or call to thank your Senators when you get a new grant? I'll bet not many. It's such a simple thing to do and the returns can be enormous.

Lobbying for funding is just one example. Educating the lay public on the value of research is equally important. The next time you're on a plane and the man or woman sitting next to you tells you their life story in five minutes take advantage of the situation and tell them what you do and why it's important. Tell them what NIH or NSF means. The next time you are asked to present to a lay audience, just do it. When your children ask you to present to the 5th grade, just do it. When you're asked to judge at a science fair or at a student competition, just do it!

This is an election year. Health care issues weigh heavily in this presidential campaign. In deciding who to support this year I urge you to carefully evaluate the candidate's views on health care, education and science research funding. Research America!'s web site, www.yourcandidatesyourhealth.org offers capsule responses on health care and research funding issues for each candidate in both major parties. It's easy to be cynical about the responses of politicians, but our membership is astute enough to read between the lines on this issue.

The list of public policy issues that require our attention is long. Funding is

important but so are animal welfare issues, the teaching of evolution and various other regulatory issues that may threaten the way we do science. The APS public affairs and science policy office has, for many years, taken the lead in advocating for the responsible use of animals in research and education. Largely through the efforts of Alice Ra'anan and the membership who serve on the Public Affairs and Animal Care and Experimentation Committees, we are clearly recognized as the "go to" society in this area.

"The lines separating the various biological disciplines have become blurred and the concept of Systems Biology may mean very different things depending on how one was trained and what one considers to be the important concepts in biology."

Mahatma Gandhi once said, "Consciously or unconsciously, every one of us does render some service or other. If we cultivate the habit of doing this service deliberately, our desire for service will steadily grow stronger, and will make, not only our own happiness, but that of the world at large." If you are passionate about your research then you should also be passionate about advocacy. The Society needs you to participate at all levels, not for the Society's sake but for the sake of physiology and science.

The Highest Ethical Standard is Central to our Profession.

The ingredients that make for a successful career in science predispose to a great deal of pressure on both academic and non-academic scientists. The pressures I refer to are the obvious ones, such as publications and grants necessary for promotion and tenure in academic institutions. In industry, these may take the form of productivity towards product development. For some, the pressure to "get there first" is overwhelming. As a result some have taken short cuts to success. These short cuts have either taken the form of sloppy science or blatant manipulation of data to alter the outcome in order to benefit the investigator. The goal of science is to understand the **true** nature of our universe from the cosmos to the individual molecules and atoms that regulate life. Therefore, it is antithetical for a scientist to manipulate the truth in any way, shape or form. The fact that a very small number of scientists have engaged in unethical behavior has tainted the public's opinion of what we do and why we do it. Science in general and the APS more specifically must come to grips with this issue. Given that modern science is global and is carried out in all cultures, we must develop programs that communicate the principles of ethical behaviors internationally. When Korean scientist Woo Suk Hwang's claim that his group had extracted human stem cells from embryos they had cloned proved to be false and a result of data fabrication (9) (later retracted by *Science* (11), it was widely disseminated in both the lay and scientific press. For the scientific community there was a collective sigh of disappointment and betrayal. This example is, of course, extreme. There are many more subtle issues that taint science. One of the areas where APS can play a major role is in the development of courses to help certify students and fellows in research ethics. Every institution requires recipients of NIH training grants to be certified; however, institutions tend to provide the minimum necessary to fulfill these requirements. These tend to be one or two day courses or computer-generated experiences. This type of experience may not be adequate for all individuals, especially those from vastly different cultures. I propose that the APS develop a comprehensive workshop in research ethics patterned after our current Professional Skills Workshops in scientific writing and presentation skills. At the 2008 Experimental Biology meeting, Jane Reckelhoff chaired a symposium in the career development track entitled, "What every scientist needs to know about ethical issues in biomedical research."

The recognition that these issues necessitate constant exposure in our meetings and publications is extremely important. High ethical standards are, and should be, part of the fabric of our profession. The APS should play a role in promulgating this concept.

Integrative and Systems Biology: Is it all Physiology?

Every so often, a new concept is introduced into science which results in a true paradigm shift in our view of how things work. When this happens, a new field is born. Sometimes this is based on new technology but often on new ideas about, in our case, life processes. After the genetic code was deciphered, the field of molecular genetics exploded with no apparent end in sight. Over the past 10 years or so, the field of Systems Biology has started to blossom. Those of us that call ourselves physiologists think about how genes, molecules, cells, organs and organisms communicate and influence one another in health and disease. In essence, we think about how life processes are integrated. Many of us were trained with the idea that physiology is an integrative discipline. While there is certainly integration at every level, there is also a broader integration at the organism level. So, how is Systems Biology different from Physiology? The lines separating the various biological disciplines have become blurred and the concept of Systems Biology may mean very different things depending on how one was trained and what one considers to be the important concepts in biology.

The Institute of Systems Biology (ISB) in Seattle defines System Biology as, "the study of an organism, viewed as an integrated and interacting network of genes, proteins and biochemical reactions which give rise to life… These interactions are ultimately responsible for an organism´s form and functions" (8). The research carried out at the ISB indeed is integrative but at a level reduced to those elements contained in its definition. What is missing from this systems view of biology is the focus on organ and organismal interaction. In the lead article of the December issue of *The Physiologist* (4), James P. Collins, Assistant Director for Biological Science at the National Science Foundation (NSF), wrote, "We now have much greater insight into how the parts of organisms function, but the big challenge will be explaining how organisms respond as integrated systems." Collins goes on to point out the unique role the NSF can play in bringing together seemingly diverse areas of science such as comparative, evolutionary, ecological, molecular and organismal biology. This concept melds nicely with the One Physiology Concept proposed by

Hannah Carey in her Presidential Address published in *The Physiologist* last year (3). The concept that physiology, at all levels, is intricately tied to global health defines an even higher level of integration.

While it seems necessary for groups to define themselves and their discipline, we must guard against producing silos of science that will inhibit productivity and breakthroughs by creating a "my science/your science" mentality. Science is a continuum or at least it should be. There seems to be an emerging idea that Systems Biology must take a reductionist view using powerful tools rooted in molecular biology and bioinformatics. Certainly, if one looks at the science that is being carried out in departments or institutes that call themselves Systems Biology or Systems Physiology it is heavily reductionist in nature. How can so-called integrative physiologists come together with the systems biologists in order to produce the highest quality science and significant breakthroughs? Importantly, how can the APS facilitate this coalescence? In my view, there are three critical areas that the APS can influence to promote scientific diversity and integration. First and foremost is the content of our publications. APS publishes 14 journals not including *The Physiologist*. As everyone knows, *The American Journal of Physiology* is divided into journals that concentrate on specific areas of physiology which are in large part separated along organ system lines. *AJP Regulatory, Comparative and Integrative Physiology* and *AJP Cell Physiology* as well as *The Journal of Applied Physiology* are possible exceptions, cutting across organ system lines. All APS journals can play a role in encouraging systems biologists to publish in *AJP* with the goal of true integration between molecular and organ or organismal biology. The APS currently publishes a "Physiology in Medicine" Series in the *Annals of Internal Medicine* under the editorship of Dale Benos, past president of APS. These papers are designed to highlight the translational nature of the science we do, and they have been very well received. But we can do more. Each journal can issue a call for papers in these areas and actively solicit studies that are focused on the "big picture," while using state of the art techniques to answer both fundamental and applied questions.

The second area where the APS can make a huge impact in the marriage between systems biology and integrative physiology is in our meetings and conferences programs. An outcome of the 2006 Strategic Plan is a reassessment of our programming efforts at EB and the APS conferences. With focus and forethought, we should be able to program sessions at EB that involve systems biologists as well as physiologists working on similar but perhaps broader issues. Some progress has already been made in this regard. The Physiology In Focus symposia at EB '08 promote the larger global effort of physiologists. I plan to develop Physiology In Focus symposia at EB '09 that will bring together systems and integrative physiologists around questions related to the neural control of visceral function. In addition, our Featured Topics and poster sessions can have similar themes. Every one of our conferences should consider incorporating components of systems biology in its programming. We should have no problem designing the kind of scientific forums that promote true integration at all levels.

A third area in which we can and should play a major role in fostering integrative and systems physiology is in advocacy for funding of specific programs in this area. The professed goal of the National Institutes of Health (NIH) is to fund novel interdisciplinary and translational research. The NIH Roadmap clearly outlines this cross- cutting strategy (6). While many would agree that the Roadmap helps to build on the genetic and molecular knowledge base accrued over the past 20 years or so, there is less agreement on the kinds of research that should be a high priority for funding at the national level. More importantly, the number of scientists trained to carry out true integrative biology has diminished over the past two decades. At the urging of several academic societies (largely ASPET, APS and AAA), the National Institute of General Medical Sciences (NIGMS) has funded short courses in integrative and organ systems pharmacology and physiology at four institutions. So far, these have been quite successful and well received. NIGMS plans to renew these for another round. Our experience at the University of Nebraska Medical Center has revealed that the participants in this course are largely molecular and cellular biologists who have had little previous training in organ based physiology or pharmacology. This strategy by NIH is important and should be expanded but is a small segment of what is needed to promote systems and integrative biology. The NIH must adopt the view in its funding strategy that modern biomedical science necessitates integration at many levels. Those grants that incorporate a comprehensive strategy to investigate a problem as broadly as possible should have priority for funding. In addition, training grants that target this approach to science should be encouraged and funded.

"Now is not the time to be apathetic about science policy. Now is the time for action on the part of academic societies."

Of course, this strategy breaks down if there is no money to fund new projects. This brings us back to the importance of advocacy. This is critical. Now is not the time to be apathetic about science policy. Now is the time for action on the part of academic societies. Working together with FASEB, we have been somewhat successful in convincing Congress to adopt many areas of concern to the scientific community. However, we have not done an adequate job of raising the priority for increased funding from federal research agencies. Part of the reason for this, I believe, is the small number of scientists who are actually out there advocating for increased funding. This brings us back to the issue of service to the discipline and enthusiasm for our work. We, as scientists, cannot sit back and hope things will get better. We must, in large numbers, be passionate about both our research and science as a whole. This means participating in advocacy for increased funding of science and science education. Our profession contributes much to the world; therefore, we must transmit our zeal for our work to the next generation of scientists. This means being active, not passive in everything we do.

As I write this Presidential address, I am humbled and honored to be the 81st President of your Society. I am even a bit awe-struck when I contemplate how I got here, where I am now and where I might be going in the future. I have been extremely fortunate to have served on the APS Council for the three years and as President Elect for one year. It is at

this point that I feel really comfortable in this leadership capacity. I joined APS when I was a graduate student at New York Medical College. I became a regular member in 1972 as I embarked into a postdoctoral fellowship at the University of Nebraska Medical Center. Thirty-six years later I am still a member of APS and I am still at the University of Nebraska Medical Center. Maybe the latter reflects my inability to find another job; however, the former reflects my intense admiration and respect for APS, its mission and dedication to the discipline of physiology. What is equally important is the incredibly efficient and professional way our Society is run by many dedicated, bright and highly competent people. Marty Frank, in his position as Executive Director of APS, has been at the helm for the past 22 years. The APS staff and you, the membership, have been at the core of our societal success. There have been very few professional or academic societies that I have been associated with that can hold a candle to the APS when it comes to the scope and effectiveness of their programs.

We are entering a very exciting but challenging time in science. There have never been more opportunities for us to answer age-old questions and to provide new therapies to combat disease and suffering. Our ability to carry out the mission of the APS, "To promote discovery, disseminate knowledge and advance education," will only be effective if you take action. If you uphold the philosophy of carrying out high quality science, adhere to the highest ethical and moral standards and be passionate about your research, the years ahead will be fruitful with new knowledge and applications to human and animal health.

I close with the words of the biochemist and novelist Isaac Asimov: " *The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom*" (2). It is our job to elevate and educate society to the wonders of science.

Acknowledgements

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References

1. APS Strategic Plan. *The Physiologist*. 49:163-169, 2006.
2. Asimov, I. and Shulman, JA. *Isaac Asimov's book of science and nature quotations*. Grove Press, New York, 1988.
3. Carey, HV. One Physiology. *The Physiologist*. 50:49-54, 2007.
4. Collins, JP. "21st Century Physiology: Organisms as Integrated Systems." *The Physiologist*. 50:241-245, 2007.
5. Dodgson, C ("Lewis Carroll"). *Alice's Adventures in Wonderland*. Macmillan and Co. London, 1865
6. http://nihroadmap.nih.gov/
7. http://www.associatedcontent.com/article/120804/18_to_25yearolds_are_apathetic_toward.html
8. http://www.systemsbiology.org
9. Hwang, W.S., Kyu, Y.J., Park, J. H., Park, E.S., Lee, E.G., Koo, J. M., Jeon, H. Y., Lee, B. C., Kang, S. K., Kim, S. J., Ahn, C., Hwang, J. H., Park, K. Y., Cibelli, J. B., Moon, S. Y. "Evidence of a pluripotent human embryonic stem cell line derived from a coned blastocyst." *Science*. 303:1669-1674, 2004.
10. Munzenmaier, D. H. "Help protect the future of physiology." *Adv. Physiol. Educ*. 30:100-101, 2006.
11. Retraction of Hwang, et al. *Science*. 311:335, 2006. ❖

APS Election Results

The American Physiological Society announces the results of the election of officers for 2008. **Gary C. Sieck**, May Clinic College of Medicine, is the new President-Elect. The three newly elected Councillors taking office on April 9, 2008 are **Gordon S. Mitchell**, Univ. of Wisconsin School of Veterinary Medicine; **Linda C. Samuelson**, Univ. of Michigan; and **Frank L. Powell**, Univ. of California, San Diego. The Councillors will each serve a three year term.

Gary C. Sieck
APS President-Elect

Gordon S. Mitchell
APS Councillor

Linda C. Samuelson
APS Councillor

Frank L. Powell
APS Councillor

APS Partners with *The Scientist* on a Compensation Survey

The Scientist, The Magazine of the Life Sciences, is conducting a major survey of compensation in the life sciences. The survey is open to all life scientists employed in the US, and is sponsored by several major professional societies including The American Physiological Society.

The survey is available at http://aps.scisurveys.com.

The survey is being conducted and analyzed by AMG Science Publishing, an independent consulting firm. Articles describing the results of the survey will be published in *The Scientist* September 2008 issue, on The Scientist.com web site, and in the sponsoring societies' publications.

Your participation in this study is completely voluntary and will take approximately four minutes. To ensure that we collect accurate and representative results please answer all questions carefully and completely. There are no foreseeable risks associated with this participation in this survey — all results are confidential, anonymous and coded, and data from this research will be reported only in the aggregate.

As our way of saying "thank you" for your participation, all respondents who fill out the survey by **FRIDAY, MAY 30, 2008** may enter a drawing for one of three Amazon.com gift certificates worth $100. ❖

Moving?

If you have moved or changed your phone, fax or Email address, please notify the APS Membership Office at 301-634-7171 or Fax to 301-634-7241. Your membership information can also be changed by visiting the Members Only portion of the APS Website at http://www.the-aps.org. ❖

Beijing Physiology 2008

The APS membership is invited to participate in the October 19-22, 2008 joint physiology meeting in Beijing (http://www.beijingphys2008.org/). The Society is joining with several of our sister societies to sponsor a scientific meeting in Beijing, China. The joint physiological sciences meeting in Beijing was an outgrowth of discussions held between the leadership of the APS and The Physiological Society (UK) during the 2005 IUPS Congress. The joint meeting was planned in recognition of the important role Chinese scientists play in our research laboratories and the growing prominence of physiological research in China. Consequently, a primary goal of the meeting is to provide opportunities for collaborative interactions with Chinese colleagues and to recruit students and postdoctoral fellows to work in our research laboratories.

As plans for the joint physiology meeting proceeded, the number of participating societies began to grow. As a result, the meeting is now hosted by the Chinese Association for Physiological Sciences (CAPS) and involves the participation of the American Physiological Society, Australian Physiological Society (AuPS), Canadian Physiological Society (CPS), and The Physiological Society (UK). In addition, the meeting is being co-sponsored by the International Union of Physiological Sciences (IUPS), the Federation of the Asian and Oceanian Physiological Societies (FAOPS), and the National Natural Sciences Foundation of China.

It is hoped that the joint meeting will provide opportunities for scientific and cultural exchange and the development of collaborative interactions among physiological scientists from the various countries. As biological science rapidly progresses, it is increasingly apparent that physiological research should be conducted in ways that will provide an understanding of the functions of the whole living organism and its application to medicine. Therefore, the theme of Beijing Physiology 2008 is "Physiology in Medicine: Bridging Bench and Bedside."

The scientific program and meeting location were finalized during an organizational meeting held in Beijing at Peking University International Collaboration Office from January 7-8, 2008. The organizing committee consisted of representatives of the five participating societies. The members of the organizing committee attending the meeting included Rui Wang, Martin Frank, Xian Wang, Tai Yao, Ming Fan, Chen Chen, Doug Jones, YS Chan, Giovanni Mann, David Adams, Wen-Jun Yuan, Jian-Jun Wang, and Yun Wang (Picture 1).

