Published by the American Physiological Society – *Integrating the Life Sciences from Molecule to Organism*

THE PHYSIOLOGIST

aps American Physiological Society

May 2016 • Vol. 59/No. 3

# Co-Principal Investigators And Co-Directors: Benefits of a Scientific Copilot

**Karyn L. Hamilton and Benjamin F. Miller**
*Colorado State University, Fort Collins, Colorado*

***"Life's better with company. Everybody needs a copilot."***
**From the movie *Up in the Air*, 2009**

Karyn L. Hamilton

Benjamin F. Miller

Ever since we combined our laboratories and began serving as scientific and academic "copilots," we have been entertaining questions and comments about our unique working arrangement. Although our relationship is somewhat unique, for us it was such a logical decision that we wonder, "Why don't more academic researchers run programs this way?" Indeed, others have used this strategy, and often to great success. For example, Drs. Michael Brown and Joseph Goldstein merged their research programs in 1972 and produced countless important contributions to the area of cardiovascular physiology and discoveries that earned them the Nobel Prize in Physiology or Medicine in 1985 (Goldstein J, Brown M. Joseph Goldstein and Michael Brown: demoting egos, promoting success. Interview by Ruth Williams. *Circ Res* 106: 1006-1010, 2010). In fact, most refer to Brown and Goldstein as if they are a single entity rather than individuals. While we are in no way comparing our success to that of Brown and Goldstein, we do share their experiences and can identify with their "practicalities of partnership." Our intent with this article is to address some of the questions we frequently receive and, in the process, highlight the benefits of co-directing a research program. It is our hope that this information will be valuable for others who are considering a similar working arrangement and for those who evaluate individuals in a co-directed research program.

### *Q: Why did you combine your labs?*

At first, combining our lab seemed practical. One of us had substantial expertise with in vivo human studies, and the other was proficient

*Continued on page 130*

A Matter of Opinion

## Planning for the Future

The American Physiological Society was founded in 1887, and at the time that I became Executive Director in 1985, the Society had 6,100 members and an annual budget of $4 million. APS was a founding member of the Federation of American Societies for Experimental Biology (FASEB), participating in a multi-society annual meeting called the FASEB meeting, and publishing multiple scientific research and review journals. Full regular membership was open to PhD/MD scientists in the United States, Canada, and Mexico. Those residing outside of this area were corresponding members without voting privileges. When I arrived, the Society was preparing for its centennial celebration

*Continued on page 132*

THIS ISSUE:

Published by the American Physiological Society – *Integrating the Life Sciences from Molecule to Organism*

# THE PHYSIOLOGIST

aps American Physiological Society

**Published bimonthly and distributed by The American Physiological Society**

9650 Rockville Pike
Bethesda, Maryland 20814-3991
ISSN 0031-9376



Subscriptions: Distributed to members as part of their membership. Nonmembers in the USA (print only): individuals $110.00; institutions $205.00. Nonmembers international: individuals $165.00; institutions $255.00. Single copies and back issues when available, subscriber $30.00 each; nonsubscriber $60.00 each. Subscribers to *The Physiologist* also receive abstracts of the Conferences of the American Physiological Society. The online version is available free to all worldwide.



**Please notify the APS Membership Department as soon as possible if you change your address or telephone number.**

Headquarters phone: 301-634-7118
Fax: 301-634-7241
Email: webmaster@the-aps.org
http://www.the-aps.org
Printed in the USA

# Contents

# Mentoring Forum

## How to Find More Hours in the Day

**Michelle L. Gumz**
*University of Florida, Gainesville, Florida*

Michelle Gumz

"Time keeps on slippin', slippin', slippin' . . . into the future," sang the Steve Miller Band (17). I grew up listening to this genre of music, and these song lyrics often get stuck in my head. Time does indeed seem to slip away more quickly than we would like. These particular song lyrics running through my head are amusing to me because I work on circadian clock proteins, the molecular time keepers of physiological function. It should come as no surprise then that I spend an awful lot of time thinking about time. Although not all readers of this column may consider time a critical experimental variable, certainly most of us wish we had more time: more hours in the day, more days in the week, etc. I often joke that perhaps I should change the lab's focus from the kidney clock to the development of a time-turner, like the one Hermione used in *Harry Potter and the Prisoner of Azkaban* (13) to squeeze as much into her schedule as possible. In the absence of magical abilities, what can we do to find more time in the day? One answer to this problem lies in harnessing the power of your body's circadian clock.

What is your body clock and what does it do? Within nearly every cell of the body is a molecular clock mechanism: a set of core circadian clock proteins mediate oscillations in gene expression, ultimately resulting in daily rhythms in physiological function. This mechanism is strongly conserved across several kingdoms of life and provides an important selective advantage, allowing organisms to adapt to their environment (3). Blood pressure exhibits a circadian rhythm, as does body temperature, gastrointestinal and immune function, and a number of other physiological processes (12). The central clock in the brain is directly entrained by light, and food cues contribute to synchronized rhythms among the central clock and peripheral clocks in other tissues. (For excellent reviews on the details, see Refs. 5, 11.) Coordinating the timing of food and light cues and sleep/wake habits can help you and your clock function as efficiently as possible. Time management tips and tricks abound on the internet, but this article will summarize the three best practices that have benefitted my colleagues and me since we began studying circadian biology.

### Sleep More!

The latest guidelines from the National Sleep Foundation (10) suggest that most adults need between 7 and 9 hours of sleep every night. Although we might tend to think we can get more done if we sacrifice sleep, getting adequate sleep actually helps us to be more alert, efficient, and productive during the day. Studies show that a significant number of adults are chronically sleep deprived, with consequences for cardiovascular health (6). The consequences of too little sleep are similar to those for other risk factors – increased incidence of cardiovascular disease, obesity, diabetes, and cancer (7). A recent meta-analysis demonstrated a U-shaped curve for the relationship between sleep duration and all-cause mortality (16), providing a strong argument for getting ~7 hours of sleep per night!

### Avoid Social Jet Lag!

Social jet lag was first defined by Dr. Till Roenneberg of the University of Munich to refer to the misalignment of our internal clocks with our external environment (18). To take advantage of your body clock, it helps to know your chronotype. Webster (9) defines chronotype as "the internal circadian rhythm or body clock of an individual that influences the cycle of sleep and activity in a 24-hour period." Most of us can be categorized as "morning larks" or "night owls." One example of social jet lag would be a night owl forced to be at work by 6 AM and thus has to endure a "morning lark" schedule that is misaligned with his/her internal body clock. Social jet lag has been linked to adverse health outcomes and has been documented to occur in several populations as early as adolescence (8, 14). Social jet lag can also stem from keeping one schedule on work days and another on rest days. For many people, this may explain why we feel terrible on Monday mornings. The effect of staying

up 3 hours later than your usual bedtime on Friday and Saturday nights effectively shifts your circadian rhythm as if you had traveled back and forth between Miami and Los Angeles for the weekend. Keeping the same sleep schedule on weekends and work days will help you avoid a case of "the Mondays" and could improve your mood and work performance during the week. An acquaintance of mine recently started following this advice, and she described the results as "life-changing." Consistent timing of food intake is also important for synchronizing your body clock (3). Staying on the same meal schedule from work days to rest days can potentially be beneficial as well.

## Manage Your Light Exposure!

The detrimental effects of artificial light at night (ALAN) are well established (2). A recent publication in the *International Journal of Obesity* provided the first population level findings linking ALAN to the obesity pandemic (15). A new industry has developed in response to studies like these. Special lighting for the home is available, and there are now blue-light filter apps for smartphones. Mainstream news reports offer suggestions related to reducing our exposure to light at night, including putting phones and computers away well before bedtime (4). The blue light emitted by electronic devices travels from the retina to the brain and exposure at night can disrupt circadian function, making your body clock think it's earlier in the day rather than time for bed. In addition to reducing exposure to ALAN, increasing exposure to natural sunlight during the day is also important! Sunlight is an important entraining cue for the circadian clock. A recent study demonstrated that office workers without a window experienced reduced sleep quality and less sleep time compared with workers with an office window (1). A short light break to walk outside and experience sunlight may actually help you sleep better at night, making you feel more rested and allowing you to be more productive.

In summary, to find more time and be more productive during your day, try these three ideas: optimize your light exposure (more natural light earlier in the day and less artificial light from phones/computers late in the day); keep the same sleep/wake and meal schedules on rest and work days; and get more sleep! ●

### References


1. Boubekri M, Cheung IN, Reid KJ, Wang CH, Zee PC. Impact of windows and daylight exposure on overall health and sleep quality of office workers: a case-control pilot study. *J Clin Sleep Med* 10: 603-611, 2014.

2. Cho Y, Ryu SH, Lee BR, Kim KH, Lee E, Choi J. Effects of artificial light at night on human health: a literature review of observational and experimental studies applied to exposure assessment. *Chronobiol Int* 32: 1294-1310, 2015.

3. Dibner C, Schibler U. Circadian timing of metabolism in animal models and humans. *J Intern Med* 277: 513-527, 2015.

4. Huffington Post UK. The health risks of keeping your mobile phone in your bedroom (Online). *http://www.huffingtonpost.co.uk/2014/03/11/mobile-phone-bedroom-risks_n_4940199.html*.

5. Husse J, Eichele G, Oster H. Synchronization of the mammalian circadian timing system: light can control peripheral clocks independently of the SCN clock: alternate routes of entrainment optimize the alignment of the body's circadian clock network with external time. *Bioessays* 37: 1119-1128, 2015.

6. Jackson CL, Redline S, Emmons KM. Sleep as a potential fundamental contributor to disparities in cardiovascular health. *Annu Rev Public Health* 36: 417-440, 2015.

7. Luyster FS, Strollo PJ Jr, Zee PC, Walsh JK; Boards of Directors of the American Academy of Sleep Medicine and the Sleep Research Society. Sleep: a health imperative. *Sleep* 35: 727-734, 2012.

8. Malone SK, Zemel B, Compher C, Souders M, Chittams J, Thompson AL, Lipman TH. Characteristics associated with sleep duration, chronotype, and social jet lag in adolescents. *J Sch Nurs* 32: 120-131, 2016.

9. Merriam-Webster Dictionary. *http://www.merriam-webster.com/dictionary*.

10. National Sleep Foundation. *http://www.sleepfoundation.org*.

11. Partch CL, Green CB, Takahashi JS. Molecular architecture of the mammalian circadian clock. *Trends Cell Biol* 24: 90-99, 2014

12. Richards J, Gumz ML. Mechanism of the circadian clock in physiology. *Am J Physiol Regul Integr Comp Physiol* 304: R1053 – R1064, 2013.

13. Rowling JK. *Harry Potter and the Prisoner of Azkaban*. New York: Scholastic, 1999.

14. Rutters F, Lemmens SG, Adam TC, Bremmer MA, Elders PJ, Nijpels G, Dekker JM. Is social jetlag associated with an adverse endocrine, behavioral, and cardiovascular risk profile? *J Biol Rhythms* 29: 377-383, 2014.

15. Rybnikova NA, Haim A, Portnov BA. Does artificial light-at-night exposure contribute to the worldwide obesity pandemic? *Int J Obes (Lond)*. In press.

16. Shen X, Wu Y, Zhang D. Nighttime sleep duration, 24-hour sleep duration and risk of all-cause mortality among adults: a meta-analysis of prospective cohort studies. *Sci Rep* 6: 21480, 2016.

17. Steve Miller Band. Fly like an eagle. In: *Fly Like an Eagle* (Album). Los Angeles, CA: Capitol Records, 1976.

18. Wittmann M, Dinich J, Merrow M, Roenneberg T. Social jetlag: misalignment of biological and social time. *Chronobiol Int* 23: 497-509, 2006.

Michelle L. Gumz is an Assistant Professor of Medicine and Biochemistry and Molecular Biology at the University of Florida. Gumz received her undergraduate degree in Biochemistry from the University of California Riverside and her Ph.D. from the University of Florida. Gumz's postdoctoral training in tumor biology and renal physiology took place at the Mayo Clinic and the University of Florida. The Gumz lab is located in the Division of Nephrology, Hypertension, and Renal Transplantation at the University of Florida, where the lab is working on circadian clock proteins in the regulation of blood pressure and renal function. Gumz is an active member of APS and currently serves as the Treasurer of the Renal Section and is a member of the Women in Physiology Committee.

*Continued from page 125:*

## Co-Principal Investigators And Co-Directors: Benefits of a Scientific Copilot

in methods and approaches employing tissue culture and animal models. Furthermore, we shared an interest in aging and chronic disease, and by combining our expertise we were able to take a translational approach to addressing our aims. However, sustaining the partnership requires more than just practicality. We believe that our collective productivity far exceeds the sum of our individual contributions. For example, if one of us has an idea, that idea can be turned over several times verbally between the two of us so that by the time it reaches paper, the idea has evolved to the point where it might be unrecognizable and therefore not attributed to an individual. That kind of process improves an idea substantially and is far more enjoyable and effective with a "copilot" than it was alone.

