



# The Physiologist

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## Making the Case for NIH Funding: How Cures Are Built on Decades of Research

Rebecca Osthus and Dale Benos

Following the doubling of the National Institutes of Health (NIH) budget between 1999 and 2003, the agency has been allocated only minimal funding increases in the last three years. Faced with competing spending priorities including the war in Iraq, recovery from natural disasters and rapidly rising health care costs, lawmakers in Washington have begun to ask what benefits have been derived from the nation's nearly \$30 billion per year investment in the NIH.

While those in the biomedical research field recognize that research is cumulative and that it can take years, or even decades, to understand and develop treatments for a single disease, others lack an appreciation of the process of scientific research. Less than five years after the completed doubling of the budget, they have already begun to ask where the cures are. It is up to the scientific community to advocate for a sustained investment in biomedical research by communicating both the benefits and the timeline of research.

It has become clear that simply advocating for biomedical research funding based on the promise of medical advancements is not enough. In order to answer questions about how the doubling of the NIH budget will improve human health both now and in the future, it is necessary to explain how and why research spans decades. When advocating for more research funding, scientists must explain the context of the work they currently do, the scientific discoveries that the work builds

upon, and the promise of breakthroughs and discoveries that lie ahead.

Advocacy groups such as Research!America have already begun to incorporate this theme in their messaging. Their website (<http://www.researchamerica.org>) highlights the "Then-Now-Imagine" Campaign. The messages focus on the state of medicine in the past, the present and the hopes for future treatments. NIH Director Dr. Elias Zerhouni has also begun to refocus the agency's advocacy efforts, pointing out that based on research discoveries; the medicine of the future will be preemptive, personalized and predictive. [http://www.nih.gov/about/research\\_results\\_for\\_the\\_public/index.htm](http://www.nih.gov/about/research_results_for_the_public/index.htm)

Physiology has a rich history of contributing to the development of cures and treatments for disease, stretching back throughout the history of science and medicine. Outlined below are examples of physiological research that have already improved human health and continue to hold significant promise for advancement—promise built on decades of research. In each case, a basic understanding of pathophysiology has led to advances in disease treatment. They are intended to illustrate that a sustained investment in research is the best way to improve human and animal health, today, tomorrow and in the future.

### **Parkinson's Disease**

Parkinson's disease (PD) is well known today as a disorder that involves the loss of dopamine producing neurons

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## From Mentee to Mentor: Lessons Learned Along the Way

L. Gabriel Navar

Tulane University Health Sciences Center  
New Orleans, LA

Thank you very much for bestowing this very special award to me. Words can not express how grateful I am to receive this recognition. To be associated with an award named in honor of Bodil Schmidt Nielsen is truly a very special tribute. The Women in Physiology Committee deserves to be commended for its initiative in establishing this award and thus highlighting the importance of mentoring for the future of Physiology. My special appreciation goes to Sinya Benyajati and all members of the Selection Committee. It was a truly heartwarming experience to receive so many gracious comments from former trainees and colleagues. Thanks also to Lisa Harrison-Bernard and Debbie Olavarrieta for all the work that they did in preparation of the application.

Today, I would like to focus on the theme of lessons learned along the way. At the outset, I must acknowledge my original mentors and parents, Luis and Concepcion, who provided me with a nurturing and stimulating environment and gave me the inspiration to reach for the stars. Mom was a sweet wonderful woman who thought ill of no one. She had been raised in a rather cultured environment, had a great deal of musical ability playing the piano and organ, sang in the choir, was the organist for a church, and a music teacher. She made sure that we received some lessons in the arts, music and religion, being a devout Catholic. Some of us responded better than others with my sister going on to major in music at college, but even I had enough training to sing in the high school choir and in the Singing Cadets of Texas A&M.

In contrast, my Dad was a hardened Mexican cattleman, farmer, and dairyman who came across the Rio Grande to El Paso, TX in the early 1900s with his parents. He started a dairy farm with



**L. Gabriel Navar, 2006 Schmidt-Nielsen Distinguished Mentor and Scientist Awardee, with his nominator, Lisa Harrison-Bernard.**

just a few cows but eventually managed not only the dairy but thousands of acres of ranch and farm land on both sides of the border. He did all this without the benefit of even completing grade school. He was always attentive to details and could assess the integrity of an individual within a few minutes of conversation.

I learned many lessons from him that have served me well through my many years and there are many stories that I could tell you. Some of the most important lessons are:

the difference between knowledge and belief—be confident in what you know and be able to distinguish fact from opinions;

carry out your assigned responsibilities and don't shirk your duties no matter what the challenge;

reach as high as you can in your endeavors and follow your quest wherever it takes you;

you have to work long and hard to achieve your goals; the clock doesn't matter only whether or not you get the job done.

Looking back, it is amazing to me how this man who never even finished grade school was able to achieve so much as an astute businessman, rancher and farmer. Although he was not able to do so, he made sure that all his children would receive as much education as they desired and every one of the six children went to college with two in the family receiving PhDs. The inspiration and lessons that they provided gave me the drive and courage to pursue a career in science even though no one else in our family was even remotely associated with science. Indeed, Dad was the one who encouraged me to take a more challenging path in college rather than study Agriculture or Dairy Husbandry. He recom-

mended that I strive for a "professional" degree which I ended up translating to the study of Veterinary Medicine. But even he was surprised when I told him in 1962 that I was switching from veterinary school to graduate school and going to Jackson, Mississippi to study physiology with a man called Arthur Guyton. To someone from El Paso, Mississippi was surely the end of the world—maybe even beyond.

Of course, I would be remiss if I didn't acknowledge my wonderful and understanding wife, Randa, who married me while I was a graduate student and has been with me throughout my scientific career. Without her support and understanding, it would have been impossible for me to spend the countless hours that are often required to survive in the world of science. Sometimes, it is difficult for non-scientist spouses to appreciate the passion that drives scientists, but Randa has tolerated my idiosyncrasies quite well for 40 years and gave me four wonderful children.

The scientific path is often circuitous but most of us started as youthful stu-

dents striving to reach the end of the scientific rainbow. At each crossroad there are many paths from which to choose and the best one is rarely obvious. Sometimes we falter, sometimes we go along dark roads alone, or into paths that do not go to the pot of gold at the end of the rainbow but instead up roads of frustration and anxiety. This is the way of science and our destinies are not always clear. Choosing a career in science is to follow a quest that is not fully apparent or always rewarding. In this quest, however, we are often fortified and supported by those who have gone before us and are able to provide us with the benefit of their wisdom and experience. We call them mentors, and they have an awesome responsibility to those who have chosen to come along the same pathway. A good mentor should be a shining beacon helping the mentee make decisions, but never making them for the mentee, and helping to provide the pros and cons of various avenues without directly telling them which one to take. Such is the substance of the mentor and, when successful, there are few, if any, other more meaningful and rewarding experiences that one can have. Personal success as a scientist is wonderful and rewarding, but can not be matched by the feeling of jubilation and exhilaration that comes with the realization of success by those who one has been fortunate to have had under their wings.

I have been one of those fortunate enough to have had the privilege of mentoring many dedicated and outstanding young scientists throughout the various phases of my career. It was very heartwarming to realize that those who have trained with me and/or who have shared trials, tribulation and moments of victory with me thought enough to nominate me for this award. If I served as a good mentor, it is because I myself have been very fortunate to have served with outstanding mentors who provided me with guidance through difficult years. I

learned most of what I know by experiencing their guidance, listening to their advice, and observing their strategies.

Importantly, I myself was privileged and honored to have had as a scientific mentor perhaps the most renowned physiologist of our time. It is not an exaggeration to say that Arthur C. Guyton is probably the most widely recognized name in the physiological world. Wherever he went throughout the vast parts of this globe, colleagues and students alike would swarm around him to get his signature on their copy of his textbook, the last of the single author, comprehensive textbooks of physiology. Yet, back home, Arthur Guyton was a dedicated, hardworking plain speaking mentor and chairman. He was always accessible by a simple knock at his door and always willing to put his important work aside to talk with a graduate student, fellow or faculty to discuss research ideas or to counsel about personal problems. He always had helpful suggestions and he certainly had many more ideas for experiments than one could possibly do. Importantly, Arthur Guyton would have lengthy discussions about ideas and concepts with his students and fellows. He would suggest and guide but would not demand that certain experiments be done. He would encourage us to buy into the concept and to help design the perfect experiment that would test it. He would not write our papers for us and expected a manuscript that represented our very best effort before we gave it to him. He expected us to present our seminars and talks without extensive notes and he never allowed us to read the manuscript as the talk. Those are among the many lessons that I learned from him during and even after my time with Arthur Guyton. Some of the most important and enduring ones were to focus on concepts and mechanisms and that, in the final analysis, the experimental data have to be reconciled into a logical framework. You run experiments to

## The UAB Years 1974 - 1988

Importance of having a close knit group with quite different interests but common objectives to establish an uncompromising program of excellence.

Importance of mutual support in both professional and personal issues.

Importance of establishing a culture of personal confidence and minimize disruptive interactions that contribute to internal tensions and anxiety.

learn and the value of the experiment depends on the lessons that you learn from it. This is why he focused so much of his efforts on systems analysis and mathematical modeling.

During the years that I was with Guyton, I took a year off to do postdoctoral work at Duke University with Dr. Jim Clapp and Ike Robinson in Nephrology. While the environment in Dr. Guyton's department was very comfortable, and it would have been very easy for me to stay there, I felt it important to reach out for new challenges and opportunities. Dr. Guyton knew how important it was not to squeeze the bird too tight and he gently encouraged me to seek new independence. The years at Duke were extremely rewarding, learning renal micropuncture techniques in close association with Tom Burke and testing our hypothesis directly. Both Jim Clapp and Ike Robinson were excellent mentors guiding me in the design of the experiments, the interpretation of the results, and the preparation of presentations and manuscripts. An added benefit was the proximity to University of North Carolina where I benefited greatly from the mentorship of Carl Gottschalk and the friendship of others at UNC. During my brief period at Duke, I learned about the value and importance of interacting with physician scientists and strategies for testing ideas and hypotheses in the most direct way possible.

Shortly after returning from Duke, I got to know Tom Andreoli who was forming a Nephrology Research and Training Center (NRTC) at the University of Alabama at Birmingham. Tom had strong Duke connections and most of his faculty did too. My year at Duke qualified me for the BTU (Been to Duke) degree so I was considered favorably and

## The Guyton Years 1962 - 1974

Strong emphasis on concepts and mechanisms.

Mechanisms can best be understood through systems analysis.

Experimental data have to be reconciled into a logical framework.

If it doesn't make sense, determine the point of confusion and run the experiments to resolve it.

You don't understand the physiology until you establish the cause-effect relationships.

Working in the lab is important, but there is a BIG difference between activity and productivity.

## The Tulane Years 1988 - 2006

Chair of Physiology Department

Very rewarding period but the lessons learned along the way have served me well

Mentoring at each level is different

*Graduate Students:* need reassurance and an exciting thesis project

*Postdoctoral Fellows:* cultivate a special turf that they brand as their own

*Junior Faculty:* striving to achieve independent funding, a solid program of research and maintain productivity

*Mid-Level Faculty:* maintain a balance among research, teaching, institutional service

I moved to UAB in Birmingham, Alabama. Tom served as both a colleague and a mentor and we would spend many moments discussing aspects of our research areas. We formed a very close group and I learned the importance of having colleagues as mentors while you yourself are mentoring others. For many years, we interacted closely and worked together on program project grants, center grants and training grants building the center. Indeed we call those the "Camelot years" because for one brief shining moment, everything seemed perfect and we were successful in virtually all our efforts. It was very important to Tom to have trained experienced investigators serving as research mentors to the Nephrology fellows and I interacted and helped to mentor many MD and PhD postdoctoral fellows. We learned the importance of loyalty and teamwork, without petty jealousy or infighting, and the mechanisms for establishing individual independence within the framework of a team. In the NRTC, each major investigator had his own research program with students and fellows, but we worked together for the common goal of excellence within the Center. After Tom left to follow his quest we continued on and the various divisions of the NRTC grew and prospered. During those years at UAB, I was also heavily involved as the director of the Minority Hypertension Summer Training Program, which was sponsored by NHLBI. This program provided summer research opportunities for faculty at predominant minority colleges in Alabama. For about 10 years, we recruited between 6-12 science faculty and provided them with research experiences that would help them enhance their educational programs. Interacting with faculty from these predominantly minority undergraduate colleagues helped me learn much about the impor-

tance of increasing the numbers of underrepresented minority scientists in biomedical research.

Although I was quite satisfied with the situation at UAB and we had graduate students and postdoctoral fellows, and a renal center grant, my long-term quest was to become chairman of a department but, somehow, the right one had not come along. The opportunity to Chair the Department at Tulane came

## "Goal of Mentorship: Once Left On Their Own, They Make the Perfect Flight"

up at the right time and off we went to the Big Easy.

As Chair of the Department of Physiology at Tulane for 18 years, there have been many rewarding moments. Importantly, the Department is not so big that it has prevented me from still being involved with students at all levels. Our graduate student program is small and very personalized. We still try to individualize the training program for each individual. Graduate students need to be reassured, supported and above all, guided toward a project that is exciting for them. Postdoctoral fellows want to develop a special niche or turf that they can cultivate into a long-term program of action. Junior faculty members need guidance and feedback as they develop a research program that will be

highly competitive for national funding. In these days of difficulty in funding, mentoring the unfunded faculty investigator is a particularly important and sensitive responsibility. A special privilege that I have had at Tulane is to be the Director of the NIH funded Center of Biomedical Research in Hypertension and Renal Biology. This unique characteristic of this grant, which is part of the IDeA program administered by National Center for Research Resources (NCRR) is that it is specifically focused on mentoring junior faculty members and providing them with mentoring and guidance as they strive to develop their own independent NIH funded research program. It is very rewarding to nurture a junior faculty member on their way to their first major research grant.

In all, being a Departmental Chair involves mentoring at many levels. And sometimes, when we are faced with extraordinary challenges as we were after Katrina, it seems as if it is too

much to handle. At times like these, even mentors need other mentors and they turn to trusted and wise counselors that will listen to them and give guidance and reassurance. One such person is Jack McGiff, a member of our external advisory committee, who has been there to listen to my concerns and uncertainties in time of need. His counsel has been extremely valuable and comforting to me, especially during the post-Katrina months which were filled with uncertainty, anxiety and confusion.

In closing, I would like to emphasize the major challenges of mentoring. It is very important to serve as a role model. Students and mentees will see what you do and determine if you live by the advice you give to others. They are more likely to pattern their behavior from

## Challenges of Mentorship

You must be a role model. Words that are not backed up by actions are hollow and empty.

Every individual is different. A good mentor senses and detects the way they respond and continuously adjusts to provide the most appropriate guidance.

Guidance is not the same as directives. Help them to make THEIR decision. Don't make decisions for them.

Each mentee progresses at a different rate and has different challenges. Be there when they need you and fade into the background when they choose to fly alone.

observing your activities rather than from your words if they are not consistent with your actions. Importantly, those of us in science need to recognize that it is a very special profession that requires great dedication and desire, as well as creativity and sensitivity. Egos are fragile and different individuals respond to different methods of encouragement. The mentor must be able to sense the needs of the mentee and provide individualized and appropriate guidance. Furthermore, providing guidance is different from giving directives. Training and mentoring involves helping the mentees work through the options and making their own decisions. Likewise, talents and potential are expressed in many ways and the mentor will recognize that different individuals develop and mature at different rates. In the final analysis, the goal of mentoring is to allow that development to progress at just the right pace so that once left alone, the mentee will be ready to fly alone! ❖



**L. Gabriel Navar with current and past trainees who wrote letters of support for his nomination for the Schmidt-Nielsen Award.**

## DESTINY

*Why is it that autumn is the season of the year that moves my heart the most?  
Oh, can it be I share identity with those lonely leaves that from the trees must fall;  
Those lonely leaves that drift along the whiffs of wind;  
Those lonely leaves that know not where their destiny will be.*

*Why is it that I love to watch the ocean waves as they pound upon the beaches on the land?  
Oh, can it be that I share a feeling with each drop,  
No matter whether it be on top of a wave or far below?  
For it is only destiny that finally determines where that drop will be.  
And even if on top, who knows where it shall go as it joins the next full surge toward land.*

*Oh mighty drop of water surfing at the tip of wave,  
Did you get there all by yourself?  
Look down not only on the shoulders of the giants that you stand on,  
But also on all the other drops of water all around.  
Did they not give you the very loft from where you perch?  
Did they not hoist you on their backs?  
So don't forget that when the wave comes tumbling down,  
You may no longer be that drop that reaches for the sky.  
So give regard to those around lest someday they will be on top of wave and then remember what you did when you stood at the top of mountain for that one almighty second.*

*Oh powerful man, who feels control of destiny,  
Are you not also just a leaf about to leave your tree?  
Are you not just a drop of water in the sea?  
Who knows not where your final destiny will be?*

in the brain. Researchers in the 1950s and 1960s focused on working out the biosynthetic pathway for dopamine synthesis, and recognized DOPA as the precursor to dopamine. Early efforts to treat PD with DOPA were disappointing, and reflected the failure of the drug to efficiently cross the blood brain barrier. George Cotzias, an NIH-supported researcher in the 1970s, overcame that limitation by increasing the dosage and showing that it could be effective in treating the symptoms of PD. Further refinement of the therapy involved the discovery of DOPA-decarboxylase, an enzyme in the gut that breaks down DOPA, resulting in nausea and a lower amount of circulating DOPA. By pharmacologically inhibiting DOPA-decarboxylase, side effects were reduced and more DOPA was available to pass into the brain. Cotzias also went on to discover that amino acid concentration affects uptake of DOPA in the gut, leading to diet recommendations that further enhanced the therapeutic effect.

However, because DOPA improves the symptoms in PD patients, but does not halt disease progression or provide permanent relief, other treatment options have been explored, building on the basic understanding of the pathophysiology of PD. New pharmaceutical agents, including dopamine agonists and other inhibitors that prolong the bioavailability of DOPA, have been developed for use alone or in combination with DOPA therapy. Some of these therapies may even have a protective effect on dopaminergic neurons and help slow disease progression. And while most cases of PD are not genetic, several NIH funded studies investigating the genetic causes of famil-

ial PD have led to the identification of biological pathways involved in disease onset and progression (reviewed in [6]). Knowing which molecules are involved in familial PD opens the door to the development of therapies that may also work for sporadic cases. Understanding the genetic basis of the disorder also allows for the development of animal models, which are extremely useful in exploring interventions. And finally, a detailed picture of the genes involved will also help personalize treatments regimens in the future.

In addition to the development of pharmacological treatments for PD, decades of research into the structure and function of the brain has enabled the development of new surgical interventions. While some of the earliest treatments for PD were neurosurgical, there was limited success and high mortality associated with the procedures. More sophisticated instrumentation has improved the efficacy of older treatments, and contributed to the development of new ones such as deep brain stimulation, which can dramatically reduce symptoms in some PD patients.

The promise of these therapies has spawned dozens of NIH-supported clinical trials to further explore and enhance therapies for PD, offering hope to patients around the world.

