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Surviving Parenthood and Science: It Can Be Done

Laura Gilliam

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Survival.

What does that word bring to mind? Do you think of beautiful, tropical islands with scenes similar to the Discovery Channel's reality show "Naked and Afraid"? Does it bring to mind graduate school, a job interview, or an NIH grant review? On the eve of my daughter's birthday, I picture scenes from the past 2 years: the first 3 months of sleepless nights, her first smile, the learning curve of breastfeeding, our bouncing dance ritual to relieve gas pain, the balancing act of running experiments and being home in time for dinner. The memories recalled are extensive, marked with feelings of both immeasurable joy and fierce guilt. I initially thought using the word *survive* to describe the life of a scientist and parent had a negative connotation. However, synonyms of survive include words such as durable, endure, and flourish (3). Being a survivor is powerful, a mark of strength. In science, we hail each other when we survive the comprehensive exam or the brutal peer review. To be a survivor, you need a certain skill set that includes flexibility, problem solving, and a tenacious will to achieve. In some form, usually out of necessity, you acquire these skills through graduate school, and they are developed throughout your scientific career.

New parenthood feels a lot like survival mode to me. Thanks to my scientific training, I am armed with the useful skills I listed above. But I have found they aren't quite enough to keep me upright. Over the past 2 years, I have fallen down *a lot,* and I wanted to share three valuable tips that have propped me up and continue to help me survive this journey of science and parenthood.

1) Debunk the Myth of Work-Life Balance

Hearing the phrase "work-life balance" usually makes my head spin. The idea of creating compartments of work and life in equal harmony produces this pressure to be the best at both – constantly – to "have it all." This balance pursuit was my focus during the beginning stages of my parenthood journey. The results were unnecessary stress and lots of mascara-streaked ugly crying. Rather than spend the rest of my career an inconsolable mess, I vowed to be more strategic with my tasks and

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A Matter of Opinion

Nutritional Insufficiency

Experimental Biology will soon be suffering from a nutritional insufficiency. Just as the membership of the American Society for Nutrition (ASN) were informed, EB-participating societies were informed at the end of 2013 that ASN was withdrawing from EB from 2018 to 2020. ASN was initially planning to withdraw from 2016 to 2018, but due to financial penalties, they decided to roll it back to 2018.

The decision came as a shock to ASN's sister societies (APS, ASBMB, ASPET, ASIP, and AAA) who participate with them in EB. It was a shock because of ASN's long-term commitment to the EB

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PanAm Congress

Figure 1. Iguassu Falls, Brazil

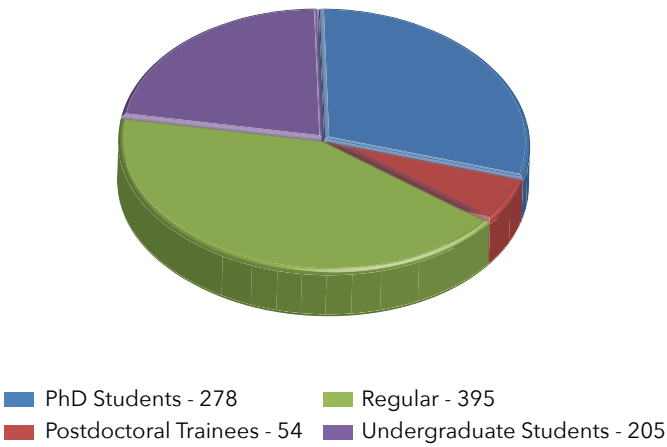
1st Pan-American Congress of Physiological Sciences

Iguassu Falls provided a fitting backdrop for the 1st Pan-American Congress of Physiological Sciences (Figure 1). Like the Iguassu River and the Iguassu Falls, science flowed freely, ignoring national boundaries and allowing for the free exchange of ideas. In planning for the August 2-6 Congress, the organizers selected Iguassu Falls, Brazil for both its natural and its symbolic beauty. Located at the juncture of three countries (Brazil, Argentina, and Paraguay), Iguassu Falls served as an appropriate reference for the Congress's motto "Physiology Without Borders." The Congress, as with all international meetings, demonstrated how the science of physiology can easily cross natural and political boundaries to create an opportunity to exchange ideas and learn from each other. The Congress attracted nearly 950 physiologists (Figure 2) from over 35 different countries (Table 1), many of whom were early stage investigators.