### *Q: How do you decide who is the principal investigator or senior author?*

We view one another's intellectual contribution to be equal. As mentioned above, ideas that arise from discussions cannot be attributed to an individual. Therefore, all grants are written as co-principal investigators and published papers as co-senior authors – this happens as the default and without discussion. Inevitably, we are questioned about our experience with multiple PI plans in our grant proposals. Simply stated, we very clearly identify for the reviewers our roles, responsibilities, communication, and plan for conflict resolution should it be needed (it hasn't!), and we have not had any reviewer concerns. As we have progressed, it is likely that some peers understand our arrangement so that it is the lab being evaluated rather than our multiple PI plan.

### *Q: What about mentoring trainees?*

Mentoring students and fellows is by far one of our favorite aspects of academic research. We co-mentor all of the trainees in our lab, and, importantly, we make this co-mentorship very clear before prospective trainees join the lab. We are very committed to holding at least weekly meetings with all students, during which time the students learn from both our individual and our collective strengths as well as our weaknesses. Furthermore, when one of us is occupied with other responsibilities, the students still have the copilot available to help guide them. We do not try to have the same mentoring style since there is little added benefit to the student from both of us being the same. Sometimes a student simultaneously requires a nudge from one mentor and a pat on the back from the other. Importantly, these are not in conflict and are both beneficial. Through others, we have heard the positive impact our co-mentorship has had on students, and we interpret the placement of our trainees in postdoctoral fellowships and subsequent career success as indicators that the dual mentorship model works well. Perhaps the greatest reflection of the success of our "copilot" approach to directing trainees is the decision of two former departmental trainees to co-direct a lab together. In this case, imitation was the best form of flattery.

### *Q: What do your administrators think?*

A very important point to make is that support from administration at both the department and college levels has been critical to the success of our scientific copilot approach. Our department heads and deans have completely supported our approach, which is particularly important when working toward tenure and promotion. Recently in a promotion discussion, the comment arose that it was difficult to parse the individual contributions to collective success. Thankfully, our department head recognized that collective effort led to collective success and that there was no need for parsing. Our department also has a shared resource philosophy, which complements a co-directed laboratory approach by fostering collaborative, multidisciplinary research both within the lab and with other labs. It benefits the department and college to have successful research programs because of the money and prestige that those labs bring. If having a co-PI approach increases the chance of success, why would the administration not want to support that effort? It is more of a benefit to have one successful program with two PIs than two unsuccessful programs with individual PIs.

### *Q: How do you identify the right person, and how do you make it work?*

This question is probably the most difficult one to answer, and we can merely share our opinion on what qualities and characteristics have aided our scientific copilot. The partnership should be born from a shared set of research interests and different but complementary approaches to pursuing them. The complementarity extends beyond research approaches to those that bolster personal strengths while mitigating personal weaknesses. In

that sense, it helps for personalities to be different but compatible with dedication to the "greater good" of the research program.

We believe that three attributes are critical for the success and longevity of a co-directed research program: selflessness, respect, and trust. Selflessness is demonstrated by elevating the research program and even the other copilot above oneself. To do so requires setting aside any personal ego, and we speculate that this contributes to the dearth of co-PI labs. Unfortunately, it is traditional that individual success, not laboratory success, is rewarded in science. To circumvent this issue, we simply have not put personal recognition as a goal. Instead, we are dedicated to the success of the lab. Second, we respect one another. Like any relationship, personal or professional, there has to be a mutual respect. Finally, we trust that we both entered into a partnership for a common goal. By having these qualities, it is known that even when you may not agree with the other person, you respect their decision and trust that it was made in the interest of both of you.

These thoughts are just what we have learned along the way. We hope that this perspective encourages others to try a similar approach. We have challenges too, but overcoming the challenges is always easier with a copilot. ●

*Continued from page 125:*

## Planning for the Future

and was spending much of its time looking backward at its history as opposed to focusing on future opportunities for the Society and for the discipline. My charge, besides getting through the centennial, was to focus the Society on its future and that of the discipline.

The concept of strategic planning and introspection is not foreign to the APS. Ralph Gerard wrote a book titled *Mirror to Physiology* in 1958 that explored the health and viability of the discipline (3). In 1990, an APS Long Range Planning Committee reported on the discipline of physiology and the Society, and made multiple recommendations designed to strengthen both (4). There were many such efforts between both reports. During my tenure as APS Executive Director, the Society has held four strategic planning retreats, creating the 1992 (5), 2000 (2), 2006 (1), and 2011 (6) Strategic Plans. The 2011 Strategic Plan focused on five key strategic priority areas:

- increase efforts to ensure awareness of, and advocacy for, the discipline of Physiology
- actively work to attract, meet the needs of, engage, and retain membership subgroups
- develop strategies to strengthen the Society's publications in a changing world
- enhance opportunities for scientific interaction and exchange
- increase the visibility of physiology in life sciences and health sciences education.

When one reviews the various strategic planning documents, one is struck by the extraordinary high level of success the Society has achieved in meeting the goals, objectives, and action items set forth in these plans. Indeed, the APS is now comprised of nearly 11,000 members and has an annual budget of approximately $20 million.

However, as we all know, past performance is not a predictor of future success. Yes, APS has been a success over the past 30 years, growing in size, in stature, and in program offerings. However, there remains a malaise impacting the Society's ability to recognize and accept its past successes. I have referred to it as a Rodney Dangerfield moment, a moment when neither the Society nor the discipline of physiology gets the respect it deserves. What has contributed to that malaise? There are several factors, none of which are truly under our control. Specifically, they are:

- LCME-directed restructuring of the medical school curriculum from a semester-based to a problem-/case-based teaching program
- consolidation of basic science departments in academic medical schools, eliminating the name *physiology* from departmental structures
- the NIH funding crisis and the move to support translational research without recognizing the need for basic science/physiology, which serve as building blocks for translational medicine
- a generalized sense that physiological research is not modern science, yet genomics without physiology is only A, C, T, and G.

While we could address the problem by conducting another strategic planning retreat, it is difficult to do so successfully without some better insights into the challenges facing the discipline. To gain better insight into the challenges facing the Society and the discipline, the APS issued an RFP seeking the assistance of professionals who could help the Society better assess the situation. The RFP was sent to approximately 15 consulting groups, from which the candidate pool was narrowed to 6. The Society selected Minding Your Business (MYB), a group that worked with the American Anthropological Association. MYB has been conducting focus groups and surveying members and nonmembers to identify issues and to help us better assess the problems facing the Society and the discipline. For those who have responded to the survey or participated in the focus groups, thank you. We expect to receive MYB's report this summer, and it will help guide the Society as it prepares for its next strategic planning meeting in 2017. Our goal is to meet the needs of our membership and our discipline in order to maintain physiology's role as a critical science in the discovery process. ●

**Martin Frank**

### *References*

1. American Physiological Society. American Physiological Society Strategic Plan 2006-2010. *The Physiologist* 49: 163-169, 2006.

2. Boron WF. The APS Strategic Plan: a vision for the new millennium. *The Physiologist* 43: 71-74, 2000.

3. Gerard RW. *Mirror to Physiology: A Self-Survey of Physiological Science.* Bethesda, MD: Am. Physiol. Soc., 1958.

4. Giebisch GH, Granger JP, Greenleaf JE, Lydic RB, Mitchell RH, Nadel ER, Schultz SG, Wood JD, Knobil E. What's past is prologue. A "white paper" on the future of physiology and the role of the american physiological society in it. *The Physiologist* 33: 161-177, 180, 1990.

5. Staub NC, Schultz SG, Frank M. American Physiological Society's Strategic Plan. *The Physiologist* 35: 37, 40-42, 1992.

6. Towards a strategic plan: summary of APS strategic planning meeting. *The Physiologist* 54: 113, 116-120, 2011.

# Science Policy

## President Obama Presents FY 2017 Budget Proposal

On February 9, 2016, President Obama presented his budget proposal for fiscal year (FY) 2017. This is the President's final budget proposal, and he took the opportunity to highlight his administration's priorities, including research: If the President's FY 2017 request were enacted, overall funding for research and development would increase by 4%.

It is important to note that Congress is currently operating under budget caps established through the Bipartisan Budget Act of 2015. This legislation provided additional discretionary funding for FY 2016 and 2017, but the overall budget level for FY 2017 will only be $3 billion more than the FY 2016 level. Rather than adhere to these caps, President Obama proposed both discretionary and mandatory funding for a number of programs in his budget request. Currently, these programs are funded only through discretionary spending via the annual Congressional appropriations. Adding mandatory spending would require Congress to pass new authorizing legislation, and it is unclear whether there is the political will to accomplish this.

The table below gives an overview of research agency funding requests in the President's FY 2017 budget, along with FASEB's recommendations.

The budget proposal for the NIH would include $825 million in new money for priority programs including the Cancer Moonshot ($680 million), the Personalized Medicine Initiative ($100 million), and the BRAIN initiative ($45 million). The President's FY 2017 budget would hold the rest of the NIH to FY 2016 funding levels. The total FY 2017 request would bring the estimated total number of research project grants (RPGs) to 36,440 (+600 vs. FY 2016), with 9,946 new and competing grants (-807 vs. FY 2016). Please note that, in the current year (FY 2016), some of the budget increase will be spent on RPGs that incur multi-year commitments, which will decrease the number of new and competing grants NIH can fund in FY 2017.

The budget proposal for the NSF would provide a $500 million increase, with $400 million of that request in the form of new mandatory spending. The budget for the BIO directorate would be increased by 6.2%, whereas Research and Related Activities overall would receive a 6.5% increase.

As has become tradition in Washington, members of Congress declared President Obama's budget dead on arrival. More information will become available as Congress gets its budget and appropriations processes underway.

| Agency | FY 2016 Enacted | FY 2017 Proposal | FY 2017 Discretionary Request | FY 2017 Mandatory Request | FASEB FY 2017 Recommendation |
|---|---|---|---|---|---|
| NIH | $32.311 billion | $33.13 billion (+2.6% over FY 2016) | $31.31 billion ($1 billion **below** FY 2016) | $825 million for initiatives; $1.145 billion for the base | At least $35 billion |
| NSF | $7.46 billion | $7.96 billion (+6.7% over FY 2016) | $7.56 billion ($100 million above FY 2016) | $400 million | At least $7.9 billion |
| VA Medical & Prosthetic Research | $630.7 million | $663 million (+5% over FY 2016) | $663 million ($32.3 million above FY 2016) | $0 | At least $664.7 million |
| NASA | $19.3 billion | $19.0 billion (-1.6% over FY 2016) | $18.25 billion ($1.05 billion below FY 2016) | $763 million | FASEB does not make a recommendation |

# USDA Introduces "Teachable Moments" to the Animal Welfare Inspection Guide

On January 14, 2016, USDA Animal Care (AC) announced several updates to the Animal Welfare Inspection Guide. Of particular interest is a new option permitting USDA inspectors to address certain noncompliant items through "teachable moments" rather than citations. To be eligible for a teachable moment, the noncompliance must be a minor item that cannot impact animal welfare. In addition, it must be something that is not likely to become a serious noncompliant item, that can be quickly corrected by the facility, and that isn't a repeat offense.

According to the USDA announcement, teachable moments are meant to provide "an educational approach that allows an inspector and a licensed/registered facility to work together to bring minor issues at that facility that are not impacting animal welfare into compliance with Animal Welfare Act regulations and standards." Additional information is available on USDA's website at *https://www.aphis.usda.gov/animal_welfare/downloads/Animal%20Care%20Inspection%20Guide.pdf*.

## How the Process Works

The following scenario is an example of how a teachable moment might be implemented at an institution.

During a site visit, an inspector performs a walkthrough of an animal facility and finds a trash can with a missing lid inside one of the animal rooms. The inspector shares this finding with a technician from the facility. The technician then moves the trash can to the hallway until a lid can be located.

The inspector determines that the exposed trash can does not impact the health or well being of the animals in the room, is not likely to become a serious noncompliant issue, and can easily be corrected by the facility. The inspector documents the finding as a teachable moment rather than issuing a citation.

During the close-out interview with the institution, the inspector discloses his finding. The Institutional Official immediately arranges for a lid to be placed on the trash can before the inspector leaves the site. A copy of the teachable moment report is provided to the institution and uploaded to the Animal Care Inspection System after it has been reviewed by the inspector's Supervisory Animal Care Specialist (USDA Animal Welfare Inspection Guide, Chapter 2).

## Special Considerations with Teachable Moments

Certain noncompliance items cannot be addressed through a teachable moment. These include the following: any issue that was previously cited as a teachable moment; any issue that does not meet the criteria of a teachable moment; any issue that should receive a direct or critical citation; and any issue that does not comply with a section of the regulations that is referenced in another citation.