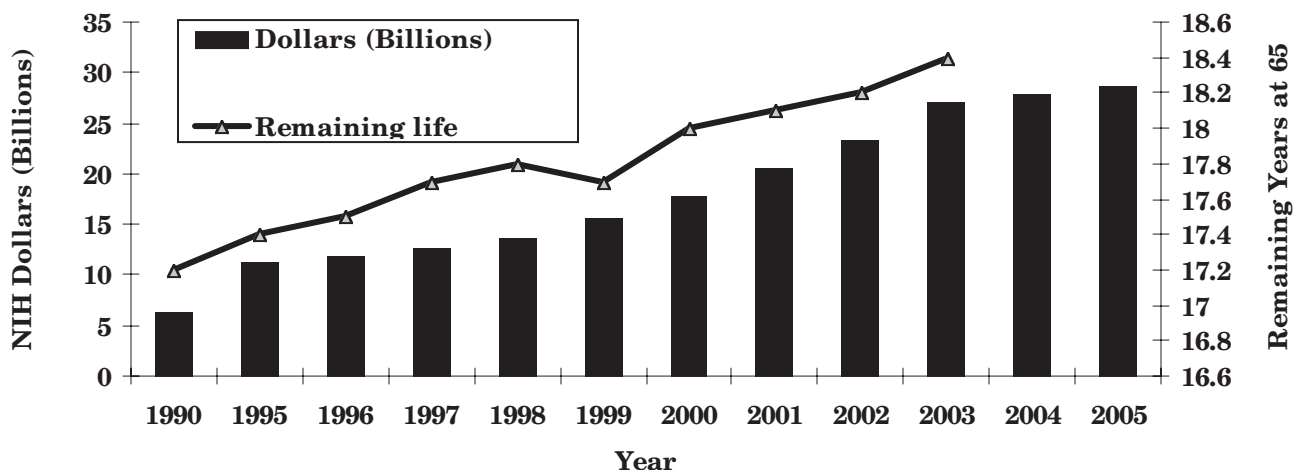
### Cholera

Cholera is a disease that has long plagued many regions of the world, causing significant mortality with each outbreak of disease. Left untreated, severe cholera infection kills up to 50% of affected patients (reviewed in [6]). Research into the pathophysiology of

cholera infection led scientists to understand that the rapid dehydration caused by diarrhea is the result of an imbalance between secretion and absorption of water and electrolytes in the gut. Early research into sodium-linked glucose transport provided the scientific basis for the development of oral rehydration therapy, which has saved millions of lives around the world since its introduction in the 1970s. Oral rehydration therapy has been an extremely effective treatment because it is both affordable and readily accessible to affected populations. However, despite the enormous success of oral rehydration therapy, vulnerable populations such as the very young, the elderly and the malnourished still often succumb to the disease.

Research funded by the NIH over the last several decades has provided a body of basic scientific knowledge that will allow for the continued development of newer and better therapies. Recent scientific efforts have focused on refining treatment beyond supportive rehydration, and the development of a preventative vaccine. Detailed knowledge of precisely how cholera toxin invades cells and disrupts absorption and secretion has led to the development of several possible drug targets [3]. Current NIH-funded research focuses on drug development for the treatment of cholera infection [4], investigation of the genetic determinants of virulence [1], and the development of more effective vaccines [5], among others topics. With the looming threat of bioterrorism and the potential use of cholera and other organisms as biological weapons, these studies will continue to be of value to human health all over the world.

Figure 1. Remaining life expectancy in years at age 65.



## Cystic Fibrosis

The completion of the human genome sequence in the late 1990s provided an enormous resource for the study of genetic disease. But more than a decade before that landmark event, scientists funded in part by the National Institutes for Diabetes and Digestive and Kidney Diseases identified the gene responsible for cystic fibrosis (CF) using positional cloning [6]. Identification of the cystic fibrosis transmembrane conductance regulator (CFTR) was a major discovery that has allowed scientists to study the molecular events that lead to the development of CF with an eye toward early intervention and disease therapy.

While cystic fibrosis is a relatively rare disease, CF is one of the most common human genetic disorders, and approximately 10 million Americans carry mutations in the CFTR gene. Understanding the genetic basis of the disorder has led to the development of accurate diagnostic tests which allow at-risk individuals to be tested for carrier status, as well as the use of prenatal genetic testing when appropriate.

Numerous studies in the last 17 years have expanded upon our knowledge of the molecular mechanisms underlying CF, including how the gene is expressed in its normal and mutant forms, and how the protein product localizes and functions at the cell membrane as a chloride channel. Treatments including the use of anti-inflammatory drugs, antibiotics, pancreatic enzymes and nutrition supplements have all been developed based on knowledge of CF pathophysiology, and have contributed greatly to reduced morbidity and mortality in affected individuals. In the past

30 years, the average lifespan for individuals affected with CF has increased dramatically and now stands at 36.8 years, compared with 30 years ago when most deaths occurred during childhood or the teenage years.

Researchers are now focused on the development of gene therapy techniques that would deliver CFTR to affected tissues, most importantly the lung. Current research is focused on the development of animal models that can be used to test gene therapies, as well as testing different viral and non-viral methods for gene delivery (reviewed in [4]).

In addition, increased knowledge of the molecular underpinnings of CF has increased the understanding of other related disorders. For example, researchers have speculated that deleterious mutations in the CF gene are maintained at such a high rate in the population because they may confer some degree of resistance to the development of typhoid fever and secretory diarrheas such as cholera. Investigation of that association led to the observation that the pathogen responsible for typhoid fever enters cells in the gut through the CFTR transporter. CF research has also led to insights into male infertility, idiopathic pancreatitis and primary sclerosing cholangitis.

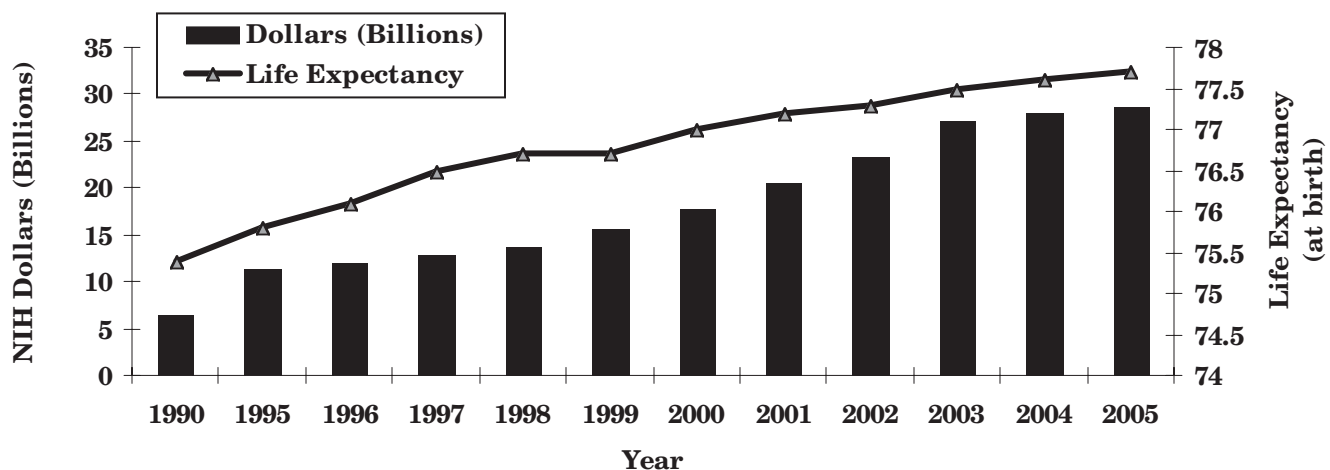
The National Institutes of Health continue to sponsor research that explores CF and the best way to treat problems associated with the disease. Currently, the agency spends approximately \$100 million per year on CF research, and according to the federal database of clinical trials, there are currently 69 clinical trials actively recruiting CF patients to study various aspects of the disease.

## Mechanical Ventilation and Lung Damage

Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) are serious lung conditions that are associated with high mortality rates. Patients whose lungs are damaged by injury or illnesses such as pneumonia sometimes go on to develop severe inflammation and ARDS, which can result in respiratory failure in a matter of days. These patients require extensive medical treatment, including being placed on a respirator to help them breathe. According to one recent study, approximately 200,000 people in the United States are affected by ALI each year, and the mortality rate is about 40% [5].

In an effort to improve treatment and reduce mortality due to ALI and ARDS, the National Heart Lung and Blood Institute developed a consortium of clinical centers to test new therapies. Clinical researchers tested new drugs that they hoped would improve patient outcome, and also enrolled more than 800 patients in a study that examined mechanical ventilation. Physiologists had speculated that the amount of air being passed into the patient's lungs might actually be causing damage, so they experimented with giving the patients less air with each breath. The researchers found that the results were dramatic, and that patients who were given less air with each breathe had a mortality rate that was 31% as compared to 40% in the control patients receiving traditional ventilation therapy. The results were so convincing that researchers stopped the study early so that more patients could be treated with the new clinical protocol [3]. Researchers have gone on to study the

Figure 2. Life expectancy in years (at birth).





biological basis of this phenomenon, and early results in animals show that higher levels of ventilation lead to increased inflammation in the lung [3].

## Conclusion

As illustrated in the examples given above, progress from basic research to disease treatment can be slow and arduous. Despite the lengthy process, there are countless examples of improvements to human health that are built upon years of research. By making an effort to communicate this to members of Congress, scientists can enhance the understanding of the research process, and hopefully increase support for federal funding of biomedical research. If citing specific examples of diseases doesn't appear persuasive enough, perhaps demonstrating a correlation between NIH funding levels and longevity (either measured as life expectancy from birth [Fig. 1A] or from age 65 [Fig. 1B]) would be in order. It will be informative to note what the trends will look like if the NIH funding level remains flat or decrease over the next several years.

## Acknowledgements

We would like to thank members of the APS sections for contributing the ideas that formed the basis of this article, especially Bill Talman, Michael Matthay and Hannah Carey. We also thank Ms. Janice Phillips for preparation of Figure 1.

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# APS News

## APS Bylaw Change

### ARTICLE IV. Officers

SECTION 1. Council. The management of the Society shall be vested in a Council consisting of the President, the President Elect, the immediate Past President, and nine other regular members. The terms of the President and President Elect shall be one year. The terms of the nine additional Councillors shall be three years each and they shall not be eligible for immediate reelection except those who have served for two

years or less in filling interim vacancies.

A quorum for conducting official business of the Society shall be two-thirds of the elected members of Council.

The Chairpersons of the Publications Committee, the Finance Committee, the Joint Program Committee, the Education Committee, the Public Affairs Committee, the APS Representative to the FASEB Board, and the Executive Director are ex officio members of the Council without vote; the Chairperson of the Section Advisory Committee is an ex

officio member of the Council with vote. The Council may fill any interim vacancies in its membership. Council shall appoint members to all committees except the Section Advisory Committee.

In the interim between meetings of Council, an Executive Cabinet consisting of the President, President Elect, Immediate Past President, and the Executive Director shall implement the policies of the Council. ❖

## New Regular Members

\*Transferred from Student Membership

**Daniel Lewis Adams**

Univ. of California, San Francisco

**Diego F. Alvarez\***

Univ. of South Alabama, Mobile, AL

**Corina Balut**

Int'l. Ctr. Biodynamics, Romania

**Hui-Fang Bao**

Emory Univ., GA

**Miroslav Blumenberg**

New York Univ.

**Andrew M. Carroll**

Harvard Univ., MA

**Xueni Chen**

Nat'l. Jewish Med. & Res Ctr., Denver, CO

**Adam Joseph Chicco\***

Univ. of Colorado, Boulder

**Panneerselvam Chinnakkannu**

Med. Univ. of South Carolina, Charleston

**Beverly Shelley Colley**

Philip Morris USA, Richmond, VA

**Tatjana Coric**

Yale Univ., CT

**Monica Ann Daley**

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**Joseph P. De Bono**

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**Alessandro Marco De Nunzio**

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**Dere James Dossdall**

Univ. of Alabama

**Jamie P. Dwyer**

Mayo Clinic, Jacksonville, FL

**Govindaiah Govindaiah**

Univ. of Illinois

**Mei Han**

Inst. of Basic Medicine, Shijiazhuang, China

**Amy B. Harkins**

St. Louis Univ., MO

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New York Med Coll.

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**Richard A. Johnston\***

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Detroit Medical Center, MI

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New York Medical College, Valhalla

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**Jung-Jun Park**

Children's Nat'l. Med. Ctr., DC

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Univ. of Calgary, AB, Canada

**John M. Quayle**

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**Yinusa Raji**

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**Farah A. Ramirez-Marrero**

Mayo Clinic, MN

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**Victoria H. J. Roberts**

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Butantan Inst., Sao Paulo, Brazil

**Zhiying Shan**

Univ. of Florida

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Ross Univ., Sch. Med., NJ

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Cleveland Clinic Lerner Res. Inst., OH

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Indiana Univ. Sch. of Med.

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**Wenwu Zhang\***

Indiana Univ.

**Bin Zheng**

Inst. Basic Med., Shijiazhuang, China

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**Vincent P. Dole**

New York, NY

**Michael H. Leblanc**

Jackson, MS

**Otakar V. Sirek**

Toronto ON, Canada

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Ladoke Akintola Univ. of Tech., Nigeria

**Damilare Adeyemo**

Ladoke Akintola Univ. of Tech., Nigeria

**Yahya Alayafi**

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**Christopher Allen**

Univ. of Alabama, Birmingham

**Gustavo Ares**

Henry Ford Hospital, MI

**Rachel Austin**

Howard Univ., DC

**Tesleem Babalola**

Ladoke Akintola Univ. Tech., Nigeria

**Subrata Biswas**

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Center Vet. Hlth Sci., Stillwater, OK

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Univ. of South Alablama

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**Joseph Rutkowski**

Ecole Polytechnique Fed De  
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**Vinayak Shenoy**

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**Sean Thatcher**

Joan C. Edward Sch. of Med.,  
Huntington, WV

**Carmen Troncoso Brindeiro**

Univ. of Nebraska

**Nora Von Wahl**

Draeger Medical, Andover, MA

**Lizette Warner**

Mayo Clinic, MN

**E. Courtenay Wilson**

Massachusetts Inst. Tech.

**Lei Yao**

Hong Kong Polytechnic Univ.

**Colin Young**

Univ. of Missouri, Columbia

**Wei Zhang**

Chiba Univ. Grad. Sch. of Med., Japan

## New Affiliate Members

**Steven W. Hachtman**

Saint Paul, MN

**Luis Jose Martinez**

Elgin Community College, Elgin IL

## 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>. ❖

## House Passes NIH Reform Act of 2006

On September 26, 2006, the House of Representatives overwhelmingly passed H.R. 6164, the National Institutes of Health Reform Act of 2006. Drafted by Energy and Commerce Chairman Joe Barton (R-TX), the bill was passed with broad bipartisan support on a vote of 414-2.

H.R. 6164 serves as authorization legislation for the National Institutes of Health (NIH). All federal agencies require periodic Congressional authorization, and the purpose is to allow lawmakers to provide guidance and oversight, as well as set funding levels. Although Congress should reauthorize the NIH regularly, the agency does not require reauthorization in order to function. The last NIH reauthorization was in 1993.

In the absence of a reauthorization bill, appropriators in Congress often include their own oversight recommendations in the yearly spending bills for the agency. Because the NIH budget was more than doubled over the last 10 years without a reauthorization, some Members of Congress felt that oversight of the agency was long overdue.

More than 50 scientific societies and other organizations endorsed the NIH Reform Act, including the APS, the Federation of American Societies for Experimental Biology, the Association of American Medical Colleges and the Association of American Universities. To read the letter that APS sent in support of the legislation, go to: <http://www.the-aps.org/pa/resources/archives/comments/NIHreformAct.pdf>

Highlights of the legislation are outlined below.

### The NIH budget

H.R. 6164 authorizes 5% budget increases each year during the period FY 2007-2009. NIH's authorized budget level is \$29.75 billion in FY 2007, \$31.24 billion in FY 2008 and \$32.8 billion in FY 2009. The proposed increases represent an improvement over the sub-inflationary increases the agency has received in the past few years, but with the biomedical research and development price index (BRDPI) hovering at 3.5%, the increases will do little to stem the loss of purchasing power. Some criticized the authorized budget increases in the bill as too low, but the consensus is

that even a 5% increase will be challenging to achieve in the current fiscal climate. It is also important to note that the appropriators are not required to fund the agency at the authorized level.

The bill also establishes a "Common Fund" within the NIH budget that will support trans-NIH initiatives. Trans-NIH initiatives are research projects that involve 2 or more institutes and centers (ICs). The Common Fund will be established using half of any new dollars allocated to NIH starting in the next fiscal year. This means that if NIH receives a 5% increase next year, half of those new dollars will go into the Common Fund. When the Common Fund reaches a level that is equal to 5% of the total NIH budget, the program will be reevaluated. The Common Fund will be used to fund a range of projects, and will include investigator-initiated research.

### Agency restructuring

Included in the bill are numerous provisions that affect the management of the NIH. While no restructuring of existing institutes, centers, or divisions is mandated, the bill specifies that there should be no more than the current 27 ICs. A newly created Scientific Management Review Board made up of the NIH director, several IC directors

and outside scientific experts will be charged with evaluating the structure of the agency every 7 years. The recommendations of that panel will be subject to a public review process before implementation, and the NIH director will have the formal opportunity to object to any of the panel's recommendations.

### Reporting mechanisms

H.R. 6164 will create a new reporting system to track the use of NIH dollars. The new system will electronically code grants and allow Congress and the public to see how much money NIH is spending on different areas of research.

### Prospects for Senate passage

While the House Energy and Commerce Committee devoted considerable time to drafting the NIH Reform Act, the Senate has not considered reauthorization legislation in the current Congress. Prospects for the bill's passage in the lame duck session are uncertain. Nevertheless, the NIH Reform Act found broad bipartisan support in the House and if it does not become law by the end of the current legislative session, it is likely to resurface in the next Congressional session.

## Are you worried about dwindling federal support for biomedical research?

### Plan now to visit Congress during EB 2007!

Next year's Experimental Biology meeting will be held in Washington, D.C., providing an excellent opportunity for physiologists to tell Members of Congress about the importance of sustained support for biomedical research. The APS Public Affairs Committee and staff are already organizing so that members can easily plan visits to Capitol Hill during EB 2007. For more details, see our website: <http://www.the-aps.org/pa/ebweb/index.htm>.

To learn more about what's at stake, plan to attend the symposium entitled "NIH at the Crossroads: How Diminished Funds Will Impact Biomedical Research and What Scientists Can Do About It," featuring NIH Director Dr. Elias Zerhouni and the Honorable John Porter, former Congressman and longtime NIH champion. For more information on this and other public affairs events at EB 2007, go to: <http://www.the-aps.org/meetings/eb07/program.htm#pa>.

## SHAC 6 Sentenced

Six members of Stop Huntington Animal Cruelty (SHAC) convicted earlier this year for their roles in a campaign of intimidation against Huntingdon Life Sciences (HLS) have been sentenced to prison. Their convictions were the first under the Animal Enterprise Protection Act. HLS is a New Jersey company that conducts FDA mandated safety tests on animals. SHAC is an informal alliance of activists who have sought to shut down the company because it conducts animal testing.

Judge Anne E. Thomas handed down sentences ranging from six years in prison for its leader, Kevin Kjonaas, to one year in prison for Darius Fullmer, who researched targets. SHAC itself was served a judgment for \$1,000,001 in restitution. However, because SHAC is considered defunct, the six defendants will be required to pay the fine.

SHAC orchestrated its campaign against HLS via a website, which asserted that part of SHAC's mission was to "operate outside the confines of the legal system." The site listed personal information about HLS employees ranging from their names, addresses and phone numbers to the churches they attend, and the names and schools of their children. Posted along side this information were "Top 20 Terror Tactics," anonymous

boasts of illegal activity, and the exhortation "Go Get Them."

This incited followers to make thousands of threatening phone calls, faxes and e-mails; overturn cars; hold demonstrations outside employees' homes at all hours of the day and night; and spray-paint homes and driveways with abusive language and obscenities. One employee's child was so traumatized by these kinds of actions that he crouched behind his front door with a kitchen knife and promised to protect his mother from "the animal people." According to the US District Attorney, the website also encouraged "firebombing cars and bomb hoaxes; and ... threats to kill or injure someone's partner or children."