In planning the meeting, an effort was made to structure the symposia in a manner that would involve representatives from the participating societies. In general, physiologists from at least three of the participating countries are included on each symposium. Each of the symposia is designed to compliment the overall theme of "Physiology in Medicine." The symposia program is as follows:

Calcium Signalling

Plasticity of the Cardiopulmonary - Digestive Axis

Novel aspects of aging and stress

Glucose and lipid metabolism and the metabolic syndrome

Breathing at the Extremes

Signalling with Gas: Gasotransmitter in perspective

Progenitor cells in endocrine systems

Mechanotransduction and Mechanobiology

Oxidative stress and angiotensin signalling in the control of cardiovascular function

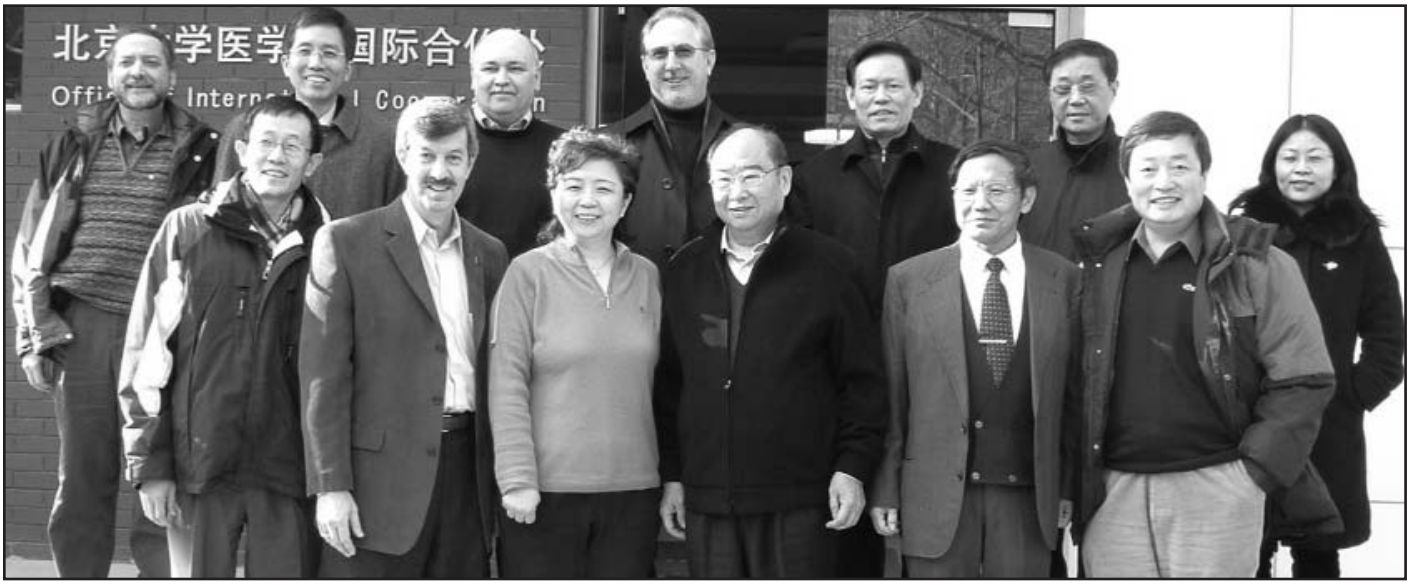
Oxygen sensing: function and dysfunction

Acupuncture and homeostasis

Histamine actions in the brain

Ion channels and cardiovascular disease

Plasticity in sensory network for-



The organizing committee of Beijing Physiology 2008 met in Beijing at Peking University International Collaboration Office from January 7-8, 2008 where the scientific program and meeting location were finalized.

mation and sensory gating

Plasticity of Motor Systems in the Spinal Cord

Cardiovascular disease: Physiology, genetics and metabolism.

In addition, the APS and The Physiological Society have organized an all day workshop for Saturday, October 19 that is titled, "How to get your work published in English-language biomedical journals and trends in Western biomedical publishing." This workshop, aimed at students, postdoctoral fellows and junior faculty, will provide insights into strategies for telling a compelling scientific story and increasing one's chance of getting research into print. Speakers will also address current trends in biomedical publishing, including the impact of electronic publishing and the open access movement, and will cover ethical practices of major English-language journals, including prohibitions on duplicate publication, inappropriate manipulation of scientific images, animal and human subject concerns, and self-plagiarism. The workshop is timely given the rapid acceleration of scientific productivity in China and a desire on the part of many Chinese authors to publish in Western journals, coupled with data indicating a decreased acceptance rate for articles authored by non-native speakers submitted to such journals.

In addition to the exchange of scientific information and the development of collaborative interactions, Beijing Physiology 2008 will provide attendees with an opportunity to discover Beijing and its many sites. Beijing is an elegant and graceful city, bustling with life and rich in tradition. The Chinese capital offers the visitor some of the world's best-known and most breathtaking historical sites, such as The Forbidden City and The Great Wall of China**,** but at the same time, caters to international tastes in dining, entertainment and shopping. The thriving city of Beijing is truly a study in contrasts. With its wide avenues and spacious parks, Beijing can appear vast and grandiose; but take a stroll around a marketplace or down one of the city's back streets, the narrow alleyways known as "hutong," and a world of ancient customs, sights and smells is revealed—stalls of mysterious herbal remedies and aromatic teas, woks sizzling with exotic food, and warm people who will welcome you into their lives. A modern metropolis that is steeped in history, it's not hard to discover why this imperial city is one of the world's most fascinating destinations.

Beijing has a lot to offer in a scientific realm and culturally.

Join your Society in celebrating opportunities for scientific interaction by participating in Beijing Physiology 2008. Meeting information is being posted at http://www.beijingphys2008.org/. The abstract deadline is May 31 and the registration deadline is July 15. The APS has set up a Travel Award Program designed to encourage the participation of students and physiologists who are within 15 years of receiving their doctoral degree and are underrepresented minorities. In addition, the program's emphasis will be to provide awards to those who have submitted abstracts to the meeting. The Society expects to make at least 60 travel awards of $750 each. Because many potential registrants will not be able to attend unless they receive a travel award, our goal is to finalize award selection at least 10 days prior to the abstract submission deadline. The deadline for submission of applications for a travel grant is April 28. Information about the program can be found at http://www.the-aps.org/awards/society/beijing.htm.

We look forward to a very successful meeting in Beijing, China. Your participation will contribute greatly to the success of the conference and the further strengthening of international friendships. We would also like to encourage meeting participants to arrange visits to laboratories in Beijing and around China to further strengthen these bonds. ❖

New Regular Members

***Transferred from Student Membership**

Kashif Adh Ahmad
Northwestern Hlth. Scis. Univ., MN
Rodrigo Ricardo Alzamora
Univ. of Pittsburgh, PA
Eun Hui Bae
Chonnam Nat'l Univ., South Korea
Debra Page Baluch*
Arizona State Univ., Tempe
Sebastien Banzet
Ctr. De Recherches, De Sante, France
Kenneth A. Barbee
Drexel Univ., PA
Brenda Louise Bass
Univ. of Utah, Salt Lake City
Harold J. Bell*
Pennsylvania State Univ., Hershey
Gregory Bion Bierer
Univ. of California, LA Med. Ctr.
Brett R. Blackman
Univ. of Virginia, Charlottesville
Grant Anderson Bledsoe
Charleston Southern Univ., SC
Marni Della Boppart
Univ. of Illinois, Urbana
Francois Boudreau
Univ. of Sherbrooke, Canada
Patrick Ross Cammarata
Univ. of North Texas, Fort Worth
Trevor Ryan Cardinal*
CA Poly. State Univ., San Luis Obispo
Mattias Carlstrom
Uppsala Univ., Sweden
Mary E. Choi
Harvard Med. Sch., MA
Richard Courtemanche
Concordia Univ., Montreal, Canada
Dane Alan Crossley
Univ. of North Dakota, Grand Forks
Gregory Clarke DeAngelis
Univ. of Rochester, NY
Sharon DeMorrow
Texas A&M Hlth Sci.,Temple
Gerene Marie Denning
Univ. of Iowa
Edgar Lichar Dillon
Univ. of Texas Med. Branch, Galveston
Jussara Marcia Do Carmo
Univ. of Mississippi Med. Ctr., Jackson
Ryan A. Dombkowski*
Saint Mary's College, Notre Dame, IN
Rebecca Anne Falin
Vanderbilt Univ., Nashville, TN
Thomas E. Finger
Univ. of Colorado, Denver
Evanna L. Gleason
Louisiana State Univ., Baton Rouge
Ilya Gukovsky
Univ. of California, Los Angeles
Valerie K. Haftel
Morehouse College, Atlanta, GA
Domitila Augusta Huber
Medical College of Georgia, Augusta
Jamal A. Ibdah
Univ. of Missouri, Columbia
Ronaldo Ichiyama
Univ. of California, Los Angeles
Marina V. Ioudina
Touro Univ., Nevada
Stephen Mathias Jakob
Univ. Hosp., Bern, Switzerland
Timothy J. Jegla
Scripps Research Inst., La Jolla, CA
Bingbing Jiang
Boston Univ. Sch. Med., MA
Rebecca A. Johnson*
Univ. of Wisconsin, Madison
Thomas Joseph Jones
Univ. of Toledo, OH
Zaruhi Zara Karabekian
Washington Univ., Washington, DC
Gerald Karsenty
Columbia Univ., New York
Byron Kemper
Univ. of Illinois, Urbana-Champaign
Stefan Keslacy
Univ. of Syracuse, NY
Aisha Saleem Khan
Kinnaird College for Women, Pakistan
Uh-Hyun Kim
Chonbuk Nat'l Univ., South Korea
Masayo Koide
Univ. of Vermont, Burlington
Padmini Komalavilas
Arizona State Univ., Tempe
Kristine M. Krajnak
Natl. Inst. Occup. Safety & Health,WV
Rebecca L. Krisher
Univ. of Illinois, Urbana
Robert H. Lane
Univ. of Utah, Salt Lake City
Marie H. Larsson
AstraZeneca R&D, Sweden
Mark L. Latash
Pennsylvania State Univ.
Trese Leinders-Zufall
Univ. of Saarland, Hamburg, Germany
Shannon L. Lennon-Edwards
Univ. of Delaware, Newark
Daniel I. Levy
Univ. of Chicago, IL
Hanyu Liang*
Univ. of Texas HSC, San Antonio
Brian P. Lipton*
Arrowhead Hosp., Glendale, AZ
Shinguang Liu
Univ. of Kansas Med. Ctr.
Yurn Liu
Univ. of Illinois, Chicago
Analia S. Loria
Medical College of Georgia, Augusta
Karen M. Lounsbury
Univ. of Vermont, Burlington
Chitrawina Mahagita*
Mahidol Univ., Bangkok, Thailand
Stephen D. McCormick
US Geological Survey, MA
Jessica Meendering*
Univ. of Nebraska, Omaha
Kelly Ann Miller
Children's Hospital, Pittsburgh, PA
R. Lance Miller*
Univ. of Utah, Salt Lake City
Shio Mizuno
Univ. Fukui, Japan
Michael R. Morissette
Beth Israel Deaconess Med. Ctr., MA
Haleagrahara S. Nagaraja
Int'l. Med. Univ., Malaysia
Asma Nusrat
Emory Univ., Atlanta, GA
Kate E. O'Driscoll
Univ. of Nevada, Reno
Youichirou Ootsuka
Flinders Univ. Sch. Med., Australia
Harald Osmundsen
Univ. of Oslo, Norway
Perrie F. O'Tierney
Oregon Hlth.& Sci.Univ.
Osman V. Patel
Michigan State Univ., East Lansing
Jason Peart
Griffith Univ., Australia
Brian A Perrino
Univ. of Nevada Sch. Med., Reno
Elena Petroff
Univ. of Iowa
David B. Polk
Vanderbilt Univ. Sch. Med., Nashville
Gangjian Qin
Northwestern Univ., Chicago, IL
Kristi Suzanne Rau-Seferian*
Novartis Pharmaceuticals, CA

Don Rockey
Univ. of Texas SW Med. Ctr., Dallas
Pierre-Henri Rolland
Univ. of Marseille Sch. Med., France
Daniel S. Rooks
Novartis Inst. of BioMed Res., MA
Ivan Rubio-Gayosso*
Escuela Superior De Medinina, Mexico
Santiago Schnell
Indiana Univ., Bloomington
Frank Seebacher
Univ. of Sydney, Australia
Han Si
Albert Einstein Coll. Med., Bronx, NY
Ronald Sluyter
Univ. of Wollongong, Australia
Olivier Staub
Univ. of Lausanne, Switzerland
Joan Y. Summy-Long
Pennsylvania State Univ., Hershey
Elizabeth S. Sztul
Univ. of Alabama, Birmingham
Daniel J. Tollin
Univ. of Colorado Hlth Sci. Ctr., Aurora
Laura Trumper
Fac. Ciencias Bio. Farmace, Argentina
Maki Urushihara
Tulane Univ., New Orleans
Francesco Vetri
Univ. of Illinois, Chicago
Bradley K. Wacker
Washington Univ., St. Louis, MO
Mark T. Wallace
Vanderbilt Univ., Nashville, TN
Patty Sue D. Weber
Michigan State Univ.
Michael S. Wehr
Univ. of Oregon, Eugene
Raymond E. Willis
Texas Tech Univ., Lubbock
Jie Wu
St Joseph's Hosp./Med. Ctr., Phoenix, AZ
Huirong Xie
Vanderbilt Univ., Nashville, TN
Liuqing Yang
Univ. of California, San Diego
Yuji Yokouchi
Kumamoto Univ., Japan
Naoki Yoshimura
Univ. of Pittsburgh, PA
Peter Yuen
NIH-NIDDK, Bethesda, MD
Tamara Zaobornyj*
Univ. of Buenos Aires, Argentina
Mingzhi Zhang
Vanderbilt Univ., Nashville, TN
Honggang Zhao
Univ. of Nebraska, Omaha
Shu Zhu*
Medical Coll. of Georgia, Augusta
Kevin A. Zwetsloot*
Univ. of Missouri, Columbia

New Student Members

Ismahil Adeniyi
Univ. of Lagos, Nigeria
Carlos Eduardo Almado
Ribeirao Preto Univ., Brazil
James Asemewalen
Ambrose Alli Univ., Brazil
Manoj Bhaskaran
Oklahoma State Univ.
James Bosanquet
Univ. of Missouri
Stephen Buckley
Trinity College, Dublin, Ireland
Glaucia Carneiro
Univ. of Fed De Sao Paulo, Brazil
Arianne Cease
Arizona State Univ.
Dipanjan Chanda
Hormone Res. Ctr., South Korea
Natalie Chapados
Univ. De Montreal, Canada
Yi-Hsin Cheng
Case Western Reserve Univ., OH
Summer Cook
Syracuse Univ., NY
Juan Cordovez
SUNY, Stony Brook, NY
Daniel Curtis
Univ. of Nevada
Brian Deegan
Natl. Univ., Ireland
Phillip Dobbs
US Sports Academy, Alabama
Ryan Downey
Texas Tech Univ., Health Sci. Ctr.
John Durocher
Michigan Technological Univ.
Jessica Durrant
Univ. of Colorado, Boulder
Racine Emmons
Columbia Univ., NY
Tara Fay
Univ. of Colorado, Boulder
Anne Fink
Univ. of Illinois, Chicago
Christian Gam
Univ. of Copenhagen, Denmark
Jennifer Gay
Univ. of Oregon
John Handrakis
James J. Peters, Bronx VAMC, NY
Disa Hatfield
Univ. of Connecticut
Yujiro Hayashi
Osaka Univ., Japan
David Hogg
Univ. of Toronto, Canada
Kristine Holthouser
Univ. of Louisville, KY
Anna Ivanina
Kazan State Univ., Russia
Brandiese Jacobs
Univ. of Maryland, Baltimore
Seth Jump
Univ. of Missouri, Columbia
Aisha Kelly
Medical College of Georgia
Roozbeth Kiani
Univ. of Washington, Seattle
Kyunghee Kim
Kansas State Univ.
Michael Landram
Appalachian State Univ., NC
Thomas Larsen
Univ. of Copenhagen, Denmark
Steve Laurie
Univ. of Oregon
Johnathan Lawrence
Michigan Technological Univ.
Jennifer LeMoine
Ball State Univ., IN
Kyle Lillis
Boston Univ., MA
Zhiping Liu
Iowa State Univ.

Veronica Mackey
Meharry Medical Coll., TN
Matthew Maesas
California St. Polytech. Univ.
Miren Maiz
Univ. of California, LA
Austin Merrill
Univ. of California, Davis
Ethan Meyers
Massachusetts Inst. of Tech.
Hema Moorhy
The Volcani Center, Israel
Erica Morley
Arizona State Univ.
Damodaran Narayanan
Univ. of Tennessee
Erika Nassar
Baylor Univ., TX
Efe Omorodion-Osagie
Univ. of Lagos, Nigeria
Peipei Pan
Univ. of Nevada, Las Vegas
Amitabh Pandey
Tulane Univ., LA
Roger Paxton
Colorado State Univ.
Matthew Perkins
SUNY Stony Brook, NY
Julie Phillips
Univ. of California, Merced
Oneica Poole
SUNY Stony Brook, NY
Inefta Reid
SUNY Stony Brook, NY
Jennifer Richards
Colorado State Univ.
Dwindally Rosado-Rivera
Teachers College Columbia Univ.
Bruno Roseguini
Univ. of Missouri, Columbia
Tiffany Schmidt
Univ. of Minnesota
Rajini Seevaratnam
York Univ., Canada
Mohammad Shadab
Jawaharlal Nehru Med College, India
Ali Shawki
Univ. of Cincinnati, OH
Sunena Srivastava
Kyorin Univ., Japan
Bridget Sullivan
Ball State Univ., IN
Laura Trent
Univ. of Alabama, Birmingham
Britta Veitenheimer
Univ. of Minnesota
Angela Verdoni
Univ. of Wisconsin, Madison
Letitia Weigand
Johns Hopkins, MD
Justin Wilson
Howard Univ., Washington, DC
Liang Xiao
Univ. of Nebraska Med. Ctr.
Ximeng Yang
Univ. of Oregon
Xiaoyuan Zhu
Univ. of Alabama, Birmingham

New Affiliate Members

Michael Brett Adams
Univ. of TX, Southwestern
Taira Fujioka
Ridge Corp., TX
Antonia Jameson Jordan
Cornell Univ., NY
Darvin G. McBrayer
FITlab, TX
Robby Nelson
US Army Research Inst., MA
Marcos Sanchez-Gonzalez
Univ. of Turabo, Puerto Rico

Recently Deceased Members

John A. Bevan
Charlotte, VT
Joseph A. Chromiak
Mississippi State, MS
Jacqueline Clause-Walker
Houston, TX
William F. Ganong
Albany, CA
Joan Wright Goodman
Berkeley, CA
Werner P. Koella
Oberwil, Switzerland
Luis Gabriel Melo
Kingston, ON, Canada
Herbert Silvette
Stanardsville, VA
Jacob W. Stutzman
Naples, FL
Shoaib Tauheed
Karachi, Pakistan
G. Donald Whedon
Clearwater Beach, FL
Wanda Wyrwicka
Los Angeles, CA

Outreach Fellows Bring Physiology to K-12 Classrooms

The APS K-12 Minority Outreach program seeks to foster communication between minority graduate and postdoctoral students and middle/high school minority life sciences students. Program activities include year-long outreach fellowships for senior graduate students and postdoctoral fellows to visit K-12 classrooms, help conduct teacher professional development workshops, and attend scientific meetings. The fellowship is supported by a grant from the National Institute Diabetes and Digestive and Kidney Disorders (NIDDK) at the National Institutes of Health (Grant # R13 DK39306).