The seeds for the Pan-American Congress were sown 5 years ago in Kyoto, Japan during the 2009 IUPS Congress when Benedito Machado and Vagner Antunes had discussions with the APS leadership (Gary Sieck, Peter Wagner, and Martin Frank) about a possible joint meeting of the APS and the Brazilian Society of Physiology (SBFis). A few months later, Machado and Antunes shared the idea of a joint meeting with colleagues from several societies of physiology from South America during the Annual Congress of the Chilean Society of Physiological Sciences in Pucón. During the Congress, Rodrigo Iturriaga held a meeting to discuss ideas for the organization of the next Latin-American Congress of Physiology. At the end of 2009, the SBFis Executive Council considered the two ideas and suggested a Pan-American Congress of Physiological Sciences instead of a joint meeting with the APS or a Latin-American Congress of Physiology.

During the 2010 Annual Congress of SBFis, members of APS, SBFis, and ALACF met and agreed to start work on the PanAm-2014 project. An International Planning Committee was constituted, working on ideas, plans,

Figure 2. Registration by Category



and discussions through e-mails, Skype, and face-to-face meetings held in conjunction with the Experimental Biology meetings in Anaheim, Washington, San Diego, Boston, and San Diego.

Table 1. Registration by country

Country	No.
Brazil	603
United States	92
Chile	55
Argentina	44
Canada	34
Mexico	17
Turkey	15
United Kingdom	13
Australia	9
Saudi Arabia	5
Japan	4
Bolivia	3
Slovakia	2
Peru	2
Switzerland	2
Poland	1
Paraguay	1
Sao Cristovao	1
Greece	1
Egypt	1
Israel	1
Qatar	1
Holland	1
Croatia	1
Denmark	1
Spain	1
Cuba	1
Taiwan	1
Ukraine	1
Pakistan	1
Colombia	1
Nigeria	1
Uruguay	1
Netherlands Antilles	1
New Zealand	1
Total	920

The International Scientific Programming Committee, co-chaired by Benedito Machado and Jane Reckelhoff, was able to organize a world-class scientific program consisting of 747 posters, 5 plenaries lectures, 16 keynote lectures, 28 symposia, and 5 workshops. Importantly, more than 60% of the registrants were early career investigators, and most of them were students presenting their posters to an international audience.

Thiago S. Moreira provided the initial welcome to attendees during the opening ceremony on Saturday, August 2. He welcomed representatives from the Brazilian Society of Physiology, the Latin American Association of Physiological Science, the American Physiological Society (APS), the Canadian Physiological Society, the Argentinian Society of Physiology, the Chilean Society of Physiology, the Mexican Physiological Society, the Cuban Physiological Society, the International Union of Physiological Sciences, The Physiological Society (UK), and the South Asian Association of Physiologists, and they each extended their greetings to those in attendance (Figure 3). The welcome was followed by a plenary lecture by Cecilia Hidalgo (Chile) titled "Calcium ROS, and Synaptic Plasticity Processes." Each day, the Congress opened with a plenary lecture followed by the presentation of four to five simultaneous symposia/workshops and four simultaneous keynote lectures. Poster sessions were held during a 3-hour lunch break in the convention center. There was ample content for one to identify sessions worthy of their attendance and posters that were relevant to one's research.

The Congress dinner was held at the Rafain Brazilian Steakhouse. Although the food was plentiful, one could find better food elsewhere. However, they did provide a musical dance show that started with the mythical history of Iguassu Falls and transported diners from early days to modern Brazilian and South American dance and culture. It provided a nice respite from the scientific presentations and an opportunity to mingle with Congress attendees and a relaxed setting. The Congress proved noteworthy because there were six APS presidents in attendance at the Congress: Doug Eaton, Gary Sieck, Irv Zucker, Sue Barman, Kim Barrett, and Patricia Molina. They were joined by Joseph (JR) Haywood, the FASEB President (Figure 4).

The APS was a full participant in the meeting, providing logistical support to plan the Congress as well as financial support for U.S. speakers and APS travel award recipients. APS allocated approximately $125,000 to partially support the participation of 62 invited speakers and 36 Pan-American Congress Travel Award recipients. In organizing the Congress, each participating national society from the Americas agreed to provide partial travel support for speakers from their home country. In addition, APS set aside funds for awards to APS members who were participating in the Congress no matter their country of residence.

The APS also offered a workshop titled "Publishing 101: How to get your physiology paper published and avoid ethical minefields along the way." Kim Barrett, Rita Scheman, Christina Bennett, and Martin Frank presented in the workshop (Figure 5). APS staff members Christina Bennett and Miranda Byse also presented posters at the meeting.