USDA will take note of institutions where multiple teachable moments are issued, and those facilities should be re-inspected within 90 days to ensure that they remain in compliance. ●

## FASEB Issues Reproducibility Recommendations

On January 14, 2016, FASEB issued a report entitled *Enhancing Research Reproducibility,* outlining various steps needed to promote the reproducibility and transparency of research.

The recommendations address general factors that impede the ability to reproduce experimental results, as well as specific issues that affect two key research tools: mice and antibodies. The report suggests actions that could be taken by stakeholders, including scientists, institutions, professional societies, journals, and federal agencies, to enhance rigor, reproducibility, and transparency.

*Enhancing Research Reproducibility* was based on four meetings involving delegates from APS and other FASEB member societies, invited experts, and representatives of federal granting agencies.

Read the report at *http://bit.ly/ResearchReproducibility*. ●

# Chapter News

## Annual Meeting of the Puerto Rico Physiological Society Discusses Pathophysiological Mechanisms of Stress

**Sabzali Javadov**
***President, APS Puerto Rico Chapter-Puerto Rico Physiological Society***

The Sixth Annual Meeting of the Puerto Rico Physiological Society (PRPS) was held on Friday, February 12, 2016 in San Juan. The meeting was hosted by the University of Puerto Rico (UPR) Medical Sciences Campus and brought together over 120 faculty and trainees from all universities and research institutions of Puerto Rico. Meeting participants were welcomed by Edgar Colon, Dean of the UPR School of Medicine, and Sabzali Javadov, President of PRPS, who described the main objectives of the meeting and relevance of the topic "Pathophysiological Mechanisms of Stress on Different Levels: From Cells to Organisms."

The first speaker was Martin Frank, Executive Director of APS, who gave a detailed presentation on the role of APS in the development of the physiological sciences through its interaction with chapters affiliated to the Society. He discussed the issue of members' access to publications, meetings, and education programs, and the role of the Society in the professional development of physiologists by providing access to career-related services and through scientific interactions in meetings and conferences.

The scientific sessions were moderated by Javadov and Sylvette Ayala-Peña (Secretary/Treasurer PRPS), and included the following presentations. Peter Lauf, from the Department of Pathology, Boonshoft School of Medicine, Wright State University (Dayton, OH), presented recent data on the role of Bcl-2 proteins and the sodium-potassium ATPase in cell survival and death. The presentation was followed by an exciting talk on the possible evolutionary role of sialic-acid recognizing I-type lectins (Siglecs) in inflammation and aging by Ajit Varki from the Departments of Medicine, and Cellular and Molecular Medicine, UC San Diego (La Jolla, CA). Then Charles Steenbergen, from the Department of Pathology, Johns Hopkins University (Baltimore, MD), highlighted the mechanisms of adverse effects of mitochondrial micro-RNA overexpression in the heart. Kevin Davy, from the Department of Human Nutrition, Foods, and Exercise, and Fralin Translational Obesity Center, Virginia Tech (Blacksburg, VA), discussed the results obtained by his group on the interindividual variability in metabolic and cardiovascular adaptation to the stress by caloric

Main session of PRPS meeting

PRPS Meeting participants (from *left* to *right*): Sylvette Ayala, Sabzali Javadov, Edward Hall, Ajit Varki, Caroline Appleyard, Kevin Davy, Charles Steenbergen, Martin Frank, Peter Lauf, Norma Adragna, and Guido Santacana

PRPS honors Pablo Altieri with a Distinguished Service Award. From *left* to *right*: Martin Frank, Sabzali Javadov, Pablo Altieri, Nelson Escobales, and Guido Santacana

excess. He was followed by Caroline Appleyard, from the Department of Basic Sciences, Ponce Health Sciences University (Ponce, PR), who described novel interventions for targeting stress-induced exacerbation of endometriosis. Norma Adragna, from the Department of Pharmacology & Toxicology, Boonshoft School of Medicine, Wright State University (Dayton, OH), talked about the mechanisms of oxidative stress-modulation of potassium-chloride cotransporters. And finally Edward Hall, from the Department of Anatomy & Neurobiology, University of Kentucky Chandler Medical Center (Lexington, KY), presented new data on pathophysiological mechanisms and treatment of oxidative stress in central nervous system injury.

During the meeting, Pablo Altieri, a Professor of Medicine and Cardiology at the UPR School of Medicine, was awarded with a "Distinguished Service Award" for his outstanding contributions to the Society and the physiological sciences in Puerto Rico. Altieri has contributed to improve education and healthcare in Puerto Rico through the training of new physicians and biomedical scientists. He has been a strong supporter of the PRPS since its creation in 2009.

The main session was followed by a poster session where undergraduate students together with graduate students and postdoctoral fellows from academic institutions in Puerto Rico presented the most recent results of their research. The posters were evaluated by a Judge Committee to estimate the overall quality of the presentations. Following the poster session, the Committee announced the winners of the presentations that included: Raymond Isidro from the Department of Basic Sciences Ponce Health Sciences University, who received the Pablo I. Altieri Research Recognition Award for his work entitled "The Probiotic Mixture VSL#3 Attenuates Colitis and Decreases Macrophage Infiltration in an Acute Colitis Model"; Pablo González from the Department of Physiology, UPR Medical Sciences Campus, received the First PRPS Award for his work "Effects of Tamoxifen on Secondary Damage and Regenerative Proteins After Spinal Cord Injury"; Omar Soler-Cedeño from the Basic Sciences Department, Ponce Health Sciences University, received the Second PRPS Award for his presentation on "Fear Conditioning and Extinction Induce Plasticity of Ventral Hippocampus Synapses in the Medial Prefrontal Cortex"; and Annelyn Torres-Reverón from the Department of Basic Sciences, Ponce Health Sciences University, received the Third PRPS Award for her presentation entitled "Changes in CRF and CRF-Receptor Type 1 Within Endometriotic Vesicles and Uterus During Early Endometriosis."

Following the poster session, President of the PRPS Sabzali Javadov gave the business report

Poster session

to the Chapter. He informed about the new PRPS webpage (*www.prps-aps.org*) that contains detailed information about past, current, and future activities of the Society. PRPS established the Pablo I. Altieri Research Recognition Award, which will be awarded every other year. It is alternated with the Peter Lauf and Norma Adragna Travel Award created in 2011. Both awards, recognizing quality and outstanding contributions to the physiological sciences, are presented to students and young investigators during the Annual PRPS meetings. The awards support travel expenses of awardees to attend scientific meetings on biomedical research.

Javadov also reported on outreach activities by the Chapter conducted last year by PRPS members from the Department of Physiology, University of Puerto Rico School of Medicine, the Department of Basic Sciences, Ponce Health Sciences University, and the Pontifical Catholic University of Puerto Rico. These activities included the PhUn Week activity at four elementary and high schools of the island that involved more than 200 students. These activities were conducted at Caribbean School, Colegio San Conrado and Academia Santa Maria Reina in Ponce, and the Colegio del Espiritu Santo in Hato Rey. During the outreach activities, faculty members and graduate students gave a talk about general principles of physiology, major physiological systems in human body, and how important to be a physiologist in research and academic areas. They also presented basic concepts of physiological systems, with demonstrations that involved the participation of school students. At the end of activities, PRPS members responded questions from interested students.

Finally, Javadov acknowledged the sponsors of the meeting, which included the UPR School of Medicine and the Department of Physiology, the American Physiological Society, Ponce Health Sciences University, and Central University of the Caribbean. He also expressed his gratitude to the Department of Physiology, the Poster's Judge Committee members, and volunteers for their assistance in organizing and helping to make the meeting a success.

The business meeting of the PRPS finished with the selection of the new Executive Committee members for 2016-2017: Priscila Sanabria, President (Universidad Central del Caribe); Cariluz Santiago, President-Elect (Pontifical Catholic University of Ponce); Gladys Chompre, Secretary/Treasurer (Pontifical Catholic University of Ponce); Rebecca Parodi, Councilor (UPR School of Medicine); and Yaileen Quiñones, Councilor (Universidad Central del Caribe). ●

PhUn Week activity for high school students at Holy Spirit School in Hato Rey, Puerto Rico, organized by faculty members and graduate students of the Department of Physiology, UPR School of Medicine

# The Eighth Annual Meeting of the Arizona Physiological Society

A very successful eighth annual meeting of the Arizona Physiological Society (AzPS) was hosted by Midwestern University during November 13-14, 2015. In attendance were 89 registrants, from five state-wide university campuses: University of Arizona-Tucson (UA-Tuc), University of Arizona-Phoenix (UA-Phx), Arizona State University (ASU), Northern Arizona University (NAU), and Midwestern University (MWU). Of those attending, 35/89 (41%) were faculty members, 8/89 (16%) were postdoctoral trainees, 33/89 (31%) were graduate students, and 13/89 (12%) were undergraduate and medical students. A number of high-quality abstracts (51 total) were submitted from undergraduate students (11), graduate students (28), postdoctoral fellows (7), and regular members (5). The meeting was sponsored by The American Physiological Society, Midwestern University Office of the President, Midwestern University Department of Physiology, University of Arizona-Tucson Department of Physiology and College of Medicine, Northern Arizona University, and Arizona State University, with additional contributions from the following vendors: DMT and ADInstruments (both of whom also attended and participated in the meeting).

The meeting commenced with an introduction and welcome given by Society Immediate Past-President Layla Al-Nakkash (MWU) and Society President Kiisa Nishikawa (NAU), and followed with the first session of the conference, "Trainee Physiology Research Presentations-I," chaired by Tobias Riede (MWU) and Johnnie Moore-Dotson (Postdoc, UA-Tuc). There were five talks in this session, with topics ranging from "The Kinetics of Ligand Interactions With the Organic Cation NBD-MTMA at OCT2" by Philip Sandoval (grad. student, UA-Tuc), to "An Evaluation of Eccentric Contraction Function During a Stretch Shortening Cycle for Muscles in Mice" by Anthony Hessel (grad. student, NAU).

The second session of the conference included two concurrent events, and attendees could participate in one of the two sessions and then swap after 30 minutes. *Session 1:* "Sim Lab & Teaching of Health Care Professionals" by Jaqueline Spiegel [PA-C, Director of Clinical Skills and Simulation Center (MWU)] and Layla Al-Nakkash (Professor, MWU). The session aimed to describe the potential uses of the Sim Center in healthcare education and utilized the

Sim lab 1: pneumothorax demonstration by Faisal Masood (MSII; lead), Omar Jawhar (MSII), and Trung Mylavarapu (MSII)

Sim lab 2: pneumothorax demonstration by Shawn Catmull (MSII; lead), Doug Gauffin (MSII), and Charisma Mylavarapu (MSI)

Poster presentation awardees, undergraduate, graduate student and postdoctoral trainees. From *left* to *right:* Kiisa Nishikawa (NAU), Cheng-Yu Chen (UA-TUC), Manal Zein-Hammoud (UA-Phx), Maura Cotter (UA-Tuc), John Kanady (UA-Tuc), Uzma Tahir (NAU), Julian Wagner (ASU), Brittney McCormick (UA-Phx)

The Arizona Distinguished Lecturer Eldon Braun (UA-Tuc; *left*) receives a commemorative plaque from Kiisa Nishikawa (NAU; *right*)

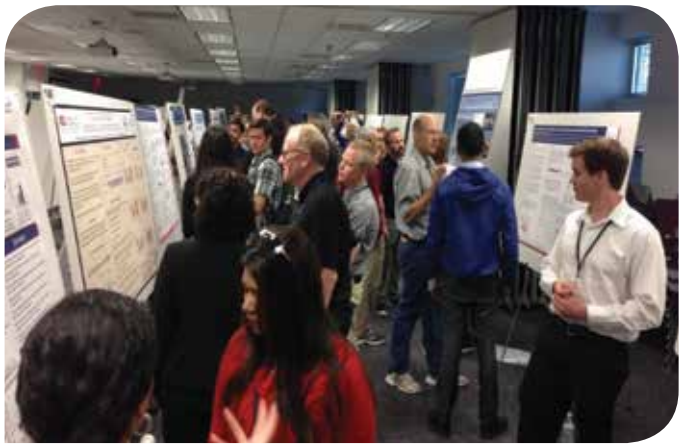
example of teaching respiratory lung compliance to medical students, aiming to relate that to the clinical pneumothorax condition. Around 25-30 attendees/session were taken to the Sim Center to watch two simultaneous clinical scenario demonstrations (provided by three MWU MSII students/clinical exam room) of the treatment of a motor vehicle accident patient with pneumothorax, followed by a tour of the facility. *Session 2:* "Physiology Outreach" by Karen Sweazea (Associate Professor, ASU) and Cindy Rankin (Associate Professor, UA-Tuc). This session aimed to describe several key simple and applicable tools to describe to elementary/middle school children information relating to nutritional decisions (using various snacks in brown paper lunch bags to determine fat content on the paper bag) and to use of various candies to "make" a gastrointestinal tract. This session was repeated to allow attendees the opportunity to attend each event.