This program helps students improve their teaching skills at all levels, reach out to the next generation of minority scientists, participate in outreach activities to K-12 students and teachers and become more comfortable talking about careers in physiology. To accomplish these goals, Outreach Fellows serve as a Physiologist-in-Residence for the Frontiers in Physiology Research Teachers during the Science Teaching Forum, receive funding to attend two Experimental Biology meetings as well as the ABRCMS and SACNAS meetings, and arrange to visit two K-12 classrooms and/or participate in PhUn Week. To be eligible, students must have been APS Minority Travel Fellows and/or Porter Fellows in the past.

Since its inception in 2006, the APS has awarded five fellowships:

The 2006-2007 Fellow was Mesia M. Steed, Univ. of Louisville. Steed is a graduate student in the Department of Physiology at the University of Louisville. Her research focuses on how homocysteine affects the three isoforms of nitric oxide synthase (NOS): endothelial, inducible and neural, in the development of cardiovascular diseases. In October and November 2006, Steed visited five middle and high schools in Kentucky and Indiana. During those visits, she reached almost 400 students! Her presentations ranged from large groups in the cafeteria to small groups of students. She gave talks about careers in physiology and how she got to where she is today. She also led large group activities on exercise physiology using egg cartons and marbles to demonstrate how blood flow and oxygen delivery changes from rest to exercise and how it's related to hypertension and heart disease. Steed continues to do outreach with various groups, i.e., the Girl Scouts.

Steed attended EB 2006 and EB 2007. She also attended ABRCMS 2006 to promote the APS, its meetings, summer research opportunities and programs for minority students, and careers in physiology.

The 2007-2008 Fellows are Jessica A. Clark, Washington Univ. School of Medicine, and Clintoria Richards-Williams, Univ. of Alabama at Birmingham.

Clark is a postdoctoral fellow in the Department of Surgery. She is currently studying the role of the intestinal epithelium in the pathogenesis of sepsis. In September 2007, Clark visited three elementary school classrooms in Arizona and New Mexico. She taught almost 250 students about why digestion is important by dissecting owl pellets, talked about what it means to be a scientist, used hands-on activities to show the effect of exercise on heart rate and response rate, and discussed the cardiovascular system, the importance of exercise, and the scientific method.

Richards-Williams is a graduate student in the Department of Physiology. Her research focuses on the role of ATP and zinc in pancreatic ß-cell physiology. In October 2007 and January 2008, Richards-Williams visited two classrooms at an intermediate school, as well as at a Learning Center in the Birmingham area. She reached over 130 students. Richards-Williams worked with the teachers and students to discuss careers in physiology, learn what scientists do, learn that scientists come from different backgrounds, and discuss the scientific method. She engaged the students in a modified version of the "Elvis Experiments" (how the cardiovascular system responds to exercise).

Clark and Richards-Williams both attended EB 2007 and will attend EB 2008. Clark attended the SACNAS meeting and Richards-Williams attended ABRCMS 2007, both promoting the APS, meetings, the Undergraduate Summer Research Fellowship, careers in physiology and programs for minority students.

The 2008-2009 Fellows are TanYa Gwathmey, Wake Forest Univ. School of Medicine and Keisa Mathis, LSU Health Sciences Center.

Gwathmey is a postdoctoral fellow in the Hypertension and Vascular Research Center. Mathis is a graduate student in the Department of Physiology. They will attend EB 2008 and 2009, the 2008 Science Teaching Forum, and ABRCMS and/or SACNAS and will participate in outreach activities throughout the fellowship.

Questions regarding the APS/NIDDK K-12 Minority Outreach Fellowship, can be directed to Brooke Bruthers, Award Coordinator, at bbruthers@the-aps.org. For additional information about the program, please visit http://www.the-aps.org/education/minority_prog/stu_fellows/k-12_minor/ov_k12.htm. ❖

APS Presents Award for the Best Physiology Project at a New Mexico High School Science Fair

Scott Divett, a senior at Rio Rancho High School in Albuquerque, NM, received an APS reward for the best physiology project at the high school's Eighth Annual Fall Research Expo. Scott was also the second place overall winner at the Research Expo that was held on December 6, 2007. Scott is the first student to receive a science fair award packet from The American Physiological Society. APS members Karen Sweazea and Jessica Snow of the University of New Mexico were judges on behalf of the APS and presented Divett with his award. He received an APS "Physiology: Life, Logic Study" t-shirt, an APS researcher pin, and a certificate for the best physiology project. The title of Scott's project is: "10,000 Steps a Day Keeps the Diabetes Away." His teacher and sponsor is Zenaida Ahumada.

Any APS member who participates as a judge in a local or regional science fair at an elementary, middle, or high school is eligible to apply and receive an APS award packet. For more information, visit www.the-aps.org/education/science-fair or contact Scarletta Whitsett (swhitsett@the-aps.org) in the APS Education Department. ❖

The Physiologist
Vol. 51, No. 2, 2008

Early Years and Planning for Tenure Review

Barbara T. Alexander
A recently tenured Associate Professor at the University of Mississippi Medical Center, Jackson, MS

Congratulations! You have just started your career as a new tenure-track assistant professor. So, what do you do first? Find your new parking space, set up your laboratory, hire new laboratory personnel, establish your IACUC, IRB, Biohazard, and/or Radiation certifications, or obtain a copy of your university's tenure, promotion, and evaluation of time and performance review? The last choice is the one choice that you should **not** overlook before you get busy with experimental design, grant deadlines, manuscript revisions, teaching duties, committee meetings, etc. Although your tenure review may be five to six years in the future, what you do, how well you document what you do, and how well you are perceived by others within and outside your department and university will be critical to your tenure review.

What is tenure?

The dictionary defines tenure as the act, right, manner, or period of holding something as landed property, an office, or a position (1). The National Education Association (NEA) and the American Association of University Professors (AAUP) state tenure is vital to the protection of academic freedom (2, 3) or the right to teach and learn without interference (1). In general, a tenured faculty member has a continuous faculty appointment that will extend until retirement unless it is terminated due to death, resignation, or a significant change in faculty performance according to your departmental and university standards and an unacceptable post-tenure review.

What is the tenure system?

The tenure system is an internal policy adapted by a university. As endorsed by the AAUP, it generally consists of a seven-year maximum probationary period for a tenure-track faculty member to establish their record for tenure. If tenure is not granted by one year prior to the end of the mandatory probationary period, a tenure-track faculty member will be granted a one-year terminal year of employment (2).

What are your chances of receiving tenure?

In 2001, approximately 46% of all college and university faculty members were tenured. When separated by gender, 52% of the male faculty was tenured, 34% of the women (4). Nationally, about one in five probationary faculty members are denied tenure and lose their job (3).

Barbara T. Alexander

What is expected of a tenure-track candidate?

Expectations for tenure will vary based on the research, service, and teaching goals of that department and/or university. In general, a candidate's positive recommendation for promotion or tenure is based on their past record and future potential as an effective member of the academic community. It requires several years of sustained, outstanding achievements in the areas of research, service, and teaching that are consistent with the goals of the department and university. For a candidate in a department with a strong focus on research, such as a department of physiology located in a medical university, criteria for tenure may specify that a candidate be an independent, extramurally funded investigator who has produced a significant body of high-quality work and gained positive recognition of peers in the profession with consideration for teaching and service endeavors.

How do you apply for tenure review?

Often your tenure application will be initiated by your departmental chair or your departmental tenure and promotion committee. Following their recommendation, you will submit a tenure application based on the criteria and deadlines listed in your department's/university's tenure review policy. This application will summarize your research, service, and teaching during your probationary period. Additionally, you may be asked to provide external letters of support or a list of external references that you deem can expertly comment on your teaching, service, and research activities.

What is a tenure application?

Your tenure application will be defined by the tenure system of your university. Tenure criteria can vary from institution to institution and even department to department within a university system. It is critical that you receive a copy of the tenure policy that will apply to your tenure review process. This policy will include not only criteria for your record of research, service, and teaching, but also important dates and deadlines critical to your tenure review. Importantly, you may need to refer to the tenure system at your university to determine whether credit for prior service at another university or prior academic service can or will reduce your probationary period. In addition, note that the tenure review policy at your university may differ from one faculty member to another based on hiring date and updates and revisions in university tenure policy. Therefore, it is imperative that you have the correct tenure review policy with applicable deadlines that is specific for you and your hire date.

How do you prepare for tenure review?

After you have the correct copy of the tenure policy relevant to your tenure process, read it! Keep a tenure folder on your desk and on your computer. Document everything. Keep current with all your documentation. Collect and organize your tenure application based on the criteria provided by the tenure policy at your university. In general your tenure application may contain some or all of the following:

General: Biographical information, employment history, and academic background.

Research: 1) A statement of your research goals. 2) Your current curriculum vitae, including your publication list, awards, honors, participation at national and international meetings and conferences, invited talks at other institutions, sources of funding, etc. 3) An expansion of your CV. This could include

an expanded description of your role in a grant; copies of grant award letters containing information on the amount and date of the award, in addition to a listing of PIs and CPIs; and the title, collaborators, and your role for grant proposals under development. Your tenure application may also include copies of published manuscripts, materials that are submitted for review, "in press" publications, or books or book chapters you have authored. 4) Listing of all undergraduate or graduate students and postdoctoral fellows. Include the dates and your interactions, such as a supervisor or a member of a thesis committee; provide information regarding current career positions of former students and fellows. 4) List of industry contacts and the nature of your interactions. 5) List of involvement at national and international meetings, including your invited talks, and meeting participation, including moderator or chair of a scientific session.

Service: 1) List service to your department and university. Identify your position and membership on committees and length of service. 2) List activities related to students outside of regular departmental duties and alumni activities. 3) List service to national funding agencies and professional societies, including journal editorial duties and editorial board memberships, peer-review study sections, conference abstract grader, committee involvement, elected office, involvement in training workshops, etc.

Teaching: 1) A statement of your personal teaching philosophy and a summary of your main strengths as a teacher. 2) List courses taught by year and include a course syllabus for each; include student evaluations with official documentation of the number of students enrolled. 3) List teaching awards.

References: You may be asked to provide letters of support. Or, you may be asked to provide a list of external references. External letters of reference are often required for tenure and ensure that the candidate has an achievement and performance level that is comparable with faculty at peer institutions. Letters of reference, as a part of your tenure application, are usually held in confidence in order to protect the identity, privacy, and confidentiality of the evaluator.

How do you improve your tenure application and chances to gain tenure?

Tenure Policy. First and most importantly, get a copy of your institution's tenure policy. Make sure it is the correct edition with all pertinent addendums.

Document. Know what type of documentation you will need and document everything! Feedback. (a) *Mentor*. Find a mentor or mentors. Periodically, meet with your mentor(s) and go over your progress. Are my teaching duties sufficient? How critical are my teaching evaluations by students? Do I need more service activities on my CV? Do I need more service on national committees? Can you recommend me for such a position? (b) *Annual Review*. Does your department have an annual review procedure? Is it a formal review process? Are the criteria similar to those of tenure? What is the feedback from your departmental chair in your annual reviews?

Network. If you will need external references, who will you ask? This is where your participation at national and international meetings is critical. At large meetings a mentor may be vital to your introduction to others. Attendance at smaller specialty meetings can be very beneficial in providing a more casual opportunity for interaction with others. Service on scientific society committees provides an excellent opportunity to interact with faculty from other institutions who may not be in your direct field of research. Also, service on grant peer-review committees can provide an excellent chance for networking and meeting other investigators critical to your career and your tenure review.

Hard work and perseverance. Last, but not least, *publish* and obtain *independent extramurally funded grant support*; these are the hallmarks of your tenure application and, of course, advancement in your scientific research career.

How is your tenure judged?

It is also important that you understand how your tenure application will be judged. Are you a senior author on publications in high-quality peer-reviewed scientific journals? Are your publications counted by number or is impact factor important in their review? Are you a PI on a research grant from a national peer-reviewed funding agency, such as the National Institutes of Health? Or, does funding from an organization such as the American Heart Association carry the same impact? How well does your application demonstrate your recognition as an authority in your field? How will the tenure committee evaluate your teaching performance? Have you been able to attract quality students and postdoctoral fellows? How important is your participation on university and national committees? Also, understand the review process. The tenure review process may involve your tenure application, a departmental tenure review committee, a detailed form prepared by your departmental chair, external letters of reference, a university tenure review committee, review by appropriate Deans and subsequent Chancellors or Vice-Presidents, then review by the University President/Chancellor, with a final approval from an Institute of Higher Learning or Board of Trustees.

What is post-tenure review?

Post-tenure review is a means to monitor performance of tenured faculty through the use of an annual performance evaluation. It may be triggered by a number of years of low performance based on post-tenure review guidelines at your institution and may result in disciplinary action.

Final thoughts.

Tenure follows the simple guidelines for success in science. Follow the instructions (just as you would when working with a RNA isolation kit!), document your work, work hard, and persevere!

Other resources

American Association of University Professors:
http://www.aaup.org/AAUP/issues/tenure/resources.htm

National Education Association: http://www2.nea.org/he/tenure.html

American Association of University Women: http://www.aauw.org/index.cfm

References

1. The Merriam-Webster Dictionary, Home and Office Edition, Merrium-Webster, Inc, Publishers, Springfield, MA. 1995.
2. http://www.aaup.org/AAUP/issues/tenure/resources.htm
3. http://www2.nea.org/he/truth.html
4. http://www.aauw.org/advocacy/laf/lafnetwork/library/tenure_stats.cfm.

To comment on this article, go to: http://www.the-aps.org/careers/careers1/mentor/tenure.htm. ❖

President Issues Budget for FY 2009

On February 4, 2008 President Bush issued his budget proposal for fiscal year (FY) 2009. The Administration is seeking to control spending by holding non-defense domestic discretionary programs at FY 2008 levels. The $3.1 trillion spending measure covers all federal programs, including those for life sciences research.

The President's budget reflects the priorities established in the American Competitiveness Initiative and the America COMPETES Act of 2007. It proposes significantly increased funding for the National Science Foundation (NSF), Department of Energy's Office of Science and the National Institute of Standards and Technology. Most biomedical research programs do not fare as well. If enacted, the Administration's budget would hold the National Institutes of Health (NIH) to its FY 2008 level and cut Veterans' Affairs (VA) medical and prosthetic by nearly 8%. NASA as a whole would increase by 1.8%, with funding for life sciences research increasing by 3.4%. Details for each agency's budget proposal are below.

While the budget presents a mixed picture for life sciences research, the current political climate makes it unlikely that the Administration's proposal will be enacted in its current form. With the distraction of the Presidential and Congressional elections in November, there is speculation that the budget for FY 2009 may not be complete until as late as January 2009, when a new administration will be in place. Despite the fact that the Administration will be new, there are significant economic pressures that will continue to make it a challenge to increase funding for research.

NIH

The Administration's budget proposal would provide the NIH with $29.3 billion in FY 2009, the same as the current (FY 2008) level. This falls significantly below FASEB's budget recommendation of $31.2 billion, and provides no inflationary increase even though the Biomedical Research and Development Price Index (BRDPI) is 3.5%.

Most institutes and centers would receive slight increases over last year with money freed up by the proposed elimination of the Children's Health Study. The proposal would fund approximately 9,700 competing awards, with a success rate of 18% overall. The total number of research project grants would be 36,516, a drop of more than 500 when compared to FY 2007. Funding for NIH Roadmap programs would increase by $38 million to a total of $534 million, representing a total of 1.8% of the NIH budget. Pre- and postdoctoral fellows would receive 1% salary increases, and NIH would continue to prioritize funding for new and young investigators. Approximately 240 Director's Bridge Awards would be distributed to sustain investigators whose funding has lapsed.

More details about the NIH budget proposal can be found here: http://officeofbudget.od.nih.gov/ui/HomePage.htm.

NSF

Under the President's proposal, the NSF would receive an increase of $822 million, a 13.6% increase over FY 2008 for a total of $6.85 billion. While the proposal would boost the NSF budget above last year, the level falls well short of the planned budget doubling laid out in the America COMPETES Act, which would have funded the agency at $7.33 billion, which is the same as FASEB's FY 2009 recommendation.

The bulk of the increase would go to Research and Related Activities (R&RA), for an increase of $772 million. This would allow the agency to fund an additional 1,370 research grants and increase the funding rate to 23%. Within R&RA, the Biological Sciences (BIO) Directorate would increase by $63 million (10.3%). The NSF plans to invest in four cross-foundation initiatives, two of which involve BIO. The Adaptive Systems Technology will focus on "generating creative pathways and natural interfaces between human physical systems that will revolutionize the development of novel adaptive systems" and the Dynamics of Water Processes in the Environment "aims to increase fundamental understanding of the Earth's freshwater systems and provide the scientific basis for decision-making about water resources."