The Congress also provided an opportunity to meet with the President of the Sociedad Cubana de Ciencias Fisiológicas, Alberto Juan Dorta Contreras. Patricia Molina and Martin Frank (Figure 6) met with him to

Figure 3. Opening ceremony featured welcomes from representatives of participating organizations. *Left to right:* Michael Spyer (The Physiological Society), Penny Hansen (International Union of Physiological Sciences), Carolina Escobar (Mexican Physiological Society), Claudio Capurro (Argentinian Physiological Society), Kim Barrett (American Physiological Society), Jane Reckelhoff (co-chair, International Scientific Program Committee), Benedito Machado (Brazilian Society of Physiology and co-chair International Scientific Program Committee), Rodrigo Iturriaga (Latin American Association of Physiological Science), Douglas Jones (Canadian Physiological Society), Juan Reyes (Chilean Society of Physiology), Alberto Dorta Contreras (Cuban Physiological Society), and Arif Siddiqui (South Asian Association of Physiologists)

Figure 4. Presidents gather at the Congress banquet. *Back row (left to right):* J.R. Haywood, Kim Barrett, Gary Sieck, Patricia Molina. *Front row (left to right):* Irving Zucker, Susan Barman, Douglas Eaton

Figure 5. Publishing 101 Workshop speakers Rita Scheman, Kim Barrett, Christina Bennett, and Martin Frank.

Figure 6. Sociedad Cubana de Ciencias Fisiológicas President Alberto Juan Dorta Contreras with APS President-elect Patricia Molina and APS Executive Director Martin Frank

discuss opportunities for collaboration and the potential for APS to bring a delegation of U.S. physiologists to Havana to learn about physiological research in Cuba and their medical education system. It would also provide the APS with an opportunity to update their knowledge of physiological science and share information about publishing in the Society's journals. Professor Dorta expressed interest in seeing the APS Workshop Publishing 101 presented in Havana. Future discussions may lead to the signing of a Memorandum of Agreement to facilitate future exchanges.

The APS offered information about the Society's programs, publications, and membership in the exhibit hall and received considerable interest from those in attendance. Rita Scheman, Miranda Byse, and Christina Bennett answered questions raised by attendees and directed them to information about the Society.

In closing, the Congress on Wednesday, August 6, Benedito Machado thanked all those in attendance for their support and contributions in making the 1st Pan-American Congress of Physiological Sciences a success. He also informed the attendees that the members of the organizing committee had met to discuss the future of the Pan-American Congress – would there be a 2nd Congress or would the Brazilian Congress be the last? Machado reported that there was enthusiastic support for a future Congress to be held in 2019, so as not to conflict with the 2017 IUPS Congress in Rio de Janeiro, Brazil. Although the location of the 2019 Pan-American Congress has not been finalized, there are three countries interested in hosting the meeting: Argentina, Chile, and Cuba. The host country should be determined by the end of 2014. ●

Pan-American Congress Travel Program

The Pan-American Congress was established through the cooperation of societies in the Americas. The goal was to encourage participation by having each national society agree to provide financial support for speakers from their country. For APS, that meant that the Society provided travel grants of $1,500 to 62 U.S. speakers. In addition, the Society allocated funds for a travel award program, making awards ranging from $750 to $1,000. Overall, the Society committed $125,000 in support of the Pan-American Congress.

The speakers and travel award recipients were asked to respond to a survey designed to gain their impressions of the Congress and whether their participation provided them with any benefit (Table 1). Travel award recipients received their doctoral degrees ranging from 1964 to 2014, with the median being 2010. They were also asked to rate the meeting on a 1-10 scale with 10 being the best. The mean and median of their evaluations was 8, with 75% of the respondents providing a rating of 8 or higher.

The speakers similarly were asked to evaluate the Congress and their participation in the meeting. Speakers received their doctoral degrees between 1960 and 2014, with the median being 1988. They also rated the Congress grading it as a mean of 7.8 and a median of 8. Sixty-four percent rated the Congress as 8 or higher.

Those receiving financial support from the Society were asked to respond to four questions concerning

their participation in the Congress (Table 1). Twenty-nine percent of travel awardees and speakers used the Congress as an opportunity to visit a research laboratory in Brazil. Almost all of the respondents indicated that the Congress provided an opportunity to develop a collaborative project with a colleague. Seventy-four percent of travel awardees used the meeting as an opportunity to explore the possibility of working in another laboratory, whereas only 46% used the meeting for that purpose. Seventy-eight percent of speakers used the Congress as an opportunity to recruit candidates to work in their laboratory, whereas only 42% of the travel awardees did the same.

The survey respondents were also invited to comment about the Congress. Although the Congress hotel received a fair amount of criticism, the actual Congress received many positive comments. Some of the comments were as follows:

> "Sessions were well organized. I was also made aware of the research work being done in South America (the posters sessions were very helpful in this). Met several students who were interested in pursuing postdoc work in the U.S."

> "There is great work in whole animal physiology ongoing in Brazil and S. American as a whole. I appreciated the opportunity to interact with the student researchers who cannot readily come to the U.S."