The defendants claim they were exercising free speech. U.S. Attorney Christopher J. Christie said "There is nothing legitimate about inciting violence and intimidation against innocent people."

## Improved Animal Enterprise Terrorism Act Passes Senate

Late in evening on its last day before adjourning to campaign, the Senate approved the Animal Enterprise

Terrorism Act (AETA) by unanimous consent. It is hoped that the House will take up the bill when Congress returns for a lame duck session following the November election. S. 3880, co-sponsored by Senators James Inhofe (R-OK) and Dianne Feinstein (D-CA) was a revised version of Inhofe's earlier legislation, S. 1926. S. 3880 included language clarifying that the bill was not intended "to prohibit any expressive conduct ... protected from legal prohibition by the First Amendment to the Constitution."

Drafted with the advice of Department of Justice and FBI experts, the AETA would provide protections to those who work with animals by addressing the new tactics of animal extremists. Some extremists had adapted their strategy to exploit loopholes in existing laws by focusing their efforts not on primary targets such as animal research facilities, but rather on secondary targets such as researchers, other employees and their families, or tertiary targets such as companies that are customers or suppliers. The recent attempted firebombing of a UCLA researcher's home demonstrates the extremes to which some activists are willing to go, and why this legislation is needed.

### The American Physiological Society Medical Physiology Curriculum Objectives

<http://www.the-aps.org/education/MedPhysObj/medcor.htm>

Download in HTML or PDF format

***NOW AVAILABLE IN PRINT FORM; UP TO 15 COPIES FREE PER DEPARTMENT.***

## NEW UPDATES: Cardiovascular and Respiration Section

The **Medical Physiology Curriculum Objectives** is a joint project of The American Physiological Society and the Association of Chairs of Departments of Physiology.

APS Education Office  
9650 Rockville Pike, Bethesda, MD 20814-3991  
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[education@the-aps.org](mailto:education@the-aps.org); <http://www.the-aps.org/education.htm>



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

**Frances Mary Ashcroft**  
Univ. of Oxford

*"ATP-sensitive K-channels  
and Disease: From Molecule  
to Malady"*

SATURDAY, APRIL 28, 5:45 PM

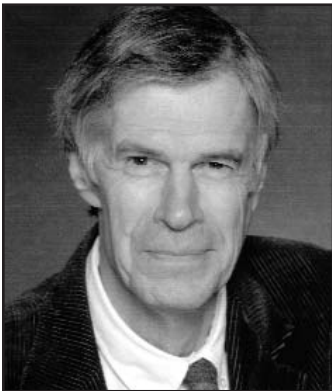


HENRY PICKERING BOWDITCH  
AWARD LECTURE

**James D. Stockand**  
Univ. of Texas

*"New Insight Into the  
Regulation of ENaC by  
Small G Proteins and  
Phosphatidylinositides"*

SUNDAY, APRIL 29, 5:45 PM



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

**John Andrew Armour**  
Univ. of Montreal

*"The Little Brain on the  
Heart"*

SUNDAY, APRIL 29, 8:00 AM



ROBERT M. BERNE  
DISTINGUISHED LECTURESHIP  
OF THE CARDIOVASCULAR  
SECTION

**William C. Sessa**  
Yale Univ. School of Medicine

*"Regulation of Endothelial  
Nitric Oxide Synthase: Cell  
Biology to Function"*

SUNDAY, APRIL 29, 10:30 AM



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

**Roger D. Cone**  
Oregon Health and Science  
University

*"From Color to Calor: The  
Diverse Physiological Roles of  
the Melanocortin Peptides"*

SUNDAY, APRIL 29, 2:00 PM

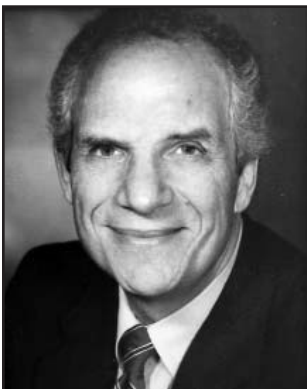


JULIUS H. COMROE, JR.  
DISTINGUISHED LECTURESHIP  
OF THE RESPIRATION SECTION

**Brigid Hogan**  
Duke Univ. Medical Center

*"Genetic Regulation of Lung  
Development and Repair"*

SUNDAY, APRIL 29, 3:15 PM



CLAUDE BERNARD  
DISTINGUISHED LECTURESHIP  
OF THE TEACHING OF  
PHYSIOLOGY SECTION

**Hilliard Jason**  
Univ. of Colorado

*"Becoming a Truly Helpful  
Teacher: Considerably More  
Challenging—and Potentially  
Far More Fun—Than Merely  
Doing Business as Usual"*

MONDAY, APRIL 30, 8:00 AM



HUGH DAVSON  
DISTINGUISHED LECTURESHIP  
OF THE CELL AND MOLECULAR  
PHYSIOLOGY SECTION

**David Clapham**  
Harvard Medical School

*"Ion Channels:  
Bacteria to Brain"*

MONDAY, APRIL 30, 10:30 AM

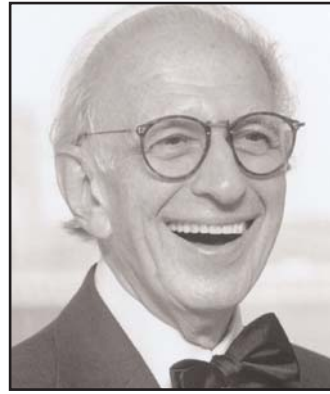


AUGUST KROGH  
DISTINGUISHED LECTURESHIP  
OF THE COMPARATIVE &  
EVOLUTIONARY PHYSIOLOGY  
SECTION

**David R. Jones**  
Killam Univ.

*"Extra Cardiac Chambers"*

MONDAY, APRIL 30, 2:00 PM

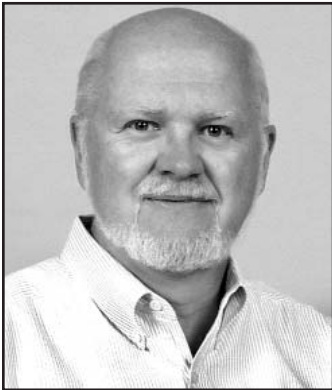


JOSEPH ERLANGER  
DISTINGUISHED LECTURESHIP OF  
THE CENTRAL NERVOUS SYSTEM  
SECTION

**Eric Kandel**  
Columbia Univ.

*"The Long and Short of Long-  
Term Memory: Molecular  
Mechanisms for Perpetuating  
Learning Specific Growth"*

MONDAY, APRIL 30, 3:15 PM



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

**Jack A. Boulant**  
Ohio State Univ.

*"Hypothalamic Neurons and  
the Regulation of Body  
Temperature"*

TUESDAY, MAY 1, 9:00 AM



CARL W. GOTTSCHALK  
DISTINGUISHED LECTURESHIP  
OF THE RENAL SECTION

**Chris Baylis**  
Univ. of Florida

*"Nitric Oxide Deficiency  
in Renal Disease"*

TUESDAY, MAY 1, 10:30 AM



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

**Pedro Jose**  
Georgetown University,  
Children's Medical Center

*"Salt Sensitive Hypertension,  
A Problem of  
Communication"*

TUESDAY, MAY 1, 2:00 PM



HORACE W. DAVENPORT  
DISTINGUISHED LECTURESHIP  
OF THE GASTROINTESTINAL &  
LIVER SECTION

**Mark Donowitz**  
Johns Hopkins Univ.  
School of Medicine

*"NHE3 and its Signaling  
Complexes: How a  
Transporter is Regulated"*

TUESDAY, MAY 1, 3:15 PM

WALTER C. RANDALL LECTURER IN BIOMEDICAL ETHICS

### The Dark Side



**Sandra L. Titus**  
US Dept. Health & Human Services, Office of Research Integrity

*"Research Misconduct:  
How to Avoid, Prevent, Detect and Report"*

**David Prentice**  
Family Research Council

*"Motives, Ethics,  
and Responsibility in Research"*

TUESDAY, MAY 1, 2:00 PM



April 28-May 2, Washington, DC

**Saturday, April 28, 2007 8:00 AM–12:00 PM**

**Refresher Course**

*Refresher Course in GI Physiology*

Education Track

**P.K. Rangachari and L. Britt Wilson**

**Saturday, April 28, 2007 12:30 AM–2:30 PM**

**Workshop**

*Emerging Techniques for Ion Channel Studies*

Ion Channels Track

Education Track

**Tzyh-Chang Hwang and Douglas Krafte**

**Saturday, April 28, 2007 3:00 PM–5:00 PM**

**Workshop**

*Chronic Instrumentation in Conscious Small Animals*

Education Track

**Joseph R. Haywood and Sue Mulrone**

**Symposium**

*Microcirculatory Society President's Symposium*

TBA

**Saturday, April 28, 2007 3:15 PM–5:15 PM**

**Symposium**

*Human Subject Research Ethics: Issues for Going from Bench to Bedside*

Education Track

**Michael Portman and Virginia Miller**

**Saturday, April 28, 2007 5:30 PM–10:00 PM**

**Business Meeting**

*Microcirculatory Society Business Meeting and Social*

**Sunday, April 29, 2007 8:00 AM–10:00 AM**

**Symposium**

*Emerging Insights into the Purinergic Signaling in Renal, Pulmonary and Microvascular Physiology and Pathophysiology*

**Bellamkonda K. Kishore and Edward W. Inscho**

**Symposium**

*Interrelations between Transcellular Ion Transport Function and Paracellular Tight Junctional Properties in Lung Epithelial and Endothelial Barriers*

Ion Channels Track

**Kwang-Jin Kim and Simon A. Lewis**

**Symposium**

*Linking Molecular Profile to Physiology*

**Mingyu Liang and Norman H. Lee**

**Symposium**

*Mechanotransduction Mechanisms of Muscle Hypertrophy: Translation from Rodent to Human Studies*

**Marcas M. Bamman**

**Symposium**

*Pharmacogenomics of Estrogen and Cardiovascular Disease*

Translational Physiology Track

**Virginia M. Miller and S. Mitchell Harman**

**Symposium**

*Physiological Genomics: From Bench to Bedside*

**Susan E. Old and Melinda R. Dwinell**

**Symposium**

*Protein O-linked N-acetylglucosamine (O-GlcNAc): Nutrient Sensor and Modulator of Cardiovascular Function*

**Amy J. Davidoff and Anne-Marie Seymour**

**Symposium**

*Transport-Metabolism Coupling through AMPK*

Transporters Track

**Kenneth Hallows and Alicia A. McDonough**

**Featured Topic**

*Circadian Rhythms: From Animals to Humans*

**Roberto Refinetti**

**Featured Topic**

*Emerging Properties and Concepts in Respiratory Rhythm Generation*

**Donald R. McCrimmon and William K. Milsom**

**Sunday, April 29, 2007 10:30 AM–12:30 PM**

**Tutorial**

*Publishing 101: Dos and Don'ts of Publishing in*

*APS Journals*

Career Track

**Kim Elaine Barrett and Margaret Reich**

**Symposium**

*Alternatives to Animal Experimentation Revisited*

Education Track

**Linda A. Toth**

**Symposium**

*Connexins and the Kidney*

**Janos Peti-Peterdi and Klaus Willecke**

**Symposium**

*PPAR $\gamma$ : a Novel Molecular Target in Lung Disease*

Translational Physiology Track

**Mike Hart**

**Symposium**

*Respiratory Control in Insects:*

*Integration from the Gene to the Organism*

Oxidative Stress/Hypoxia Track

**Scott Kirkton**



## Symposium

*Stem Cells in Physiology and Drug Discovery*

Translational Physiology Track

**Chahrzad Montrose-Rafizadeh and Brigid Hogan**

## Featured Topic

*Growth Factors, Proliferation and Differentiation  
in the Gastrointestinal System*

**Yana Zavros**

## Featured Topic

*Ion Channels*

Ion Channels Track

**Peter M. Snyder and Estelle Cormet-Boyaka**

## Featured Topic

*Neural-Glial-Vascular Communication in the Brain*

**Jessica A. Filosa and Eric A. Newman**

## Sunday, April 29, 2007 3:15 PM–5:15 PM

### Lecture

*Microcirculatory Society Landis Award Lecture*

**TBA**

### Symposium

*Breakthroughs in Protection of the Ischemic Heart*

Translational Physiology Track

**Steven P. Jones and Elizabeth Murphy**

### Symposium

*Insulin Resistance and the Cardiometabolic Syndrome:*

*Adipose Tissue and Skeletal Muscle Factors*

Metabolic Abnormalities Track

**James R. Sowers and Craig S. Stump**

### Symposium

*Nanotechnology, Biology, and Medicine in SEBM's*

*Second Century*

**Burton E. Sobel and Charles A. Blake**

### Symposium

*Novel Technologies in Physiology and Medicine.*

*Novel Approaches to Structure-Function Relations  
in Membrane Transport Proteins*

Physiology InFocus

Ion Channels Track

**Christopher Miller**

### Symposium

*Teaching about Evolution in a Biomedical Context*

Education Track

**Jon Harrison**

### Featured Topic

*CV Section Young Investigator Awardee Featured Topic*

**TBA**

### Featured Topic

*Donald Reis Memorial Featured Topic*

**Deborah A. Scheuer**

## Featured Topic

*Muscle Fatigue*

**Jean-Marc Renaud**

## Sunday, April 29, 2007 4:15 PM–6:00 PM

### Poster Discussion

*Graduate Student Highlights in Respiration Physiology*

**Susan S. Margulies and Judith A. Neubauer**

## Monday, April 30, 2007 8:00 AM–10:00 AM

### Symposium

*Being Heard: The Microinequities that Tilt the Playing Field*

Career Track

### Symposium

*Endothelial Cell Mechanotransduction: Roles of Glycocalyx,  
Membrane, and Cytoskeleton*

**Peter J. Butler and John Tarbell**

### Symposium

*Frontiers in the Cellular and Molecular Physiology of the  
Hepatic Microcirculation*

**Robert W. Brock and Alison Fox-Robichaud**

### Symposium

*Functional Imaging of Autonomic Circuits: New Frontiers in  
Optical Approaches and Applications*

**Jeffrey Potts and Robert Rogers**

### Symposium

*Hypoxia and Cancer*

Oxidative Stress/Hypoxia Track

**Gregg L. Semenza**

### Symposium

*Novel Technologies in Physiology and Medicine.*

*Experimental Evolution as a Tool of Physiological Analysis*

Physiology InFocus

**Michael R. Rose**

### Featured Topic

*Activity-Dependent Gene Expression*

**David Hood**

### Featured Topic

*Angiogenesis and Cell-Based Therapies*

**Hua (Linda) Cai and Joyce Bischoff**

### Featured Topic

*Endothelial and Epithelial Signaling in Lung*

**Jahar Bhattacharya**

### Featured Topic

*Renal Transporters*

Transporters Track

**Alicia A. McDonough and Nuria Pastor-Soler**

## Featured Topic

*Role of L-Arginine Metabolism in Cardiovascular/Renal Disease*

**Fruzsina K. Johnson**

## Monday, April 30, 2007 10:30 AM–12:30 PM

### Symposium

*Effective Use of Course Management Systems to Enhance Student Learning*

Education Track

**Jonathan Kibble**

### Symposium

*Microcirculatory Society Young Investigator Session*

TBA

### Symposium

*Molecular Regulation of Renal Epithelial Transport Proteins in the Nephron: Lessons from Ontogeny and Disease*

Transporters Track

**Young Hee Kim and Lisa M. Satlin**

### Symposium

*New Horizons in Cardiovascular Aging*

**Gabor Kaley and Zoltan Ungvari**

### Symposium

*Obesity and the Central Nervous System*

Metabolic Abnormalities Track

**Steve Mifflin and Alison Strack**

### Symposium

*Understanding the Role of the Pancreas in Digestion: Placing Current Understanding in a Historical Perspective*

**John A. Williams and Joel W. Adelson**

## Featured Topic

*Energy Balance, Exercise and Cancer*

**Thomas M. Nosek**

## Featured Topic

*Gap Junctions Mediating Cell-Cell Communication in the Vascular Wall*

**Brant E. Isakson**

## Featured Topic

*Hypertension: Integrated Mechanisms and Sequelae*

**L. Gabriel Navar and Joey P. Granger**

## Featured Topic

*Mitochondrial Mechanisms in Cerebrovascular Function in Health and Disease*

Oxidative Stress/Hypoxia Track

**David W. Busija**

## Monday, April 30, 2007 2:00 PM–4:00 PM

### Symposium

*Guide for Successful Collaboration:*

*From the Handshake to the Collaborative Research Agreement*

Career Track

**Douglas G. Johns and Catherine F.T. Uyehara**

## Monday, April 30, 2007 3:15 PM–5:15 PM

### Symposium

*Engineering Vascular Cell Function using Nanoscale Cues*

**Brian P. Helmke and Richard J. Price**

### Symposium

*Intercellular Regulation of Smooth Muscle Contraction*

**Michael Sanderson and Susan Gunst**

### Symposium

*Muscle Mechanics: Molecular Properties to Contractile Function*

**Kenneth S. Campbell**

### Symposium

*Novel Aspects of the Regulation and Physiology of NHE1*

Transporters Track

**Diane Barber and Stine Falsig Pedersen**

### Symposium

*Suspended Animation – Fact or Fiction?*

**Lisa R. Leon and Kathy L. Ryan**

### Symposium

*Use of Genome Variation in Understanding Complex Disease and Genomic Regulation*

**Anne Kwitek and Monika Stoll**

## Featured Topic

*O<sub>2</sub> Sensing by Central Nervous System*

Oxidative Stress/Hypoxia Track

**Irene C. Solomon and Judith A. Neubauer**

## Featured Topic

*Roles of Intestinal Epithelia and Bacteria in Inflammatory Disease*

Translational Physiology Track

**Jerrold R. Turner**

## Tuesday, May 1, 2007 8:00 AM–10:00 AM

### Symposium

*Drug Discovery Efforts for Pain Indications: Ion Channels and GPCRs*

Translational Physiology Track

**Michael F.A. Finley and William Martin**

### Symposium

*Multiple Career Paths for a Physiologist: Understand Your Options and How to Get There*

Career Track

**Jennifer L. Pluznick and Erica A. Wehrwein**

## Symposium

*Neural Plasticity of the Hypoxic Reflex: Carotid Bodies, NTS and Pons*  
Oxidative Stress/Hypoxia Track  
**Chi-Sang Poon and David D. Kline**

## Symposium

*Neuroimmuno Interactions*  
**Valeria Rettori and Jose Antunes-Rodrigues**

## Symposium

*Novel Technologies in Physiology and Medicine. Forensic Medicine*  
Physiology InFocus  
**Gregory G. Davis**

## Featured Topic

*Molecular Physiology of Cation-Coupled Bicarbonate Transporters*  
Transporters Track  
**Mark O. Bevensee and Irina I. Grichtchenko**

## Featured Topic

*New Insights on Adaptations to Environmental and Metabolic Stress From Genomics and Proteomic Studies*  
**Severine Kirchner and Ronaldo Ferraris**

## Featured Topic

*Phenotype and Functional Plasticity of Pulmonary Airway and Vascular Smooth Muscle Cells in Health and Disease*  
**Andrew J. Halayko**

## Featured Topic

*Renal Section Young Investigator Award Featured Topic*  
**Volker Vallon**

## Tuesday, May 1, 2007 10:30 AM–12:30 PM

## Symposium

*Epithelial Development, Disease, and Regeneration*  
**Caroline R. Sussman**

## Symposium

*Comparative Genomics: Linking Noncoding DNA to Biology and Disease*  
**Marcelo Nobrega**

## Symposium

*The SLC26 Transporter Family and Epithelial Function*  
Transporters Track  
**Michael A. Gray**