The third session of the conference, "Trainee Physiology Research Presentations-II," was chaired by Tom Broderick (MWU) and Megan Garlapow (Postdoc, ASU). The three talks in this session were given by MWU students: "Mild Aerobic Exercise Improves Aortic Wall Integrity and Elasticity in a Mouse Model of Marfan Syndrome" by Christine Gibson (MSI, student; mentor: M. Efandiarei), "Experience-Dependent Changes in Vocal Production in Male Rats" by Chistine Hernandez (CVMII, student; mentor: T. Reide), and "A Mouse Model of Diabetes: Loss of CFTR Expression Contributes Towards Reduced Jejunum Chloride Secretion" by Faisal Masood (MSII, student; mentor: L. Al-Nakkash).

The keynote lecture, introduced by Kiisa Nishikawa (NAU), was given by Andrew Biewener (Lyman Professor of Biology, Director Concord Station, Department of Organismal & Evolutionary Biology, Harvard University) and entitled "How Do Running Animals Achieve Stability? The Neuromechanical Control of Rapid Locomotion." This excellent talk by a wellrespected leader in his field was followed by a reception and buffet dinner, and the return of the popular minute poster presentations (each poster presenter is given 1 minute of microphone time to "advertise who they are, and give a brief overview of the research poster they will shortly present"). The minute poster session was chaired by Scott Boitano (UA-Tuc) and Christiane Danilo (Postdoc, UA-Tuc), including research presentations by 28 graduate and medical student members. All graduate and medical students then presented their actual posters.

The second day of the meeting began with an opportunity for Postdocs to meet with Andrew Biewener over breakfast. The first session of the day was chaired by Tom Broderick (MWU) and Christiane Danilo (Postdoc, UA-Tuc), and was entitled "Trainee Physiology Research Presentations-III." The four talks in this session were

given by undergraduate students: "Age-Related Decline of Anoxia Tolerance in Adult *Drosophila Melanogaster*" by James Sargent (ASU; mentor: J. Harrison), "Temporal Expression of Cyclooxygenase-2 Following Lateral Fluid Percussion Injury in the Male Brain Rat," by Colleen Kerrigan (UA-Phx; mentor: R. Gonzales), "Effect of Genistein Diet on Diabetic Jejunum Function and Histology in the ob/ob Mouse" by RussL Altabtabaee (ASU/MWU; mentor: L. Al-Nakkash), and "Differential Cardiovascular and Penile Responses to Angiotensin II and Bradykinin B1-Receptor Antagonism Treatment in Sprague-Dawley Rats" by Brittney McCormick (UA-Phx; mentor: T. Hale).



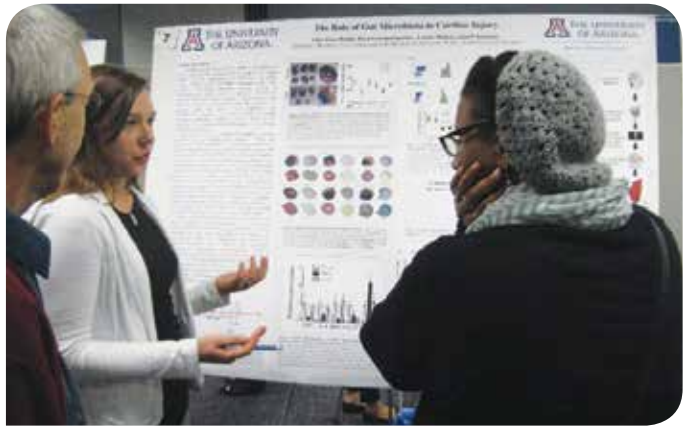
Poster session

Attendees at a talk session

Stan Lindstedt (NAU) then introduced this year's Arizona Distinguished Lecturer, Eldon Braun (UA-Tuc), who gave a wonderfully engaging and animated lecture regarding "The Comparative Physiology of Osmoregulation: Lessons From Avian Studies."

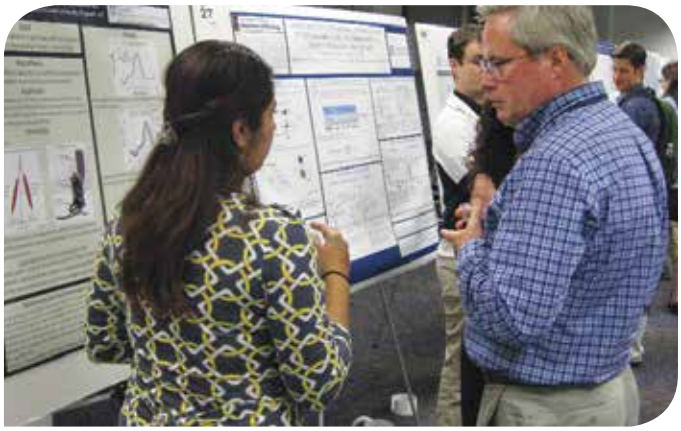
The second minute poster session was chaired by Layla Al-Nakkash (MWU) and Dennis Pollow (grad. student, UA-TUC), affording the remaining 23 poster presenters an opportunity to give a 1-minute spiel of their research before their poster presentations. During both minute poster sessions, attendees were treated to Starbucks gift cards, jackets, pen, and magnetic clip giveaways, generously donated by VWR and Fisher. During the lunch hour, while judges of the poster categories met to discuss the finalists of the posters sessions, the graduate students were invited to have lunch with Andrew Biewener. The final oral communication session of the meeting, "Physiology Research in Arizona," was chaired by Steve Wright (UA-TUC) and Robert LeMoyne (Postdoc, NAU), and comprised four oral presentations on such topics as "A Lymphedema-Inducing Mutation of CX47, R259C, Alters Growth Pattern and CX43 Processing in Rat Insulinoma Cells" by John Kanady (Postdoc, UA-Tuc), and "Sex-Differences in Cardiovascular Responses to Stress in Adult Rats Prenatally Exposed to Dexamethasone" by Taben Hale (UA-Phx).

The meeting concluded with the Business meeting chaired by Layla Al-Nakkash (MWU) and Kiisa Nishikawa (NAU). The minutes of the 2014 business



Christiane Danilo (Postdoc, UA-Tuc) presents her poster to Tom Pannabecker (UA-Tuc) and Johnnie Moore-Dotson (UA-Tuc)

meeting were unanimously approved, and a summary of the Chapter Advisory Committee meeting held at Experimental Biology in Boston April 2015 was discussed (attended by Layla Al-Nakkash and Taben Hale). Members of the executive council who had completed their terms of service were thanked for their hard work and awarded a certificate of appreciation: Dennis Pollow (Graduate Student Representative, UA-Tuc) and Johnnie Moore-Dotson (Postdoctoral Representative, UA-TUC). Recognition was also given to incoming executive council members who were recently voted into their positions: John Kanady (Postdoctoral Representative, UA-TUC) and Uzma Tahir (Graduate Student Representative, NAU).



Uzma Tahir (graduate student, NAU) presents her poster to Keynote Speaker Andrew Biewener

Subsequently, financial awards were given for poster presentations that represented $100 for first place, $50 for second place, and $25 for third place. Listed in Table 1 are the names and institutions associated with the various awards. Our 2-day Annual Chapter meeting continues to flourish in Arizona, bringing together Physiologists from throughout the State. This meeting provides valuable support for our trainees, and emboldens positive interactions between trainees and faculty alike. The ability to build and foster new collaborations, and share techniques and ideas serves to improve physiology research and teaching within Arizona.

Table 1. Abstract Awardees

| Abstract Category | Postdoctoral Fellow | Graduate/Medical Student | Undergraduate |
|---|---|---|---|
| First place | John Kanady (UA-Tuc) | Uzma Tahir (NAU) | Brittney McCormick (UA-Phx) |
| Second place | Manal Zein-Hammoud (UA-Phx) | Maura Cotter (UA-Tuc) | Julian Wagner (ASU) |
| Third place | Cheng-Yu Chen (UA-Tuc) | Puneet Raman (UA-Phx) | RussL Altabtabaee (MWU) |

# Indiana Physiological Society Fifth Annual Meeting Report

**Richard E. Klabunde**
***President, Indiana Physiological Society (2015-2016)***

The Indiana Physiological Society (INPhys) held its fifth annual meeting on February 21, 2015 at the campus of Marian University (MU) College of Osteopathic Medicine located in Indianapolis. Despite a winter storm, there were 105 attendees, 34 of whom were faculty from Indiana colleges, universities, and biomedical companies. Most of the remaining attendees were high school, undergraduate, graduate, and postdoctoral students. The theme for the meeting was *Exercise*.

Figure 1. Student poster presentation

Following registration and a continental breakfast, the participants were welcomed by Mari Hopper (INPhys President, 2014-2015) and Paul Evans (Dean, MU College of Osteopathic Medicine). The scientific sessions began with a keynote address given by Harold Laughlin (University of Missouri-Columbia) on the topic of "Mechanisms Responsible for Beneficial Effects of Physical Activity on Atherosclerosis and Coronary Artery Disease." This was followed by four excellent oral presentations given by students who were selected by a committee based on their submitted abstracts. The morning sessions were concluded with the first half of 37 poster presentations (Figure 1). Posters by students were evaluated and scored by a panel of judges for student awards.

Following a catered hot lunch, attendees were invited to participate in one of three hour-long breakout sessions: "Careers in Physiology" (Figure 2), "Simulation Lab Experience for Faculty" (Figure 3), or "Preparing for Your Academic Future." The second keynote speaker was Andrew Adams (Eli Lilly & Company) who spoke on "Mining the Physiology of Exercise and Calorie Restriction to Develop Novel Treatments for Diabetes and the Metabolic Syndrome." A second poster session followed, during which time a special simulator session for high school students was conducted. After the poster session, another oral session was scheduled with four student presentations. Near the end of the meeting, Michael Sturek (Indiana University School of Medicine) challenged the

Figure 2. Panel-led breakout session on Careers in Physiology

meeting participants with a Research Advocacy presentation. Following his presentation, awards were given for poster and oral presentations to four graduate and two undergraduate students (Figure 4). Two new Councilors were voted into office during the meeting.

As the INPhys leadership has reflected back on the meeting, we are very pleased with the large number of students who were able to participate in the meeting and for the quality of their oral and poster presentations. Research is alive and well among our future scientists in Indiana! We are grateful for the stimulating presentations by our keynote speakers that inspired all, particularly the students. Finally, we appreciate the following sponsors that financially supported the meeting, keynote speakers, and awards: MU College of Osteopathic Medicine and College of Mathematics & Sciences, MU Office of Admissions, Indiana University (IU) Department of Cellular & Integrative Physiology, IU School of Medicine-Muncie, University of Southern Indiana, Data Sciences International, Kent Scientific, and the American Physiological Society.

Figure 4. Student award presentations

Figure 3. Simulation lab experience for faculty

# Education

## 2016-2017 K-12 Minority Outreach Fellows Announced

The APS K-12 Minority Outreach Fellowship seeks to foster communication between minority graduate and postdoctoral students and middle/high school minority life sciences students. Program activities include year-long outreach fellowships for senior graduate students and postdoctoral fellows to visit K-12 classrooms, help conduct teacher professional development workshops, and attend scientific meetings.

The APS and Porter Physiology Development and Minority Affairs Committee congratulate the 2016 K-12 Outreach Fellows:
**Carmen De Miguel,** University of Alabama at Birmingham
**Joshua Sheak,** University of New Mexico

Fellows attend EB 2016 and 2017, work with the Frontiers in Physiology Research Teachers, participate in PhUn Week, and attend conferences for minority students in the fall (ABRCMS or SACNAS national conference). For more information, see the APS website at *www.the-aps.org/k12minorityoutreach* or contact Brooke Bruthers, Senior Program Manager, Diversity Programs, in the APS Education Office at *education@the-aps.org*. The application deadline for the 2017-2018 fellowship year is December 1, 2016. ●

## Minority Travel Fellowship Awards Available for 2016 APS Conferences

APS will be offering Minority Travel Fellowship Awards, which provide up to $1,800 in travel expense reimbursement, for the upcoming 2016 APS Conferences.