> "The meeting featured a wide array of topics with only one session on each, which allowed me to explore more outside my own area within physiology. Also, I met a lot of people whom I had never had the opportunity to meet at U.S. meetings. That was very positive."

> "The plenary lectures and symposia at the Congress were outstanding."

> "Scientifically, it provided an opportunity to learn about other research lines, which I found interesting, and to discuss experimental models and techniques that I could apply to my own research work. I was able to establish contact with other laboratories in my field, which will hopefully bring forth some collaborative work in the future. Also, personally, it was my first international congress, and I am most grateful for the assistance and sponsorship of the APS."

> "I met several colleagues I had not met before. Our science discussions were valuable since I learned of new research and techniques that I was unaware of. This new knowledge has initiated a potential collaboration. I also had the valuable experience of seeing Brazil and some of its natural wonders!"

Although the meeting in Brazil was the first, it will not be the last. The next Pan-American Congress will be held in 2019 either in Argentina, Chile, or Cuba. APS will once again be helping to make the 2nd Congress a success. ●

Table 1.

Did your participation in the Pan-American Congress provide you with an opportunity to …			
Visit a research lab in Brazil?	Develop a collaborative research project with colleagues?	Identify opportunities to work in another lab?	Recruit candidates to work in your lab?
Pan-American Congress Speakers, U.S.			
13 Yes/32 No	42 Yes/3 No	21 Yes/24 No	35 Yes/10 No
Pan-American Congress Travel Awardees			
9 Yes/22 No	30 Yes/1 No	23 Yes/8 No	13 Yes/18 No

Committee Reports

APS Council Holds Summer Meeting in Bethesda

The APS Council held its annual summer meeting in Bethesda, MD, July 10-12, 2014, at the Bethesda Marriott Hotel. Each summer, the Council invites the APS Committee Chairs to the summer meeting to present their annual committee reports to Council. The committee reports begin on p. 266 and will be posted to each committee's web page.

Council approved the request to continue as an affiliate member of AAAS (American Association for the Advance of Science), indicating that affiliation with AAAS continues to be a benefit to the society.

Council accepted a proposal to create a local physiology network program comprised of all APS members at an institution. The program will be initiated on a pilot basis at the University of Alabama at Birmingham, Medical College of Wisconsin, University of Wisconsin at Madison, and University of Missouri at Columbia.

In addition to presenting their reports, the chairs discussed the highlights of their committees' activities and programs during the past year and updated Council on the committee's goals and plans for the coming year. The chairs also submit requests for new committee programs to Council for their approval.

The Education Committee submitted two requests to Council. The first request was to support the participation of two Committee members in the 2015 NDGS meeting. The Committee's second request was to recognize the 5- and 10-year PhUn Week participants during the APS Business meeting at Experimental Biology. Council approved both of the Education Committee requests.

The Membership Committee submitted a proposal to Council to implement an APS Fellows Program (FAPS). Council accepted the proposal in principle and asked the Committee to revise the criteria for membership before the program is formally announced to the membership.

APS staff recognition awardees. *Front row:* Iliana Torres, Leona Kanaskie, Ellyn Kestnbaum, Carolyn Villemez, Stephanie Demma, Maria Pasho, Sarah Knox. *Back row:* David Pollock, Mark Goodwin, Martin Mould, Kevin Chian, Rebecca Osthus, Robert Price, Kathleen Beaulieu, Jennifer Navas-Marquez, Martin Frank

APS Council. *Front row:* Jeff Sands, Patricia Molina, David Pollock, Kim Barrett, Bill Yates, Pamela Carmines. *Back row:* Kevin Kregel, Michael Wyss, Marilyn Merker, Barbara Alexander, Rudy Ortiz, John Chatham, Ann Schreihofer, Hannah Carey, Harold Laughlin, William Talman, Hershel Raff

As requested by the Publications Committee, Council approved the proposal for the formation of a joint APS/TPS (The Physiological Society) data-working group to develop guidelines for publishing source data along with the research article.

The Career Opportunities Committee submitted a proposal to expand the current Phizzy Bear activity book to include age-appropriate career information and science/math activities for early education students. Council approved the committee's request to expand the Phizzy Bear activity books.

APS Committee Chairs. *Front row:* Robert Brock, Barbara Goodman, Michael Brands, Michael Hill, Jennifer Sasser. *Back row:* Gaylen Edwards, Kathy Ryan, Michael Sturek, Angela Grippo, Ida Llewellyn-Smith

The Trainee Advisory Committee submitted a proposal for funding for a networking breakfast session at the annual Experimental Biology meeting for all trainees who are members of the APS Committees and Section Steering Committees. The Committee also submitted a proposal to create career-related webinars jointly with the Career Opportunities Committee and the Porter Physiology Development and Minority Affairs Committee. The Council approved the request for funding the networking session and the request to develop a webinar series.