More information about these initiatives and the NSF budget can be found here: http://www.nsf.gov/about/budget/fy2009/index.jsp.

VA

In FY 2008, Congress added emergency funds to the VA medical and prosthetic research budget, bringing it to a total of $480 million. If enacted, the Administration's budget would reduce funding for medical and prosthetic research programs at the VA by nearly 8% ($38 million), bringing the funding to $442 million in FY 2009. FASEB and the Friends of VA recommend an increase of $75 million to $555 million, with an additional $45 million for building and infrastructure development in FY 2009.

Priorities in the VA budget include research into combat-related injuries (traumatic brain injury, amputation and prosthetics, post-traumatic stress disorder), mental health (combat-related, substance abuse, anxiety disorders, depression, and dementia), personalized medicine, care for chronic conditions and long-term care for older veterans.

More details on the VA budget can be found here: http://www.va.gov/budget/summary/2009/index.htm.

NASA

The proposal for NASA's FY 2009 budget would give the agency an additional $304.8 million, bringing the total budget to $17.6 billion (1.8% increase). The budget for the Human Research Program (HRP), which conducts research and develops countermeasures

with the goal of enabling safe and productive human space exploration, would increase by $5 million (3.4%) to $151.9 million.

The HRP is focused on studying the physiological and behavioral effects of prolonged spaceflight and the effects of environmental radiation exposure on the human body, with the goal of reducing the risks associated with human spaceflight by developing countermeasures and technologies.

For more information, see the NASA budget page: http://www.nasa.gov/news/budget/index.html.

Science and the 2008 Election

With the 2008 Congressional and Presidential elections approaching, scientists are eager to hear the candidates address important topics relevant to scientific research including climate change, stem cells, renewable energy and bioethics. While many of these topics are addressed in the context of larger policy issues such as health care, the environment and world politics, there has been no focused discussion on science issues among the Presidential candidates. Several groups have initiated efforts that range from planning a debate on science to collecting and distributing information on the candidates' views. Below is a list of resources.

Science Debate 2008

Supported by dozens of distinguished scientists, government officials, and scientific organizations, this effort is aimed at sponsoring a debate on scientific topics for the Presidential candidates. At press time, the debate was scheduled for April 18 at the Franklin Institute in Philadelphia, PA but participation by the candidates remains in question. (http://www.sciencedebate2008.com/)

Research!America

Based on the results of questionnaires sent to each of the Presidential campaigns, Research!America presents the views of each candidate. Features include the ability to compare and contrast candidates' views. Later in the election season, responses to the questionnaire sent to Congressional candidates will also be available. (http://www.yourcandidatesyourhealth.org/)

FASEB

The Federation of American Societies for Experimental Biology (FASEB) has initiated a web site that provides tools for scientists to get involved in the 2008 elections. The site highlights the importance of the National Institutes of Health at the local, state and national levels as well as tools for becoming an advocate for scientific research in the 2008 elections. (http://www.sciencecures.org/)

AAAS

The AAAS has prepared a comparison of the Presidential candidates' views on scientific issues based on information provided on the campaigns' official websites as well as other resources. (http://election2008.aaas.org/).

Zerhouni Condemns Attack on UCLA Researcher

"Terrorism against researchers using animals is real and intolerable" declared National Institutes of Health (NIH) Director Elias Zerhouni in response to an attack on the home of a University of California, Los Angeles (UCLA) researcher. It was the second attack in four months against Edythe London, an NIH grantee who is studying nicotine and methamphetamine addiction. In his February 8 statement denouncing animal rights extremism, Zerhouni stressed that animal research is vital to medical progress as well as thoroughly regulated.

On February 5, 2008, animal extremists detonated an incendiary device on the porch of London's Los Angeles home. The device set fire to her front door, but no one was injured. London, formerly a senior scientist at the NIH, conducts both clinical and animal studies. The latter—some of which involves vervet monkeys—has made her a target for animal extremists.

The earlier attack on London's home occurred in October of 2007. The Animal Liberation Front (ALF) claimed responsibility for flooding London's home, causing tens of thousands of dollars in damage. In their statement claiming responsibility, the extremists said "[w]e will not stop until UCLA discontinues its primate vivisection programe [*sic*]."

Over the last few years, UCLA and other research institutions around the county have seen a rise in the frequency of attacks on animal researchers. One, involving a Molotov cocktail that failed to detonate, nevertheless caused a neurobiology researcher to abandon his work with animals. The escalation of harassment has sparked many statements denouncing the violence, including two at the end of 2007 from NIH Deputy Director for Extramural Research Norka Ruiz Bravo.

February 21, 2008, UCLA filed a suit against several individuals and organizations to block "a campaign of terrorism, vandalism and menacing threats" directed against its employees. The same day, a judge issued a temporary restraining order prohibiting the listed parties from further attacks on UCLA employees. The order also required that the individuals named in the suit to stay at least 50 feet away from UCLA employees during demonstrations. The judge further directed that personal information about employees be removed from the extremists' websites.

American College of Neuropsychopharmacology (ACNP) President Judith Rapoport also condemned the February 5 attack. "We are fortunate that dedicated scientists such as [London] are willing to continue their important research even in the face of

such endangerment to life and property," Rapoport said in a statement.

London, whose father died from complications of nicotine addiction, responded to the flooding of her home with a November 1, 2007 Op-Ed in the *Los Angeles Times*. She said it would be "immoral to decline an opportunity to increase our knowledge about addiction and develop new treatments for quitting smoking." She resolved to continue her work saying "[w]e must not allow these extremists to stop important research that advances the human condition."

Zerhouni's statement touched on the economic and personal cost of addiction, calling it "a disease that devastates individuals, families, communities" and praised London's work as "a prime example of NIH's efforts to promote translational research." He concluded saying "[t]he terrorist activity against London and her family was not just intimidation—it was life threatening. This was a threat not only to her, but to dedicated scientists working to improve serious health problems facing this country. This violence must stop."

ILAR Issues Updated Distress Report

The Institute for Laboratory Animal Research has completed an update to its 1992 report *Recognition and Alleviation of Pain and Distress in Laboratory Animals*. The pre-publication version was released in late 2007, and the final version of the report was expected to be published in March 2008. The full report can be viewed online or purchased from the National Academies Press at (http://books.nap.edu/catalog/11231.html). A seven page executive summary is also available as a free download.

According to the executive summary, the updated report "focuses specifically on the scientific understanding of the causes and the functions of stress and distress, the transformation of stress to distress, and the identification of principles for the recognition and alleviation of distress." The authoring Committee said that it "approached its task from the perspective of performance standards without describing – among others – factors such as intensity, duration, or types of perturbations." The Committee did so because the report is intended as "an advisory document about an insufficiently understood phenomenon." Consequently, the members of the Committee "believe that – within the current state of science – the best approach to recognize and alleviate distress is through best practices and professional judgment."

The executive summary also notes that there is little agreement about what constitutes distress and how to measure it: "Most definitions of *distress* characterize it as an aversive, negative state in which coping and adaptation processes in response to stressors fail to return an organism to physiological and/or psychological homeostasis." However, there are "philosophical differences" about whether the definition of distress should also encompass "emotions and feelings affected by this state of being." In addition, the Committee noted that "while it is accepted that the failure of the organism to return to homeostasis adversely impacts an animal's well-being and leads to poor welfare, defining *well-being* without relying on some form of anthropomorphic measures is a challenge."

"Scientific research does not yet support objective criteria or principles with which to qualify distress," the Committee wrote in explaining its approach. "Objective scientific assessment of subjective emotional statues cannot be made." Furthermore, "while there is often a measure of agreement on the interpretation of physiologic and/or behavioral variables as indicators of stress, distress, or welfare status, there is not always a direct link" between the intensity, duration, or type of stressor and a resulting state of distress.

The executive summary highlights the following recommendations of the report:

1. Strategies involving replacement, refinement and reduction should be employed wherever possible to identify, modify, avoid, and minimize causes of distress in laboratory animals.

2. Animal research protocols should incorporate strategies for enrichment, animal training, and socialization to improve housing and husbandry conditions.

3. Institutional support and commitment to animal welfare is essential to ensure that veterinarians and animal care personnel have adequate time to evaluate animals' well-being on a daily basis.

4. The use of appropriate statistical methodologies will help avoid, minimize, and alleviate distress.

5. There is a need for a centralized repository of published research on the prevention and alleviation of distress. Examples of topics to include are distress itself, the effects of enrichment strategies on animal physiology, and identifying humane endpoints. Peer-reviewed biomedical journals should be encouraged to accept articles on animal welfare issues. This will engage the broader scientific community and keep it informed. This recommendation is also intended to make it possible for "concerns about research interference or unjustified expenses [to] be debated on scientific, ethical, or regulatory grounds."

6. Federal agencies and other entities that support biomedical and behavioral research should make funds available for research into topics relevant to distress.

7. More frequent communication is needed between researchers who study animal welfare and those who work with animal models. ❖

Postdoctoral Positions

Postdoctoral Research Fellow: Position is available to study cellular signaling in central chemosensitive neurons. The role in central chemosensitivity of changes of intracellular and extracellular pH and calcium induced by hypercapnia, and the ion channel targets of these signals, are studied in rodent brainstem slices using patch clamp (whole cell and perforated patch in current or voltage clamp mode) techniques simultaneously with fluorescence imaging microscopy. Whole animal plethysmography is also employed to study development and plasticity of the ventilatory response to hypercapnia. A PhD or equivalent degree is required. Previous research in neuroscience, experience with electrophysiological measurements and/or studies of chemoreception or chemical control of ventilation is preferred. Send letter of interest, curriculum vitae, and the names of three references to: Dr. Robert W. Putnam, Department of Neuroscience, Cell Biology and Physiology, Wright State University Boonshoft School of Medicine, 3640 Col Glenn Hwy, Dayton, OH 45435 (Email: robert.putnam@wright.edu). [AA/EOE]

Postdoctoral Research Position in Cardiovascular Genetics and Genomics: A position is available to investigate the molecular genetic basis of heart failure using forward (quantitative trait locus mapping) and reverse genetics (trangenics and knockouts) in the mouse. We had previously identified seven distinct quantitative trait loci that modify the heart failure phenotype in a transgenic model of cardiomyopathy. For a recent paper that illustrates this work, see (Wheeler FC, Fernandez L, Carlson KM, Wolf MJ, Rockman HA, Marchuk DA. QTL mapping in a mouse model of cardiomyopathy reveals an ancestral allele affecting heart function and survival. *Mammalian Genome* 16:414-423, 2005). We are now closing in on the identification of these genes and the investigation of their pathophysiological mechanisms. We seek a highly motivated postdoctoral fellow who has experience with or interest in using mouse genetic and genomic approaches to investigate the molecular basis of cardiovascular phenotypes. Send letter of interest, curriculum vitae, and the names of three references via email to: Dr. Douglas A. Marchuk, PhD Department of Molecular Genetics and Microbiology, Duke University School of Medicine, Durham NC. Email: march004@mc.duke.edu.

Postdoctoral Opportunity in Integrative Bone Physiology: We seek a highly motivated individual for a postdoctoral fellowship in our dynamic collaborative group, which includes faculty and students in exercise science, nutrition, and mechanical engineering. This fellow will assist with studies of the integrative physiology of bone responses to exercise, microgravity, and energy restriction funded by National Space Biomedical Research Institute and by the Department of Defense. A completed PhD in exercise science, physiology, nutrition, biomedical engineering or related fields is required, as are excellent writing skills and the ability to work both independently and within a team. Previous experience in bone biology and/or live animal research preferred but not required. Candidate will have the opportunity to pursue funding opportunities and interests in related areas. Yearly stipend is at NIH post-doctoral fellow levels, with full benefits. A recent survey of postdoctoral fellows by *The Scientist* magazine places Texas A&M University in the top 20 (and third best land-grant institution) for quality of postdoctoral experiences. To apply, send your curriculum vitae, a brief description of research interests and career goals, and names, Email addresses and telephone numbers of two to three professional references to: Susan Bloomfield, Professor; Dept of Health & Kinesiology, Texas A&M University, College Station, TX 77843-4243 or to sbloom@tamu.edu.

Postdoctoral Position: A postdoctoral research position is available in the Department of Neurobiology and Behavior at SUNY-Stony Brook. This position is in the laboratory of Dr. Lorne Mendell. The major focus of the laboratory is electrophysiology of the injured spinal cord, specifically the functional properties of neurons and circuits after injury, as well as strategies to enhance recovery that include training and the use of factors such as neurotrophins. The laboratory is funded by NIH and also participates in an international research consortium supported by the Christopher and Dana Reeve Foundation. The successful candidate will have the opportunity to collaborate actively with the other laboratories in this Consortium (http://www.christopherreeve.org/site/c.geIMLPOpGjF/b.1048735/k.2971/Consortium.htm). Applicants should hold a doctoral degree. Commitment to electrophysiological studies of the injured spinal cord required. Previous experience with in vivo or in vitro CNS preparations highly desirable but not required. Please send a curriculum vitae and the names of two references to: Dr. Lorne Mendell, Department of Neurobiology and Behavior, Life Sciences Building Room 532, SUNY-Stony Brook, Stony Brook, NY 11794-5230, or by Email to: lorne.mendell@sunysb.edu.

Postdoctoral Research Associate: Position is available immediately in the Shock, Trauma & Nutrition Research Laboratory, Division of Trauma and Critical Care, Department of Surgery, The University of Tennessee Graduate School of Medicine, Knoxville, TN (http://gsm.utmck.edu/surg_research/main.htm). The postdoctoral fellow will assist in investigations on the renin-angiotensin system in animal models of injury (burn trauma, sepsis and acute lung injury) and its influence on the molecular aspects of insulin receptor signaling transduction pathways in skeletal muscle and angiotensin-induced pulmonary inflammation. Candidates will participate in the design of experiments and be expected to present research findings at national meetings, prepare manuscripts, and apply for extramural and intramural research funding. Ideal candidates will have earned their PhD in physiology or related field with a strong background in molecular and cellular biology. Previous experience in live animal research, transgenic animals and cell culture techniques is preferred but not required. Review of applications will begin immediately and continue until the position is filled. Please send your curriculum vitae, a brief statement of research interests and career goals, and contact information (email addresses and phone numbers) for two to three professional references to karlstad@utk.edu or you may mail the application package to: Michael D. Karlstad, PhD, Professor and Director of

Surgical Research, Department of Surgery, The University of Tennessee Graduate School of Medicine, 1924 Alcoa Highway, Knoxville, TN 37920. Employment is contingent upon the successful completion of post-offer drug/alcohol and TB screenings. Salary is dependent on experience and qualifications. The University of Tennessee is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA Institution in the provision of its education and employment programs and services.

Postdoctoral Positions: Pennington Biomedical Research Center, a research facility of the Louisiana State University System, has one or more postdoctoral positions available in the Autonomic Neuroscience Laboratory of Drs. GE Hermann and RC Rogers. Research interests center on determining the interactions between immune and neural systems in disease and trauma as they relate to homeostatic control, as well as intercommunication between glia and neurons in the hindbrain involved in autonomic function. The laboratory utilizes an array of technical approaches including in vitro live cell calcium imaging, in vivo and in vitro neurophysiology, histochemistry, and behavior. To apply send a letter of application, curriculum vita, names and contact information for three references, and a short description of research accomplishments and goals to: Director of Human Resources – Ms. Gena Doucet, Ref: Hermann-Rogers, 6400 Perkins Rd., Baton Rouge, LA 70808, Electronic mail should be sent to: Jobs@pbrc.edu. [EOE/EAE]

Postdoctoral Position: Molecular Biology of Prostaglandin Synthesis St. Joseph's Hospital, Phoenix, AZ, USA Available immediately is a Postdoctoral Fellow/Research Associate position to study lipid mediators of fever and hypothermia in systemic inflammation in rats and mice (see *PLoS Biol* 4: e284, 2006). Proficiency in molecular biology techniques is required. Additional experience in neuroanatomy or immunohistochemistry is preferred. Knowledge of prostaglandin synthesis pathways is desired. The position is in a productive, well-funded integrative physiology lab. Advanced technical help with animal work will be provided. Participation in other projects to study neuroanatomy of behavioral thermoregulation (*PLoS ONE* 1: e1, 2006) or in vivo roles of TRP channels in thermoregulation (*J Neurosci* 27: 7459, 2007) will be possible. Mandatory requirements include an advanced degree, a track record of peer-reviewed publications, excellent computer skills, and good writing skills. To apply, send your curriculum vitae, up to five reprints of full-length papers, a brief description of research interests and career goals, and names, Email addresses, and telephone numbers of at least two references to: Andrej A. Romanovsky, MD, PhD, Director, Systemic Inflammation Laboratory, St. Joseph's Hospital, 350 W. Thomas Road, Phoenix, AZ 85013, USA; aromano@chw.edu. Complete contact information: Andrej A. Romanovsky, MD, PhD, Senior Staff Scientist, Director, Systemic Inflammation Laboratory, Trauma Research, St. Joseph's Hospital and Medical Center, 350 West Thomas Road, Phoenix, AZ 85013 USA, Tel.: 602-406-5059; Fax: 602-406-4113.