## Symposium

*Two-Pore Domain Potassium Channels: Vascular Control by a Newly Discovered Channel Family*  
Ion Channels Track  
**Robert M. Bryan, Jr. and Arthur Weston**

## Symposium

*Ultra Fast and Ultra Active: The Strange Life of Extraocular Muscles*  
**Francisco H. Andrade**

## Featured Topic

*Adipocyte Hormones: Focus on Adiponectin*  
Metabolic Abnormalities Track  
**Willis K. Samson**

## Featured Topic

*Cardiovascular Section Carl J. Wiggers Award Featured Topic*  
**Charles Antzelevitch**

## Featured Topic

*Disorders of the Enteric Nervous System*  
**Shanthi Srinivasan**

## Featured Topic

*Osmoregulatory Function in Health and Disease*  
**Sean D. Stocker and Ann M. Schreihofner**

## Featured Topic

*Role of ATP Receptors in Respiratory Responses*  
*Point/Counter-point: ATP Receptors underlie Central CO<sub>2</sub> Sensitivity (or not)*  
**Gregory D. Funk and Estelle Gauda**

## Tuesday, May 1, 2007 3:15 PM–5:15 PM

## Symposium

*Control Mechanisms of Renin Synthesis and Release: A 21st Century Perspective*  
**Pontus B. Persson and Heimo Ehmke**

## Symposium

*Metabolomic Approaches to Study Cardiovascular Disease Mechanisms and Diagnosis*  
Metabolic Abnormalities Track  
**Christopher Hardin and Christopher B. Newgard**

## Symposium

*Novel Technologies in Physiology and Medicine. Novel Technologies and Approaches in Imaging*  
Physiology InFocus  
**P. Darwin Bell**

## Symposium

*Role of Adipose Tissue Macrophages in Obesity-Induced Insulin Resistance*  
Metabolic Abnormalities Track  
**Meredith Hawkins**

## Featured Topic

*Current Concepts in the Control of Skin Blood Flow in Humans*  
**Craig Crandall and Fruzsina K. Johnson**

## Featured Topic

*Scientific Principles for Education Research*  
Education Track  
**Barbara E. Goodman**

**Featured Topic**

*The Vascular Supply during Aging*  
**Steven S. Segal**

**Featured Topic**

*Neural Control and Autonomic Regulation Section Trainee  
Featured Topic*  
**Chris Madden and Daniela Sartor**

**Tuesday, May 1, 2007 5:45–7:30 PM**

**Business Meeting**

*APS Business Meeting*

**Wednesday, May 2, 2007 8:00 AM–10:00 AM**

**Symposium**

*Biomarkers of Acute Kidney Injury- Early Diagnosis,  
Pathogenesis and Recovery*  
Translational Physiology Track  
**Chirag Parikh**

**Symposium**

*Exercise Hyperemia: Are there any Answers Yet?*  
**Michael J. Joyner and Bengt Saltin**

**Symposium**

*Heart Failure and Exercise: Autonomic and Cardiovascular  
Responses*  
**Lawrence Sinoway**

**Symposium**

*Mechanotransduction in Cell Migration*  
**Song Li**

**Featured Topic**

*Control of Coronary Blood Flow*  
**William M. Chilian**

**Featured Topic**

*Novel Ion Channels in Neuro-Cardiovascular Regulation:  
Focus on ASIC and TRP Channels*  
Ion Channels Track  
**Francois M. Abboud**

**Featured Topic**

*Sex Steroids in Cardiovascular-Renal Physiology*  
**Jane F. Reckelhoff and Carmen Hinojosa-Laborde**

**Wednesday, May 2, 2007 10:30 AM–12:30 PM**

**Symposium**

*Calcific Aortic Valve Disease: A Disease Process Comes of Age?*  
**Kevin D. O'Brien and Emile R. Mohler III**

**Symposium**

*Estrogen and the Cardiovascular System*  
**Mark C. Chappell**

**Symposium**

*What Have We Learned About Respiratory Control  
From the Use of Transgenic Models?*  
**Judith A. Neubauer and Claude Gaultier**

**Featured Topic**

*Experimental and Computational Approaches for  
Integrating Genotype, Phenotype, and Gene Expression:  
Toward Biological and Disease Networks*  
**Pek Lum**

**Featured Topic**

*The Impact of Fatty Acids and Glucose on Insulin Resistance  
Across Species*  
Metabolic Abnormalities Track  
**Karen L. Sweazea and Eldon J. Braun**

## Positions Available

### Postdoctoral Positions

**Postdoctoral Research Fellow:** An NIH-supported position is available immediately to study structure-function relationships in membrane transporters. Our laboratory uses a combination of enzymology, molecular biology, and transport physiology. Current projects include studies of Na,K-pump diversity after heterologous expression in cultured cell models and a comparative analysis of cotransport systems in amphibians. Candidates should have a PhD degree (or its equivalent) in physiology or a related field. Send curriculum vitae, including a brief statement of your research background and interests,

along with the names of three references to Thomas A. Pressley, Department of Physiology, Texas Tech University Health Sciences Center, 3601 4th Street, Lubbock, TX 79430. Email: Thomas.Pressley@ttuhsc.edu. [AA/EOE]

**Postdoctoral Fellow:** Lung Biology Research, Programme in Lung Biology Research, Hospital for Sick Children, Toronto, Ontario. Salary and Conditions: Commensurate with experience according to CIHR guidelines. A position is available, for a qualified applicant with an interest in discovering fundamental mechanisms underlying lung diseases characterized by fluid filled airspaces. The laboratory focuses on research to

elucidate fundamental molecular and biochemical aspects of the epithelial sodium channel (ENaC) and its relationship to lung fluid clearance at birth or pulmonary edema fluid clearance in congestive heart failure or adult respiratory distress syndrome. The project will focus on the effects of long-term beta-agonist treatment (alone or combined with glucocorticoids or changes in oxygen tension) on rodent lung explants or primary cultures of distal lung epithelial cells. End points will include functional electrophysiologic measures of ion transport, as well as effects on mRNA and protein synthesis, with an emphasis on effects on translation initiation. Further information about Dr. O'Brodovich's laboratory is available

under "Staff Profiles" at <http://www.sick-kids.on.ca/research/default.asp>. Candidates should have a PhD or equivalent with significant experience in molecular biology. Experience in primary cell culture and mechanisms of protein translation initiation would be an asset. Duration: up to three years. Deadline Date: Open until filled. Please send CV and names of at least two academic references to Dr. H. O'Brodovich, Senior Scientist, Lung Biology Research, Hospital for Sick Children Research Institute, 555 University Avenue, Toronto, Ontario M5G 1X8; Tel: 416-813-8203; Fax: 416-813-5771; Email: [hugh.obrodovich@sickkids.ca](mailto:hugh.obrodovich@sickkids.ca).

**Postdoctoral research position (ultrasound imaging):** Postdoctoral research position available, effective immediately, in cardiovascular imaging program, Section of Cardiovascular Medicine, Yale University School of Medicine. Looking for candidate to participate in Bioengineering Research Partnership (BRP) focused on development and validation of 3D echocardiographic speckle tracking. Position in multidisciplinary laboratory focused on targeted imaging of myocardial angiogenesis, post-infarction left ventricular remodeling, coronary physiology, and myocardial mechanics. Laboratory employs small and large animal models of ischemia/reperfusion to develop non-invasive imaging approaches for assessment of myocardial angiogenesis and remodeling. NIH funded projects involve cardiovascular imaging of large and small animals with multiple modalities, including; 3D echocardiography, single photon emission computed tomography (SPECT), microSPECT, microCT, angiography, and magnetic resonance imaging. Applicant should hold PhD and/or MD degree, and have strong background in bioengineering, cardiovascular physiology with some experience in animal surgery, or imaging. Please send a statement of research interests, curriculum vitae, and three letters of reference to Albert J. Sinusas, MD, Professor of Medicine and Diagnostic Radiology, Director of Animal Research Laboratories, Section of Cardiovascular Medicine, Yale University School of Medicine, PO Box 208017, New Haven, CT 06520-8017; Email: [albert.sinusas@yale.edu](mailto:albert.sinusas@yale.edu). [AA/EOE]

**Postdoctoral Research Position (molecular imaging):** Postdoctoral research position available, effective immediately, in molecular imaging program, Section of Cardiovascular Medicine, Yale University School of Medicine. Position in multidisciplinary laboratory focused on targeted imaging of myocardial angiogenesis, post-infarction left ventricular remodeling, coronary physiology, and myocardial mechanics. Laboratory employs small and large animal models of ischemia/reperfusion to develop non-invasive imaging approaches for assessment of myocardial angiogenesis and matrix metalloproteinase activation. NIH funded projects involve cardiovascular imaging of large and small animals with multiple modalities, including; 3D echocardiography, single photon emission computed tomography (SPECT), microSPECT, microCT, angiography, and magnetic resonance imaging. Applicant should hold PhD and/or MD degree, and have strong background in cardiovascular physiology with some experience in immunohistochemistry, animal surgery, or imaging. Please send a statement of research interests, curriculum vitae, and three letters of reference to Albert J. Sinusas, MD, Professor of Medicine and Diagnostic Radiology, Director of Animal Research Laboratories, Section of Cardiovascular Medicine, Yale University School of Medicine, P.O. Box 208017, New Haven, CT 06520-8017; Email: [albert.sinusas@yale.edu](mailto:albert.sinusas@yale.edu). [AA/EOE]

**Graduate and Postdoctoral Positions** in Gastrointestinal Physiology: Openings exist immediately for graduate students and postdoctoral fellows to train in Keith Sharkey's laboratory at University of Calgary (<http://www.ucalgary.ca/~ksharkey/>). Our lab studies aspects of the pathophysiology of the innervation of the gastrointestinal tract in inflammation, cannabinoids in the brain-gut axis and the neurobiology of obesity. We are looking for motivated trainees to contribute to each of these areas. The lab is part of the Hotchkiss Brain Institute and Institute of Infection, Immunity and Inflammation, Faculty of Medicine, University of Calgary where modern approaches to all aspects of neuroscience and gastrointestinal research allow for excellent training opportuni-

ties and exposure to faculty from a variety of disciplines. Postdoctoral fellows must have obtained their PhD within the last four years and must have a strong record of publications. Potential graduate students must have an undergraduate GPA of at least 3.4/4.0 or equivalent. Salary levels will be determined by Canadian Institutes of Health Research guidelines. Applicants should submit a curriculum vitae, transcripts and names and email addresses of three referees by email to: Dr. Keith Sharkey ([ksharkey@ucalgary.ca](mailto:ksharkey@ucalgary.ca)). Closing date: **December 31, 2006.**

**Postdoctoral Fellow Position:** A postdoctoral position is available immediately in Dr. Laura Conforti's laboratory at the University of Cincinnati to study the role that ion channels play in the function of human T lymphocytes in health and disease (cancer and autoimmunity). Current projects include studies of ion channels' membrane trafficking upon T cell activation and signaling pathways mediating ion channel modulation during hypoxia. A variety of experimental approaches are employed in these studies including fixed and live microscopy; patch clamp electrophysiology of native channels in T lymphocytes and heterologously expressed in mammalian cells; analysis of gene and protein expression; Ca<sup>2+</sup> imaging; flow cytometry. Candidates should have a PhD degree (or equivalent). The ideal candidate will have experience in microscopy, particularly live cell imaging. Interest in ion channels and electrophysiology are considered a plus. Interested applicants should send a cover letter, curriculum vitae, and names of three references to: Laura Conforti; PhD, Department of Internal Medicine, University of Cincinnati, 231 A. Sabin Way, Cincinnati, OH 45267-0585, Email [laura.conforti@uc.edu](mailto:laura.conforti@uc.edu).

**Postdoctoral Research Position:** A postdoctoral research position is available immediately in the laboratory of Dr. Scott Earley to examine functional roles of transient receptor potential (TRP) channels in the peripheral and cerebral vasculature at Colorado State University. <http://www.cvmb.colostate.edu/bms/Earley.htm>. Current projects focus on regulation of TRP channel activity in cerebral artery vascular smooth muscle and endothelial cells and

astrocytes. Preference will be given to candidates with experience in patch clamp electrophysiology, video and fluorescent imaging of isolated resistance arteries, live cell imaging, small animal surgery, and/or molecular biology. The laboratory is located in on the main campus of Colorado State University in Department of Biomedical Sciences, within walking distance to downtown Fort Collins and near the front range foothills of the Rocky Mountains. Two University Programs of Scholarly Excellence, two NIH Training Grants, and active graduate programs support the strong research emphases in reproductive biology and neurobiology in the Department of Biomedical Sciences and provide a stimulating environment for advanced training experience. Applicants must have a PhD or equivalent, and must be willing to assume primary responsibility for the design and execution of projects and communication of the results to the scientific community. Applicants will be expected to participate in laboratory and departmental activities including journal clubs and retreats. Starting date and salary are negotiable. Applications will be reviewed after October 15, 2006 and the search will be continued until an appropriate candidate is found. Please send a statement of research interests, curriculum vitae, and names and contact information of three individuals who will provide letters of reference to: Scott Earley, PhD, Assistant Professor, Department of Biomedical Sciences, 234 Physiology Campus Delivery 1680, Colorado State University, Fort Collins CO, 80523; Tel.: 970-491-2062; Fax: 970-491-7569; Email: Scott.Earley@colostate.edu. [AA/EOE] The Office of Equal Opportunity is located in 101 Student Services. In order to assist Colorado State University in meeting its affirmative action responsibilities, ethnic minorities, women and other protected class members are encouraged to apply and to so identify themselves.

**Postdoctoral Positions:** Two postdoctoral positions are available in the Division of Nephrology at University of Utah to conduct projects funded by multiple federal grants. The central goal of the research program is to understand the role of arachidonic acid metabolites in renal physiology and pathophysiology. Currently, there are four major projects in the lab: 1) to study interaction of

COX-2 and nNOS in regulation of renin secretion; 2) to study the role of renal medullary COX-2 in regulation of sodium balance and blood pressure; 3) to study the role of prostaglandins in tubulointerstitial fibrosis; and 4) to study renal function of peroxisome proliferator-activated receptors. Experimental approaches involve gene knockout, cell biology, whole organ physiology, etc. Highly motivated individuals with strong background in molecular biology and renal physiology are seriously considered. Please email CV and names of three references to Dr. Tianxin Yang, MD, PhD, Margaret A. Amundsen Professor of Medicine and Associate Professor of Medicine and Physiology, Division of Nephrology, University of Utah, Salt Lake City, UT. Email: Tianxin.Yang@hsc.utah.edu.

**Postdoctoral Positions:** Positions are available in our NIH-funded project on ion transport in the larval mosquito gut and its control by hormones and neuropeptides, for individuals with interests and/or experience in some of the following: epithelial transport, perfused preparations of tubular tissues, intracellular microelectrodes and ion-specific microelectrodes, immunohistochemistry, in-situ hybridization, RNAi techniques. Washington State University is located in Pullman, WA, a pleasant university town; the proximity of the University of Idaho, in Moscow, ID, provides a variety of cultural events. The rural environment offers many opportunities for outdoor recreation. For further information, contact David F. Moffett at 509-335-3553 or dmoffett@wsu.edu.

**Postdoctoral Position:** The Department of Molecular and Cellular Physiology, Louisiana State University Health Sciences Center in Shreveport, LA invites applicants for a postdoctoral position. Qualified candidates will have a PhD in a biological science discipline and a strong publication record. Research for this position will involve cell culture and murine models of obesity for the purpose of investigating mechanisms of inflammation associated with overeating and obesity. Send curriculum vitae and names of three references to Dr. Chantal Rivera, LSUHSC Shreveport, 1501 Kings Highway, Shreveport, LA 71103; Email: crivel@lsuhsc.edu. [EEO/AA]

## Faculty Positions

**Head-Department of Integrative Biology and Physiology:** The University of Minnesota Medical School invites applications from exceptional leaders to be considered for the position of Head of the Department of Integrative Biology and Physiology (IBP). As Head of the Department, the successful candidate will establish and lead the research and teaching missions of the unit as well as recruit outstanding faculty in basic and translational aspects of physiology to the University. We seek candidates whose scientific expertise complements existing strengths in the Department and Medical School. Particular interest will be given to those investigators who work at the systems level to study human disease and/or model systems, but investigators in all areas of physiology are encouraged to apply. The candidate must also have an outstanding record of scholarly accomplishment, educational experience and executive leadership as well as excellent interpersonal, team building and communications skills. For details about the Department please consult: <http://physiology.med.umn.edu>. All candidates must have a PhD and/or MD degree and qualify for appointment as a tenured professor of the University. We will begin reviewing applications immediately and until the position is filled. Please send curriculum vitae and the names of three references to Dr. David A. Bernlohr, Chair, IBP Search Committee, Department of Biochemistry, Molecular Biology and Biophysics, University of Minnesota, 6-155 Jackson Hall, 321 Church Street S.E., Minneapolis, MN 55455 or as an attachment to swans143@umn.edu. Confidential inquiries are welcomed. [AA/EOE]

**Assistant/Associate Professor:** The University Of Missouri-Kansas City School of Pharmacy Division of Pharmacology invites applications for a 12-month, tenured or tenure-track position at the Assistant/Associate Professor level. Applicants should possess a PhD, PharmD 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. 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://www.umkc.edu/pharmacy>. 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, University of Missouri-Kansas City, 2411 Holmes Street, Kansas City, MO 64110-2741; Tel.: 816-235-2415; Email: [kumaran@umkc.edu](mailto:kumaran@umkc.edu). [AA/EOE]

**Neuroscientist (Assistant/Associate Professor, Tenure Track):** The Department of Biomedical Sciences in the College of Veterinary Medicine and Biomedical Sciences at Colorado State University (<http://www.cvmb.colostate.edu/bms/>) is seeking a Neuroscientist, preferably with background in Systems or Integrative Neuroscience. The Department's research strengths are currently in Molecular, Cellular and Integrative Neuroscience and Animal Reproduction. Candidates must have a vigorous, extramurally-funded research program and will be expected to teach in the undergraduate, graduate or professional veterinary programs of the department. Applicants must have a PhD, DVM, MD or equivalent and relevant postdoctoral experience. Experience in electrophysiological and/or other integrative approaches to answer innovative questions in neurobiology are highly desirable. Women and minority candidates are encouraged to apply. A letter of application, curriculum vitae and names of three references should be sent electronically or by post to: Dr. Sue C. Kinnamon, Department of Biomedical

Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO 80523; Email: [sue.kinnamon@colostate.edu](mailto:sue.kinnamon@colostate.edu). Review of applications will begin Oct. 23, 2006 and will continue until a suitable candidate is selected. [EEO/AA]

**Assistant Professor, Excitable Membrane/Ion Channel Biophysicist:** Department of Biomedical Sciences, Colorado State University. The Department of Biomedical Sciences (BMS) seeks a scientist to fill a tenure-track position at the rank of Assistant Professor and contribute expertise in an area directly related to excitable membrane biophysics. The successful candidate is expected to develop an independent, extramurally-funded research program, preferably in an area that complements existing departmental program strengths. The individual selected for this position is also expected to contribute to undergraduate and graduate teaching. Teaching responsibilities will be in the general area of neurobiology but with emphasis on excitable membrane/ion channel function. The BMS Department has 28 regular faculty members. The Department's strengths are focused in two University Programs of Research and Scholarly Excellence; the Molecular, Cellular and Integrative Neurosciences Program (MCIN) and the Animal Reproduction and Biotechnology Laboratory (ARBL). Interests of faculty in MCIN include ion channel and neurotransmitter receptor structure/function, mechanisms of neurotransmitter release, integrative neurotransmission, taste transduction, neuroendocrinology, developmental neurobiology and biological rhythms. Research programs in ARBL broadly address regulatory mechanisms that underlie mammalian reproductive function. In addition, the department is currently expanding its program in cardiovascular physiology. Opportunities for collaboration exist with faculty in clinical and other basic science departments. Additional information about the BMS Department and its faculty can be found at <http://www.cvmb.colostate.edu/bms>. The Department sponsors an undergraduate Biomedical Sciences major and both MS and PhD graduate programs. Departmental faculty participates in DVM/PhD training and in two NIH training grants emphasizing graduate students and postdoctoral fellows. Facilities available

include well-equipped general instrumentation rooms, a fluorescence-activated cell sorter/flow cytometer laboratory, a microscope laser-capture microdissection laboratory, machine shops, central animal care facilities, confocal microscopes including a Zeiss LSM 510 Meta and a spinning disk confocal dedicated to live cell imaging, an electron microscopy center equipped with a 200KEV JEOL Transmission EM, and a scanning EM, and the University Macromolecular Resource Facility containing DNA/RNA synthesizers, peptide synthesizers, gas-phase protein sequencer, automated capillary DNA sequencer, Affimatrix gene chip array reader, and electrospray, MALDI/TOF, and MALDI/TOF/TOF mass spectrometers. Information on the city of Fort Collins can be found at <http://www.ci.fort-collins.co.us/>. Applicants must have a PhD, DVM, MD or equivalent degree and postdoctoral research experience. A letter of application, curriculum vitae, statements of research and teaching interests, and a list of three references, who may be contacted when appropriate, should be sent to the Chair of the search committee: Michael Tamkun, Department of Biomedical Sciences, Campus Delivery 1617, Colorado State University Fort Collins, CO 80523. Application materials can be submitted to [tamkunmm@lamar.colostate.edu](mailto:tamkunmm@lamar.colostate.edu). Review of applications will begin October 1, 2006, and continue until a successful candidate is found. Applications received after October 1, 2006 may or may not be considered. Colorado State University is an Equal Opportunity/Affirmative Action employer and complies with all Federal and Colorado state laws, regulations and executive orders regarding affirmative action requirements and programs. The Office of Equal Opportunity is located in 101 Student Services. In order to assist Colorado State University in accomplishing its affirmative action objectives, ethnic minorities, women and other protected class members are encouraged to apply and to so identify themselves.