The Section Advisory Committee submitted a proposal for the creation of APS Endowed Matching Funds Accounts for four sections: Cardiovascular Section (CV), Central Nervous System (CNS), Cell and Molecular Physiology (CaMP), and the Water and the Electrolyte Homeostasis Section (WEH). Council approved the request for APS Endowed Matching Funds accounts for the four sections.

Each year during the Council/Committee Chairs meeting, APS hosts an employee appreciation reception. The reception provides an opportunity for members of Council and the committee chairs to meet with the APS staff. During the reception, APS President David Pollock thanked the staff, saying, "It is a pleasure for me to present the staff with the service awards this year. APS is presenting 14 awards, which is a testament to the society and its leadership. The staff helps APS run smoothly and ensures that the ideas that Council and the Chairs have become a reality. No other society has as dedicated a staff as APS."

The highlight of the reception every year is the recognition of those staff members who have worked for APS for 5 years or more (anniversary is based on 5-year intervals). Each employee celebrating an anniversary receives a certificate of appreciation and a gift certificate. This year, APS President David Pollock presented a 25-year certificate to Mark Goodwin (Editorial Manager); 20-year certificates to Carolyn Villemez (Staff Assistant) and Stephanie Demma (Journal Supervisor); 15-year certificates to Robert Price (Director of Finance and Administration), Jennifer Navas-Marquez (Copy Editor), Martin Mould (Journal Supervisor), Maria Pasho (Journal Supervisor), Ellyn Kestnbaum (Journal Supervisor), and Iliana Torres (Peer Review Coordinator); 10-year certificates to Rebecca Osthus (Senior Policy Analyst), Sarah Knox (Senior Meeting Planner), Leona Kanaskie (Copy Editor), and Kevin Chian (Financial Analyst); and a 5-year certificate to Kathleen Beaulieu (Marketing Specialist). ●

Animal Care and Experimentation Committee


Gaylen L. Edwards

The Animal Care and Experimentation (ACE) Committee continues to focus on two main areas: advocacy for the humane use of animals in research and reducing unnecessary regulatory burden. This year, we also began to address the emerging challenge of ensuring the rigor of science and therefore the reproducibility of research findings.

Advocacy

As part of the ACE Committee's fall meeting in Bethesda, committee members went to Capitol Hill to discuss animal research issues with staff in the offices of 7 Senators and 8 Representatives from a total of 11 states. Committee members explained the pivotal role that research with animals plays in efforts to cure disease. They underscored scientists' commitment to animal welfare but pointed out that overly burdensome regulations divert time and resources from research efforts.

The ACE and Science Policy Committees initiated a new Chapter Advocacy Outreach program in 2013. This program makes it possible for APS to sponsor speakers at up to three Chapter meetings per year to offer training in advocacy both for biomedical research in general and for animal research in particular. The 2013 Chapter Advocacy Outreach speakers were Richard Nichols (Iowa Physiological Society), Bill Talman (Nebraska Physiological Society), and Kevin Kregel (Arizona Physiological Society). APS Chapters that would like to arrange an advocacy speaker should contact the Office of Science Policy.

In June, 2014, the ACE Committee brought to Council a position statement in support of companies that provide air transportation for animals scientists need to study various diseases. Air transport is highly regulated and "makes these animal models of disease available when and where they are needed," the statement noted. Unfortunately, some airlines have ceased transporting research animals. No doubt this is due in part to the difficulties associated with complying with the complex and sometimes conflicting regulations intended to protect not only the animals but also travelers and crew. However, some animal rights groups are also using pressure tactics against the airlines that transport animals. The APS statement says in part: "Air transportation is essential so scientists can work with animal models that otherwise would not be available for life-saving research. Moreover, it is the most humane transportation option for the animals themselves. The APS calls therefore upon regulators, research sponsors and transporters to take steps to ensure that air transportation of animals can continue."

The complete statement is posted at *http://www.the-aps.org/mm/SciencePolicy/About/Policy-Statements/Animal-Air-Transport.html*.

Reducing Regulatory Burden

The ACE Committee sponsored the EB 2014 Public Affairs Symposium on "Administrative Burden: Mitigating the Impact on Research." The speakers focused on administrative burden as it relates to animal research. Several speakers emphasized that institutions should exercise caution not to over-interpret regulations: that is, unless a practice is mandated by the AWA, PHS Policy, or other governmental authority, and if the practice does not advance animal welfare, the institution, usually via the IACUC, shouldn't require it. In addition, IACUC oversight should focus on performance-based standards that result in improved animal welfare outcomes. Finally, every effort should be made to optimize the relationship between investigators and IACUCs. One speaker noted that direct conversation is frequently more effective than e-mail in resolving issues expeditiously.