Faculty Positions

Assistant/Associate Professor: The Division of Pharmacology and Toxicology in the School of Pharmacy at the University of Missouri-Kansas City invites applications for a 12-month, tenured or tenure-track position at the Assistant/Associate Professor level. Applicants should possess a PhD, Pharm.D or MD in pharmacology, neuroscience, toxicology, or a related discipline. Preference will be accorded to applicants with interdisciplinary research experience involving neuroscience, pharmacogenomics, substance abuse or translational research; outstanding candidates from other relevant areas are also strongly encouraged to apply. The successful applicant at the Associate Professor level is expected to have a vigorous, well-established and externally funded research program, and to provide instruction in the Doctor of Pharmacy professional program and dental pharmacology program. The position includes excellent compensation, startup package, and comprehensive benefits. Application review will begin immediately, and will continue until the position is filled. All final candidates will be required to successfully pass a criminal background check prior to beginning employment. UMKC is a comprehensive research university exemplifying the values of education first, innovation, accountability, diversity and collaboration. More about UMKC is at http://www.umkc.edu, or go to http://pharmacy.umkc.edu. Applicants should electronically submit a cover letter and curriculum vitae with research plan, and arrange to have letters from three professional references Emailed to: Anil Kumar, PhD, Chair, Search Committee, Division of Pharmacology and Toxicology, University of Missouri-Kansas City, Health Sciences Building, 2464 Charlotte Street, Kansas City, MO 64108-2718, Phone: 816-235-2415, Email: kumaran@umkc.edu. [AA/EOE]

Assistant/Associate/Full Professor: Applications are invited for Tenured or Tenure Track Faculty positions at any level from Assistant to Full Professor in the Department of Physiology at Emory University. We seek outstanding investigators to join a strong and established group devoted to basic cellular or molecular physiology and neuroscience. Areas of interest include membrane transport, ion channels and neuronal excitability, synaptic and cellular signaling mechanisms, and spinal cord function. We are particularly interested in candidates who can bridge these areas of interest. The successful candidate will be expected to establish an independent research program and participate in the scholarly activities of the Emory academic community. Women and minority candidates are encouraged to apply. Applicants are asked to send by mail or electronically a curriculum vitae, a statement of research and teaching interests, and a list of three to five references to Dr. Martin J. Pinter, Department of Physiology, Emory University, 615 Michael Street, Suite 648, Atlanta, GA 30322 or to search@physio.emory.edu. The review of applications will begin immediately and will continue until the available positions are filled. [AA/EOE]

Assistant/Associate Professor: The Department of Biological Sciences at Western Michigan University invites applications for an Animal Physiologist at the Assistant or Associate Professor level beginning Fall, 2008, pending budgetary approval. A PhD and relevant postdoctoral experience are

required. Responsibilities will include teaching an undergraduate Human Physiology course for majors, other related courses and an upper level course in the applicant's area of expertise. Other responsibilities include establishment of a vigorous extramurally funded research program and supervision of undergraduate and graduate research in the department's BS, MS and PhD programs. Western Michigan University is a student-centered research university with a strong commitment to research excellence in the life sciences. The Carnegie Foundation for the Advancement of Teaching has placed WMU among the 76 public institutions in the nation designated as research universities with high research activity. Applicants should visit http://www.wmich.edu/hr/careers-at-wmu.htm to apply. Please submit curriculum vitae, statement of teaching philosophy and research interests. In addition, please send three letters of recommendation to: Dr. C. Linn, Chair, Animal Physiologist Search Committee, Department of Biological Sciences, Western Michigan University, 1903 W. Michigan Avenue, Kalamazoo, MI 49008-5410, Tel.: 269-387-5615, Fax: 269-387-5609, Email: cindy.linn@wmich.edu. Review of applications will begin Feb. 15, 2008, and will continue until the position is filled. [AA/EOE]

Tenure-Track Assistant Professor of Cardiovascular or Neurosciences: VPA Reference #MEDI-2007-001: The Division of BioMedical Sciences in the Faculty of Medicine, Memorial University of Newfoundland invites applications for a tenure track position in cardiovascular or neurosciences at the Assistant Professor level. We seek applicants with research interests that compliment our existing areas of expertise in cardiovascular (http://www.med.mun.ca/basic/pages/programs_cardio.htm) or neuroscience research (http://www.med.mun.ca/basic/pages/programs_neuroscience.htm). Applicants are required to have a PhD and postdoctoral experience in cardiovascular sciences, neuroscience or a related field with clear evidence of research promise and scholarship. The successful candidate will be expected to develop an externally funded research program and participate in teaching at both the undergraduate and graduate level. In addition to teaching within their area of research interest, individuals with experience teaching Gross Anatomy would be of particular interest. Further information about Memorial University and the Division of BioMedical Sciences can be found at http://www.mun.ca and http://www.med.mun.ca/basic. The Division also has research programs in Immunology/Infectious Diseases and Cancer/Developmental Biology, offering the potential for interdisciplinary collaborations. Interested applicants should submit a curriculum vitae, a detailed statement of research interests and goals and the names of three referees to Dr. Karen Mearow, Professor and Associate Dean, Division of BioMedical Sciences, Faculty of Medicine, Health Sciences Centre, Memorial University of Newfoundland, St. John's, NL, Canada A1B 3V6 (jblundon@mun.ca). Memorial University (http://www.mun.ca) is the largest university in Atlantic Canada. As the province's only University, Memorial plays an integral role in the education and cultural life of Newfoundland and Labrador. Offering diverse undergraduate and graduate programs to almost 18,000 students, the St. John's campus of Memorial offers a unique learning environment within the safe, friendly backdrop of the oldest city in North America. St. John's offers a vibrant cultural life with easy access to a wide range of year round outdoor activities. Canadians and permanent residents of Canada will be given priority; however, all qualified candidates are encouraged to apply. Memorial University is committed to employment equity and encourages qualified applicants from women, men, visible minorities, aboriginal persons and persons with disabilities. The deadline for receipt of applications is April 15, 2008 for a proposed start date of September 1, 2008.

Assistant Professor Opening in Greece: The Medical School of the University of Patras has announced an opening for a post of Assistant Professor of Physiology. The candidate should have commensurable to the post academic record and be able to teach in Greek language. Applications, CV and relevant credentials should arrive before March 17, 2008 at the Secretariat, Medical School, University of Patras, 26500 Patras, Greece, Tel.: +30-2610-969100, 969104, Fax: 2610996103. Information regarding the Department: George K. Kostopoulos MD, PhD, Professor and Chairman of Physiology, Medical School, University of Patras, Patras, Greece Tel.: +30_2610_969157 (pers.),_969155 (secr.), Fax:+30_2610_997215, gkkostop@med.upatras.gr; http://nucleus.med.upatras.gr/NU.

Assistant/Associate/Full Professor: Emergency Medicine Tenure Track: The Department of Emergency Medicine at the University of Pennsylvania, School of Medicine seeks candidates for an Assistant, Associate, and/or Full Professor position in the tenure track. Rank will be commensurate with experience. The successful applicant will have experience in the field of Emergency Medicine with a focus on Resuscitation Science. Applicants must have an MD and/or PhD degree and have demonstrated excellent qualifications in Research. The effective date of appointment will be 07/01/2008. The University of Pennsylvania is an equal opportunity, affirmative action employer. Women and minority candidates are strongly encouraged to apply. Please submit curriculum vitae, a cover letter, and three reference letters to: William G. Baxt, MD, The Hospital of the University of Pennsylvania, 3400 Spruce Street, Department of Emergency Medicine Ground Ravdin, Philadelphia, PA 19104, William.Baxt@uphs.upenn.edu.

Teaching Postdoctoral: BIOLOGY/Specialty Physiology: Augustana College invites applications for a one year Teaching Postdoc or Sabbatical Replacement (title will depend on professional experience) to begin with the 2008-2009 academic year. While a PhD is preferred, consideration will be given to advanced ABDs. Primary teaching responsibilities include human physiology and comparative physiology, and the possibility of general biology for non-majors. A commitment to undergraduate teaching in a liberal arts setting is required. There are approximately 350 students majoring in biology and the pre-health professions, and 12 faculty in the biology department. Augustana College is a highly selective, four-year, liberal arts institution of 2,450 students, most of who live in residence halls on a wooded 115-acre campus. Rock Island, IL is one of the Quad-Cities of Illinois and Iowa, a diverse metropolitan area on the Mississippi River with 400,000

residents. Augustana College is an equal opportunity employer and actively encourages applications from women and persons of diverse ethnic backgrounds. We do not discriminate based on age, race, color, ethnic origin, gender, sexual orientation, disability or creed. Details about Augustana, our expectation of the faculty, the selection process, and the Quad Cities are all available at the Faculty Search website; http://www.augustanafaculty.org. Send a letter of application, curriculum vita, graduate transcripts, a statement of teaching philosophy and three letters of recommendation to search #124-08Bio./Spec.Physiology Committee, c/o Jeff Abernathy, Dean of the College, Augustana College, 639-38 Street, Rock Island, IL 61201. Questions may be directed to the department co-chair at SteveHager@augustana.edu. Review of applications will begin March 17, 2008.

Assistant/Associate/Full Professor: The Department of Integrative Physiology at the University of North Texas Health Science Center (UNTHSC) is seeking outstanding applicants for a full time, tenure track faculty appointment at a rank of Assistant, Associate or Full Professor. Applicants must hold the PhD or equivalent doctoral degree with at least two years postdoctoral experience and a currently funded independent research program related to the cardiovascular sciences. Applicants whose research complements existing areas of departmental strength will receive the highest priority. Departmental programs include cardiovascular aspects of neuroendocrine and neural reflex control, central cardiorespiratory control, cerebral blood flow, exercise training, aging, sleep apnea, hypertension, diabetes, obesity, sudden cardiac death, myocardial metabolism, cardioprotection, cardiac hypertrophy, heart failure, and renal calcium signaling in cellular, animal and human models. The successful applicant will also participate in the institution's graduate, medical, and allied health education programs. Laboratory space and startup funding will be competitive. Initial rank will be commensurate with experience. Please submit a letter of application, curriculum vitae, statement of career objectives, and the names and addresses of at least three references to James L. Caffrey, PhD, Search Committee Chair, Department of Integrative Physiology, UNTHSC, 3500 Camp Bowie Boulevard, Fort Worth, TX 76107. Completed applications are expected by: April 25, 2008. You must apply for this position at the UNTHSC web site at: https://www.unthscjobs.com [EOE]

Assistant/Associate/Full Professor: The University of California, Davis, School of Medicine, Department of Pharmacology invites applications for two-four (2-4) full-time academic tenure track position(s) at the Assistant/Associate/Full Professor level. http://www.ucdmc.ucdavis.edu/pharmacology/. The Pharmacology Department is housed in the new UC Davis Genome Center and recently successfully recruited a new Department Chair, Dr. Donald M. Bers, with plans for significant growth, including recruitment of up to five new faculty in the coming three years. One area of anticipated research growth within the department is cardiovascular, but candidates with strong research programs in other areas are welcome. Pharmacology has strong links to the Genome Center, Center for Neuroscience, Physiology & and Membrane Biology, UC Davis Health System Cancer Center and Cardiovascular research groups. Candidates must possess a PhD and/or MD degree and at least two years of productive postdoctoral experience. Individuals selected for the position(s) will be expected to build or continue a successful, independent, extramurally funded research program and to achieve excellence in the teaching of basic sciences to medical and graduate students. The most important criteria in the consideration of applications are: *1*) a record of excellence, creativity, and initiative in research, which establishes a strong potential to build a vigorous and competitive research program; and *2*) a demonstrated ability to communicate effectively as a teacher participating in the teaching of medical and graduate students. Research areas should complement others in Pharmacology and campus programs. Particular interests include function, expression, trafficking, signaling pathways, structure and regulation of membrane proteins (such as ion channels and receptors) and novel therapeutic strategies. Priority will be given to candidates whose record of innovative research and commitment to teaching demonstrate their potential as leaders in their fields. These positions will be open until filled, but for full consideration applications should be received by March 1, 2008. Applicants should send a curriculum vitae, up to three key reprints, a synopsis of research interests and plans (past, present and future goals), a summary of teaching experience/philosophy and the names/addresses of three to five references to be sent to Peter M. Cala, Ph.D., Interim Chair, Department of Pharmacology, attention: Tom Watkins, Genome Building, Room 3502, 451 Health Sciences Drive, UC Davis, Davis, CA, 95616. [AA/EOE] Search #s PH-06R-08.

President: New Jersey Association for Biomedical Research (NJABR) Seeks President. NJABR seeks to fill the position of President. The position is available in June 2008. To assure consideration, candidates should submit their application by January 31, 2008. NJABR is dedicated to improving the health of humans and animals through biomedical research and promoting public understanding of and support for bioscience research. NJABR is an independent, not-for-profit 501(c)(3) organization. As Chief Executive officer, the President is responsible for providing overall strategic, programmatic and administrative leadership and for management of the affairs, funds and staff of NJABR in accordance with the directives of the Board of Directors. The President is the lead spokesperson for the organization.

Research Positions

Exercise Physiologist: Exercise Physiologist to become a key member of our team developing a cutting edge physiological monitoring product. Foster-Miller is a technology and product development company that is bringing to market a new product for physiological monitoring, and we are looking for a high energy, experienced EP to join our team and help shape and test the product. **Duties:** Coordinate and manage the in-house validation of the system; coordinate and manage testing done by outside labs; research previous studies that are applicable to this new product; conceive and execute comparative testing with competitive product; meet with potential customers in athletic, medical and military markets and

develop new use models for the technology; help guide development of product hardware and software; recruit and manage beta test sites for athletic and medical product applications; supervise user trials and work with marketing to define appropriate product features and marketing plans. **Qualifications:** Bachelor's or Master's degree in Exercise Physiology or Exercise Sciences, PhD preferred, previous experience in laboratory testing, Certified Exercise Specialist, ACSM, preferred. **Skills:** knowledge of physiologic parameters of interest for athletic performance optimization; knowledge of physiologic parameters of interest for cardiac rehabilitation and/or weight loss; demonstrated project management skills; knowledge of biomechanics a big plus; knowledge of regulatory process and requirements for FDA and CE Mark also a big plus; outgoing personality and demonstrated ability to work with others; experience working in an athletic performance lab, a cardiac rehabilitation or similar preferred.

Principal Scientist: (0716643) Johnson & Johnson; Warren, NJ. Ground breaking, life changing careers that reward the power of ideas and innovation. For more than 40 years, Cordis Corporation has pioneered less invasive treatments for vascular disease. Technological innovation and a deep understanding of the medical marketplace and the needs of patients have made Cordis the world's leading developer and manufacturer of breakthrough products for interventional medicine, minimally invasive computer-based imaging, and electrophysiology. Today, over 7,000 Cordis employees worldwide share a strong commitment to continue the Company's groundbreaking work in the fight against vascular disease. Cordis Corporation offers tremendous opportunities and world-class resources. Our decentralized structure provides the feel of a small-company environment with big-company impact. We are focused on developing leaders with a broad base of business and cultural skills, along with a strong commitment to the values expressed in Our Credo. By choosing Cordis Corporation, you are choosing to positively impact the lives of millions of people each year. The candidate will lead a research program to develop new drug-device treatment strategies for myocardial infarction and thrombosis. The individual will be highly motivated and work independently to design, execute and summarize experiments to evaluate new therapeutic agents, formulations and local delivery systems in a variety of animal models. The position requires strong knowledge of cardiovascular diseases, animal models, and therapeutic mechanisms and treatment strategies. The individual will work in a team environment to develop new cardiovascular products. The candidate will report to the head of Therapeutics Research in the R&D organization and be based in Warren NJ. **Essential duties and responsibilities:** Design protocols and execute experiments in animal models, primarily using external contract research organizations; perform statistical analyses of data and write research reports; develop new animal models of CV disease for screening and evaluation of drug-device formulations; shares knowledge and information with others in the organization; develops new therapeutic treatment strategies for myocardial infarction and thrombosis; evaluates the pharmacokinetics and pharmacodynamics of drug delivery systems; capable of working in a cross-functional team of scientists and engineers to develop solutions to complex cardiovascular problems; interacts with physicians and opinion leaders; attends relevant scientific meetings and presents findings to peers; develops a budget and manages spending for projects; works with attorneys to draft patents when necessary; evaluates new technology and advises management on potential opportunities; maintains knowledge of new scientific information and competitive developments that can affect the organization. **Education and/or experience:** PhD or MD in biological science, medical science, or bioengineering with postdoctoral training and four or more years of additional experience in the field of cardiovascular or inflammation research; pharmaceutical or biomedical industry experience preferred; experience with local drug delivery technologies and medical devices is an asset; candidate will have strong scientific credentials based on a record of publications and patents. **Other skills and abilities:** candidates must have a fundamental knowledge of cardiovascular physiology, pharmacology and pathology as well as strong working knowledge of experimental design, data analysis, statistics and graphics; candidate must have excellent written and verbal communication skills and show initiative and the ability to work independently; preference for individuals who have worked in pharmaceutical drug discovery research organizations. **Work environment:** Primary work environment will be an office setting in Warren NJ; research will be executed primarily at external CROs under the guidance of the candidate; hands-on research will also be encouraged at laboratories and vivariums in J&J. As a valued team member, you'll receive a competitive salary and great benefits including medical/dental, a 401(k), a pension plan and a comprehensive wellness program. If interested, please apply directly on-line at our web site http://www.jnj.com/careers noting Req. Code 0716643. The Johnson & Johnson Family of Companies has a strong commitment to diversity and welcomes applications for all individuals. EOE M/F/D/V