**Assistant/Associate Professor:** The Kinesiology Department at Kansas State University invites outstanding applications for a tenure-track position beginning August 2007 whose research focus compliments the department's existing physiological research areas (cardiovascular, cardiorespiratory, mus-

cle exercise physiology). Outstanding individuals with an emphasis in human research are strongly encouraged to apply. Responsibilities include: conduct research, seek extramural funding, maintain a national presence in professional societies, teach undergraduate and graduate courses, and provide service to university and professional organizations. Qualifications include: completed PhD or equivalent in exercise physiology or related field; a focused line of research with potential for federal grant support; evidence of effective teaching. Postdoctoral experience strongly preferred. The successful candidate at the Associate level is expected to have a vigorous, well-established and externally-funded research program. Letter of application stating which position is sought (Assistant or Associate), curriculum vitae, and names, addresses, and phone numbers of three references should be mailed to: Dr. Tim Musch, Search Committee Chair, Dept Kinesiology, 1A Natatorium, Kansas State University, Manhattan, KS 66506. Screening will begin November 1, 2006. [AA/EOE]

**Assistant Professor:** The Section of Neurobiology, Physiology and Behavior, in the College of Biological Sciences, University of California, Davis, invites applications for a faculty position in Physiology at the assistant professor level. The section has initiated a new program emphasis in Muscle Biology and encourages applicants specializing in skeletal, cardiac or smooth muscle physiology to apply. Areas of significant interest include, but are not limited to, exercise physiology, muscle growth and atrophy, muscle development and regeneration, neuromuscular interactions and motor control, metabolic signaling and control, calcium signaling, and muscle mechanics. Successful applicants will be expected to establish a vigorous research program supported by extramural funding, and contribute to the teaching mission of the Section, including the Exercise Biology major. The Section has been steadily expanding since its inception in 1993 to include 32 ladder rank faculty who conduct research encompassing a general theme of integrative biology, ranging from muscle physiology and biomechanics, molecular endocrinology, environmental physiology, cell physiology, aging, molecular, cellular, and developmental neurobiolo-

gy, systems neuroscience, and animal behavior. In addition, UC Davis has one of the largest concentrations of life scientists in the world, with vibrant units across campus that would provide the successful candidate with a wide range of collaborative interactions. These units include the Department of Physiology and Membrane Biology in the Medical School, the Exercise Biology Program (now fully integrated into the Section), the UC Davis Genome Center, the Mouse Biology Program, the Clinical Nutrition Research Unit, the Molecular, Cellular, and Integrative Physiology and Exercise Science Graduate Groups, the Center for Neuroscience, the Department of Biomedical Engineering, and other physiology-related departments of the Schools of Medicine and Veterinary Medicine and College of Agriculture and Environmental Sciences. Candidates must possess a PhD or MD degree with significant postdoctoral experience. Applicants should send a letter describing their research plan and teaching interests, a curriculum vitae, copies of representative publications, and the names of at least five persons from whom references can be obtained to: Professor Sue Bodine, Chair, Muscle Physiology Search Committee, Section of Neurobiology, Physiology, and Behavior, One Shields Avenue, University of California, Davis, CA, 95616-8519. All materials must be received by January 15, 2007, to be assured full consideration. For more information on the position and UC Davis in general, please visit the following web site: <http://www.npb.ucdavis.edu/facultypositions/>. [AA/EOE]

**Department Head:** Virginia Tech seeks an accomplished, visionary head for its Department of Human Nutrition, Foods and Exercise (HNFE, <http://www.hnfe.vt.edu>) in the College of Agriculture and Life Sciences (CALs, <http://www.cals.vt.edu>). The successful applicant will be expected to lead the HNFE Department in its mission of promoting human health through the integration of teaching, research and extension programs in nutrition, foods and exercise. The Department, which was established in 1960, is one of the few in the nation which offers a combination of nutrition, foods and exercise programs in one unit. HNFE is one of the largest departments within Virginia Tech's College of Agriculture and Life Sciences,

with 21 faculty, 14 staff, approximately 900 undergraduate students, and 45 graduate students. The faculty has been successful in obtaining research grants from NIH, DOD, USDA, and MDA as well as from numerous industry sources. The Department offers an undergraduate Didactic Program and a Dietetic Internship, both accredited by American Dietetic Association. The Virginia Expanded Food and Nutrition Education Program and the Food Stamp Nutrition Education (FSNE) plan are also administered by the department. The department has state of the art laboratories dedicated to research in its mission areas. Virginia Tech, a land-grant university of the Commonwealth, is located in Blacksburg, adjacent to the scenic Blue Ridge Mountains. There are 21,000 full-time residential undergraduates and 6,250 graduate and professional students enrolled both on- and off-campus throughout the state. Additional information about Blacksburg, VA can be found at <http://www.bev.net>. The successful applicant will have the opportunity to play a major role in the development of an obesity-focused research initiative as identified by the Institute for Biomedical and Public Health Sciences (IBPHS, <http://www.ibphs.vt.edu>) and emphasized as an area of immediate strategic focus in Virginia Tech's Strategic Plan. CALS has committed eight new positions and additional resources to the Department of Human Nutrition, Foods and Exercise to support this research priority. CALS and HNFE are partnering with the Carilion Biomedical Institute <http://www.biomedicalinstitute.org/> and the Carilion Health System <http://www.carilion.com/> in Roanoke, VA to facilitate the integration of basic/clinical research with healthcare delivery. A state of the art clinical laboratory is being constructed for two new tenure-track faculty to take advantage of the excellent opportunities for collaboration with the Carilion Health System and local medical community. As such, the successful candidate will have a unique opportunity to develop a program of excellence with extensive support from Virginia Tech and surrounding communities. Qualifications: Desired qualifications include: 1) earned doctorate in a field related to the department's mission and programs; 2) academic records and professional achievement with national and international recognition that supports a tenured appointment to the rank of



professor at Virginia Tech; 3) evidence of visionary leadership in supporting and promoting excellence in teaching, research, and extension; 4) effective financial and personnel management; 5) demonstrated ability to attract external funding; 6) effective organizational and communication skills, and 7) demonstrated ability to foster linkages with other programs and units at the university. Responsibilities: include leadership of all department programs and administrative responsibility for visioning, planning, fiscal management and human resources, including recruitment, development, and retention of faculty and staff. The Department Head should provide effective advocacy for the department both within and outside the University and actively support the securing of resources to strengthen and broaden its mission. The department seeks an individual who will foster excellence in teaching, research, and extension, and encourage a positive, collegial climate and participatory decision-making process within the department. Application: The Committee will begin screening applicants on November 10, 2006 and will continue receiving applications until the position is filled. Applicants should submit curriculum vitae, the names of five references and a cover letter summarizing the applicant's administrative philosophy, leadership abilities, and vision for the position. Apply online at [www.jobs.vt.edu](http://www.jobs.vt.edu) (Job Posting #061062). Direct inquiries to Dr. Sharron Quisenberry, Dean, College of Agriculture and Life Sciences, Virginia Tech, 104 Hutcheson (0402), Blacksburg, VA 24061; Phone: 540-231-4152; Fax: 540-231-4163; Email: [sharronq@vt.edu](mailto:sharronq@vt.edu). Virginia Tech has a strong commitment to the principle of diversity and, in that spirit, seeks a broad spectrum of candidates including women, minorities, and people with disabilities. Individuals with disabilities desiring accommodations in the application process or needing this material in an alternate format should notify the Personnel Department, 540-231-5301 by the application deadline.

**Assistant or Associate Professor:** The Pediatric Exercise Research Center in Children in the Department of Pediatrics, School of Medicine, University of California, Irvine (UCI) is seeking to recruit an MD clinical translational scientist in the in-residence series. The

level will be at the Assistant or Associate Professor of Clinical Pediatrics salary and rank commensurate with experience. The successful candidate must have a MD or MD/PhD and be capable of conducting independent research broadly focused on the mechanisms of health effects of exercise in the context of the growing child. Experience in clinical pediatrics, as well as dealing with infants or children in research projects focused on obesity, exercise, exercise training and fitness and their relationship to growth and development and the presence of pediatric diseases like asthma, diabetes or arthritis is necessary. A proven track record of original publications in this field is a prerequisite, as well as established scholarly activity. Teaching responsibilities will include formal participation in exercise physiology and practice courses and lecture series aimed at UCI undergraduates, medical students and postdoctoral fellows. In addition, the candidate will be expected to be familiar with bedside and outpatient teaching of pediatric residents in the area of clinical exercise. Clinical duties will include evaluation and treatment of children and adolescents with sports or exercise related injuries and conditions and developing protocols for pre-participation sports physicals. This position is located at UCI Medical Center, the only full-service academic hospital in an extended geographic region and serves a large patient base. It is located in thriving Southern California, which offers diverse cultural and recreational opportunities. Interested candidates should send their curriculum vitae and three references to: Dan M. Cooper, MD, Professor and Search Chairman, Department of Pediatrics, 101 The City Drive, Bldg 25, 2nd Floor, Orange, CA 92868; Email: [dcooper@uci.edu](mailto:dcooper@uci.edu). [AA/EOE]

**Assistant Professor,** Exercise Physiology. The Pennsylvania State University, Department of Kinesiology at Penn State University (<http://www.hhdev.psu.edu/kines/>) is seeking an entry-level faculty member with expertise in the area of exercise physiology, complementing concurrent recruiting efforts in the general area of exercise science and development. This tenure-track position, which will begin Fall Semester 2007, provides opportunities to join a progressive, multi-disciplinary group of faculty working to reduce the

prevalence of obesity in children and adolescents. Candidates emphasizing a translational approach linking physical activity with metabolism, energy balance, body composition, endocrinology or related areas will receive special consideration. Candidates must have an earned doctorate in an appropriate area, an established record of scholarship, and a commitment to excellence in teaching and service. The successful candidate will be expected to secure extramural research funding and assume teaching responsibilities at the undergraduate and graduate levels. Postdoctoral experience and an established research program are preferred. The Department of Kinesiology is an academic unit in the College of Health and Human Development (<http://www.hhdev.psu.edu>) offering BS, MS, and PhD degrees. The educational environment is enriched by the considerable breadth and diversity of faculty expertise and educational opportunities for students. Significant resources in areas pertinent to the study of obesity exist, including nutrient metabolism, energy balance (intake and expenditure), body composition, biomechanics and control of movement, genetics, stress physiology, ingestive behavior, cognition, and psychosocial functioning. Collaborations with multi-disciplinary Penn State organizations such as the Children, Youth and Families Consortium, Center for Childhood Obesity Research, Center for Developmental and Health Genetics, Diabetes Research Center, General Clinical Research Center, Hershey Medical Center, Huck Institute for the Life Sciences, and the Prevention Research Center are encouraged. The Pennsylvania State University is the land grant institution of Pennsylvania. University Park is the largest of Penn State's 24 campuses, with an undergraduate enrollment of approximately 42,000 students and offering more than 150 programs of graduate study. University Park is located in Central Pennsylvania, adjacent to the municipality of State College, which enjoys high rankings for cultural opportunities, local schools, and quality of life. Applications should include the following: cover letter describing interests and qualifications for the position; curriculum vitae, reprints of three recent publications, brief (one to three page) statement of the candidate's five-year research plan, which will be evaluated for merit, feasibility, and synergy with

other members of the Penn State community, name, address, and telephone number of three references. Direct all correspondence to: Jim Pawelczyk, PhD, Chair, Search Committee, Noll Laboratory, Box J, Penn State University, University Park, PA 16802; Tel.: 814-865-3453; Email: jap18@psu.edu. Penn State values diversity in all its forms. Women and minorities are encouraged to apply. Completed applications will be reviewed beginning October 30, 2006, and will continue until the position is filled. [AA/EOE]

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**Assistant Professor:** The Biology Division at Kansas State University (<http://www.ksu.edu/biology>) invites applications for a tenure-track faculty position at the assistant professor level, in the general area of animal physiology, beginning Fall 2007. Areas of interest, which would complement current research strengths in the Division, include cellular or molecular physiology (e.g., immunophysiology, neuroendocrinology) and physiological ecology (e.g., ecotoxicology, chemical ecology). Applicants should have a PhD in biology, biochemistry, or related discipline; and postdoctoral experience is required. The successful candidate will have demonstrated excellence in research, and must show outstanding promise for developing an independent, extramurally-funded research program. A strong commitment to graduate and undergraduate education will also be required, including participation in delivery of our physiology course offerings, as well as a commitment to mentoring of students and to serving a diverse population. Applicants should submit a cover letter, a curriculum vitae, brief description of research interests, a statement of teaching experience and philosophy, representative reprints, and have three letters of reference sent to: Dr. David Rintoul, chair, Animal Physiology Search Committee; Division of Biology; 116 Ackert Hall; Kansas State University; Manhattan, KS 66506-4901. Review of applications will begin November 15, 2006, and continue until the position is filled. [AA/EOE]

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**Assistant Professor/Associate Professor/Professor:** The Department of Physiology, University of Utah School of Medicine, will undergo significant rebuilding, and several faculty will be

recruited over the next few years. Applications will be considered in any area of physiology; however, the ideal candidate will have a research interest that is focused on renal, endocrine or neural physiology with an emphasis on disease mechanisms. Applicants should hold a doctoral degree, have a strong research record, and be able to teach physiology to medical and graduate students. Candidates ranging from the level of Assistant Professor to Professor will be considered. Ample start-up packages and newly renovated laboratory space are available. Send curriculum vitae, a statement of teaching experience and research background and interest, and the names of three potential references to: Dr. F. Edward Dudek, Professor and Chair, c/o Ms. Vicki Skelton, Dept. of Physiology, Univ. of Utah School of Medicine, 420 Chipeta Way, Suite 1700, Salt Lake City, UT 84108-1297; Email: Vicki.skelton@hse.utah.edu. The review of applications will begin immediately, and applications will be considered until the positions are filled. The University of Utah provides excellent benefits. Utah offers tremendous outdoor activities for all seasons, and Salt Lake City has outstanding cultural programs in a safe environment with a reasonable cost-of-living. [AA/EOE]

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**Assistant/Associate Professor (Exercise Physiology):** The University of Tennessee, College of Education, Health, and Human Sciences, Knoxville, TN, Department of Exercise, Sport, and Leisure Studies (nine month tenure-track position beginning August 1, 2007). Qualifications: Required: earned doctorate in exercise physiology or related discipline; research specialization in the application of exercise physiology to combat current problems such as obesity, chronic disease, or youth inactivity; effective interpersonal and communication skills; and evidence of scholarly productivity. Desired: university teaching experience; postdoctoral research experience; evidence of extramural support for research; and commitment to professional organizations. Responsibilities: teach undergraduate and/or graduate classes in exercise physiology and related topics. Establish research agenda leading to publications in refereed journals and to extramural funding. Advise students and direct graduate projects,

theses and dissertations. Provide professional, university, and community service. Designated a Carnegie doctoral/research extensive university, UT is the oldest, largest and most comprehensive institution of higher education in Tennessee. Academic programs on the Knoxville campus enroll approximately 20,000 undergraduate students and 6,000 graduate students. Detailed information about the University of Tennessee may be obtained by visiting the Web site: <http://www.utk.edu>. Salary: competitive and commensurate with experience. Application: review of applications will begin December 1, 2006 and continue until the position is filled. Submit a letter of application addressing the required and desired qualifications as stated in the position announcement, a curriculum vitae, and the names, addresses, and telephone numbers of three references to: Chair, Exercise Physiology Search Committee, Dept. of Exercise, Sport, and Leisure Studies, The University of Tennessee, 1914 Andy Holt Avenue, Knoxville, TN 37996-2710; office: 865-974-9045; fax: 865-974-8981. The University of Tennessee does not discriminate on the basis of race, sex, color, religion, national origin, age, disability or veteran status in provision of educational programs and services or employment opportunities and benefits. This policy extends to both employment by and admission to the University. The University does not discriminate on the basis of race, sex, or disability in its education programs and activities pursuant to the requirements of Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act (ADA) of 1990. Inquiries and charges of violation concerning Title VI, Title IX, Section 504, ADA or the Age Discrimination in Employment Act (ADEA) or any of the other above referenced policies should be directed to the Office of Equity and Diversity (OED), 1840 Melrose Avenue, Knoxville, TN 37996 3560, Tel., 865-974 2498 (V/TTY available) or 974-2440. Requests for accommodation of a disability should be directed to the ADA Coordinator at the UTK Office of Human Resources, 600 Henley Street, Knoxville, TN 37996 4125. The University of Tennessee, Knoxville, is the state's flagship research institution, a campus of choice for outstanding undergraduates, and a

premier graduate institution. As a land-grant university, it is committed to excellence in learning, scholarship, and engagement with society. In all its activities, the university aims to advance the frontiers of human knowledge and enrich and elevate society. The university welcomes and honors people of all races, genders, creeds, cultures, and sexual orientations, and values intellectual curiosity, pursuit of knowledge, and academic freedom and integrity. The university intends that its graduates will promote the values and institutions of representative democracy, and be prepared to lead lives of personal integrity and civic responsibility.