***Inflammation, Immunity and Cardiovascular Disease***
August 24-27 in Westminster, CO
Application deadline: May 20, 2016

***The Integrative Biology of Exercise VII***
November 2-4 in Phoenix, AZ
Application deadline: July 8, 2016

For more information about the Minority Travel Fellowship Award program and to apply, visit *www.the-aps.org/minoritytravel* or contact Brooke Bruthers, Senior Program Manager, Diversity Programs, in the APS Education Office at *education@the-aps.org*. ●

# People and Places

## Christopher Lynch to Direct Office of Nutrition Research

APS member Christopher J. Lynch has been named the new director of the Office of Nutrition Research (ONR) and chief of the Nutrition Research Branch within the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). Lynch officially assumed his new roles on February 21, 2016. Lynch will facilitate nutrition research within NIDDK and – through ONR – across NIH, in part by forming and leading a trans-NIH strategic working group. He will also continue and extend ongoing efforts at NIDDK to collaborate widely to advance nutrition research. Lynch joins NIH after 27 years at Pennsylvania State University's College of Medicine, Hershey, Pennsylvania, most recently serving as professor and vice chair of the Department of Cellular and Molecular Physiology. His research focuses on how what we eat and drink influences processes leading to obesity and Type 2 diabetes. He has also investigated the relationship between antipsychotic therapy, obesity, and Type 2 diabetes, and how gastric bypass surgery changes metabolism. Lynch also led efforts to increase nutrition education in the medical school curriculum. ●

## Books Received

**Diving Physiology of Marine Mammals and Seabirds**
***By Paul J. Ponganis***
***Cambridge, UK: Cambridge University Press, January 2016, 346 p., 73 b/w illus., 23 tables, $140.00 (hardback)***
***ISBN: 9780521765558***

**Description:** Analyzing the physiological adaptations of marine mammals and seabirds, this book provides a comprehensive overview of what allows these species to overcome the challenges of diving to depth on a single breath of air. Through comparative reviews of texts on diving physiology and behavior from the last 75 years, Ponganis combines this research into one succinct volume. Investigating the diving performance of marine mammals and seabirds, this book illustrates how physiological processes to extreme hypoxia and pressure are relevant to the advancement of our understanding of basic cellular processes and human pathologies. This book underscores the biomedical and ecological relevance of the anatomical, physiological, and molecular/biophysical adaptations of these animals to enable further research in this area. An important resource for students and researchers, this text not only provides an essential overview of recent research in the field but should stimulate further research into the behavior and physiology of diving.

- A unique analysis of the diving behavior of both marine mammals and seabirds in one succinct volume, with an additional chapter on human diving physiology.
- Reviews how the diving cardiovascular response reflects principles of myocardial oxygen supply/demand and applies this to treatments used in human medicine.
- Reviews topics not usually seen in diving reviews, including antioxidants and avoidance of reperfusion injury, surfactant function in the lung, regulation of pulmonary vascular resistance, and the potential roles of gasotransmitters. ●

# Publications

## Call for Nominations for the Editorship of the *Journal of Applied Physiology*

*jap.physiology.org*

Nominations are invited for the Editorship of the *Journal of Applied Physiology* to succeed Peter D. Wagner, who will complete his term as Editor on June 30, 2017. The APS Publications Committee plans to interview candidates in the Fall of 2016.

Applications should be received before August 15, 2016.

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

Curt Sigmund, Ph.D.
American Physiological Society
9650 Rockville Pike
Bethesda, MD 20814-3991

You may also send your nominations to Curt Sigmund via e-mail, care of the APS Publications Department Administrative Assistant, Charmon Kight (*ckight@the-aps.org*). ●

## Current Calls for Papers

### Physiological Genomics

- Gut Microbiota in Health and Disease
- Systems Biology and Polygenic Traits
- Single Cell Analysis *(Submission deadline: May 31, 2017)*

### Journal of Neurophysiology

- Spinal Control of Motor Outputs *(Submission deadline: December 31, 2016)*
- Building Neural Circuits: Wiring and Experience *(Submission deadline: December 31, 2016)*
- Biology of Neuroengineering Interfaces *(Submission deadline: December 31, 2016)*
- Auditory System Plasticity *(Submission deadline: July 1, 2016)*
- Comparative Approaches in Neurobiology *(Submission deadline: July 1, 2016)*
- Glial Cells and Neuronal Signaling *(Submission deadline: July 1, 2016)*

### Advances in Physiology Education

- Historical Perspectives and Living Histories

### American Journal of Physiology – Cell Physiology

- Cellular Mechanisms of Proteostasis *(Submission deadline: June 30, 2016)*
- Gasotransmitters *(Submission deadline: June 30, 2016)*
- Omic Approaches to Epithelial Cell Biology *(Submission deadline: June 30, 2016)*
- Regulation of Cell Signaling Pathways *(Submission deadline: June 30, 2016)*
- Stem Cells: Physiology and Microenvironment *(Submission deadline: June 30, 2016)*

### American Journal of Physiology – Gastrointestinal and Liver Physiology

- Microbiome and Host Interactions
- Nutrient Sensing, Nutrition, and Metabolism

- Systems Biology
- Translational Human Pathophysiology

## American Journal of Physiology – Heart and Circulatory Physiology

- Beginning on March 15 update Metabolism, Cell Signaling and Disease
  *(Submission deadline: September 15, 2016)*
- The Cardiorenal Syndrome-Integrative and Cellular Mechanisms
  *(Submission deadline: September 15, 2016)*
- Cardiovascular Actions of Hydrogen Sulfide and Other Gasotransmitters
  *(Submission deadline: August 31, 2016)*

## American Journal of Physiology – Lung Cellular and Molecular Physiology

- Electronic Cigarettes: Not All Good News?
  *(Submission deadline: October 1, 2017)*
- Ion Channels and Transporters in Lung Function and Disease
- Age-Related Dysfunction in Lung Barrier Function in Health and Disease
- Real-Time Visualization of Lung Function: from Micro to Macro
  *(NEW Submission deadline: January 2017)*
- Biomarkers in Lung Diseases: from Pathogenesis to Prediction to New Therapies
  *(NEW Submission deadline: January 2017)*
- Sex Differences in the Respiratory System
- Translational Research in Acute Lung Injury and Pulmonary Fibrosis
  *(NEW Submission deadline: January 2017)*

## American Journal of Physiology – Regulatory, Integrative and Comparative Physiology

- Sex and Gender Differences in Cardiovascular, Renal and Metabolic Diseases
  *(Submission deadline: June 30, 2016)*
- Hypertensive Disorders of Pregnancy: Effects on Mother and Baby
  *(Submission deadline: December 1, 2016)*

## American Journal of Physiology – Renal Physiology

- Endothelin in Renal Physiology and Disease
  *(Submission deadline: June 30, 2016)*
- Imaging Techniques in Renal (Patho)physiology Research
  *(Submission deadline: June 30, 2016)*
- Inflammation and Inflammatory Mediators in Kidney
  *(Submission deadline: June 30, 2016)*
- Purinergic Signaling Mechanisms in the Lower Urinary Tract
  *(Submission deadline: June 30, 2016)*
- Mechanism and Treatment of Renal Fibrosis and Treatment
  *(Submission deadline: June 30, 2016)*
- Transport Proteins as Regulators of Blood Pressure Homeostasis
  *(Submission deadline: June 30, 2016)*

For a complete list of current Calls for Papers, visit the APS website.