Chair of Pharmacology, Physiology and Neuroscience: The University of South Carolina School of Medicine is seeking an established PhD, MD, or combined MD PhD scientist and academic leader to assume the position of Chair of the Department of Pharmacology, Physiology and Neuroscience. Successful candidates should have expertise in at least one of the three departmental areas and be qualified for appointment at the level of Professor with tenure in the School of Medicine. The selected candidate will be expected to fulfill the department's teaching mission in medical and graduate education, expand and enhance the research base of the basic sciences, lead his or her own externally funded research program, and facilitate the development of translational research in the department and School of Medicine. Opportunities exist for collaboration with ongoing research programs on the University of South Carolina campus. The position offers a competitive salary and the resources needed to expand this outstanding department. Major areas of investigation in the department (http://ppn.med.sc.edu) include the manipulation of gene expression with viral vectors, physiological aspects of ion channel pharmacology, as well as the physiology and pharmacology underlying age-related cognitive deficits and neurodegenerative disorders. Research focus areas include chronic pain, depres-

sion, epilepsy, diabetes, stress, and anxiety. The School of Medicine, located on the campus of the William Jennings Bryan Dorn Veterans Administration Medical Center, offers the MD degree, master's and doctoral degrees in biomedical science, and master's degrees in genetic counseling, rehabilitation counseling, and nurse anesthesia. State-funded Research Centers of Economic Excellence are devoted to cancer, stroke, cardiovascular disease, brain imaging, biomedical ethics, health services, and primary health care. The School of Medicine is a key component of the university's Innovista research initiative. Since biomedical and health sciences are among the university's core research areas, substantial space in Innovista's Discovery Plaza, a new 125,000 sq ft biomedical research building, could be made available to the department. Review of applications will continue until the position is filled. Send a curriculum vitae including research plans, and contact information for three references either electronically (c/o DAWN@gw.med.sc.edu) or via mail to: Kenneth J. Gaines, MD, Professor and Chief, Division of Neurology and Search Committee Chair, c/o Dawn L. Bruce, Office of the Dean, School of Medicine, Bldg 3, Rm 205A, Columbia, SC 29208. Inquiries may be directed to Dr. Gaines (803-434-4260 or KGAINES@gw.mp.edu). Women and minorities are strongly encouraged to apply. The University of South Carolina does not discriminate in educational or employment opportunities or decisions for qualified persons on the basis of race, color, religion, sex, national origin, age, disability, sexual orientation or veteran status. The University of South Carolina is responsive to dual career couples. [AA/EOE]

Call for Nominations

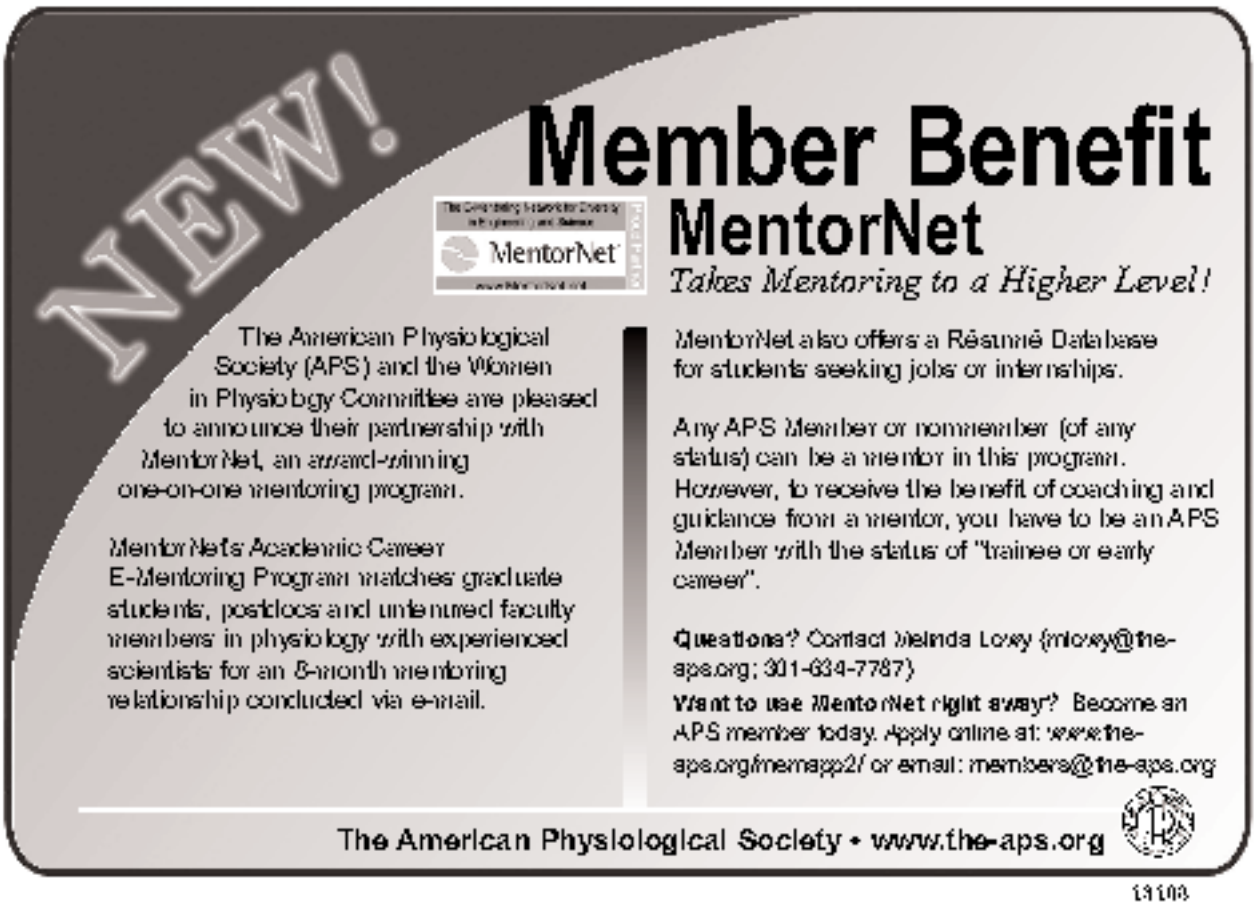
For the Editorship of the
American Journal of Physiology-Gastrointestinal and Liver Physiology

Nominations are invited for the Editorship of the *American Journal of Physiology-Gastrointestinal and Liver Physiology* to succeed M. Montrose, who will complete his term as Editor on June 30, 2009. The Publications Committee plans to interview candidates in the Fall of 2008.

Applications should be received before **August 15, 2008**.

Nominations, accompanied by a curriculum vitae, should be sent to the Chair of the Publications Committee:

Kim E. Barrett, PhD
9650 Rockville Pike
Bethesda, MD 20814-3991



Zucker Named UNMC Scientist Laureate

Irving Zucker

APS President Irving Zucker has been named the second University of Nebraska Medical Center (UNMC) Scientist Laureate for his outstanding research into heart failure. The award is the highest recognition given to a UNMC scientist. The Distinguished Scientist award is sponsored by the chancellor and recognizes UNMC researchers who have been among the most productive scientists in the country over the past five years.

Zucker is a professor and chairman of the cellular and integrative physiology department in the UNMC College of Medicine. He joined the medical center in 1973.

"These scientists rank among the world's best in their respective areas," said Tom Rosenquist, vice chancellor for research at UNMC. Rosenquist said, "Among this distinguished company, Dr. Zucker stands out. There are few scientists anywhere with his long record of outstanding achievement. He is recognized around the world, not only for the impact of his original work, but for his ability to nurture and inspire younger scientists. UNMC is truly fortunate to have been able to enjoy the benefit of Irv Zucker's contributions for 30 years."

Both the 2007 Distinguished Scientists and New Investigators received a monetary award at an awards event UNMC hosted on March 20 to publicly recognize each honoree's research accomplishments.

Hay Named Provost and Executive VP

Meredith Hay, a physiologist and University of Iowa vice president for research since 2005, has been named provost and executive vice president of the University of Arizona, pending formal approval by the Arizona Board of Regents at its March meeting. She will assume her new position April 30. Hay also will receive a tenured appointment as professor of physiology at the UA College of Medicine.

APS Member Czeisler Receives Lifetime Achievement Award

The National Sleep Foundation (NSF) presented the Lifetime Achievement Award to Charles A. Czeisler, Baldino Professor of Sleep Medicine and Director, Division of Sleep Medicine of Harvard Medical School, and Chief, Division of Sleep Medicine of Brigham and Women's Hospital.

Czeisler received the award at a ceremony on March 3 "for his major contributions to the advancement of sleep research and his assiduous dedication to broadening the understanding of the nature of sleep and its contributions to health and well-being. The NSF Board of Directors are deeply impressed with Dr. Czeisler's outstanding scientific accomplishments, promotion of sound public policies, and leadership abilities, and NSF is pleased to accord him the Foundation's highest honor."

Narahashi Selected for Scholar Award

Toshio Narahashi, Northwestern University, has been selected as the recipient of the Distinguished Lifetime Toxicology Scholar Award from the Society of Toxicology (SOT). This is the highest honor from the SOT which includes 6,500 plus members. The award ceremony was held at the time of the 47th Annual Meeting of the Society held in Seattle, WA, from March 16 to 20, 2008. The award is based on Narahashi's electrophysiological work since the 1950s which includes the mechanism of action of the pufferfish toxin tetrodotoxin, environmental toxicants, and therapeutic drugs on neuroreceptors and ion channels as the basis for therapeutic or toxic effects.

Two APS Members Honored

Two APS members have been honored in the naming of the recently endowed Solomon, Gardner, Sterling Research Chair in Nephrology at the University of New Mexico's School of Medicine. The late Sidney Solomon was a 31-year member of the Society. He came to UNMSOM in 1963 to serve as the school's first chairman of the Department of Physiology, a position he held for 19 years. He died in 1992.

Kenneth D. Gardner Jr., an Emeritus Professor and an APS member since 1966, came to UNMSOM in 1973 and served 20 years as the Department of Medicine's chief of Nephrology.

William A. Sterling, Professor of Surgery, was the university's first chief of Transplant Surgery, serving in that role from 1975 until his retirement in 1994. The three were honored for their integrated contributions to teaching, patient care, and research in renal medicine. ❖

Call for Nominations

For the Editorship of the *Physiological Genomics*

Nominations are invited for the Editorship of the *Physiological Genomics* to succeed A. W. Cowley, Jr., who will complete his term as Editor on June 30, 2009. The Publications Committee plans to interview candidates in the Fall of 2008.

Applications should be received before **August 15, 2008**.

Nominations, accompanied by a curriculum vitae, should be sent to the Chair of the Publications Committee:

Kim E. Barrett, PhD
9650 Rockville Pike
Bethesda, MD 20814-3991

Kolapo Ajuwon has joined the Department of Animal Sciences, Purdue University, West Lafayette IN. Ajuwon had been associated with Department of Animal Science Food and Nutrition, Southern Illinois University.

Amir Askari is currently Professor, Dept. of Physiology and Pharmacology, University of Toledo College of Medicine, Toledo, OH. Prior to this position, Askari was Professor, Dept. of Pharmacology, Medical College of Ohio, Toledo.

John Baldwin is currently President, Texas Tech University, Lubbock, TX. Prior to this position, Baldwin was President/CEO, CBR Institute for Biomedical Research, Boston, MA.

Robert W. Brock is currently Associate Professor, Department of Physiology and Phramacology, West Virginia University, Morgantown, WV. Prior to this position, Brock was Assistant Professor, Department of Pharmacolgy and Toxicology, University of Arkansas Medical School, Little Rock, AR.

Stanley Brown is currently Department Head of Kinesiology, Mississippi State University, Mississippi State. Prior to this position, Brown was Dean of Allied Health, Our Lady of the Lake College, Baton Rouge, LA.

David P. Carlton is currently Marcus Professor, Dept. of Pediatrics, Emory University, Atlanta, GA. Prior to this position, Carlton was Associate Professor, Department of Neonatology, University Wisconsin, Madison.

Derek Denton is currently Professor, Dean's Gaglion, University of Melbourne, Melbourne, Australia. Prior to this position, Denton was at Howard Florey Institute, Parkville, Australia.

Lara R. DeRuisseau is currently Visiting Assistant Professor, LeMoyne College, Syracuse, NY. Prior to this position, DeRuisseau was a Postdoctoral Associate, Department of Neurosurgery, SUNY, Syracuse, NY.

James Fisher is currently a Lecturer (Assistant Professor) in Exercise Physiology at the University of Birmingham, UK. Prior to his new position, Fisher was a Postdoctoral Fellow in the Department of Pharmacology and Physiology at the University of Missouri-Columbia.

Sudip Ghosh recently moved to the University of Cincinnati, Division of Digestive Diseases. Ghosh was formerly with the Division of Gastroenterology/Department of Medicine, Northwestern University, Chicago, IL.

James Hoying is currently Associate Professor, Cardiovascular Innovation Institute, Louisville, KY. Prior to this position, Hoying was an Associate Professor, University of Arizona, Tucson.

Cynthia A. Jackson is currently Associate Professor, Tuskegee University, Tuskegee, AL. Prior to this position, Jackson, was Assistant Professor, Vanderbilt University Medical Center, Nashville, TN.

Bina Joe is currently Assistant Professor, Dept. of Physiology and Pharmacology, University of Toledo College of Medicine, Toledo, OH. Prior to this position Joe was Assistant Professor, Dept. of Pharmacology, Medical College of Ohio, Toledo.

Wolfgang G. Junger is currently Visiting Professor in Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA. Prior to this position, Junger was Professor, Department of Surgery, University of California, San Diego.

Yu-Ming Kang is currently Assistant Professor, Comparative Biomedical Sciences, Louisiana State University, Baton Rouge, LA. Prior to this position, Kang was Assistant Research Scientist, Internal Medicine, University Iowa, Iowa City.

Jonghan Kim recently moved to Harvard University, School of Public Health, Boston, MA. Kim was formerly with the Department of Internal Medicine, Ohio State University.

Jeffrey Lemmer is currently a Visiting Professor, at Grand Valley State University, Allendale MI. Lemmer was formerly an Assistant Professor for Michigan State University.

Jian Ma is currently a Postdoctoral Professor, Brigham and Women's Hospital, Boston, MA. Prior to this position, Ma was a Postdoctoral Professor, Medical University of South Carolina, Charleston, SC.

Tara McIsaac is currently a Postdoctoral Research Associate, Dept. of Kinesiology, Arizona State Univ., Tempe, AZ. Prior to this position, McIsaac was a Postdoctoral Research Fellow, Dept. of Behavioral Sciences, Columbia University Teachers College, New York, NY.

Nikolai Modyanov is currently Professor Department of Physiology and Pharmacology, University of Toledo College of Medicine Health Science Center, Toledo, OH. Prior to this position, Modyanov was Professor, Department of Pharmacology, Medical College of Ohio, Toledo.

Allan Morris recently moved to the International Medical Center, Sorenson Heart-Lung Center. Morris was formerly with the Department of Pulmonary Division, University of Utah.

Peter Morsing is currently Professor, AstraZeneca, Molndal, Sweden. Prior to this position, Morsing was Professor, Dept. of Physiology, Gothenburg University, Molndal, Sweden.

Adonis Moschovakis is currently Professor, Institute of Applied Comp. Math, IACM, Iraklion Crete, Greece. Prior to this position, Moschovakis was Professor, Dept. of Basic Sciences, University of Crete, Faculty of Medicine, Crete, Greece.

Gustavo Nader has acquired the position of Assistant Professor, Karolinska Institute Department of Clinical Neuroscience Center for Molecular Medicine, Stockholm Sweden. Prior to his new affiliation, Nader was a Research Associate with Children's National Hospital Center, Washington, DC.

Hugh M. O'Brodovich is currently Chief Pediatrics, Department of Pediatrics, Stanford University School of Medicine, Stanford, CA. Prior to this position, O'Brodovich was Professor and Chairman, Department of Pediatrics, The Hospital for Sick Children, Toronto, ON, Canada.

Nanduri Prabhakar is currently Director, Section of Emergency Medicine, University of Chicago, IL. Prior to this position, Prabhakar was Assistant Professor, Department of Medicine, University Hospitals of Cleveland, OH.

Jalees Rehman is currently Assistant Professor, University of Chicago, IL. Prior to this position, Rehman was Assistant Professor, Krannert Institute of Cardiology, Indianapolis, IN.

Rudolf Schilder accepted a position with the School of Biological Sciences, University of Nebraska. Schilder was formerly with Pennsylvania State University.

Toku Takahashi is currently Professor, Research Service, Medical College of Wisconsin, Milwaukee, WI. Prior to this position, Takahashi was Associate Professor, Department of Surgery, Duke University VA Medical Center, Durham, NC.

Yanggan Wang is currently Assistant Professor, Dept. of Pediatrics, Emory University, Atlanta, GA. Prior to this position, Wang was Assistant Professor, University of Texas Southwestern Medical Center, Dallas, TX.

Cuihua Zhang is currently Assistant Professor, Division of Cardiology, University of Missouri, Columbia, MO. Prior to this position, Zhang was Assistant Professor, Dept. of Vet. Physiology and Pharmacology, Texas A&M Univ., College Station, TX.

Yuehan Zhou is currently Senior Research Associate, Dept. of Physiology & Biophysics, Case Western Reserve University, Cleveland, OH. Prior to this position, Zhou was Associate Research Scientist, Dept. of Cellular/Molecular Physiology, Yale Univ., New Haven, CT. ❖

Senior Physiologists' News

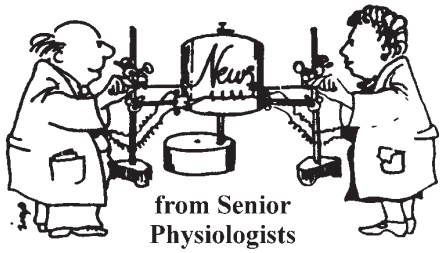
Letter to to Virendra Mahesh

Ian Michael Phillips writes: "I drew the cartoon for 'News from Senior Physiologists' about 25 years ago, and it has appeared ever since in *The Physiologist* . If you look at the cartoon on the left side, you will see 'imp,' my initials for Ian Michael Phillips. So I have always enjoyed reading the letters, although I must admit to being surprised that I am now to writing one of them.

"Writing about oneself will inevitably be full of 'I's'. As Mark Twain said, 'the only person who can use "we" is a reigning monarch or someone with a tape worm.'