In May, the APS submitted the comments to a Request for Information (RFI) from NIH's Office of Laboratory Animal Welfare (OLAW) on Proposed Guidance to IACUCs Regarding Significant Changes to Ongoing Animal Activities. The APS response emphasized the need to provide an "optimal regulatory environment" for the conduct of federally funded research and urged NIH to further clarify the guidance to avoid regulatory burden. The letter is available at *http://www.the-aps.org/mm/SciencePolicy/About/Comments-Letters/IACUC-Protocol-Changes.pdf*.

Reproducibility

In recent months, there has been growing attention to the reproducibility of research findings. Both the ACE and Science Policy Committees have been involved in addressing these questions. In June, Gaylen L. Edwards represented the APS journals at a roundtable on "The Missing R: Reproducibility in a Changing Research Landscape," sponsored by the Institute for Laboratory Animal Research. The 2-day meeting covered a wide range of topics, with several speakers emphasizing the need for journal articles to include more detail about research methods and study design, including sample-size calculations and statistical analysis. Other points emphasized included rigorous attention to experimental design, ensuring that appropriate animal models are utilized, and stressing the strength of validating phenomena in multiple species. The value of publishing negative data was also highlighted, along with the recommendation that journal reviewers pay attention to whether the data presented are appropriately analyzed and interpreted to support the conclusions of the paper. There was a consensus that the current culture of science itself needs to change. The emphasis ought to be on publishing complete, high-quality studies rather than on rushing to press with the "least publishable unit" or exciting findings that lack scientific rigor.

Council accepted the report of the Animal Care and Experimentation Committee ●

Awards Committee

Ida Llewellyn-Smith, Chair

One of the most important functions of the Awards Committee is to assess applications for APS's Young Investigator Awards and APS's Career Enhancement Awards.

The Research Career and Teaching Career Enhancement Awards received 13 applications for the Fall 2013 deadline. Eleven of these applications were for a Research CEA and two were for a Teaching CEA. Four applications were funded in the Research category, and one of the two applications was funded in the Teaching category. In the Spring 2014 Round, there were four applications for Research CEAs and four applications for Teaching CEAs.

Although the Young Investigator Awards (YIA) continued to attract a great number of extremely competitive applications, the numbers of applications for the Young Investigator Awards (YIA) were down for all but the Arthur C. Guyton Award for Excellence in Integrative Physiology. The Committee received 5 applications for the Arthur C. Guyton Award, 6 for the Lazaro J. Mandel YIA, 3 for the Shih-Chun Wang YIA, and 11 for the Dean Franklin YIA. Despite the fact that the number of applications has declined, the quality of the applications received was truly outstanding.

The APS Awards Committee met at the Experimental Biology Annual Meeting in San Diego, CA. At that meeting, the Committee discussed the review of the YIA applications and highlighted that the content of the applications for each award was quite variable. The Committee decided that the descriptions and guidelines for each YIA should be rewritten. There are now revised descriptions and guidelines available on the APS Awards website (*www.the-aps.org/mm/awards/Other-APS-Awards*).

Young Investigator Awards

The APS has three Young Investigator Awards: the Arthur C. Guyton Award for Excellence in Integrative Physiology, the Shih-Chun Wang Young Investigator Award, and the Lazaro J. Mandel Young Investigator Award. The Arthur C. Guyton Award for Excellence in Integrative Physiology was presented to Richard Wainford, Boston University School of Medicine, Boston, MA. The Lazaro J. Mandel Young Investigator Award was presented to Oleh Pochynyuk, University of Texas Health

Science Center, Houston, TX. The Shih-Chun Wang Young Investigator Award was presented to Christopher Mendias, University of Michigan, Ann Arbor, MI. The Dean Franklin Young Investigator Award was presented to Colin Young, Cornell University, Ithaca, NY.

Council accepted the report of the Awards Committee ●

Research Career Enhancement Awards			
Fall 2013	Joaquin Uranga Gonzales	Texas Tech University	U.S.
	Stephen Lomber	University of Western Ontario	Canada
	Jin O-Uchi	Thomas Jefferson University, PA	U.S.
	Kedra Wallace	University of Mississippi Medical Center	U.S.
Spring 2014	Karyn Hamilton	Colorado State University	U.S.
	James McCormick	Oregon Health & Sciences University	U.S.
Teaching Career Enhancement Awards			
Fall 2013	Margarita Curras-Collazo	University of California, Riverside	U.S.
Spring 2014	Reem Abraham	Melaka Manipal Medical College	India
	David Harris	University of Central Florida	U.S.
	Martha Perez	University of Habana	Cuba