# Membership

## New Regular Members

***transferred from student membership**

**Rufus Ojo Akomolafe**
Obafemi Awolowo Univ., Ile Ife, Nigeria

**Jason Bazil**
Michigan State Univ., East Lansing, MI

**Eric S. Bennett**
Univ. South Florida, Tampa, FL

**Zoltán Benyó**
Semmelweis Univ., Budapest, Hungary

**Rajay Narayan Bharshankar**
All India Inst. of Med. Sci. Bhopal, Bhopal, India

**Mathilde Bonnemaison**
Univ. of Nebraska Med. Ctr., Omaha, NE

**Gavin Buckingham**
Univ. of Exeter, Exeter, United Kingdom

**Cristina Caldari**
Centenary Coll. of Louisiana, Shreveport, LA

**Michael Camilleri**
Mayo Clinic, Rochester, MN

**Jane Schluter Chapman**
Heartland Community Coll., East Peoria, IL

**Elizabeth Cordonier**
Baylor Coll. of Med., Houston, TX

**Naima Covassin**
Mayo Clinic, Rochester, MN

**Georges Daoud**
American Univ. of Beirut, Beirut, Lebanon

**Michael E. Davis**
Emory Univ. Sch. Med., Atlanta, GA

**Linda L. Demer**
David Geffen Sch. of Med. at UCLA, Los Angeles, CA

**Jeffrey G. Dickhout**
McMaster Univ., Hamilton, Canada

**Evgenia Dobrinskikh**
Univ. of Colorado-Denver, Aurora, CO

**Travis Matthew Doggett**
Univ. of South Florida, Tampa, FL

**Timothy Domeier**
Univ. of Missouri, Columbia, MO

**Nicolle Jasmin Domnik**
Queen's Univ., Kingston, Canada

**Elise Donovan**
Oklahoma Med. Res. Foundation, Oklahoma City, OK

**Jeremy Stuart Duffield**
Biogen, Cambridge, MA

**Anthony Adam Duplanty***
LSU HSC, Jefferson, LA

**Conrad Earnest**
Woodbolt International Coll., Station, TX

**Erick E. Elung**
Collin Coll., Frisco, TX

**John F. Engelhardt**
Univ. Iowa. Iowa City. IA

**George Edward Farmer**
UNT Hlth. Sci. Ctr., Fort Worth, TX

**Daniel H. Feldman**
Univ. of California-Davis, Sacramento, CA

**Amy Leanne Firth**
Univ. of Southern California, Los Angeles, CA

**Charles Wayne Frevert**
Univ. Washington-VAMC, Seattle, WA

**Roman V. Frolov**
Univ. of Oulu, Oulu, Finland

**Stefano Gaburro**
DataScience Intl., Eberswalde, Germany

**George David Giraud**
Oregon Hlth. & Sci. Univ., Portland, OR

**Jordan Tanin Gladman**
NIH, Rockville, MD

**Liara M. Gonzalez**
North Carolina State Univ., Raleigh, NC

**Ted G. Graber**
Univ. of Texas Med. Branch, Galveston, TX

**Julien Grondin**
Columbia Univ., New York, NY

**Tetsuya Hayashi**
Osaka Univ. of Pharmaceutical Sci., Takatsuki, Japan

**Matthew W. Heesch***
Univ. of Nebraska at Omaha, Omaha, NE

**Erica Christine Heinrich**
UC San Diego, San Juan Capistrano, CA

**Angelina Marie Hernandez-Carretero**
Univ. of California-San Diego, La Jolla, CA

**James Howells**
The Univ. of Sydney, Camperdown, Australia

**Chiung-Kuei Huang**
Albert Med. Sch. Brown Univ., Providence, RI

**Yan Huang**
Univ. of Arkansas, Fayetteville, AR

**Yunlong Huo**
Peking Univ., Beijing, China

**Chansol Hurr***
The George Washington Univ., Arlington, VA

**Jon-Philippe K. Hyatt**
Georgetown Univ., Washington, DC

**Abishek Iyer**
The Univ. of Queensland, Brisbane, Australia

**Arshad Jahangir**
Aurora Hlth. Care, Milwaukee, WI

**Yanyan Jiang**
Penn State Hershey, Hershey, PA

**Michael J. Jurczak**
Univ. of Pittsburgh, Pittsburgh, PA

**Radha Kalluri**
Univ. of Southern California, Los Angeles, CA

**Yuho Kim***
York Univ., Thornhill, Canada

**Paulo Kofuji**
Univ. of Minnesota, Minneapolis, MN

**Ben Korman**
Royal Perth Hospital, Yokine, Australia

**Alison Kreisler**
Scripps Res. Inst., San Diego, CA

**James Matthew Kuczmarski**
Penn State Coll. of Med., Hershey, PA

**Matthew Ryan Kuennen**
High Point Univ., High Point, NC

**Yugeesh Ryan Lankadeva**
Florey Inst. of NeuroScience and Mental Hlth., Melbourne, Australia

**Joanie Larose**
Nike, Beaverton, OR

**Sergio Lavandero**
Univ. of Chile, Santiago, Chile

**L. Stan Leung**
Univ. of Western Ontario, London, Canada

**Chia-Yang Li**
Kaohsiung Med. Univ., Kaohsiung, Taiwan

**Xiao C. Li**
Univ. of Mississippi Med. Ctr., Jackson, MS

**Yunki Lim**
Univ. of Rochester Med. Ctr., Rochester, NY

**Mike T. Lin**
Univ. of South Alabama, Mobile, AL

**Melissa Anne Linden***
Pfizer, Inc., Boston, MA

**Kenneth Long**
California Lutheran Univ., Thousand Oaks, CA

**Alicia N. Lyle**
Emory Univ., Atlanta, GA

**Kirsten Madsen**
Univ. of Southern Denmark, Odense, Denmark

**Scott Thomas Magness**
Univ. North Carolina at Chapel Hill, Chapel Hill, NC

**Greg Maguire**
BRS, San Diego, CA

**Patricia McCallinhart**
Nationwide Children's Hospital, Columbus, OH

**Luke Michaelson**
Department of Veterans Affairs, Bethesda, MD

**Joost Monen**
Ramapo Coll. of New Jersey, Mahwah, NJ

**Brahmaraju Mopidevi**
The Univ. of Toledo, Toledo, OH

**Clarissa Muere**
Med. Coll. of Wisconsin, Milwaukee, WI

**Dollyane Muret***
Lyon NeuroScience Res. Ctr., Bron, France

**Marco Vincenzo Narici**
Univ. of Nottingham, Derby, United Kingdom

**Oliver Neubauer**
Queensland Univ. of Technology, Brisbane, Australia

**Angela Nissen**
Western Univ., London, Canada

**Felicia V. Nowak**
Ohio Univ., Athens, OH

**Matthew Nystoriak**
Univ. of Louisville, Louisville, KY

**Emma O'Donnell**
Loughborough Univ., Loughborough, United Kingdom

**Masahiro Okamoto**
Univ. of Tsukuba, Ibaraki, Japan

**Hidenori Otani**
Himeji Dokkyo Univ., Hyogo, Japan

**Brian Panama**
Masonic Med. Res. Lab., Utica, NY

## New Graduate Student Members

**Nicholas William Aguirre**
Univ. of California-Davis, Davis, CA

**Abimbola Olufunmilayo Aiku**
Univ. of Birmingham, Birmingham, United Kingdom

**Mitchell Allen**
East Carolina Univ., Greenville, NC

**Kayla Marie Baker**
Univ. of Central Florida, Orlando, FL

**Ruben Omar Banuelos**
A.T. Still Univ., Mesa, AZ

**Tasha Barr**
Univ. of California-Riverside, Riverside, CA

**Jennifer Blankenship**
Univ. of Massachusetts-Amherst, Amherst, MA

**Brittney G. Borowiec**
McMaster Univ., Hamilton, Canada

**Timothy Dean Bryson**
Henry Ford Hlth. System, Detroit, MI

**Andrew Chapp**
Michigan Tech Univ., Houghton, MI

**Hsin-Hung Chen**
National Yang-Ming Univ., Kaohsiung, Taiwan

**Stephen S. Cho**
California State Univ. of Northridge, North Hills, CA

**Joonseok Cho**
Univ. of Florida, Gainesville, FL

**Ting-Heng Chou**
Univ. of Texas at Austin, Austin, TX

**Marissa Ciesla**
Univ. of Florida, Gainesville, FL

**Ryan Colquhoun**
Oklahoma State Univ., Stillwater, OK

**Betsy J. Conaty**
SUNY Sullivan Loch, Sheldrake, NY

**Laura Constance**
Kansas State Univ., Manhattan, KS

**Sheri Lynn Core**
Oklahoma State Univ. Ctr. for Hlth. Sci., Ochelata, OK

**Jonathan Arthur Cunha**
San Diego State Univ., El Cajon, CA

**Todd Dart**
Wyle Labs, San Antonio, TX

**James Thomas Davis**
Univ. of Oregon, Eugene, OR

**Jack Day**
Univ. of East Anglia, Norwich, United Kingdom

**Matthew Solomon Delfiner**
NYIT Coll. of Osteopathic Med., Long Island City, NY

**Athan George Dial**
McMaster Univ., Hamilton, Canada

**Brendan Doyle**
Univ. of Florida, Gainesville, FL

**Natasha Darne Driescher**
Stellenbosch Univ., Wellington, South Africa

**Brian Ellis**
California State Univ., Chico Chico, CA

**Cassandra Lyn Ellis**
Western Univ., London, Canada

**Caroline Borges Ferreira**
Federal Univ. of Sao Paulo, Hershey, PA

**Amie Francis**
Oklahoma State Univ. Ctr. for Hlth. Sci., Tulsa, OK

**Amie Francis**
Oklahoma State Univ. Ctr. for Hlth. Sci., Tulsa, OK

**Cassandra Gohn**
IUSM, Indianapolis, IN

**Christopher Goncalves**
Univ. of Connecticut, Vernon, CT

**Chelsea Goodenough**
Texas A&M Univ., College Station, TX

**Angela Greenman**
Univ. of Wisconsin-Madison, Waukesha, WI

**Kevin Gries**
Ball State Univ., Muncie, IN

**Georgios Grigoriadis**
Univ. of Illinois at Chicago, Chicago, IL

**Katherine Grue**
Texas Tech Univ., Lubbock, TX

**Zachary Ian Grunewald**
Univ. of Georgia, Athens, GA

**Tiffany Nicoe Halfacre**
Carson-Newman Univ., Jefferson City, TN

**Robert A. Hart**
Univ. of New England, Armidale, Australia

**Donald M. Harting**
West Chester Univ., Downingtown, PA

**James Hester**
Penn State Univ., University Park, PA

**Ethan C. Hill**
Univ. of Nebraska-Lincoln, Lincoln, NE

**Leanne Marie Hochberg**
The Univ. of Northern Colorado, Greeley, CO

**Grace Marie Hudson**
Univ. of Calgary, Calgary, Canada

**Catherine Lee Jarrett**
Arizona State Univ., Phoenix, AZ

**Alexander Jones**
Univ. of Nevada-Las Vegas, Las Vegas, NV

**Cody Robert Kilar**
Univ. of Florida, Gainesville, FL

**Fu-Shan Kuo**
Univ. of Connecticult, Storrs, CT

**Alexie Larson**
Univ. of Michigan, Ann Arbor, MI

**Samantha Carly Levin**
Univ. of Queensland, Carlsbad, CA

**Ben Locke**
San Francisco State Univ., San Francisco, CA

**Terence Michael Loftus**
Univ. of Auckland, Auckland, New Zealand

**Chitaranjan Mahapatra**
Indian Inst. of Tech. Bombay, Powai, India

**Trista Manikowske**
Univ. of Northern Colorado, Evans, CO

**Sarah Arwen Marshall**
Univ. of Melbourne, Brunswick East, Australia

**Koji Maruta**
NDMC Internal Med. 2 Saitama, Tokorozawa, Japan

**Aaron Ryan David Matthews**
Brock Univ., St. Catharines, Canada

**Colm McCabe**
Hammersmith Hospital, London, United Kingdom

**Matthew W. McDonald**
Western Univ., London, Canada

**Austin McKenna**
Univ. of Nevada-Las Vegas, Henderson, NV

**Craig McNulty**
Charles Sturt Univ., Bathurst, Australia

**Thomas Mota**
California State Univ., Long Beach Downey, CA

**Tyler Muddle**
Univ. of Central Florida, Orlando, FL

**Amreen Mughal**
NDSU, Fargo, ND

**Arshi Mustafa**
Uppsala Univ., Uppsala, Sweden

**Andrew Nickerson**
West Virginia Univ., Morgantown, WV

**Christoph Nowak**
Uppsala Univ., Uppsala, Sweden

**Ashley Nicole Oliveira**
York Univ., Toronto, Canada

**Naomi Onisawa**
The Univ. of Tokyo, Tokyo, Japan

**Amrita V. Pai**
Georgetown Univ., Washington, DC

**Victoria Shayla Parker**
Univ. of Iowa, Iowa City, IA

**Evan Pasha**
The Univ. of Texas at Austin, Austin, TX

**Mark Paterson**
Med. Coll. of Wisconsin, Milwaukee, WI

**Justin Perry**
Brody Sch. of Med., Greenville, NC

**Tim Podlogar**
Univ. of Birmingham, Trzin, Slovenia

**David Pruitt**
The Univ. of Texas at Dallas, Richardson, TX

**Margherita Raccuglia**
Loughborough Univ., Loughborough, United Kingdom

**Sabrina Ramelli**
Univ. of South Alabama, Mobile, AL

**James Richey**
Univ. of Colorado at Boulder, Boulder, CO

**Naiomy Deliz Rios-Arce**
Michigan State Univ., Okemos, MI

**Soumyadip Sahu**
Northeast Ohio Med. Univ., Rootstown, OH

**Lubriel Sambolin**
Escobales Pontifical Catholic Univ. of Puerto Rico, Adjuntas, PR

**Philip Joseph Sandoval**
Univ. of Arizona, Tucson, AZ

**Niccole Schaible**
Mayo Clinic, Rochester, MN

**Brandon Michael Schickling**
Univ. of Iowa, Iowa City, IA

**Jessica Sessenwein**
Queens Univ., Kingston, Canada

**Keisha Smith**
Meharry Med. Coll., Nashville, TN

**Denisha Renee Spires**
Med. Coll. of Wisconsin, Greendale, WI

**Derek William Stouth**
McMaster Univ., Ancaster, Canada

**Bjorn Tam**
The Hong Kong Polytechnic Univ., Yuen Long N.T., Hong Kong

**Lia Taylor**
Georgia Regents Univ., Augusta, GA

**Jennifer Joan Terpstra**
Univ. of Arizona, Tucson, AZ

**Molly Thorson**
Univ. of Michigan, Ann Arbor, MI

**Shuchita Tiwari**
Univ. of Saskatchewan, Saskatoon, Canada

**Zoltan Andre Torok**
Univ. of Northern Colorado, Windsor, CO

**Rishi K. Trivedi**
LSU Hlth. Sci. Ctr.-New Orleans, New Orleans, LA

**Marion Valle**
Univ. Laval, Québec, Canada

**Bo Wang**
Washington State Univ., Pullman, WA

**Paul Allen Williams**
Loma Linda Univ., Loma Linda, CA

**Brittany Wilson**
Temple Univ., Cherry Hill, NJ

**J. Winny Yun**
LSUHSC-Shreveport, Shreveport, LA

**Weinan Zhou**
Univ. of Illinois at Urbana-Champaign, Urbana, IL

## Undergraduate Student Members

**Nicholas E. Arnold**
Alma Coll., Reese, MI

**Shelby Logan Buckner**
Augusta Univ., Appling, GA

**Veronica Winnie Clark**
Virginia Commonwealth Univ., Richmond, VA

**Taylor Copeland**
Georgia State Univ., Jonesboro, GA

**Abby Breanna Daniels**
Berry Coll., Mount Berry, GA

**Bob Bruce Edwards**
Australian Catholic Univ., Glen Iris, Australia

**Mohamed Hazem Elshahidi**
Mansoura Faculty of Med. Aga, Dakahliya, Egypt

**Alexander Fees**
Kansas State Univ., Manhattan, KS

**Melanie Flaherty**
Northern Michigan Univ., Marquette, MI

**Norman E. Frederick**
Univ. of Scranton, Pittston, PA

**Laura Galarza**
Emory Univ., Cumming, GA

**Joshua Tear Gaudette**
Albion Coll., Grosse Ile, MI

**Laurie Marie Gillespie**
Ivy Tech Community Coll. of Central Indiana, Indianapolis, IN

**Dillion Hutson**
Tulane Univ. Sch. of Med., New Orleans, LA

**Daniel Kikuchi**
Emory Univ., Atlanta, GA

**Linda Wenyi Li**
Emory Univ., Atlanta, GA

**Mirandy Schiphen Li**
Emory Univ., Atlanta, GA

**Valerie Linck**
Emory Univ., Atlanta, GA

**Danny Linggonegoro**
Univ. of Iowa, Iowa City, IA

**Jack MacGregor**
Berry Coll., Marietta, GA

**Kaitlyn Maffuid**
Southern Methodist Univ., Dallas, TX

**Lauren Pearl Newhouse**
Mayo Clinic, Rochester, MN

**Xuan Qu**
Bowdoin Coll., Brunswick, ME

**Vijyendra Ramesh**
Univ. at Buffalo (SUNY), Buffalo, NY

**Ta'Shariah Robinson**
Univ. of Mississippi Med. Ctr., Jackson, MS

**Zach Scruggs**
Mayo Clinic, Stewartville, MN

**Brady Allen Slater**
Chapman Univ., Prineville, OR

**Adelaide M. Sobotik**
UW-Madison, Madison, WI

**Grace Lockhart Swaim**
Emory Univ., Huntsville, AL

**Michelle Stephany Swedek**
UC-Davis, Davis, CA

**Daniel Naveed Tavakol**
Univ. of Virginia, Vienna, VA

**Amrit Kaur Vasdev**
Mayo Clinic/Carleton Coll., Rochester, MN

**Andrew David Vigotsky**
SUNY Rockland, West Nyack, NY

**Lamario Williams**
Univ. of Alabama at Birmingham, Birmingham, AL

**Yunwei Xia**
Cornell Univ., Wallingford, PA

**Jacob Overton Young**
Univ. of Missouri, Columbia, MO

## Affiliate Members

**Hana Alzamil**
King Saud Univ., Riyadh, Saudi Arabia

**Nathalie B. Caron**
Univ. of Namur, Namur, Belgium

**Jordan Cunningham**
Mater Adult Hospital, Brisbane West End, Australia

**DaeJan-Elizabeth Grigsby**
Houston Community Coll., Houston, TX

**Cetin Kocaefe**
Hacettepe Univ. Faculty of Med., Ankara, Turkey

**Eunsil Koh**
The Catholic Univ. of Korea, Seoul, Republic of Korea

**Natalia Lajczak**
Royal Coll. of Surgeons in Ireland, Dublin, Ireland

**Xiaoru Liu**
Johns Hopkins Med. Institution, Baltimore, MD

**Ray Mitchell**
Texas A&M Hlth. Sci. Ctr., Temple, TX

**Julie Anna O'Neill**
Univ. Coll. Cork, Cork, Ireland

**Virginia Huddleston Secor**
Emory Univ., Atlanta, GA

**Yali V. Zhang**
UCSB, Santa Barbara, CA

# News From Distinguished Physiologists

## Letter to Peter K. Lauf

**Richard Alexander Awad writes:** "I was born in Honduras, the son of a British-nationality Arab father and a Honduran mother of Spanish descent. I studied medicine at the National Autonomous University of Mexico, and I conducted my internship in pathology and training in gastroenterology. I completed my research training in Marseille, France at the Hôpital Nord, the University D'Aix-Marseille II, and the Institut National de la Santé et de la Recherche Médicale (INSERM) Unite de Recherches de Pathologie Digestive U-131 under the experienced and wise guidance of Professors Jean Claude and Henry Sarles.