"In 2003, I took a retirement package from the State of Florida that I could not refuse. But I did not feel in the least like retiring. I still had nearly $2 million in three active NIH grants, including a Merit Award. So I was delighted when I was appointed to an endowed chair at the Keck Graduate Institute, one of the Claremont Colleges in Claremont, California. Returning to California after 38 years is like coming home. I now run a research program on stem cells, and teach whatever I like. I am also an affiliate professor of physiology at the University of South Florida, and Physiology chair emeritus at the University of Florida.

"As an undergraduate at Exeter



University in the UK, I trained in math, biology and what was then physiological psychology. Today, it would have been neuroscience.

"My PhD was in neuropharmacology. I studied how drugs affected the brain, by measuring EEG and behavior. My research analyzed stereotypic movements and one night I discovered that chlorpromazine totally stopped the toxic movements induced by amphetamine. That discovery became widely used in UK emergency rooms to save teens overdosed on 'speed.'

"In 1967 I joined James Olds for postdoctoral training, at Caltech in Pasadena, CA. We published our results in *Science* on how neurons give sensory inputs significance by integrating them with the motivational state. Caltech was a wonderful place to be with all its Nobel laureates. I had as casual mentors, Nobelists Max Delbruck, Roger Sperry and Richard Feynman.

"In 1970 I became an Assistant Professor of Physiology at the University of Iowa. I had to develop a medical neurobiology course that had great faculty participants, including Rodolfo Llinas. I was fortunate to be included in a cardiovascular group headed by Frank Abboud, and to be introduced to angiotensin by Kim Johnson. When my lab found that angiotensin in the brain raises blood pressure, we began an exciting time. We showed that the brain made angiotensin independent of the kidneys. David Cushman at Squibb and and Charles Sweet at Merk sent us the earliest formulations of anti-angiotensin drugs to test in reducing hypertension. The drugs, angiotensin converting enzyme inhibitors, became marketed as captopril and enalparil.

I was also fortunate to get an NIMH career development award which enabled me to have research leaves at the University of Heidelberg with Detlev Ganten, at the University of Zurich with Dominik Felix, and at NIH in the labs of Phil Nelson and Julius Axelrod.

"In 1980 I became chairman of Physiology at the University of Florida. It was the most productive time in my career despite the hassles of being chairman. I had to build up young faculty and change the department to a modern one, –even adding the title: Functional Genomics. It is hard to imagine how resistant many physiologists were to molecular biology in the 1980's. As

President of the Association of Chairs of Depts of Physiology (ACDP), I ran a workshop to teach chairmen the techniques of molecular biology as tools, because the chairs felt threatened by it.

"With Birgitta Kimura, my research assistant, we continued working on angiotensin. It is a field that constantly produces new discoveries. In 1988, I chaired the Gordon Conference on Angiotensin at which Timmermans from Dupont Merk announced they had developed angiotensin receptor blockers. That greatly stimulated the field and ARBs are now the leading aantihypertensive drugs.

"I have always been blessed with exceptional graduate students, open to new ideas. With students Robert Gyurko and Jon Bui we developed antisense as a gene therapy approach to hypertension, initially targeting angiotensin receptors and then with Clare Zhang, targeting beta-1 `adrenergic receptors. Antisense has given way to siRNA which we have also tested and found it is effective in lowering hypertension and reducing heart failure. Jay Mehta, a friend and clinician scientist steered me to studying heart failure.

"After 23 years as chairman I moved over to the 'dark side' and became VP for Research at the University of South Florida. It was a great experience working at a time of rapid growth of USF in research. We built new research buildings and incubators in the Research Park and a bit later I became interested in patenting our lab discoveries. I never really thought about it before, but I now believe patents are as important as papers.

"At KGI , I am working on stem cells in the heart for heart failure with Yao Liang Tang, and I have joined the Cancer Center at the City of Hope. For even more fun I am enrolled as a student at UCLA in screenplay writing, hoping to turn my play, 'Rembrandt,' into a movie.

"Tips for young physiologists:

"For all the bragging above, I should say to young people making physiology a career, don't follow me. I have always been a dilettante. To get known and get ahead you need to be focused. People like to pigeon-hole you and you lose out if they cannot identify you easily.

"If you want to learn something really well, teach it. Teaching is not a hinderance to research. The best teacher I ever heard, Richard Feynman, also did the best research and even after he won the Nobel Prize continued to teach.

"Enjoy the life. The life of a physiologist with a friendly society like APS and Marty Frank at the helm, is wonderful. For the young there are all sorts of prizes and awards to be had.

"Science is international with so many opportunities to travel and make friends. Even if you have to spend some of your own money, go for it.

"Writing is more important than talking. If you don't publish your discoveries no one will know them (and you will kick yourself w when someone publishes later what you had found earlier.)

"To get a grant you really need to have all the data before applying. To get the data, you need the cover of a genuine mentor – one who will give you freedom to do the work and not take anything away from you.

"For more information see: http://kgi.edu/Phillips.xml.

Letters to Julio Cruz

Ananda Prasad writes: "So nice of you to remember me. I received your card also.

"I am continuing to remain active in my research efforts. As you know, I discovered the role of zinc in humans and described the first examples of human zinc deficiency in 1961-63 and since then I have continued my research efforts in this field. At present I am working on the role of zinc in immunity. Molecular zinc is a nuclear signal for immune cells and is involved in gene expression.

"I am working full time but mostly in research and some teaching. I see patients on consult only rarely. I have been funded continually thus far since 1963 and I have submitted my grant for renewal. I hope I get it.

"I am truly grateful to you for your kind letter."

Arthur W. Merrick writes: "Thank you, and the members of your committee, our APS, for remembering a rather special birthday. Nothing seems changed and I don't feel too old. I endeavor to keep up with relative aspects of physiology, thanks to our APS, AAAS, the magazine, Scientific American, and several weekly news magazines. All well here in retirement. Comfortable and easy living and the surrounding (360) mountains are beautiful. The small, big, and huge ones are currently covered with a modest amount of snow—breathtaking.

"Marty is to be so deservedly and highly congratulated for his many years of outstanding leadership. He is the crown jewel of our society. I have always felt honored to be a member. I do treasure my years as a teacher and researcher, and especially my several years with the grant review process in the National Heart, Lung, and Blood Institute. They came and went much too quickly.

"Thanks again for the thoughtful APS birthday card and pleasant comments in your personal letter." ❖

Books Received

Vander's Human Physiology: The Mechanisms of body function with ARIS
Eric P. Windmaier, Hershel Raff, Kevin T. Strang
New York, USA: McGraw-Hill, 2008, 770 pp.,illus., index, $151.56.
ISBN: 978-0-07-304962-5

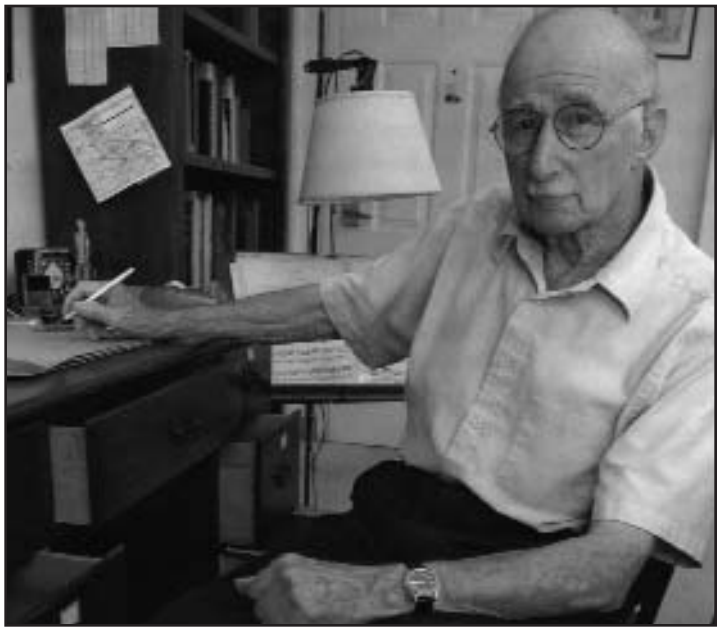
Fundamentals of Human Physiology
Stuart Ira Fox
New York, USA: McGraw-Hill, 2009, 449 pp., illus., index, $135.00.
ISBN: 978-0-07-340349-6

The Physiologist
Vol. 51, No. 2, 2008

John Richard Pappenheimer

37th APS President
(1915-2007)

John Richard Pappenheimer, George Higginson Professor of Physiology, Emeritus, at Harvard Medical School, died on Sunday, December 9, 2007. Pappenheimer is widely known for his seminal contributions to physiology. He was an ingenious experimenter and an original and insightful thinker; many of his contributions opened new avenues of physiological research. He was a dedicated teacher of medical and graduate students and an inspiring mentor to postdoctoral associates and colleagues. He was a member of national advisory panels and on editorial boards of major physiological journals.



John Richard Pappenheimer

Pappenheimer became a member of the APS in 1946. In the following years he served the APS on numerous committees and editorial boards, including the editorial boards of the 1961-66 and 1972-78 *Physiology Handbooks*. He was elected to the APS Council in 1961, and was APS President for 1964-65. In 1979, he received the Society's prestigious Ray S. Daggs Award in recognition of his extensive service.

A dedicated internationalist, Pappenheimer enjoyed close relationships with physiologists in Europe, Latin America and, especially, the UK. He served for nine years on the Council of the IUPS and was Program Director for its XXIV International Congress in 1968. In 1971-72 he was a Visiting Fellow at Churchill College, Cambridge, England, and in 1975-76 he was George Eastman Visiting Professor at Oxford. In 1981 he was elected to Honorary Membership of The Physiological Society of Great Britain and Ireland.

Pappenheimer was the recipient of numerous honors. In 1953, he was awarded a lifetime Career Investigatorship of the American Heart Association. In 1954 he was elected to the American Academy of Arts and Sciences. In 1956 he was chosen for the American Physiological Society's first Bowditch Lectureship. In 1965 he was elected to the National Academy of Sciences. He was invited to present numerous honorific lectures in the United States and abroad, including the Bowditch Lecture of the APS, the Harvey Lecture of the New York Academy of Sciences, the Wiggers Lecture of the APS Cardiovascular Section and the Physiological Society's Bayliss-Starling Memorial Lecture at University College, London.

John Richard Pappenheimer was born in New York City. His father, Alwin Max Pappenheimer, Sr. was Professor of Pathology at the Columbia University College of Physicians and Surgeons and one of the leading experimental pathologists of his time. John grew up in a harmonious, culturally rich home, where art and music flourished. His mother Beatrice played the piano, while his father played the violin and viola. Chamber music sessions were a frequent feature of home life. In 1949 he married the violinist Helena F. Palmer. John was an excellent cellist, and continued to play chamber music with family, friends, and colleagues throughout his life. Wherever he traveled, home or abroad, he found opportunities to participate in chamber music, often taking his cello to APS meetings and International Congresses.

John followed his older sister, Anne Pappenheimer Forbes, and his older brother, Alwin Max, Jr. to Harvard. (All three eventually became Harvard Professors, Ann in Medicine, Alwin Jr. in Biochemistry/Biology.) John was awarded a BS in Biology from Harvard University in 1936. He went to Cambridge University, England, to study classical mammalian physiology with Frank Winton and was awarded a PhD in Physiology in 1940. He returned to the United States, and from 1940-1942, he was a research fellow and instructor in physiology at the College of Physicians and Surgeons of Columbia University, NY. In 1942-1945, during WW II, he worked with Glenn Millikan, H.K. Hartline and others in the Johnson Foundation for Medical Physics in Philadelphia, PA, on developing oxygen equipment and night vision devices for high altitude military aircraft (6). After the war, Pappenheimer was appointed Associate in Physiology (1946-1949) and then Assistant Professor (1949-1952) at Harvard Medical School in Boston, MA. Eugene Landis was Chairman of the Department. In 1953, Pappenheimer was promoted to the rank of full Professor. At Harvard he had major responsibilities for teaching Physiology to medical students and graduate students. In the course of his career he trained eight graduate students and 25 postdoctoral Fellows. In 1969 he was appointed George Higginson Professor of Physiology of Harvard Medical School.

In Professor Landis' department,

Pappenheimer turned his attention to capillary permeability. He developed methods for measuring mean capillary pressures and transcapillary fluid movements in perfused mammalian muscles, from which he calculated capillary filtration coefficients corresponding to those measured for frog mesentery capillaries by Landis (3). A follow-up study of the transient osmotic effects of inert diffusible solutes revealed a relation of permeability to molecular size consistent with a porous membrane structure (8). These papers show imaginative design, close attention to experimental detail, and boldly reasoned analysis based on a sound knowledge of physical principles. Both are considered microcirculatory landmarks (1). With many subsequent modifications, the general theory survives and continues to be a major stimulus to research in the field.

John Pappenheimer was unique among 20th century physiologists in the wide range of topics that he influenced. Having achieved his goals in one project, he moved on to another with a fresh and original point of view. His next experimental adventure was an investigation of the methods used to measure alveolar gas composition, and the components of the respiratory dead space (5). This was followed by a series of studies on the autoregulation of blood flow and glomerular filtration in the kidney (4). Subsequently, Pappenheimer and his colleagues developed a technique for ventriculo-cisternal perfusion in unanesthetized goats, which they used to investigate chemical control of respiration, cerebrospinal ion and fluid exchange and chemical factors involved in control of sleep (4). Pappenheimer started his last research on intestinal absorption of sugars and amino acids (2), at about the time he retired. He demonstrated that osmotic interaction of trans-cellular and intercellular pathways is a major contributor to transport of these nutrients. The concepts he brought to this work are remarkably similar to those developed in his earlier studies of capillary transport. In a sense, they complete the circle of his research career. He never had a large research group, tending to work on his own or with one or two colleagues (usually students or postdoctoral fellows). Although he wrote fewer than 100 research papers, nearly all of his work made a considerable impact when it was published.

In 1987 he became Professor Emeritus, and moved to the Concord (MA) Field Station of the Harvard Department of Biology, where he continued his research on intestinal transport. His last peer-reviewed paper was published in the *Journal of Physiology*, when he was 88 (8). Some of Pappenheimer's conclusions led to controversy and his theory for the autoregulation of renal blood flow was shown to be incorrect. He had no regrets about this, pointing out that at the time he put forward his "plasma skimming" theory, it was clearer than any other idea of autoregulation, and that it had provoked others to carry out experiments to disprove it. This attitude is stated at the end of his Bayliss-Starling lecture (on sleep) at University College, London in 1982, when he quoted Bayliss, "..it is better to hold to a well-understood and intelligent opinion even when it wrong, than to be content with a (muddle-headed) mixture of conflicting views."

John Pappenheimer's avocations included bicycling (8), hiking, mountain climbing, skiing, gardening, tennis, and most important, music. He entered into these activities with the same intensity he devoted to his scientific interests. He is survived by his wife of 58 years, Helena (Hylie) Palmer, three children, Will, Rosamond Zimmermann and Rick, and by five grandchildren. We have been privileged to be among those who have worked with him and have got to know him, to appreciate his friendliness, the depth of his knowledge of history, literature and current affairs and music as well as of science. Undoubtedly John Pappenheimer was one of the greatest physiologists of the 20th century and a remarkable and delightful person.

Selected Publications

1. Michel, CC. "Microvascular permeability, ultrafiltration, and restricted diffusion. Essays on APS Classic Papers. *AJP: Heart.* 287: H1887-H1888, 2004.

2. Pappenheimer, JR. "On the coupling of membrane digestion with intestinal absorption of sugars and amino acids." *AJP* 265:G409-G417, 1993.

3. Pappenheimer, JR. Past-president's address. "A bicycle in the age of jets." *The Physiologist* 8: 341-347, 1965.

4. Pappenheimer, JR. Fencl V, Heisey SR, and Held D. "Role of cerebral fluids in control of respiration as studied in unanesthetized goats." *AJP* 208:436-450, 1965.

5. Pappenheimer, JR, Fishman AP, and Borrero LM. "New experimental methods for determination of alveolar gas composition and respiratory dead space in the anesthetized dog and in man." *JAP* 4:855-867, 1952.

6. Pappenheimer JR, Jackson CB, Schechter WH, Miller RR, and Bovard RM. "Chlorate candles as a source of oxygen." *Industrial and Engineering Chem*. 42:2348-2353, 1950.

7. Pappenheimer, JR and Kinter WB. "Hematocrit ratio of blood within the kidney and its significance for renal hemodynamics." *AJP* 185: 377-390, 1956.

8. Pappenheimer, JR and Michel CC. "Role of villus microcirculation in intestinal absorption of glucose: coupling of epithelial with endothelial transport." *J Physiol* 553: 561-574, 2003.

9. Pappenheimer, JR, Renkin EM, and Borrero LM. "Filtration, diffusion and molecular sieving through peripheral capillary membranes." *AJP.* 167: 13-46, 1951.

10. Pappenheimer, JR and Soto-Rivera A. "Effective osmotic pressure of the plasma proteins and other quantities associated with the capillary circulation in the hindlimbs of cats and dogs." *AJP.* 152: 471-491, 1948. ❖

EM Renkin,
Univ. of CA, Davis;
CC Michel,
Imperial College of London, UK

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Vol. 51, No. 2, 2008

William Francis Ganong

50th APS President
(1924-2007)

William Francis Ganong, MD, who served The American Physiological Society at the Society's 50th President from 1977-1978 died on December 23, at age 83.

Known by his friends as "Fran," Ganong chaired the department the Department of Physiology at the University of California, San Francisco (UCSF), from 1970 to 1987, building it into one of the leading departments of its kind in the United States. He developed a basic research and clinical program that was ranked the top physiology department in the country for at least a decade by the National Academy of Sciences. The department was strong in several disciplines under his leadership, but saw particular growth in the neurosciences. During his chairmanship, Ganong was awarded an endowed chair, the Jack D. and DeLoris Lange Chair in Physiology. In 1996, his contributions to UCSF were honored by the creation of an endowed chair in his name.