Career Opportunities in Physiology Committee

Kathy Ryan, Chair

2014 Career Symposium

In 2014, the Career Opportunities in Physiology (COPC), Trainee Advisory, and Women in Physiology Committees again coordinated the topics of their sessions to provide a complementary set of career advancement sessions for physiologists. The session was entitled "Conscious Choice and Serendipity in Your Career Trajectory: A Panel Discussion," and speakers provided information about various careers and the paths that led them to that career. The speakers then took questions from the audience, followed by "breakout" sessions in which attendees with an interest in one of these careers could speak directly with the speakers. Multimedia presentations for the symposium will be posted at the APS website and catalogued at the Life Science Teaching Resource Community digital library for wide dissemination. Users can listen to a narrated PowerPoint presentation.

2015 Career Symposium

The symposium to be presented will be entitled "Resilience is Power: Dealing with the Ups and Downs of Your Scientific Career."

Undergraduate Summer Research Fellowship Program (UGSRF)

2013-14 Program. The 2013-14 UGSRFs completed their fellowship year by attending EB 2014 in San Diego, CA. Of the 24 fellows, 22 (92%) attended EB and 20 (91%) submitted an abstract. The 2013-2014 UGSRFs, like those in the past, competed successfully in the David S. Bruce Excellence in Undergraduate Research Award program, winning 7 of the 30 abstract awards and 3 of the 14 Bruce Awards.

2014-15 Program. For the 15th year of the program, 113 applications were received. The quality of the applications was deemed very high by the Committee, and they were pleased to be able to recommend 24 students for fellowships. Over the 15-year history of the program, the program has received 829 applications for the 276 awards granted, with an average funding rate of about one-third (33%).

APS Undergraduate Research Excellence Fellowship Award (UGREF)

For the second year of the program, 33 applications were received for the 6 fellowships. The quality of the applications was deemed very high by the Committee. The Committee was pleased to recommend six students for fellowships; 18% of the applications were funded. This indicates that there is a significant pool of potential applicants for this program and that there are students who are eager to continue their physiology studies over multiple years and who are primarily interested in PhD or MD/PhD programs.

Undergraduate Orientation Session at EB

The EB 2014 orientation session attracted more than 100 undergraduate students. All undergraduate students who submitted a first-author physiology poster were invited, and announcements were posted in e-mails to the Trainee and All-APS listservs.

Career Outreach Resources

The APS Career PowerPoint Presentations provides downloadable PowerPoint files for use at the middle and high school levels, as well as lower and upper undergraduate levels. Since the initiation of this project, these PowerPoint presentations have become important tools not only for use by APS members individually but in both undergraduate and K-12 outreach programs, especially PhUn Week. It also provides interactive, online physiology activities to enhance the PhUn Week website and engage younger children (early or pre-readers) in doing simple physiology experiments and to engage their interest in science careers. The Committee has recently developed career trading cards aimed at upper elementary and middle school grades. In addition to the "cool factor" of the cards, each card contains a link to the APS website with pages where students can answer physio-quizzes to unlock special cards and posters.

APS Local and Regional Science Fair Awards

This program encourages APS members to make an APS physiology award at their local or regional science fair at the elementary, middle, or high school level. The program provides opportunities for students from elementary through high school to learn what physiology is and to become "associated with the field" through recognition of their work. The program also builds connections between APS members and their local schools. Finally, it encourages local fairs to promote physiology-based projects to their students, since there are potential awards to be won. Student winners receive an APS t-shirt and a certificate for the best physiology project. The teachers of the winning students receive the APS book *Women Life Scientists: Past, Present, and Future* and an APS resource packet. Up to 100 awards are available each year on a first-come, first-served basis.

Physiology Video Contest for Undergraduate and Graduate Students

The Committee was pleased to receive nine submissions that met all of the criteria for copyright, permissions, etc. The applicants included both undergraduate and graduate students. The Committee selected "Avian Surgery!" by Peter Luu, Laura Philbin, Lubaina Elah, and David Tatarakis at San Jose State University as the first place winner. The Viewer's Choice Award selected by the general viewing public was "Goose Bumps" by Derek S. Burkhardt, Marc Stanieich, and Joshua Linnane at University of New Hampshire at Manchester. All entries will be included in the Archive.

Excellence in Professional Student (MD or DO) Research Travel Award

For the 2nd year of the program, eight applications were received. The Committee was pleased to recommend six students for fellowships; thus 75% of the applications were funded. These students were matched with a mentor for EB, similar to what is done for the Minority Travel Fellows Program. Fellows and mentors corresponded via e-mail and then met each other at an orientation session on Sunday morning.