"I started my training in electromyography and motility working with rabbits as an experimental model. Most of my experiments pertained to the rabbit sphincter of Oddi, although I also focused on the rectum and the internal anal sphincter. At that time, it was impressive to observe how, in an in vitro rectal and anal sphincter preparation completely separated from the rabbit body, fecal material located at the proximal end of the rectum moved alone through the rectum and out through the internal anal sphincter, recording on their way the spontaneous rectoanal inhibitory reflex.

"Back in 1980, I realized the existence and autonomy of the enteric nervous system (a scientific basis that in the future would lead me to develop my own methodology of anorectal biofeedback to treat fecal incontinence in patients with spinal cord injuries based on trauma or a congenital defect, as in myelomeningocele). However, upon returning to Mexico and realizing that it was not easy to extrapolate the results of experimental models to humans, I began working directly with patients.

"My workplace has undergone changes. Over the years, I have begun to realize what it means to have worked for 32 years in an institution where new ideas emerge and so quickly evaporate. It is not new to anyone that there is always a lack of support. One of the most important messages for new investigators is that they must always be alert to the signs. They must fight to avoid working with a mediocre administrative head who is completely ignorant of the significant advantages provided by research. When I was doing my training in France, I had a notebook in which I drew a light bulb every time I had an idea. Back in Mexico at the general hospital, the pages of this notebook were empty; there were no light bulbs that gave light. Time passed in a difficult way. I hope that new generations might have the wisdom to know when to go to another place in which they can draw light bulbs.

"My work has been and is still in neurogastroenterology and motility. One of my current original ideas pertains to the development of a new mechanism of noninvasive brain stimulation for the treatment of dysphagia. I am conducting a pilot investigation of esophageal biofeedback by balloon distension of the esophagus combined with swallowing-related visual, olfactory, and gustatory stimuli. The results so far are clinically significant, and I have cured patients with dysphagia. I have presented my findings at some of most important scientific meetings in North America and Europe.

"What's next? I aim to use my methodology to investigate visual, olfactory, and gustatory external stimuli reach areas in the brain that, when stimulated, may modify neuronal plasticity. The goal of this work is recover the previously established program for swallowing. If we can identify the brain areas activated with my biofeedback methodology by means of structural and functional neuroimaging studies, we will be on our way to establishing a scientific model applicable to other unknown mechanisms of neurological disorders.

"I now realize that new ideas always appear; there are other projects. The passage of time provides something that is not knowledge acquired via observing and studying. This sometimes is that the universe is more clear and understandable, that there is energy to continue investigating. I call this phenomenon the neuronal age. The neuronal age is the current capacity to be working, generating ideas, writing projects, making protocols, carefully analyzing results, drawing conclusions, and writing articles. Which means being still young, very young." ●

# Positions Available

**Leadership Position:** Actelion Ltd. is a leading biopharmaceutical company focused on the discovery, development, and commercialization of innovative drugs for diseases with significant unmet medical needs. Actelion is a leader in the field of pulmonary arterial hypertension (PAH). Our portfolio of PAH treatments covers the entire spectrum of care, from WHO Functional Class (FC) II through to FC IV, with oral, inhaled, and intravenous medications. Actelion is also offering treatments for a number of specialist diseases including Type 1 Gaucher disease, Niemann-Pick type C disease, Digital Ulcers in patients suffering from systemic sclerosis, and mycosis fungoides in patients with cutaneous T-cell lymphoma. Founded in late 1997, Actelion now has over 2,400 dedicated professionals covering all key markets around the world including the U.S., Japan, China, Russia, and Mexico. Actelion has its corporate headquarters in Allschwil/Basel, Switzerland. Actelion shares are traded on the SIX Swiss Exchange (ticker symbol: ATLN) as part of the Swiss blue-chip index SMI (Swiss Market Index SMI). All trademarks are legally protected. *The Position:* After becoming the world leader in PAH, Actelion strives to become a highly competitive player in other therapeutic areas. In particular, the drug discovery group is heavily involved in the search for new anti-inflammatory drugs with innovative mechanisms of action. We have made public an exciting clinical portfolio in immunology, with innovative molecules and promising indications. We are now searching for a highly motivated scientist to lead in preclinical pharmacology an ambitious group of research scientists devoted to the discovery of new immunology projects and compounds. *Job Responsibilities:* As the group leader of this immunology pharmacology group, your primary responsibilities will be to impact the discovery strategy for new innovative compounds in immune-related diseases, to drive the in vivo pharmacology laboratories for the characterization of molecules and proof-of-concept studies in pathological models, and to actively contribute to the choice of clinical indications for each product arising from drug discovery and brought to clinical development (knowledge of diseases, translational medicine, bridge to clinical development). You will help identify the translational tools to support clinical translation and participate in the identification of new targets in immune-related diseases with high medical needs. You will collaborate with all involved parties in Drug Discovery and Clinical Development. The group leader in immunology pharmacology will communicate effectively and work as an influential member of collaborative and interdisciplinary teams in a dynamic and fast-moving domain. The successful candidate will create an environment of scientific excellence, data quality, value-added contribution, and timeliness, working in a proactive and supportive manner. Regular presentation and publication of scientific results is strongly encouraged. *Candidate Requirements:* MD/PhD (preferred) or PhD level; significant high-level experience in drug discovery in the immunology field; significant experience in in vivo pharmacology; solid publication record in immunology drug discovery, including high-level publications related to in vivo results; ability to critically assess cutting-edge publications related to research, pharmacology, and clinical results in the field; excellence in protocol and interpretation of in vivo studies; strategic thinking with a deep knowledge of discovery processes in immunology, able to influence and support a truly differentiated pipeline; excellent leadership skills and high motivation to contribute to multidisciplinary teams; excellent communication skills and flexible mindset; educational or professional experience of >3 years in multicultural environment outside country of origin will be advantageous; excellent knowledge of English language. *What Actelion Offers:* A competitive salary and generous social benefits; the possibility for development and advancement within our dynamic organization; the innovative and stimulating atmosphere of a multicultural environment. The research facilities are located in Allschwil, Switzerland, a suburb of Basel on the borders of France and Germany.

**Leadership Position**: The University of Toledo College of Medicine and Life Sciences, driven by the recent regional affiliation agreement with ProMedica (*https://www.utoledo.edu/med/partnership/*), is poised for significant growth and expansion of its research portfolio. Applications are solicited for the position of Director of the Center for Diabetes and Endocrine Research (CeDER). The goal of the Center is to stimulate and foster collaborative interdepartmental and interdisciplinary research in both basic and clinical areas related to diabetes. This is a senior level established investigator position for a qualified candidate who preferably demonstrates a track record of extramural grant support from the National Institutes of Health for Diabetes or related research. The successful candidate will assume a leadership role in furthering CeDER into

a regionally and nationally successful research center for diabetes. CeDER members are drawn from multiple university departments and colleges. The director will have opportunities to promote and lead collaborative research, with excellent shared cores for physiological, advanced imaging, and -omics studies. Along with a competitive salary, the University of Toledo offers an excellent benefits package. Applications should include a cover letter summarizing research, educational, and administrative background, curriculum vitae, and a vision statement for CeDER. Deadline for receipt of materials is April 1, 2016. Application materials may be sent via e-mail (PDF preferred) to CeDER Director Search Committee, c/o Candace Busdiecker, COM Dean's Office, The University of Toledo, 3000 Arlington Ave., MS 1018, Toledo, OH 43614. The University of Toledo is an equal access, equal opportunity, affirmative action employer and educator. Contact us at *Candace.Busdiecker@utoledo.edu*.

**Postdoctoral Fellow:** A postdoctoral position is available in the laboratory of Dr. Jin O-Uchi at the Cardiovascular Research Center (CVRC), Rhode Island Hospital and the Warren Alpert Medical School of Brown University, Providence, RI (*http://cvrc.brownmedicine.org/*). My lab is seeking one highly motivated postdoctoral fellow with an interest in cardiac ion channel physiology and mitochondrial biology. Our research aims to explore the detailed mechanism underlying the cardiac excitation and contraction/metabolism coupling by $Ca^{2+}$ ion in the normal and disease hearts. Specifically, we are investigating the significance of adrenergic signaling in heart and its regulation of cardiac ion channel/transporters. The interdisciplinary CVRC is home to scientists, physician-scientists, and students investigating molecular mechanisms of cardiac disease, with focal areas in cardiac hypertrophy and failure, ischemia/reperfusion, arrhythmias, and sudden cardiac death. Investigators are supported by Hospital- and Brown-based core facilities. Applicants will be expected to study the role of adrenergic signaling on mitochondrial $Ca^{2+}$ influx mechanism in the normal and disease hearts using novel mitochondria-targeted biosensors for $Ca^{2+}$, ATP, and ROS measurements. The candidate will have unique opportunities to carry out interdisciplinary researches, which cover cardiac physiology, molecular biology, and ion channel biophysics to address biologically and clinically significant questions. Multidisciplinary techniques such as gene transfer, Western blot, patch-clamping, and confocal imaging are routinely applied to isolated cardiac mitochondria, single live cells, tissues, and in vivo preparations. Candidates should have a PhD and/or MD degree and postdoctoral/predoctoral research training in cardiac physiology and/or mitochondrial biology. It is preferred that the applicants have experience in $Ca^{2+}$ imaging, confocal microscopy, cardiac electrophysiology, and mitochondrial biology. Additional qualifications include excellent interpersonal and communication skills, including the ability to publish in English language peer-reviewed journals. The salary will be based on years of experience, commensurate with NIH guidelines. Interested candidates should submit curriculum vitae, a brief cover letter highlighting their career goals and major accomplishments, as well as contact information of three references to: *jin.ouchi@lifespan.org*. Electronic submission in pdf format is encouraged. Review of applications will commence immediately and will continue until the position is filled. Rhode Island Hospital is an equal opportunity and affirmative action employer. Additional information for PI and O-Uchi lab is available at: *https://www.researchgate.net/profile/Jin_O-Uchi*, *http://www.ncbi.nlm.nih.gov/pubmed/?term=o-uchi+j*, and *http://profiles.jefferson.edu/display/33562*.

**Postdoctoral Position:** A postdoctoral position is available in the Pluznick Lab at the Johns Hopkins University School of Medicine for a motivated individual interested in renal/cardiovascular physiology and/or sensory systems (candidate must have a PhD and/or MD). Current projects are focused on elucidating the role of sensory signaling pathways in regulating renal and cardiovascular function, particularly blood pressure regulation, using a combination of in vitro and in vivo techniques. To apply, please send (in pdf format) a description of research background/interests, CV, and the names and contact information for three references to: *jpluznick@jhmi.edu* with the subject heading, "Postdoctoral Position."

**Postdoctoral Positions:** Two postdoctoral positions are available in the laboratory of Dr. Stuart Dryer at the University of Houston to study cellular and molecular aspects of diabetic nephropathy and nephrotic syndromes. The ideal candidate for one position should have experience with patch-clamp recording methods, cell and tissue culture, optical measurements of cell signaling, and use of transgenic rodents. Preference will

be given to candidates with a background in renal or cardiovascular physiology. The ideal candidate for the second position, who will work primarily on animal models of diabetic nephropathy, will have experience with evaluation of glomerular disease phenotypes, animal surgery, and use and breeding of transgenic rodent models. An earned doctorate (PhD or MD/PhD) is required. Funding for these projects is available for at least 3 years. Salary will be based on previous experience and NIH and University of Houston guidelines. Candidates should submit a curriculum vitae, research plan, a list of publications, detailed description of previous research experience, e-mail addresses of 3 references whom we may contact, and cover letter to: *http://jobs.uh.edu/postings/29275* and *http://jobs.uh.edu/postings/29282*. The University of Houston is an equal opportunity/affirmative action institution. Minorities, women, veterans, and persons with disabilities are encouraged to apply. Additionally, the university prohibits discrimination in employment on the basis of sexual orientation, gender identity, or gender expression.