A member of APS from 1957, Ganong served the Society in many different capacities. In 1969-70 he was chairman of the Neuroendocrine Discussion Group, one of the informal groups associated with APS. He was elected to APS Council in 1975 and as president elect the following year. He belongs to the category of former presidents who had originally intended to practice medicine, as well as to the group who are graduates of Harvard Medical School. As president, he initiated the Financial Development Committee (chairman, 1980-83), which seeks alternative sources of support for the Society to alleviate partially the dues burden on the membership. He also served as a member of the council of the Section on Endocrinology and Metabolism and as a member of the Publications Committee (1984-1987) at a time the Society was transitioning its book program to Oxford University Press.

During the year Ganong was president of APS, three movements that had been in progress earlier finally came to realization. One was broadening the bases of membership, so that the Society might become more representative of physiology as a whole, and inclusive rather than exclusive. Another was a more active participation of members in both state and federal governmental policies relating to biomedical research.

W. Francis Ganong

The third was final settlement of the question of equity of the several societies in the assets of FASEB.

Ganong was born in Northampton, MA, and entered Harvard College (1941) just in time to be caught up in wartime disjointing of college and professional education. Drafted into the US Army and assigned to the infantry, he finally was enrolled in the ASTP in Georgetown College in Washington, DC, for a year of premedical study and then assigned for two years to the University of Virginia Medical School in Charlottesville (1945-47). Harvard, meanwhile, decided that they could award him an A.B. degree in 1946, and at long last (1947) he was able to transfer to the Harvard Medical School, from which he graduated in 1949. For the next two years he was a member of the house staff in medicine at Peter Bent Brigham Hospital and then was recalled to the Army as a medical officer assigned to duty in Japan and Korea. From 1952 to 1955 he was able to return to Harvard as a research fellow in medicine and surgery for training in the laboratories of George W. Thorn and David M. Hume, respectively. His clinical research preparation came to an end in 1955, however, when he accepted a position in the department of Leslie L. Bennett at the University of California at Berkeley. Three years later the department was moved to San Francisco, where by 1964 Ganong held the rank of professor. In 1982 he became the Jack D. and DeLoris Lange Professor of Physiology. He served some years as vice-chairman of the Department of Physiology, and from 1970 until 1987 he served as its chairman.

Ganong's vision extended beyond the neurosciences to include all aspects of physiology. He recruited top scientists and funded basic research and clinical-research programs in endocrinology, respiratory medicine and cardiology.

A neuroendocrinology researcher in his own right, Ganong published more than 200 scientific publications. He was co-discoverer of the Lown-Ganong-Levine syndrome, an electrical abnormality of the heart. His research focused on the mechanisms by which the brain controls several different hormones, particularly those regulating body fluids and nutrients, reproduction, blood pressure and responses to stress.

In the chapter about Ganong in the APS Centennial History (1), Fran indicated that his "first paper (3) is a favorite, partly because it was my first but also because it introduced a treatment of the Guillain-Barre syndrome that proved to be useful. I had always had a secret ambition to be 'immortalized' by having my name attached to a syndrome, and I am pleased that the Lown-Ganong-Levine syndrome grew out of my second paper (2). I also published several papers on Korean hemorrhagic fever before settling down to fundamental physiological research."

Ganong was the author of the landmark textbook *Review of Medical Physiology*. The 22nd edition of the textbook was published in 2005, and has been translated into 18 foreign languages. John Williams, now at the University of Michigan, who was recruited to UCSF by Ganong, remembered him attending physiology department seminars and "taking notes on 3 x 5 cards to be filed away for when he worked on a new edition of his textbook." During his years at UCSF, Williams also learned from Ganong "that it is important to participate yourself if you want faculty to participate." Williams also commented that while at UCSF he "learned the importance of the departmental softball game, a number of which were held at Tilden Park in Berkeley at which Fran would always be the pitcher, umpire and cheerleader

combined."

Mary Dallman, UCSF Professor who worked in Ganong's lab from the 1970s-1980s remembered starting the week with "'the Monday Morning Meeting,' or the M3 as it was familiarly known. Attendance was mandatory, but it was also generally interesting and worthwhile, although occasionally terrifying. Fran would start the meeting with a recap of a meeting he had attended the previous week, or a series of papers he had read, or with his tightly gathered thoughts about a topical issue of interest to the junior faculty and the, at times unruly, bunch of graduate students, post docs and technicians in the lab." According to Dallman, "Fran did not like complications, and did cleave to the notion of Occam's Razor, that the simplest answer was likely to be correct. This attribute of his did not support complex interpretations. It was fine training in the scientific tradition, from a truly remarkable man whose junior faculty and students were treated as family," according to Dallman.

After retirement from UCSF in 1999, he served as secretary of the UCSF Emeritus Faculty Association and as an officer of the French-American Foundation for Medical Research and Education. He and his wife of nearly 60 years, Ruth Jackson Ganong, traveled extensively. More recently, he enjoyed spending time with his large family and watching the San Francisco 49ers.

Ganong, who died after living with prostate cancer for 17 years, is survived by his wife, his sister Ann Seidler; four children, Francis, Susan, Anna and James and their spouses; 12 grandchildren, four great-grandchildren, and numerous colleagues and friends around the world. A memorial service was held in the Lange Room of the Parnassus Library at UCSF on March 3, 2008.

Contributions in Dr. Ganong's memory to support research and education in physiology may be sent to the UCSF Department of Physiology, c/o UCSF Foundation, Box 45339, San Francisco, CA, 94145-0339.

1. Brobeck, JR, Reynolds, OE, and Appel, TA. *History of The American Physiological Society - The First Century, 1887-1987*. American Physiological Society, Bethesda, MD 1987.

2. Lown, B, Ganong, WF and Levine, SA. The syndrome of short P-R interval, normal QRS complex and paroxysmal rapid heart action. *Circulation* 5: 693-706, 1952.

3. Stillman, JS, and Ganong, WF. The Guillain-Barre syndrome: Report of a case treated with ACTH and cortisone. *N. Engl. J. Med.* 246: 293-296, 1952. ❖

Bowditch Award Lecture

The Bowditch Lectureship is awarded to a regular member, under 42 years of age, for original and outstanding accomplishments in the field of physiology. Selected by the APS President, the recipient presents a lecture at the Experimental Biology meeting, which is considered for publication in the Society journal of their choosing. The recipient receives an honorarium of $2,500, reimbursement of expenses incurred while participating in the Experimental Biology meeting, and a plaque. The membership is invited to submit nominations for the Bowditch Lecturer. A nomination shall be accompanied by a candidate's curriculum vitae and one letter detailing the individual's status, contributions, and potential.

More information on the award and nomination procedures are available at http://www.the-aps.org. Nominations should be sent to: The APS Bowditch Lecture Award, c/o Linda Jean Dresser, 9650 Rockville Pike, Bethesda, MD 20814-3991; or submitted online at http://www.the-aps.org/cgi-bin/Election/Lecture_form.htm.

Physiology in Perspective
Walter B. Cannon Memorial Lecture

The Cannon Memorial Lecture, sponsored by the Grass Foundation, honors Walter B. Cannon, President of the Society from 1913-1916, and is presented annually at the spring meeting to an outstanding physiological scientist, domestic or foreign, as selected by the President-Elect with the consent of Council. The recipient presents a lecture on "Physiology in Perspective," addressing Cannon's concepts of "The Wisdom of the Body." The lecture is considered for publication in the Society journal of their choosing. The recipient receives an honorarium of $4,000, a plaque, and reimbursement of expenses incurred in association with delivery of the lecture. The membership is invited to submit nominations for this lecture. A nomination shall be accompanied by a candidate's curriculum vitae and one letter detailing the individual's status and contributions.

More information on the award and nomination procedures are available at http://www.the-aps.org. Nominations should be sent to: The APS Cannon Lecture Award, c/o Linda Jean Dresser, 9650 Rockville Pike, Bethesda, MD 20814-3991; or submitted online at http://www.the-aps.org/cgi-bin/Election/Lecture_form.htm.

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Hi all:

Here is one more New Zealand Sauvignon Blanc to add to the list in the previous column:

2007 Drylands Sauvignon Blanc, Marlborough, $12. If you ever wanted to experience the aroma of passionfruit and can't find one in the supermarket (or don't want to pay $2 for it), here it is. Has some lemon/lime as well. The palate is very clean, but a bit thin when too cold; it is better closer to room temperature. Acidity is quite high, but there is a richness and balance throughout the palate that makes this attractive.

By the way, had the chance to re-taste the 2006 Whitehaven Marlborough SB on which I reported last issue, and it was every bit as good, and best in a flight of six NZ SB's tasted blind.

Now for some thoughts about recent release Yellowtail wines from Australia. These wines (regular bottlings $5-6; reserves $10) always seem worth reporting on even if not all shine each year.

2006 Yellowtail "The Reserve" Shiraz, Southeastern Australia, $10. Takes a few minutes to open and change from a simple stemmy nose to a more interesting dark berry, spice, and black pepper aroma with a little chocolate. Palate is medium weight, with light tannins and moderately high acid. Fruit is red and dark cherry, and a bit simple, but bright. Despite 14% alcohol there is no heat. It is not over the top. It's priced about right—a real wine that could last a couple of years, not just a fruit and alcohol bomb, but still accessible and good enough with decent food.

2005 Yellowtail "The Reserve" Cabernet, Southeastern Australia, $10. Aroma is red ripe cherry and plums and light herbal and oak notes. Palate is forward and fleshy but the fruit is not classic cabernet in taste—too cherry/plum like with quite high acidity. Tannins are medium, weight is medium. Finish is a bit dull and a faint tin can element is noted. This wine has nice extract but the high acid and plum/cherry flavor make this one wine I would not myself buy again. It will appeal to some, no doubt.

Peter Wagner

2007 Yellowtail Shiraz/Cabernet, SE Australia, $6. This is decent wine. Typical yellowtail style—ripe (dark cherry) fruit, soft tannin, clean, medium body, a touch generic. But this one has interesting coffee notes on the nose and palate, solid body and medium tannins, good acid and nice vanilla. This would do OK as a dinner wine for a midweek occasion.

2007 Yellowtail Cabernet/Merlot, SE Australia, $6. This is fair, not as good as the above. Slightly stemmy, simple, almost sweet ripe red cherry fruit and vanilla. OK as a backyard BBQ party wine, not a real dinner wine.

2007 Yellowtail Cabernet, SE Australia, $6. This is weird stuff. Has a generic sweet "berry" flavor; you would never guess it is cabernet. Very simple, soft, juicy, clean, but I won't buy any more.

2007 Yellowtail Shiraz, SE Australia is not yet available in San Diego, but when it is released I will report back.

2006 Lindemans Bin 50 Southeastern Australia Shiraz, $9. This wine is nice right out of the bottle but in the glass the fruit fades over perhaps 30 minutes. The nose has plums and anise/green olive. The palate at first is lush with dark berry fruit, spice, olive and soft tannins and oak but the fruit fades as mentioned while the tannins stay. The finish is accordingly short. Although this won a trophy for best current drinking red at the Perth wine show in Australia, which is why I am reporting on it, the rapid fading is quite disappointing even at the price.

2005 Luna Sangiovese, Napa Valley, $16. If you want to try a California attempt at this classic Italian varietal, this is one that may be worth a shot. I should warn you the alcohol level is high (15%), which combined with soft ripe red/dark cherry fruit gives the wine a sweetness and accessibility that is dangerous. There is vanilla, spice, and soft tannins. The acidity is a bit low. Not a wine to keep long term, and will not appeal to everyone.

2005 Estancia Meritage, Paso Robles Reserve, $20. Estancia Meritage has for many years been a terrific wine in which I have indulged every vintage. It used to come from Alexander Valley (Sonoma) grapes but for about the past three vintages it has been made from Paso Robles grapes. I could never find out why they changed, fixing what definitely was not broken. It is always a Bordeaux blend, and this year it consists of Cabernet Sauvignon 56%; Merlot 32%; Petit Verdot 9% and Malbec 3%. Every vintage has a repeatable characteristic: the wine is very ordinary when the bottle is first opened, but decant it and wait 30 minutes (or use a Vinturi aerator), and it opens beautifully. This vintage is no exception, and the following describes it after this transformation has occurred: The nose has lots of dark cherry, with some anise and dill. There is forward dark cherry fruit on the palate which is quite rich and viscous. Tannins are on the light side as usual, and the acidity is perfect for my taste. There is vanilla, dill and anise on the palate too. Balance and length are excellent. This is a very nice vintage for Estancia, perhaps not the best, but still well worth $20 (if you can decant and wait the 30 min). ❖

May 16-21
2008 American Thoracic Society International Conference (ATS), Toronto, Canada. *Information:* American Thoracic Society, 61 Broadway · New York, NY 10006-2755. Tel.: 212-315-8600; Fax: 212-315-6498; Email: ats2008@thoracic.org; Internet: http://www.thoracic.org/index.cfm.

May 17-18
7th International Head-Out Water Immersion (HOWI) Symposium, Tartu, Estonia. *Information:* Internet: http://www.howi-symposium.net/index.php.

May 18-21
TIDES 2008, Las Vegas, NV. *Information:* Internet: http://www.ibclifesciences.com/tides/8490.xml.

May 24-29
The 22nd Annual HAPS Conference, New Orleans, LA. *Information:* Judy Venuti, Conference Coordinator. Email: jvenut@lsuhsc.edu; Internet: http://www.hapsweb.org/display-convention.cfm?conventionnbr=4287.

June-September
FASEB's 2008 Summer Research Conferences held in Carefree, AZ; Saxtons River, VT; New Haven, CT; Snowmass Village, CO; Lucca, Italy; and Copenhagen, Denmark. *Information:* FASEB Summer Research Conferences, 9650 Rockville Pike, Bethesda, MD 20814. Internet: http://src.faseb.org/.

June 1-5
15th International Vascular Biology Meeting, Sydney, Australia. *Information:* IVBM 2008 Conference Secretariat, PO Box 1179, Crows Nest, NSW 1585. Tel.: +61 2 9436 0232; Fax: +61 2 9436 4462; Email: ivbm@conceptevents.com.au; Internet: http://www.ivbm2008.com/.

June 4-6
Second Annual Scientific Meeting of The Organization for the Study of Sex Differences, New Orleans, LA *Information:* Viviana Simon, PhD, Tel: (202) 496-5002; Email: viviana@ossdweb.org; Internet: http://www.ossdweb.org/meeting_2008.html.

June 8-14
IWPCPS®-10—Tenth International Workshop on Physical Characterization of Pharmaceutical Solids, Bamberg, Germany. *Information:* Internet: http://www.assainternational.com/workshops/IWPCPS_10/IWPCPS_10.cfm.

June 20-22
The International Conference of the Pulmonary Hypertension Association, Houston, TX. *Information:* Internet: http://www.phassociation.org/Conference/.

June 26-28
5th International Symposium on Courgh: Mechanisms and Treatment, London, UK. *Information:* Karina Dixon, Events Office, National Heart & Lung Institute, Imperial College, Dovehouse Street, London SW3 6LY, UK. Tel.: 00 44 (0) 207 351 8172; Fax.: 00 44 (0) 207 351 8246; Email: k.dixon@imperial.ac.uk.

June 28-July 3
33rd FEBS Congress and 11th IUBMB Conference, Biochemistry of Cell Regulation, Athens, Greece. *Information:* Georgina Alexopoulou, Promotion and Communication. Tel.: +30 210 6889100; Fax: +30 210 6844777; Email: febs-iubmb2008@cnc.gr; Internet: http://www.febs-iubmb-2008.org/.

June 28-July 11
SEB at Glasgow 2009, SEB Annual Meeting 2009, Glasgow, United Kingdom. *Information:* Email: k.steel@sebiology.org; Internet: http://www.sebiology.org/meetings.

June 29-July 1
Metabolic Signaling in the Cardiovascular System: From Basic Discovery to Clinical Application, Boston, MA. *Information:* Internet: http://www.heartmetabolism.org/.

July 6-11
SEB at Marseille 2008, Society for Experimental Biology Annual Meeting, Marseille, France. *Information:* Email: k.steel@sebiology.org; Internet: http://www.sebiology.org/meetings.

July 26-30
Society for Developmental Biology 67th Annual Meeting, Philadelphia, PA. *Information:* Society for Developmental Biology, 67th Annual Meeting, 9650 Rockville Pike, Bethesda, MD 20814. Internet: http://www.sdbonline.org/2008Mtg/webpage.htm.

August 17-22
IASP 12th World Congress on Pain, Glasgow, Scotland, UK. *Information:* Fiona McGillvray or Vicki Grant, Congress Secretariat, Meeting Makers, Jordanhill Campus, 76 Southbrae Drive, Glasgow G13 1PP, United Kingdom. Tel.: +44 (0) 141 434 1500; Fax: +44 (0) 141 434 1519; Email: jasp2008@meetingmakers.co.uk; Internet: http://www.iasp-pain.org/AM/Template.cfm?Section=World_Congress_on_Pain&Template=/CM/HTMLDisplay.cfm&ContentID=3928.

September 8-15
Cardiovascular & Respiratory Systems Modeling: From Cell to Organ, Seattle, WA. *Information:* Kay Sterner, The NSR Physiome Project, Box 355061, University of Washington, Seattle, WA 98915-5061; Tel.: 206-685-2005; Email: sterner@u.washington.edu; Internet: http://www.physiome.org/Course/sept07.html.

September 11-14
Workshop on the Biology of Signaling in the Cardiovascular System, Cape Cod, MA. *Information:* Bernadette Englert, Tel: (301) 760-7745; Email: mailto:bernadette@navbo.org; Internet: http://www.navbo.org/BSCVS.

September 18-20
23rd AACVPR Annual Meeting, Indianapolis, IN. *Information:* Internet: http://www.aacvpr.org/meeting/.