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**Assistant Professor:** Animal Physiologists. The Biological Sciences Department within the College of Science and Mathematics at Cal Poly, San Luis Obispo, CA is seeking two full-time, academic year, tenure-track Animal Physiologists at the assistant professor rank beginning September 2007. Teaching responsibilities may include human anatomy & physiology, general physiology, introductory biology, histology, graduate level organismal biology, or other undergraduate and graduate courses as appropriate to background and training. The position is open to all specialties; desirable research areas include neurophysiology, endocrine physiology, comparative physiology, and integrative systems physiology. The successful candidate must have a strong commitment to undergraduate and graduate teaching, curriculum development, and implementation of a student-centered research program. PhD in related field required at time of hiring. Salary is commensurate with qualifications and experience. To apply, visit <http://www.calpolyjobs.org>, complete a required online faculty application and submit to Requisition #101098; attach your curriculum vitae, statement of teaching philosophy, and statement of professional goals. Also, mail a hard copy of the above noted documents and arrange to have official graduate transcripts, and three letters of recommendation sent to: Dr. Michael Yoshimura, Chair, Biological Sciences Department, California Polytechnic State University, San Luis Obispo, CA 93407-0401. Review of applications will begin November 20, 2006. Applicants are strongly encouraged to have all materials submitted by November 20; applica-

tions received after this date may be considered. For questions, contact the Biological Sciences Department at 805-756-5242. Cal Poly is strongly committed to achieving excellence through cultural diversity. The university actively encourages applications and nominations of all qualified individuals. [EEO]

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**Assistant Professor:** Biology, tenure track. The Biology Department at Millsaps College <http://www.millsaps.edu> seeks a broadly trained PhD biologist with a commitment to liberal arts education, combining outstanding classroom instruction with a passion for research that engages undergraduate students. Area of specialty is open and may include, but is not limited to: comparative physiology, herpetology, ornithology, entomology, but must be one that can be pursued effectively at the College's field station in southern Yucatan, Mexico (<http://www.kiuc.org>). Spanish language a plus. The successful candidate will teach Introductory Cell Biology, General Zoology, upper level courses in the specialty, and a course at the field station. Minorities are especially encouraged to apply. Send curriculum vita, statement of teaching philosophy, research interests, and names and full contact information for 3 references to: Dr. Sarah L. Armstrong, Chair, Biology Search Committee, Millsaps College, 1701 N. State St., Jackson, MS 39210; email: [armstsl@millsaps.edu](mailto:armstsl@millsaps.edu) Review of applications will begin November 15 and will continue until position is filled.

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**Assistant Professor:** Exercise Physiology: The University of Maryland Department of Kinesiology seeks a Tenure Track Assistant Professor to develop a research program in human exercise physiology that extends and complements the research of the current Exercise Physiology faculty, to supervise graduate students, and to assist with graduate/undergraduate teaching. Qualifications: Candidates must have a PhD degree in exercise physiology or a closely related life science and must have postdoctoral training. The candidate's research must emphasize the cardiovascular, metabolic, or genetic aspects of diabetes, obesity, or cardiovascular disease as applied to physical activity. Candidates must provide evidence of a productive publication histo-

ry; previous external grants and teaching experience preferred. Women and minorities are strongly encouraged to apply. Salary is competitive and commensurate with qualifications. The appointment will begin in August 2007, with an earlier start possible. For further information on the position and the Department see: <http://www.hhp.umd.edu/KNES/>. Contact James Hagberg PhD, Department of Kinesiology, University of Maryland, College Park, MD 20742-2611; Email: [hagberg@umd.edu](mailto:hagberg@umd.edu). College Park is the flagship campus of the University of Maryland System with over 2,500 faculty and 25,000 undergraduate and 10,000 graduate students. The University is located eight miles from Washington D.C. and serves a diverse constituency. [AA/EEO]

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**Assistant/Associate Professor.** Exercise Biologist. The Washington State University Program in Health Sciences invites applications for a full-time (100%), nine-month, tenure-track position at the Assistant/Associate Professor level located at the WSU Spokane campus. Position is available August 16, 2007. Responsibilities include developing an extramurally-funded research program, teaching graduate/undergraduate courses in exercise biology or other related areas, and meeting service expectations. The applicant will be evaluated on his/her potential to: function as a successful, collaborative team member with faculty in the Clinical and Experimental Exercise Science graduate degree and the Exercise Physiology and Metabolism undergraduate degree; sustain a focused and externally funded research program with a cellular and/or molecular focus in an area related to exercise biology and/or disease prevention and management; teach and develop courses for graduate and undergraduate students in the area of expertise or in related areas; advise and direct graduate student theses or projects and contribute to the development of comprehensive graduate exams; contribute to interdisciplinary collaborations in scientific and health-related disciplines within the university; demonstrate a service commitment at the program, university, community, state, and national levels; and participate fully in all aspects of program development and duties required for successful functioning of the Program in Health Sciences.

Screening begins January 11, 2007. The complete description, including qualifications requirements and application information and program information, is available at <http://www.phs.spokane.wsu.edu> and [www.chr.wsu.edu](http://www.chr.wsu.edu). Information about WSU is available at <http://www.spokane.wsu.edu/> and <http://www.wsu.edu/>. Information about Spokane is available at <http://www.spokanechamber.org> and <http://www.spokanechamber.org/spokanechamber/>. [EEO/AA]

## Research Positions

**Research Associate III:** Baxter Healthcare is looking for a Research Associate primarily responsible for directing/coordinating safety pharmacology and toxicology studies in compliance with FDA/GLP regulations, including writing study protocols, generating and reviewing study data, interpretation of study data, and writing study reports. The incumbent will also be responsible for maintaining the pharmacology laboratory and associated instrumentation according to applicable regulations/standard procedures. Job Requirements: 1) Master's degree in animal/human physiology or related field. Experience in pharmaceutical/medical device industry is preferred but not required; 2) Candidates who have experience in working with physiological instrumentation and who are aware of the FDA/GLP regulations are favored; 3) Ability to work independently with minimal supervision; strong trouble-shooting and problem-solving skills; and ability to work well with multi-cross-functional teams; 4) Outstanding written and verbal communication skills. Please apply online by visiting the Careers section of the Baxter website or use the following link: [http://jobs.brassring.com/en/asp/tg/cim\\_jobdetail.asp?partnerid=2104&siteid=50&AReq=21396BR&Codes=](http://jobs.brassring.com/en/asp/tg/cim_jobdetail.asp?partnerid=2104&siteid=50&AReq=21396BR&Codes=)

**Research Associate:** The University of Texas Southwestern Medical Center of Dallas at the Institute for Exercise and Environmental Medicine Pulmonary Function and Cardiopulmonary Exercise Laboratories. Opportunity to work in busy human physiology lab on studies related to lung function and human performance. Active projects include investigation of the physiologi-

cal effects of obesity, aging, and lung disease on the ventilatory response to exercise. The candidate will work with normal volunteers as well as patients with chronic diseases. The individual will be responsible for testing of subjects, maintenance and development of equipment, management of data and data analysis. Study coordination and publication/presentation of data possible for interested and able individuals. Master's degree in exercise science or equivalent training/experience; familiarity with electronics and basic equipment maintenance; creativity with light fabrication in laboratory environment. Please fax (not Email) your resume to Sherry Burnside 214-345-4618. [EEO/AA]

**Research Scientist:** Biology, Scientist I or II, Job Code: IPD-RS1-0648 (PhD). The Institutes for Pharmaceutical Discovery, LLC (IPD) is a pharmaceutical research company dedicated to the discovery and development of novel treatments for metabolic disorders. IPD provides the best of large pharma resources and expertise in a small company setting with a strong team atmosphere. IPD is collaborative in spirit and intellectually dynamic. As an integral team member, you consistently interact with all other research disciplines (biology, comparative medicine, DM/PK, etc.). Located in a state-of-the art facility in the shoreline community of Branford, CT, IPD offers a relaxed suburban living environment with easy access to New York City, Boston and Yale University. Combining excellent compensation, benefits and training opportunities with an exciting working environment, IPD seeks to attract and retain the finest research professionals. IPD's benefit package includes comprehensive medical & dental plans, three weeks vacation, 14 paid holidays for 2006, five personal days, 401(k) with match, annual health club membership, life insurance 2x annual salary, AD&D, STD, LTD, EAP, a casual work environment, tuition reimbursement and FSA accounts. Position Overview: IPD offers a position in the biology department for an experienced cardiovascular physiologist. The individual will be charged with the task to establish a laboratory for the investigation of compound effects on the cardiovascular system. Envisioned capabilities include in vitro vasoaction (e.g. aortic ring assays), blood flow and heart function in anesthetized animals, and

cardiovascular function assessed in vivo by telemetry. The individual should further function as an expert in cardiovascular physiology on the project team with a potential leadership function. The individual will further function within the larger department investigating diabetes and associated diseases and should intellectually contribute to all ongoing projects. Excellent verbal and written skills are required for internal and external presentations. A minimum of a PhD with 5+ years experience in academia or pharmaceutical industry is required. Major Responsibilities: Establish a laboratory to conduct in vitro and in vivo cardiovascular studies focusing on vasoaction and cardiac function; determine path to identify cardiovascular targets of test compounds and to devise drug discovery screening models; design, execute and analyze studies; communicate rationale and results of studies to internal and external customers. Supplemental Responsibilities: mentor associates collaborating in such activities; keep abreast of the scientific literature, and be able to conduct literature searches to optimize on-going research. Technical knowledge, skills, experience, special background required: excellent knowledge of cardiovascular physiology and pathology; experience in design and implementation of cardiovascular experiments. These must include subject instrumentation and experimentation in anesthetized and conscious animals to measure cardiovascular parameters, such as blood pressure, blood flow, and cardiac functions (heart rate, EKG); proven strong surgical abilities; experience with in vitro models of vasodilation and vasoconstriction is a plus; experience with heart rate and blood pressure telemetry is a plus. For immediate consideration, send a cover letter, CV, research summary, salary history and the names of three references by email. Please reference Job Code# IPD-RS1-0648 in the email subject line. No telephone inquires or third party firms please. Alissa Hamilton, Manager Human Resources, The Institutes for Pharmaceutical Discovery, LLC, 23 Business Park Drive, Branford, CT 06405; Email: [alissa.hamilton@ipd-discovery.com](mailto:alissa.hamilton@ipd-discovery.com); [www.ipd-discovery.com](http://www.ipd-discovery.com). [AA/EOE]

**Graduate Research in Exercise Physiology/Metabolism or Biomechanics:** Openings exist for several

highly motivated graduate students to study Exercise Physiology/Metabolism or Biomechanics at the University of Southern California, Los Angeles. In Exercise Physiology, our research focuses on metabolism (carbohydrates and lipids) and its regulation during exercise, with aging and in pathophysiological conditions (type I diabetes, type II diabetes and obesity). In Biomechanics, our research focuses on the mechanisms humans use to generate and control momentum during multi-joint movements (athletic, ergonomic and clinical populations). Courses for Doctoral students are offered within and outside the department in areas including biomedical engineering, computer science, integrative and evolutionary biology, physiology, gerontology and statistics. Doctoral students enter one of two interdisciplinary degree programs available at USC: Biomedical Engineering (Biomechanics) or Integrative and Evolutionary Biology (Biomechanics and Exercise Physiology). All graduate students receive appointments as teaching or research assistants with stipends, health benefits and full tuition remission. These may be renewed on an annual basis. Students are also encouraged to apply for graduate fellowships. If you are interested in learning more about the Biomechanics program, please contact Dr. Jill McNitt-Gray at [mcnitt@usc.edu](mailto:mcnitt@usc.edu). If you are interested in learning more about the Exercise Physiology/Metabolism program, please contact Dr. Lorraine Turcotte at [turcotte@usc.edu](mailto:turcotte@usc.edu).

**Graduate Research:** Opportunity in Comparative Metabolic and Muscle Physiology. Openings exist for highly motivated graduate students to study Organismal and Muscle Energetic

Physiology at Miami University, Oxford, OH. Our research program encompasses Evolutionary Physiology and Exercise/Metabolic Physiology. In Evolutionary Physiology, our research focuses on whole animal energetics and muscle plasticity as factors in life history evolution and ecological adaptation. We use both field and laboratory experimentation with a wide range of vertebrate model species for these studies. In Exercise/Metabolic Physiology, our research focuses on the mechanisms by which muscle metabolism impacts lipid homeostasis in health in pathology (e.g., diabetes and obesity). We utilize transgenic mouse models and cell culture for these studies. Graduate student course work is entirely determined by the individual together with his or her committee. All graduate students receive appointments as teaching or research assistants with stipends, and full tuition remission. These may be renewed on an annual basis. Students are also encouraged to apply for graduate fellowships. If you are interested in learning more about the program, please contact Dr. Paul Schaeffer at [schaeffp@muohio.edu](mailto:schaeffp@muohio.edu) and see our website at <http://zoology.muohio.edu>.

## Fellowship Position

**Irvine Fellowship Program:** Whittier College is a nationally recognized, selective, independent liberal arts college with a diverse student body of approximately 1,300 undergraduates and is distinguished by its small size and innovative interdisciplinary programs. The campus is located on a 95-acre hillside campus 18 miles southeast of downtown Los Angeles. We have a long history of commitment to equity, reflecting our Quaker origins, and our student body

mirrors the diversity of the region. We are involved in the Diversity Scorecard Project (via USC) and the Campus Diversity Initiative Evaluation Project (via Claremont Graduate University and AAC&U), and have two Title V grants. Our faculty, committed teachers-scholars, weave issues of diversity into their work with students. Through generous funding from The James Irvine Foundation, Whittier is pleased to continue our program of Irvine Fellowships. Similar to a Minority Scholar Dissertation Year Fellowship, these positions are designed to attract faculty from historically underrepresented groups, or those who will help to diversify the curriculum, to teach in a liberal arts college setting. Applicants for the Fellowship should be either new PhDs or in the writing stage of the dissertation before beginning the position. We are currently looking for an Irvine Fellow to teach within the Biology Department during the spring semester, 2007. The teaching responsibilities will include the anatomy portion of an upper-division team-taught course in Human Anatomy and Physiology, as well as an introductory course in Organismal Biology. Irvine Fellowships are designed to allow scholarly time for writing, while gaining teaching experience, although the spring term will be a full teaching load. Renewal for an additional year is possible and the position may be converted to tenure-track in future years. Review of materials (letter of application, vita/e, and a summary of the dissertation project) will begin immediately, and will continue until the position is filled. Send application materials to: David Bourgaize, Biology Department, Whittier College (<http://www.whittier.edu>), 13406 E. Philadelphia St., PO Box 634, Whittier, CA, 90608. [AA/EOE] ❖

## 23rd Annual Computed Body Tomography 2007 The Cutting Edge

February 15-18, 2007

Johns Hopkins Univ. School of Medicine

Disney Yacht and Beach Club Resort  
Lake Buena Vista, Orlando, FL

This seminar will provide a comprehensive review of recent advances in computed body topography focusing on 16 and 64 slice MCDT. A series of focused lectures have been designed to concentrate on specific topics in depth. Participants will have the opportunity

to expand their knowledge of the latest concepts in multidetector-row CT, CT angiography, the value of high resolution CT in the chest, the uses of CT in the GI tract, cardiac CT and coronary artery imaging, and PET/CT in oncology. There will be time for questions and discussion. Optional hands-on workstation training will be available. The daily schedule has been designed to include ample time to enjoy the luxurious facilities of the Disney Yacht and Beach Club Resort and the Disney attractions.

**Registration Fee:** Physicians \$700; Residents/Fellows/Allied Health Professionals \$650

**Contact:** Office of Continuing Medical Education; Johns Hopkins University School of Medicine; Turner 20, 720 Rutland Avenue; Baltimore, MD 21205-2195; 410-955-2959; Fax: 410-955-0807; Email: [cmenet@jhmi.edu](mailto:cmenet@jhmi.edu); web: <http://www.hopkinscme.net>. Please contact the Office of Continuing Medical Education at the above address if you have any questions. ❖

## *Harrison's Endocrinology*

J. Larry Jameson, (Editor)  
New York: McGraw-Hill, 2006, 570 pp.,  
illus., index, \$64.95  
ISBN: 0-07-145744-5

While virtually all textbooks assigned in undergraduate physiology courses contain chapters introducing the topic of Endocrinology, surprisingly the textbooks frequently assigned to first year medical and graduate students seldom treat the subject with any more depth. This has contributed to the success of such monographs as Griffin and Ojeda's *Textbook of Endocrinology* (Oxford University Press), Molina's *Endocrine Physiology* (McGraw-Hill) and Goodman's *Basic Medical Endocrinology* (Elsevier). At the medical and graduate school level the science of Endocrinology requires more comprehensive coverage and indeed is best then extended to clinical information including diagnosis, treatment and outcomes evaluation.

First year medical and graduate students often are intimidated by the wealth of information and the difficulty of the subject matter contained in the most authoritative texts such as the Williams *Textbook of Endocrinology* (Saunders) and Degroot's *Endocrinology* (Saunders); however, those are gold standards that serve as wonderful reference texts. In particular, each new edition of those texts does an excellent job of incorporating new findings in the field and the updating of their extensive reference lists is remarkably comprehensive. Just the same, many first year students find the coverage intimidating at the early stages of their careers and it is a challenge for faculty to convince the students to read those formidable texts. Instead, many classroom facilitators prefer monographs which were in fact tailored to this student population, like those mentioned above. Furthermore, for most basic science faculty active in a

problem-based medical curriculum, the Williams and Degroot texts are valuable, but quite honestly difficult, resources for preparation of the endocrine cases, even if they have sufficient background in the field to be able to assimilate the wealth of information presented.

The same problems exist for first year medical and graduate students when searching for an appropriate text that introduces them to the science of medicine. For years one of the most popular and authoritative texts has been Harrison's *Principles of Internal Medicine* (McGraw Hill), but again the sheer weight of the text has proved intimidating and the wide spectrum of topics difficult to navigate. Like the Williams and Degroot textbooks, Harrison's must limit to some degree the coverage of any one topic because of the ever expanding number of subjects that require commentary.

What seems to have been missing in the past has been a text that bridges the gap between the monographs tailored for beginning medical and graduate students and the valued encyclopedic endocrine texts. Harrison's has now offered a solution by spinning out of the "mother ship" a paperback edition of Harrison's *Endocrinology*. While designed particularly for medical students in their clinical years and residents in training, this text will be a valuable resource for faculty and students in the basic science years of medical school and graduate students interested in a career in endocrine research and teaching. Edited by J. Larry Jameson, (Northwestern) the text is a compendium of chapters contributed by some of the most respected educators and practitioners in the field. Each chapter begins with the anatomical and physiological basis of the topic and moves then into a comprehensive

description of the diagnosis of and treatment options for diseases of these systems. Algorithms for decision making are clearly presented and each chapter includes and an up-to-date reference list with suggested readings that highlight the information covered. It is easy to criticize any text that attempts a comprehensive coverage of a field as broad as Endocrinology, but in reality it is hard to do so with this book. Although very little coverage is uniquely dedicated to the important sub-discipline of cardiovascular endocrinology, the text is expanded to include a laudable chapter by the Fliers (Harvard) on "Obesity," and concise yet insightful chapters on "Disorders of the Adrenal Cortex," by Williams and Dluhy (Harvard), "Infertility and Fertility Control," by Hall (Harvard), and "Osteoporosis," by Lindsay and Cosman (Columbia). The excellent introductory chapter on "Principles of Endocrinology," by Jameson (Northwestern) sets the tone for this easy-to-read, well-illustrated textbook

An outstanding Appendix includes summaries of "Laboratory Values of Clinical Importance" and a remarkably detailed section of self-study evaluation questions authored by Cynthia Brown, Anna Hemnes, Phillip Nivatpumin, and Charles Wiener (Johns Hopkins). While this section is designed for residents in training or for practitioners preparing for recertification; it is also a tremendous resource for medical school faculty and researchers in the field of endocrinology. This section brings to life the science of endocrinology. ❖

Willis K. Samson,  
Saint Louis Univ.

Disclosure: Dr. Samson is an author of a chapter in Griffin and Ojeda's *Textbook of Endocrine Physiology* which is mentioned in this article.

## Books Received

*Cardiovascular Disease, Methods and Protocols: V. 1: Genetics.*  
Qing K. Wang, (Editor).  
Totowa, NJ: Humana Press, 2006,  
249 pp., illus., index, \$99.50.  
ISBN: 1-58829-572-9.