**Postdoctoral Fellow:** We are seeking a postdoctoral fellow in the area of regulation of cardiac energy metabolism. One goal of the project is to determine how metabolic pathways in the heart are regulated to match energy demands during exercise and when different substrates are available. Another goal is to determine whether/how dysregulation of energetic state contributes to mechanical dysfunction in heart failure. The research will employ computational models to simulate and experiments to assay biochemical kinetics in in vivo and ex vivo systems. Candidates should have a background in biomedical engineering, biophysics, or equivalent. Please send your CV, and contact information for 3 references to: Dan Beard, PhD, and Brian Carlson, PhD. Dan Beard, PhD, Department of Molecular and Integrative Physiology, University of Michigan Medical School, NCRC 10-A122, 2800 Plymouth Rd., Ann Arbor, MI 48105; or e-mail: *beardda@umich.edu*. Brian Carlson, PhD, Department of Molecular and Integrative Physiology, University of Michigan Medical School, NCRC 10-A126, 2800 Plymouth Rd., Ann Arbor, MI 48105; e-mail: *bcarl@umich.edu*. The University of Michigan is an equal opportunity and affirmative action employer.

**Postdoctoral Fellow:** We are seeking a postdoctoral fellow in the area of control of energy metabolism in skeletal muscle in Type 2 diabetes. The overall goal of the project is to determine mechanisms by which glucose disposal from blood by muscle is inhibited in disease. The project uses computational modeling/simulation of metabolic pathways (glycolysis/glycogenolysis, beta-oxidation, TCA cycle kinetics), experimental assays of enzyme kinetics, and in vivo physiological studies. Candidates should have a background in biochemistry, bioengineering, biophysics, or equivalent. Please send your CV and contact information for 3 references to: Dan Beard, PhD, and Brian Carlson, PhD. Dan Beard, PhD, Department of Molecular and Integrative Physiology, University of Michigan Medical School, NCRC 10-A122, 2800 Plymouth Rd., Ann Arbor, MI 48105; or e-mail: *beardda@umich.edu*. Brian Carlson, PhD, Department of Molecular and Integrative Physiology, University of Michigan Medical School, NCRC 10-A126, 2800 Plymouth Rd., Ann Arbor, MI 48105; e-mail: *bcarl@umich.edu*. The University of Michigan is an equal opportunity and affirmative action employer.

**Postdoctoral Positions:** Multiple postdoctoral positions are available immediately to study diabetes and attenuated cardioprotection and developmental neurotoxicity using human induced pluripotent stem cell-derived cardiomyocytes and neuronal cells. The successful candidate must have a strong background and experimental skills in stem cell biology, molecular biology, cell biology, and/or developmental biology. Experience in standard tissue culture and animal surgery and a track record of publications are required. Applicants should submit their CV and the names and contact information of 3 references to: Zeljko J. Bosnjak, PhD, F.A.H.A. Professor and Vice Chairman for Research Departments of Anesthesiology and Physiology Medical College of Wisconsin, 8701 W. Watertown Plank Rd., Milwaukee, WI 53226; telephone: 414-955-5687; e-mail: *zbosnjak@mcw.edu*. MCW is an equal opportunity/affirmative action employer.

**Postdoctoral Fellowships:** We are seeking highly motivated postdoctoral fellows interested in training in cardiovascular physiology and computational bioengineering in areas relating myocardial blood flows, cardiac contraction regionally, cellular metabolism and energetics, excitation-contraction coupling, and endothelial function. We research links between normal physiological function, vascular and cellular remodeling with cardiac dyssynchrony, and coronary heart

disease. We seek people invested in the integration of observations and explanations, the reproducibility and quantification of the uncertainty of that knowledge, and dedication to not only improving cardiovascular health but producing sharable results that others can build on. Trainees will learn methodology for mathematical modeling of cardiovascular and respiratory systems, with a central emphasis initially on regulation of substrate metabolism and cellular and regional energy balances. Support is provided by a 5-year multi-university U01 grant; the stipend is based on years of experience since doctoral degree in accord with NIH postdoctoral fellowship stipend levels. The following criteria are relevant to to the selection of candidates: *1)* PhD, MD, or equivalent, and no more than 5 years of research experience since doctoral degree. Completion of dissertation within the last 3 years is an asset. *2)* Backgrounds in cardiovascular physiology, modeling analysis of experimental data, computational methods. *3)* Good communication skills (written/spoken English), demonstrated authorship. *4)* Excellence in academic record. *5)* A keen desire and initiative to learn and the ability to function as part of a team. *6)* Experience with cardiovascular imaging is valuable but no essential. Applicants should submit a single pdf file with *1)* letter of intent outlining their qualifications and career objectives, *2)* curriculum vitae and list of publications, and *3)* contact information, including e-mail, for 3 referees who may be contacted. The application and transcripts of graduate study, dissertation abstract, and reprints of publications should be sent to Dr. James Bassingthwaighte, Department of Bioengineering, University of Washington Box 35-5061, Seattle, WA 98195-5061. Queries to *jbb2@uw.edu*. Applications should be submitted by the end of March 2016.

**Research Scientist:** At Lilly, we unite caring with discovery to make life better for people around the world. We are a global healthcare leader headquartered in Indianapolis, Indiana. Our 39,000 employees around the world work to discover and bring life-changing medicines to those who need them, improve the understanding and management of disease, and give back to our communities through philanthropy and volunteerism. We give our best effort to our work, and we put people first. We're looking for people who are determined to make life better for people around the world. *Responsibilities and Job Purpose:* The associate biologist will have responsibility for providing in vivo support for projects in cardiovascular/metabolic diseases and diabetic complication DHT (CMDC DHT). The strategic intent of this position is to develop, validate, and test compounds in in vivo models to support heart failure and diabetic kidney disease drug discovery. The job responsibilities will be part of a team effort, working with technicians, associates, and senior scientists. *Objectives and Descriptions:* Develop and validate animal models to support heart failure, diabetic kidney diseases, and other cardiovascular disease projects within CMDC DHT. Independently design, execute, troubleshoot, and interpret in vivo studies. Coordinate and monitor studies conducted at external contract research organizations. Communicate results and conclusions within the CMDC DHT and cross-functional project teams. *Basic Qualifications:* Bachelor of science degree with minimum of 2-4 years of laboratory experience in either an academic or industry setting. Cardiovascular research experience is required. Qualified candidates must be legally authorized to be employed in the U.S. Lilly does not anticipate providing sponsorship for employment visa status (e.g., H-1B or TN status) for this employment position. *Additional Skills/Preferences:* Experience in cardiac and cardiovascular functional testing including, but not limited to, blood pressure tail-cuff measurement, ex vivo cardiac and coronary function in the Langendorff-perfused rodent heart, cardiac PV loops, and cardiac ultrasound evaluation in cardiac function in rodents. Willing to work with radioisotopes. Understanding of cell biology and biochemical assays: experience with cell line generation, mammalian cell line cultures, and primary cell cultures, in vitro and ex vivo enzyme assays. Knowledge in basic statistics. Drug discovery experience is not required but preferred. *Skills:* In vivo pharmacology. Animal handling. Small animal surgery. Strong organizational skill. Regulatory compliance. Teamwork and interpersonal. Oral and written communication. *Additional Information:* Shift Information: 8.75-hr shift during flex-time hours, may require weekend hours. Location of Position: LCC. The position will require hepatitis vaccine. The position is governed by regulations including OSHA and NRC; compliance to all applicable regulations is mandatory. Travel Requirements: In U.S. - 0; outside U.S. - 0. Lilly is an EEO/Affirmative Action Employer and does not discriminate on the basis of age, race, color, religion, gender, sexual orientation, gender identity, gender expression, national origin, protected veteran status, disability, or any other legally protected status. ●

# Meetings & Congresses

## 2016

*May 17-20*

**Molecular Biology of Hearing and Deafness,** Cambridge, United Kingdom. *Information:* internet: *https://registration.hinxton.wellcome.ac.uk/events/item.aspx?e=577*.

*May 21-24*

**The European Human Genetics Conference,** Barcelona, Spain. *Information:* internet: *https://www.eshg.org/home2016.0.html*.

*June 6-11*

**Development and Homeostasis of Skeletal Muscle in Health and Disease,** Pacific Grove, CA. *Information:* e-mail: *info@musclebiology.org*; internet: *http://www.musclebiology.org/*.

*June 20-24*

**APS Institute on Teaching and Learning,** Madison, Wisconsin. *Information:* internet: *http://www.the-aps.org/mm/Conferences/APS-Conferences/2016-Conferences/ITL*; *#ITLPhysiology*

*June 22-25*

**International Society for Evolution, Medicine and Public Health Second Annual Meeting,** Durham, NC. *Information:* internet: *http://evolutionarymedicine.org/isemph2016/*.

*July 6-9*

**21st Annual Congress of the European College of Sports Science,** Vienna, Austria. *Information:* internet: *http://ecss-congress.eu/2016/16/*.

*July 21-25*

**12th International Congress of Cell Biology,** Prague, Czech Republic. *Information:* internet: *http://www.cscb.cz/*

*July 29-31*

**APS/TPS Joint Meeting: Physiology 2016,** Dublin, Ireland. *Information:* internet: *http://www.physiology2016.org/*; *#Physiology2016*

*August 4-8*

**Society for Developmental Biology 75th Annual Meeting: International Society of Differentiation 19th International Conference,** Boston, MA. *Information:* e-mail: *sdb@sdbonline.org*; internet: *https://www.sdbonline.org/2016mtg*.

*August 24-27*

**APS Conference: Inflammation, Immunity and Cardiovascular Disease,** Westminster, Colorado. *Information:* internet: *http://www.the-aps.org/Inflammation*; *#IICVD16*

*September 5-8*

**7th International Congress of the African Association of Physiological Sciences,** Lagos, Nigera. *Information:* internet: *http://aapslagos2016.org/*.

*September 9-11*

**ILCA 2016 - The International liver Cancer Association's 10th Annual Conference,** Vancouver, Canada. *Information:* internet: *http://www.ilca2016.org*.

*September 25-28*

**International Conference of Physiological Sciences,** Beijing, China. *Information:* internet: *http://www.pco-online.com/icps2016/index.html*

*November 2-4*

**APS Intersociety Meeting: The Integrative Biology of Exercise VII,** Phoenix, Arizonia. *Information:* internet: *http://www.the-aps.org/mm/Conferences/APS-Conferences/2016-Conferences/Exercise*; *#IBExercise7*

## 2017

*April 22-26*

**2017 Experimental Biology,** Chicago, IL.

*May 27-June 1*

**International Neuromodulation Society 13th World Congress,** Edinburgh, Scotland. *Information:* internet: *http://www.neuromodulation.com/ins-congress*.

*August 1-5*

**IUPS 38th World Congress: Rhythms of Life,** Rio de Janeiro, Brazil. *Information:* Internet: *http://iups2017.com/*.

# Meetings and Conferences

## APS Workshop: Institute on Teaching and Learning
June 20-24, 2016 • Madison, Wisconsin

## Physiology 2016
July 29-31, 2016 • Dublin, Ireland

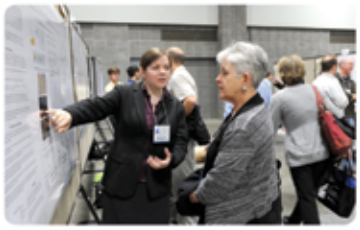
## APS Conference: Inflammation, Immunity, and Cardiovascular Disease
August 24-27, 2016 • Westminster, Colorado

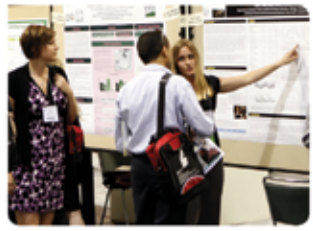
## APS Intersociety Meeting: The Integrative Biology of Exercise VII
November 2-4, 2016 • Phoenix, Arizona

## Experimental Biology 2017
April 22-26, 2017 • Chicago, Illinois

*APS is also participating in the following meeting*

## 2016 International Conference of Physiological Sciences
September 25-28, 2016 • Beijing, China





**For more information on APS meetings, please visit:**
***the-aps.org/conferences***

**APS Members receive discounted registration to EB and APS Conferences!**
The American Physiological Society usually holds one or more specialty conferences each year. In addition, APS joins with other societies to sponsor Intersociety Meetings as interest warrants. Please send an email to: meetings@the-aps.org for questions or to propose APS Conferences.

American Physiological Society • 9650 Rockville Pike • Bethesda, MD 20814
TEL: 301-634-7967 • FAX: 301.634.7241 • www.the-aps.org • meetings@the-aps.org • #PhysiolConf