*Cardiovascular Disease, Methods and Protocols: V. 2: Molecular Medicine.*  
Qing K. Wang, (Editor).  
Totowa, NJ: Humana Press, 2006,  
376 pp., illus., index, \$125.00.  
ISBN: 1-58829-892-2.

*Embryonic Stem Cells.*  
Elena Notarianni and Martin J. Evans,  
(Editors).  
New York: Oxford Univ. Press, 2006,  
359 pp., illus., index, \$75.00.  
ISBN: 0-19-855001-4.

## *Advances in Vagal Afferent Neurobiology.*

Bradley J. Uden and Daniel Weinreich, Editors. Boca Raton, FL: CRC Press, 2005, 523 pp., illus., index, \$139.95. ISBN: 0-8493-213-X.

The recent volume published in the *Frontiers in Neuroscience*, "Advances in Vagal Afferent Neurobiology" provides a timely review of research over the last several decades on the development, peripheral and central mechanisms of action and influence of "vagal" sensory nerves on respiratory, cardiovascular and gastrointestinal function. Each chapter reflects the author's research with a reasonably comprehensive review of the literature.

Chapters on the embryology and neurotrophic factors critical to development of nodose and jugular ganglia cells are based on recent anatomical and molecular studies of the relevant signaling pathways that influence epibrachial placode formation and neural crest sensory neurogenesis. While there are extensive sections on embryological development and neurotrophins, the focus is strictly at a fundamental level with little discussion of physiological or clinical ramifications, with the exception of experimental diabetes, which may involve deficiencies in transport of neurotrophins and the associated dysautonomia.

Two chapters are devoted to voltage-gated ion channels and electrophysiological studies of dissociated vagal afferent cell bodies from the nodose ganglia. Current information on various Na<sup>+</sup>, Ca<sup>2+</sup> and K<sup>+</sup> channels is described along with a discussion of important future areas of investigation, most notably the terminal sensory and synaptic connections, areas which are limited by current technology. Appropriate acknowledgment is given to limitations posed by current methods used to evaluate electrophysiological mechanisms in dissociated cell bodies.

Vagal afferents, like other afferent systems, signal the central nervous system through activation of receptors on peripheral endings that encode mechanical and chemical stimuli. Three chapters are devoted to this general area. A methodological chapter describes several anatomical tracing approaches including horseradish peroxidase, carbocyanine dyes and dextran amines or biotin conjugated dextran amines to identify afferent terminals in the gut. A second and third chapter separately evaluate mechan-

otransduction processes in the upper gastrointestinal region and chemotransduction processes using nodose ganglion cells to study ionotropic and metabotropic receptors activated by a number of endogenous chemicals. These chapters describe local mechanisms involved in receptor activation but provide little reference to physiological reflex responses or clinical relevance.

Understanding mechanisms involved in processing of vagal afferent input to the central nervous system has been an area of intense investigation over the last decade. One chapter describes our current knowledge of excitatory glutamatergic synaptic mechanisms that operate largely through fast-acting AMPA receptors on first order nucleus tractus solitarius (NTS) neurons receiving vagal input and signal conditioning by *N*-methyl-D-aspartate (NMDA) receptors on second order neurons that may prolong vagally induced excitation. There is an interesting discussion of the contribution of synaptic plasticity to adaptations that occur in some diseases, such as asthma. A second chapter discusses NTS modulation by nitric oxide (NO), including the possible importance of various NO synthase isoforms and the influence of NO on baroreflex function, including potential mechanisms involved in NO-related membrane depolarization and NO-glutamate (and other neurotransmitter) interactions. Another chapter considers monoaminergic modulation of airway-related vagal preganglionic neurons in the brainstem. In addition to the anatomical information there is an interesting discussion of the potential pathophysiological relevance of this final CNS-airway connection.

Three chapters are devoted to recent studies of vagal afferents from lung and airways, gastrointestinal tract and heart. In the first, functional classification of bronchopulmonary afferents, including their distinct physiological properties and alterations in conditions of acute airway injury and chronic inflammation are discussed along with the role of inflammatory mediators such as eicosanoids, kinins, protons, adenosine and nerve growth factor. The fundamental neurobiology of ion channels contributing to inflammatory modulation of nodose ganglia cells innervating the gastrointestinal tract in the second chapter is complemented by an excellent discussion of the behavioral aspects of vagal afferent activation, the role of cholecystokinin and the significance of cytokine activation in nausea and vomiting. The final chapter in this section

underscores the current state of our knowledge and pathophysiological relevance of cardiac vagal afferents, including their contribution to altered function in myocardial ischemia/reperfusion, heart failure, hypertension and diabetes.

Several chapters acknowledge the important reciprocal physiological reflex functions of vagal and spinal (sympathetic) afferents in several visceral organ systems. In this regard, reflex responses and sensory functions are evaluated by the final five chapters that focus on the several organ systems innervated by vagal afferents. Viscero-visceral, visceral-vascular and bronchopulmonary reflexes assist in normal physiological function and protection of the organism and are reviewed in detail in the two chapters devoted to the GI tract, airways and lungs. Axonal reflex control of tachykinin neuropeptide release in airway neurogenic inflammation and therapeutic strategies is the subject of another chapter. Evidence for the provocative role of vagal afferents in transmission and modulation of (and hence protection from) visceral pain and nociception is discussed in a separate chapter. A descending spinal inhibitory pathway may explain a modulatory role of vagal afferents in pain. In addition, a hyperalgesic component related to the sympatho-adrenal system may result from vagal afferent activation. The final chapter discusses current evidence for chronic vagal nerve stimulation as an alternative to drug therapy for epilepsy. This relatively old therapy involving implantation of an electrode around the right vagus helps resynchronize brain electrical activity and reduces vulnerability to seizing by as much as 75%. The absence of a significant effect on cardiopulmonary function, the relatively low incidence of significant side effects along with improved quality of life suggest a potentially important role for this therapy, which has been applied to over 28,000 patients with refractory partial-onset seizures.

Overall, although several sections of this monograph are very weighty and would be of interest mainly to individuals involved in studies of vagal afferent neurobiology, there is a large amount of interesting recent information on the anatomy, molecular and functional characteristics as well as the clinical relevance of these important pathways. ❖

John C. Longhurst,  
Univ. of California, Irvine

## Chien Honored by the National Academy of Engineering

During its 2006 annual meeting, the National Academy of Engineering (NAE) presented the NAE Founders Award to **Shu Chien**, who forged the field of biomedical engineering.

Chien is an NAE member, Y.C. Fung Professor of Bioengineering and Medicine at the University of California, San Diego (UCSD), and University Professor for the University of California system. He will receive the Founders Award "for outstanding contributions to elucidating the engineering foundation of cardiovascular dynamics, and integrating engineering and biomedical sciences for the development of the biomedical engineering profession." The award recognizes outstanding professional, educational, and personal achievement to the benefit of society, and it includes \$2,500 and a gold medallion.

Although trained as a physician, Chien has made extensive contributions to bioengineering, especially in cellular, molecular, and cardiovascular bioengineering and related fields. In the 1960s, while on the faculty at Columbia University's College of Physicians and Surgeons, he was one of the few physiologists to apply engineering principles and techniques to the study of biological systems. "I have chosen to combine engineering and the biomedical sciences because I believe this combination leads to the most discoveries and innovations for the improvement of human health and quality of life," said Chien. His interdisciplinary approach enabled Chien to better understand hemodynamics—the forces generated by the heart and movement of blood through the cardiovascular system—and the regulation mechanisms of blood rheology, which looks at how blood deforms and flows when stress is applied. His model of blood rheology was the first to elucidate its determinants, and he later applied the basic knowledge gained from these discoveries to understand cardiovascular and other diseases, such as sickle cell anemia.

Chien went on to combine his knowledge of cardiovascular dynamics and blood rheology to examine microcirculation, where the critical exchange between blood and tissue occurs, and figured out how blood cells and their interaction with the vessel walls govern flow

dynamics. Chien used these discoveries to explain the mechanisms of hemorrhage and shock, and the cardiovascular benefits of exercise. He described the effects of hemodynamic forces on transendothelial transport of macromolecules and proposed the enduring "cell turnover-leaky junction" theory to describe susceptibility to atherosclerosis.

Chien's more recent research at UCSD has brought about a novel and detailed understanding of how mechanical forces of blood flow affect cell signaling and gene expression, and how cells adapt to their physical environment. This pioneering work has far-reaching implications for bioengineering and particularly for tissue engineering and regenerative medicine. Chien is also designing molecular techniques to prevent and mitigate complications following balloon angioplasty, and to analyze how the vascular system responds to procedures used to treat coronary artery occlusion. In addition, he is examining how cell signals are coordinated and function over time.

Chien transformed our understanding of cells and tissues and their physical mechanisms, demonstrating that biological systems are governed by the laws of physics and chemistry. Chien's rich contributions to fundamental and applied bioengineering research are documented in some 450 peer-reviewed publications and nine books, and are recognized through numerous engineering and life-science awards and named lectureships. Furthermore, the American Society of Mechanical Engineers has twice presented Chien with the Melville Medal for the best original paper among its 20 Transactions journals; Chien is the only two-time winner of this honor.

At UCSD, Chien has been instrumental to building one of the country's top bioengineering programs. He founded and directs the Whitaker Institute of Biomedical Engineering, which facilitates research collaboration in biology, medicine, and engineering. Chien also led the formation of the Bioengineering Institute of California, a project of the University of California system that involves all 10 UC campuses and many other universities to disseminate bioengineering research. Chien has served as president for several professional societies, including the American Physiological Society, the Federation of American Societies for Experimental Biology, the International Society of

Biorheology, and the American Institute for Medical and Biological Engineering, and he is currently president-elect of the Biomedical Engineering Society. His professional activities show the widespread admiration he has received from both life scientists and engineers. Moreover, Chien is one of only six living NAE members to also hold membership in the National Academy of Sciences and the Institute of Medicine.

## APS Members Elected to Institute of Medicine

The Institute of Medicine (IOM) announced the names of 65 new members, raising its total active membership to 1,501. In addition, the Institute honored five individuals by election to foreign associate membership, bringing the total members in that category to 82. With another 68 members holding emeritus status, the total IOM membership is now 1,651. Included among the new members are 6 APS Members.

Newly elected APS members are:

**Lance B. Becker**, professor, department of emergency medicine, School of Medicine, University of Pennsylvania, Philadelphia;

**Timothy R. Billiar**, George Vance Foster Professor and chair, department of surgery, University of Pittsburgh, Pittsburgh;

**George Lister**, Robert L. Moore Chair in Pediatrics, and professor and chair of pediatrics, University of Texas Southwestern Medical Center, and pediatrician-in-chief, Children's Medical Center, Dallas;

**Joseph Loscalzo**, Hersey Professor of the Theory and Practice of Physic, Harvard Medical School, and chair, Department of Medicine, Brigham and Women's Hospital, Boston;

**Kenneth S. Polonsky**, Adolphus Busch Professor and chair, department of medicine, Washington University School of Medicine, St. Louis;

Elected to Foreign Associate Membership:

**Sten Grillner** professor and director, Nobel Institute for Neurophysiology, and chair, network program for neuroscience/psychiatry, Karolinska Institute, Stockholm, Sweden. ❖



**Edmund Osvaldo Acevedo**, as Professor, has affiliated with Virginia Commonwealth University, Department of Health and Human Performance, Richmond, VA. Prior to his new assignment, Acevedo had been an Associate Professor, Department of Exercise Science, University of Mississippi, Province, MS.

**Ahmed Ally**, an Associate Professor, recently joined the Department of Pharmaceutical Sciences, School of Pharmacy, Massachusetts College of Pharmacy & Health Sciences, Boston, MA. Ally was previously associated with the Department of Pharmaceutical Sciences, Palm Beach Atlantic University, West Palm Beach, FL.

**Lance B. Becker**, a Professor, has joined the Department of Emergency Medicine, University of Pennsylvania, Philadelphia, PA. Formerly, Becker was affiliated with the Section of Emergency Medicine, Department of Medicine, University of Chicago, Chicago, IL.

**Steve Bibevski**, a Research Associate, is presently affiliated with the Departments of Surgery, Physiology & Biophysics, Case School of Medicine, Cleveland, OH. Bibevski was formerly affiliated with the Louis Stokes Department of VA Medical Center, Cleveland, OH.

**Manuel M. Buitrago Blanco** is currently associated with the Department of Neurology, The Cleveland Clinic, Cleveland, OH. Buitrago Blanco was formerly with the Department of Neurology, Columbia University, New York, NY.

**Naibedyia Chattopadhyay** has accepted a position as Head of Endocrinology & Deputy Director, Central Drug Research Institute, Department of Endocrinology, Lucknow, India. Prior to her new position, Chattopadhyay was an Assistant Professor, Department of Medicine, Endocrinology Division, Brigham and Women's Hospital, Boston, MA.

**Zhongming Chen**, a Research Associate, joined the Department of Cell and Molecular Physiology, University of North Carolina at Chapel Hill, NC. Chen was previously a Student, Duke Institute Genome Sciences & Policy, Duke University, Durham, NC.

**Myung Dong Choi** has affiliated with the Human Performance Lab, East Carolina University, Greenville, NC. Choi previously was associated with the Department of Physical Education, Ball State University Human Performance Lab, Muncie, IN.

**Charles A. Darveau**, an Assistant Professor, has joined the Department of Biology, University of Ottawa, ON, Canada. Formerly, Darveau was a Student, Department of Zoology, University of British Columbia, Vancouver, BC, Canada.

**Keith C. DeRuisseau** is currently an Assistant Professor, Department of Exercise Science, Syracuse University, Syracuse, NY. DeRuisseau was formerly a Postdoctoral Fellow, Department of Applied Physiology and Kinesiology, University of Florida, Gainesville, FL.

**Lara Roberts DeRuisseau** is now a Postdoctoral Associate, Department of Neurosurgery, Institute for Human Performance, SUNY Upstate Medical University, Syracuse, NY. Prior to her new position, DeRuisseau was a Student in the Department of Pediatric Cardiology, University of Florida, Gainesville, FL.

**Nicholas E.P. Deutz** has accepted a position as Professor, Department of Geriatrics, University of Arkansas for Medical Sciences, Little Rock, AR. Prior to his new affiliation, Deutz was Associate Professor, Department of Surgery, Maastricht University, The Netherlands.

**Dario Dieguez**, a Postdoctoral Fellow, has affiliated with the Department of Psychology, Boston University, Boston, MA. Dieguez formerly had been a Student, Department of Biology, University of Texas at San Antonio, TX.

**Michael Richard Garrett**, an Assistant Professor, joined the Department of Physiology and Pharmacology, University of Toledo, Health Science Campus, Toledo, OH. Prior to his new position, Garrett was associated with the Department of Physiology and Molecular Medicine, Medical College of Ohio, Toledo, OH.

**Hans J. Geissler**, a Staff Surgeon, has affiliated with the Department of Cardiovascular Surgery, University of Freiburg, Germany. Geissler, as an Associate Professor, was previously associated with the Department of Cardiothoracic Surgery, University of Cologne, Germany.

**Jeffrey Stephen Gilbert** has joined the Department of Physiology, University of Mississippi Medical Center, Jackson, MS, as a Postdoctoral Research Fellow. Gilbert was previously associated with the Department of Obstetrics, as a Postdoctoral Research Assistant, University of Texas Health Science Center, San Antonio, TX.

**Joshua A. Goldberg** is currently the Manager of Neurophysiology Research Company, BioControl Medical, Yahud, Israel. Goldberg had been a Postdoctoral Fellow, Department of Biology, University of Texas, San Antonio, TX.

**Frederick D. Gregory**, a Postdoctoral Fellow, has affiliated with the Department of Pharmacology, Emory University School of Medicine, Atlanta, GA. Gregory was formerly a PhD Candidate, Department of Neurobiology, University of California, Los Angeles, CA.

**Hartmut W. Jaeschke** joined the Department of Pharmacology, Toxicology, and Therapeutics as Professor, University of Kansas, Kansas City, KS. Formerly, Jaeschke was Associate Director and Professor, Liver Research Institute, University of Arizona College of Medicine, Tucson, AZ.

**Michael S. Kramer** accepted the position of Associate Director, Preclinical Development & Safety, Medior, Inc., Malvern, PA. Kramer was formerly affiliated with the Major Preclinical Development, Biological Research, Palatin Technologies, Inc., Cranbury, NJ.

**Jacob L. Krans** is presently a Visiting Assistant Professor, Department of Biological Sciences, Mount Holyoke College, South Hadley, MA. Previous to his new position, Krans was a Postdoctoral Associate, Department of Neurophysiology and Behavior, Cornell University, Ithaca, NY.

**Darcy Lidington**, a Postdoctoral Fellow, has affiliated with the University of Toronto, Toronto, ON, Canada. Formerly, Lidington was associated with the Physiological Institute, Ludwig Maximilians University, Munich, Germany.

**Paul Johm Marvar**, a Postdoctoral Fellow, has joined the Division of Cardiology, Emory University School of Medicine, Atlanta, GA. Marvar was formerly associated with the Department of Physiology and Pharmacology, Robert C. Byrd Health Science Center, Morgantown, WV.

**Laurie Kelly McCorry** is presently Chair, Department Allied Health, Bay State College, Boston, MA. Formerly, McCorry was affiliated with the Department of Pharmaceutical Sciences, Massachusetts College of Pharmacy, Boston, MA.

**Cheri L. M. McGowan**, a Postdoctoral Fellow, is affiliated with the Mount Sinai Hospital and University Health Network, University of Toronto, ON, Canada. McGowan was formerly a Graduate Student at McMaster University, Department of Kinesiology, Hamilton, ON, Canada.

**Craig McGowan**, a Postdoctoral Fellow, joined the Department of Integrative Physiology, University of Colorado at Boulder, CO. McGowan had previously been associated with the Department of Organismic & Evolutionary Biology, Harvard University, Bedford, MA.

**Derek M. McKay**, as Professor, has affiliated with the University of Calgary, Department of Physiology & Biophysics, Calgary, Canada. Prior to his new position, McKay had been an Associate Professor, Department of Pathology, McMaster University Health Science Center, Hamilton, Ontario, Canada.

**Sandeep Misri**, a Postdoctoral Research Associate, joined the Department of Pharmacology, University of Minnesota, Burnsville, MN. Prior to his new position, Misri had been Associated with the Cell Biophysics Lab, Wright State University, Dayton, OH.

**Jeff Maurice Morrisette**, an Assistant Professor, is affiliated with the Natural Sciences Department, Lawrence Technological University, Southfield, MI. Prior to his new position, Morrisette was a Research Associate, Department of Biological Sciences, Hopkins Marine Station, Stanford University, Pacific Grove, CA.

**Rikuo Ochi**, Research Scientist, recently moved to the Department of Physiology, New York Medical College, Valhalla, NY. Ochi was previously affiliated with the Department of Bioengineering, University of California, San Diego, La Jolla, CA.

**Silviu V. Pasniciuc** is currently a Medical Resident, affiliated with the Clinton Clinic, Department of Internal Medicine, Clinton, KY. Formerly, Pasniciuc was a Medical Resident, Department of Internal Medicine, Huron Hospital, East Cleveland, OH.

**Ismaila Adebayo Raji** accepted the position of Lecturer, Department of Physiology, University of Lagos College of Medicine, Lagos, Nigeria. Prior to her new position, Raji had been a Lecturer, Department of Physiology, School of Health Sciences, Kampala International University (Western Campus), Bushenyi, Uganda.

**Magnus J. E. Richardson**, is presently Professor, Systems Biology Centre, Warwick University, Coventry House, Coventry, UK. Richardson was formerly a Postdoctoral Student, Brain and Mind Institute, Lausanne, Switzerland.

**Katrina Gotia Salvante**, is a Postdoctoral Student, Department of Biology, University of North Carolina, Chapel Hill, NC. Salvante was formerly a Student with the Department of Biological Sciences, Simon Fraser University, Burnaby, British Columbia, Canada.

**Robert G. Schaub** has been promoted to Vice President, Department of Discovery Research, Wyeth Research, Archemix Corporation, Cambridge, MA. Schaub was previously Assistant Vice President, Department of Discovery Research, Wyeth Research, Archemix Corporation, Cambridge, MA.

**Harold H. Shlevin** was recently promoted to Global Senior Vice President and Board Member, Solvay Pharmaceuticals Inc., CEO-Executive Offices, Marietta, GA. Shlevin formerly had been President and CEO, Executive Office, Solvay Pharmaceuticals Inc., Marietta, GA.

**Aleksandra Sindic**, a Research Fellow, has affiliated with the Department of Physiology and Biomedical Engineering, Mayo Clinic, College of Medicine, Rochester, MN. Sindic was formerly a Research Assistant, Department of Physiology and Biophysics, Case Western Reserve University School of Medicine, Cleveland, OH.

**Wook Song**, an Assistant Professor, has affiliated with the Department of Physical Education, Seoul National University, Seoul, South Korea. Prior to his new position, Song was a Student, Department of Cell and Structural Biology, University of Texas Health Science Center, San Antonio, TX.

**Andrea Stella** is presently the Director of the Nephrology Clinic, Nephrology University of Milano-Bicocca, Monza, Milan, Italy. Stella was formerly Associate Professor, Institute of General Clinical Medicine, University of Milan, Hypertension Clinic, Sforza, Milan, Italy.

**Shigeo Taniguchi** has been appointed Division Chief, Department of Internal Medicine, Tokyo Kosei-Nenkin Hospital, Tokyo, Japan. Formerly, Taniguchi was a Lecturer, Department of Nephrology and Endocrinology, Tokyo University School of Medicine, Hongo, Bonkyo-ku, Tokyo, Japan.

**Patrick J. Walsh** is a Professor, Department of Biology, University of Ottawa, Ottawa, ON, Canada. Walsh was formerly Professor, Department of Marine Biology and Fisheries, University of Miami, Miami, FL.

**Kristen Lee Williams Walton** is currently an Assistant Professor, Department of Biology, Missouri Western State University, St. Joseph, MO. Prior to her new assignment, Williams Walton was a Postdoctoral Fellow, Department of Biology, University of North Carolina, Chapel Hill, NC.

**Eileen M. Weinheimer**, a Graduate Research Assistant, is presently attending Purdue University, Department of Foods and Nutrition, Lafayette, IN. Weinheimer was formerly associated with Ball State University, Human Performance Laboratory, Muncie, IN.

**Jonathan E. Wingo** joined the Institute for Exercise and Environmental Medicine, Dallas, TX, as a Student. Previously, Wingo had been a Student, Department of Exercise Science, University of Georgia, Athens, GA.

**Bruce Eric Wright**, an Associate Professor of Physiology and Anatomy, has affiliated with the University of St. Eustatius School of Medicine, Caribbean, Netherlands Antille. Wright was previously affiliated with Potworks as an Associate Professor of Biology, St. James Parish, Charlestown, West Indies. ❖

## Wine Wizard

### The Wine Wizard Peter Wagner

The New World does not by any means have the market on affordable good wines all to itself despite what past columns might have implied. Here are two Europeans I was fortunate to try recently. I have no idea how widely available these two are, even in Europe, but they are worth twice the price and I would buy both for short and medium term drinking if I could.

#### White

2005 Wurzburger Stein, Silvaner Kabinett, Staatlicher Hofkeller (about 10 Euros). The nose has delicate yet forward, slightly perfumed, melon/lemon characteristics and is very clean. The palate is also one of delicate but tasty melon/lemon with slight cashew nuttiness that fits well. Acidity is well-balanced and accounts for a long, clean and dry finish. Words that come to mind are balanced, fresh, structured and even elegant, especially for the price. Easy to drink alone, yet well enough endowed to go with food.

#### Red

2004 Barbera d'Alba DOC, Enologo Mauro Sebaste, Alba, Piemonte (about 10 Euros). This is a quite "big" wine in flavor and structure, but



Peter Wagner

don't equate big with being heavy, dull, overly tannic, bitter, oxidized or coarse, which I have often found to be the case with low priced Old World reds. The nose has bright plum jam, vanilla, spice and cedar. On the palate, there is goodly tannin, and a fair dose of oak, but neither dominate the fruit, allowing all-important balance. Rather, these features enrich the lively mouthfeel and provide pleasing viscosity and a long finish, with fruit outlasting the oak.

For those of us limited to wines available in the USA here are some bargains:

#### Whites

2004 Concannon Chardonnay "Central Coast" \$6. Surprisingly enjoyable and easy to drink, this wine has forward lime and stone fruit flavors, excellent acidity and very restrained oak treatment, making for a clean, crisp and refreshing wine. Not your usual overly oaked, buttery chardonnay, it may not be very complex but is a very good value.

#### Reds:

If I can do a Two-Buck Chuck issue, I can do a Yellowtail issue. All 5 Aussie 2005 Yellowtails cost \$5 or so, and are best found at but not restricted to Trader Joe's. All are similar in style: Ready-to-drink-but-do-not-age; fruit-driven, not too tannic or tart; straightforward, go best with burgers and such. You will have to prioritize them yourself, but my taste was for the Shiraz/Cabernet (60%/40%) as first choice because of the lush dark berry fruit that comes alive after 30 minutes airing (which also eliminates the touch of sulfur).

Second place to the Cabernet 70%/Merlot 30%, just a bit less fruit; then a clear step down to the straight Shiraz, a bit briary, tart and less rich. I did not care for the straight merlot or the straight cabernet which were both generic and sulfurous. ❖

## Letter to Charles Tipton

**James S. Wiley** writes: "Thank you for your letter and request for information as part of the year 1936 cohort of physiologists."

"I am still active in research at the University of Sydney and, together with a small group, we are examining the physiology and genetics of the human P2X7 receptor in immune and hemopoietic cells."

"My interest in P2X7 began at the University of Pennsylvania in 1986, when George Dubyak introduced me to this extraordinary receptor. P2X7 is ancient in an evolutionary sense and is activated by extracellular ATP to open a channel which dilates over many seconds to form a maxi-pore. Activation is P2X7 is the basis by which ATP 'permeabilizes' cells long known to some physiologists since the work of Harold Hempling (South Carolina) and John Parker (Chapel Hill)."

"I also maintain some clinical practice which gives me access to a wide range of polymorphic variants of P2X7 with either loss or gain of function. I urge my younger colleagues to follow their curiosity and be prepared to change their field of research, something not always encouraged by granting bodies."

"I am looking forward to retirement when I will continue to work as an Emeritus Professor in a new field of neuroscience."

## Letters to Beverly Bishop

**Clara M. Szego** writes: "First thank you and the Senior Physiologists Committee that you represent for the thoughtful birthday greetings. What a reminder of my long and valued membership in our Society, and also, that it is later than we think!"

"As to the query on my present activities: I have indeed been continuing to a certain extent in writing and in scientific consulting with colleagues who have been vigorously extending the field that my laboratory helped to establish. Primarily, it has been very exciting to see that the conventional wisdom on mechanisms of steroid hormone action, which had been focused exclusively upon late genic activities, has now broadened to encompass the integrated view that the all-important *initial* recognition of the agonist occurs at the surface of those cells equipped with specific receptors at the outer cell membrane;



and that communication of this event toward and into the nuclear compartment occurs through the intervention of a chain of poised, transducing intracellular components. Thus, if I were to have the temerity, in compliance with your suggestion to offer 'words of wisdom' for younger colleagues, it would simply be that *all* confirmed observations on a phenomenon must be incorporated into a concept of function, even if some of which are considered 'inconvenient to strongly entrenched views.'

"In further response to your request for update on my activities, I confess that under the pseudonym of Marian Steele, I have enjoyed a lifetime of writing poetry. Some of my work has, occasionally, appeared in quality small-presses and anthologies. In addition, I lay claim to growing the area's biggest and juiciest tomatoes in our outdoor raised beds. Accordingly, in keeping with the aphorism coined by my husband, Professor Sidney Roberts, I am a firm believer in the 'mind over mattress' mode of behavior."

**John Cotes** writes: "This is a belated 'Thank you' for your good wishes on the occasion of my 80th birthday in February 2004! To be replying 30 months later is evidence for your letter being appreciated, though I had intended replying sooner."

"At the time I was fully involved in a re-write of my book *Lung function, physiology, measurement and application in medicine*. It was for a sixth edition which came out this year (2006) on my birthday. Publication was later than planned, but at a weight of five pounds (2.2 kg) represented a lot of book! The increase in weight compared with the first edition in 1965 was linear on calendar year, with a regression coefficient of 32.5 g per year. The increase matched the growth of the literature but clearly could not be sustained. However, any future edition is unlikely to be my problem."

"I am now back into research and, with my retired colleague Dr. Jim Reed,

recently communicated to Physoc a new two compartment model of exercise ventilation in healthy men (1). The two compartments (alveolar ventilation and ventilation of the airway deadspace) seem obvious now that they have been formulated, so it surprises me that up 'til now we lung physiologists have been content to attribute variations in minute ventilation between individuals to uneven lung function, without attempting to quantify the considerable contribution of pattern of breathing. The omission might be considered a tribute to Dr. John West whose elegant model of distribution of ventilation-perfusion ratios (2) continues to dominate thinking on this subject. Jim's and my new model, like John West's, has great clinical relevance."

"Before the year is out, I expect to have given five communications on pattern of breathing to learned societies in UK and Europe, something that would have been inconceivable had my wife not been a practicing physician with numerous outside interests. Thus, I am keeping my end up!"

Cotes, JE; Reed, JW. *Proc Physiol Soc* 2006:3-C39.

West, JB. *Respir Physiol* 1969; 7:88-110.

## Letter to Martin Frank

Felix Bronner writes: "This Senior Physiologist has been asked to pass on some news to our younger members. With my 92nd birthday safely behind me, I send them some that dates back to the years before I became a member myself."

"A Bit of History: It can fairly be said that modern electrophysiology originated in the 1930s at the Harvard Medical School laboratory run by Alexander Forbes and Hallowell Davis. Forbes had started things ten years earlier while a naval officer in World War I (1914-17) where he encountered the newly discovered vacuum tube. By 1920 he had wired together what was probably the world's first physiological amplifier and used it to deliver amplified nerve action currents to his string galvanometer recording device. His report, in 1920, runs 62 pages in *Amer. J. Physiol.*, vol. 52. Apparently editors were much more lenient with their precious published pages in those days."

"During the 1920s, Forbes and Davis used successively improved amplifiers for their studies on nerve impulses, and when I entered the lab in 1937 its engineer, Albert Grass, had just completed the first recognizably modern versions of

the two devices essential for animal and human electrophysiological research: a multi-channel ink-writing clinical EEG recorder, and the first version of an integrated laboratory system consisting of a stimulus generator, a physiological amplifier, and an oscilloscope with a 32 mm moving picture camera mounted in front of it to record the physiological responses. Both of these instruments were the first stable prototypes of the research and clinical devices used today.

"Sometime during the 1933-34 winter the first EEG alpha rhythms seen outside of Europe were displayed on the oscilloscope that had finally replaced the laboratory string galvanometer. The EEG came off Davis's scalp, recorded by two of his graduate students, H. N. Simpson and A. J. Derbyshire.

"A few years later Professor Davis—he was the elected President of our Society in 1958—brought a patient with epilepsy to the lab and invited several Boston physicians to see what was probably the

first clinical demonstration of an ink-writing EEG machine. When the patient repeatedly produced the dramatic 'spike-dome' abnormality characteristic of that disorder, the future of the EEG as a neurological diagnostic tool was assured.

"The 1930 decade at the Forbes/Davis lab yielded three more noteworthy events.

"The Davises, Hallowell and wife Pauline, reported the first auditory, visual, and somesthetic evoked responses recorded from the scalps of sleeping and waking human subjects. I was one of them, and remember how difficult it is to fall asleep during an experiment when doing so is the whole point.

"Davis recorded cochlear potentials from animals, confirming the Weaver/Bray 1930 demonstration of the electrical response of the cochlea and initiating his lifetime of contributions to hearing research.

"For the first time ever, Birdsey

Renshaw used microelectrodes to record from single brain cells (his hippocampus paper was published in 1940) and, with Davis, I used microelectrodes to record spontaneous and stimulus-driven single cochlear nucleus cell responses from the cat.

"A unique feature of that 1930 decade was the sudden confluence—in Boston and elsewhere—of so many new phenomena to be studied—Berger's brain waves, cortical evoked potentials, cochlear potentials, single brain cell responses—with so many powerful new tools for doing the job—microelectrodes, stable stimulators, reliable amplifiers, and permanent recordings from cathode ray oscilloscopes and ink-writing oscillographs. Surely there has never been a more propitious time to begin a career in neurophysiology than that 1930 decade, and it was my very good fortune to begin my brain research career at that right place at that right time. ❖

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## Noninvasive Positive Pressure Ventilation: State-of-the Art

Hannover, Germany, February 1-3, 2007

**Educational aims:** to provide a comprehensive overview of the current state of noninvasive ventilation in acute and chronic settings; to provide an evidence base for NIV in the ICU, respiratory intermediate care unit, respiratory ward, and for home care; to provide hands-on experience in setting up a variety of ventilators for acute and chronic use

**Target audience:** Young respiratory physicians; Pneumonologists; Intensivists; Anaesthetists; Physiotherapists; Nursing staff; Technicians involved in the provision of acute/chronic respiratory care.

**Course goals:** By the end of the course participants will have a detailed knowledge of: setting up an NIV programme; choosing ventilators and interfaces; selecting appropriate patients and initiating NIV; management of NIV dur-

ing acute exacerbations of COPD; use of NIV for non-COPD acute respiratory failure in the ICU; weaning using NIV; post extubation use of NIV; NIV in neuromuscular and restrictive chest wall disease; NIV during endoscopic procedures; NIV in progressive neuromuscular disease; NIV in children; NIV in congestive cardiac failure; NIV and pulmonary rehabilitation; current guidelines; and areas of controversy.

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## Clinical Applications of Pathology & Imaging in Respiratory Disease

London, UK, February 14-16, 2007

**Educational aims:** The purpose of this course is to provide an informative but critical update relating to a number of important areas within contemporary respiratory medicine. The course aims to provide introductory lectures with discussion sessions, as well as the opportu-

nity for case presentations and hands-on practice for delegates.

In addition to a clinical perspective, you will also gain new and fundamental information in pulmonary radiology, pulmonary pathology, approaches to and techniques in diagnosis, and therapeutic modalities—all relevant to the goal of best care for your patients.

**Target audience:** Pulmonologist; Radiologist; Pathologist; resident preparing for board examinations in these specialties.

By the end of the course, you will be able to: recognize common and unusual pulmonary pathological findings to diagnose a full range of chest diseases; correlate clinical presentation with histopathological and radiographic features; understand more efficiently the relationship between lung pathology, radiology and respiratory conditions; gain knowledge of diagnostic procedures for and treatment of common and unusual pulmonary diseases.

For more information:  
<http://www.ersnet.org> ❖

## 2007

*February 20-25*

**Reproduction: Advances and Challenges, Santa Fe, NM.**  
*Information:* Keystone Symposia. Tel.: 800-253-0685 or 970-262-1230; Fax: 970-262-1525; Email: info@keystonesymposia.org; Internet: <http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=845>.

*March 5-9*

**10th Tamagawa-Riken Dynamic Brain Forum - DBF'07 - In search of a new paradigm for approaching the brain as a complex system, Hakuba, Nagano Prefecture, Japan.**  
*Information:* Internet: <http://www.tamagawa.ac.jp/sisetu/gakujutu/brain/dbf2007/index.html>.

*March 21-23*

**Genomic Disorders, Cambridge, United Kingdom.**  
*Information:* Email: l.criddle@wtconference.org.uk; Internet: <http://firstcontact.hinxton.wellcome.ac.uk>.

*March 22-27*

**Systems Biology and Regulatory Networks, Steamboat Springs, CO.**  
*Information:* Keystone Symposia. Tel.: 800-253-0685 or 970-262-1230; Fax: 970-262-1525; Email: info@keystonesymposia.org; Internet: <http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=870>.

*March 22-27*

**Cell Signaling and Proteomics, Steamboat Springs, CO.**  
*Information:* Keystone Symposia. Tel.: 800-253-0685 or 970-262-1230; Fax: 970-262-1525; Email: info@keystonesymposia.org; Internet: <http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=863>.

*March 25-30*

**Molecular and Cellular Determinants of HIV Pathogenesis, Part of the Keystone Symposia Global Health Series, supported by the Bill & Melinda Gates Foundation, Whistler, British Columbia.**  
*Information:* Keystone Symposia. Tel.: 800-253-0685 or 970-262-1230; Fax: 970-262-1525; Email: info@keystonesymposia.org; Internet: <http://www.keystonesymposia.org/Meetings/ViewMeetings.cfm?MeetingID=857>.

*April 21-25*

**World Congress of Nephrology 2007, Rio de Janeiro, Brazil.**  
*Information:* Email: info@isn-online.org; Internet: <http://www.wcn2007.org>.

*May 9-12*

**First Annual Meeting of the Organization for the Study of Sex Differences, Washington, DC.**  
*Information:* Email: info@ossdweb.org; Internet: <http://www.ossdweb.org>.

*May 18-23*

**American Thoracic Society International Conference, San Francisco, CA.**  
*Information:* Internet: <http://www.thoracic.org>; Email: ats2007@thoracic.org.

*May 21-23*

**TIDES 2007 - Oligonucleotide and Peptide®, Technology and Product Development Conference, Practical Considerations for Progression through Development, Las Vegas, NV.**  
*Information:* IBC Life Sciences. Tel.: 508-616-5550; Fax: 508-616-5533; Email: taskm@ibcusa.com; Internet: <http://www.ibclifesciences.com/TIDES>.

*August 23-26*

**2007 World Conference of Stress, Budapest, Hungary.**  
*Information:* Congress Secretariat, Diamond Congress Ltd., H-1255 Budapest, P.O. Box 48, Budapest 8, Hungary. Tel.: +36 1 214 7701; Fax: +36 1 201 2680; Email: diamond@diamond-congress.hu; Internet: <http://www.stress07.com/index.html>.

*September 16-19*

**10th International Conference on Endothelin, Bergamo, Italy.**  
*Information:* Francesca Di Fronzo, Mario Negri Institute for Pharmacological Research, via Gavazzeni, 11-24125 Bergamo, Italy. Tel.: +39 035 319888; Fax: +39 035 319331; Email: difronzo@et-10.it; Internet: <http://www.et-10.it>.

## 2008

*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/>.

If you are interested in having your upcoming meeting posted on APS' Related Meetings page (<http://www.the-aps.org/meetings/related>), please forward the following information to [webmaster@the-aps.org](mailto:webmaster@the-aps.org):

Date

Meeting Title, Location

Information:

*Example:*

April 28-May 2, 2007

Experimental Biology 2007, Washington, DC

Information: EB 2007 Registration Office, 9650 Rockville Pike, Bethesda, MD 20814-3998. Tel.: 301-634-7010; Fax: 301-634-7008; Email: eb@faseb.org; Internet: <http://www.eb2007.org>



**2006 AMERICAN PHYSIOLOGICAL  
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**Comparative Physiology 2006:  
INTEGRATING DIVERSITY**

**October 8-11, 2006**

**Virginia Beach, Virginia**



**Conference  
Program  
and Abstracts**



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and Biophysics

2006 AMERICAN PHYSIOLOGICAL SOCIETY CONFERENCE

# Physiological Genomics and Proteomics of Lung Disease

NOVEMBER 2-5, 2006  
FORT LAUDERDALE, FLORIDA

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## Conference Program and Abstracts

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