Council approved the Career Opportunities Committees request for $1,000 to expand the current Phizzy Bear activity book to include age-appropriate career information and science/math activities for early education students. ●

Chapter Advisory Committee


Mike Sturek, Chair

The local APS Chapters continue to promote the future of physiological sciences overall and the APS as more grassroots involvement at the graduate, undergraduate, and high school levels. An overall goal is for the activities of the Chapters to further influence public policy. The number of Chapters in good standing is currently 13, and 1 Chapter is typically added per year. The main activity is the annual meetings, which typically have ~60-120 participants in a 1- to 2-day meeting. Novel methods for promoting poster attendance, etc. have been used. There is an increasing emphasis on career development in the changing research and education environment. A major emphasis is on trainee involvement in running meetings. The Chapter program had 4 of 13 active chapters involved in outreach/advocacy activities in the past year, so this essential function will be improved in the coming year. Involvement of smaller colleges in the Chapter activities greatly improves outreach to undergraduates.

APS Chapters contribute significantly to the various missions of the APS. For example, APS Chapters now have a trainee representative for each chapter. To this end, APS Chapters visit local high schools and demonstrate basic physiology-related experiments, organize teacher workshops and career fairs for graduate and undergraduate students, participate in state-wide science fairs and in the APS-sponsored Physiology Understanding (PhUn) week, and are engaged in various other outreach activities. Some of these activities are sponsored through the Chapter Activity Grant program that provides APS Chapters with up to $2,000 for specific outreach activities.

APS Chapters also collaborate with the APS Animal Care and Experimentation Committee and with the APS Science Policy Committee to strengthen advocacy outreach activities of APS. The goal is to disseminate the culture and philosophy of the discipline of physiology across societal strata and boundaries.

Council approved the activity grants for the DMV, Arizona, Indiana, and Nebraska chapters pending the Education Department and legal review ●

Committee on Committees


William Talman, Chair

The Committee on Committees (CoC) is composed of a representative appointed by each of the 12 APS Section Steering Committees plus two councilors who serve as Chair and In-coming Chair. Due to a conflict this year, only one member of Council was able to attend the CoC meeting as Chair. The primary duty of the CoC is to nominate individuals to serve on APS standing committees and on outside bodies where the APS is represented. The CoC members try to identify and promote members of their section who might serve on committees and, more importantly, set aside section affiliations to work together to nominate the best-qualified individuals to serve the Society while seeking to promote diversity and involvement of younger members in the committee structure.

Characteristics of the 2014 Applicant Pool

The CoC was pleased with the pool of applications for committee vacancies. This year, 228 applications (Table 1A) were submitted (this includes member positions, chairs, and trainee/student positions). Thus the total number of members applying for committee positions was 228. Table 1C shows the applicant pool by section affiliation by committee. Table 2, A and

B, show the characteristics of the applicant pool and new appointees.

Results From Coc and Council Meetings

The CoC initially had 49 positions to fill. The Education Committee requested two additional members for their committee. The additions were approved by Council.

APS Standing Committees/Number of Positions (Including New Positions Recommended by the CoC; Does Not Include Alternate Positions)

Table 3, A and B, shows the composition of the committees in terms of representation by section affiliation, members that are under the age of 45, women, members living outside of the U.S., members employed in industry, and trainees.

Planning for 2016

The CoC hopes that many APS members will consider serving the Society as a member of one of its standing committees, and we hope that the Section Steering Committees and SAC will play an active role in encouraging section members to apply. Some sections do a fine job of putting names forward, whereas others are essentially not heard from. Applications can be submitted via the APS award site and are due along with an endorsement form by January 16, 2015. Those candidates who are unsuccessful at securing a committee appointment initially are encouraged to re-submit their credentials for consideration for the same or another committee in the next cycle, and those placed as alternates will be re-considered without re-nomination

Committee	No. of Positions Available
Animal Care & Experimentation	5 members
Awards	6 members 1 trainee
Career Opportunities in Physiology	1 members, 1 clinical position
Communications	4 member, 1 trainee
Conference	3 members
Daggs	1 members
Distinguished Physiologists	1 members
Education	3 members, 1 trainee
Finance	Chair appointed by executive cabinet, 1 Young faculty member
International	3 members
Membership	0 members
Perkins	Chair, 1 member
Porter Physiology Development	3 members
Publications	Chair – appointed by executive cabinet, 2 members
Science Policy	4 members
Women in Physiology	Chair, 3 members, 1 trainee post doc, 1 trainee student
Totals	**49 Total positions*: 2 Chair, 40 members, 1 clinical positions, 4 trainees, 1 Young faculty, 1 student.**

*This number does not include the positions to be selected by the Executive Cabinet

Table 1A. Total Number of Applicants

ACE	17
Awards	23
Careers	11
Communications	17
Conference	8
Daggs	0
Distinguished Phys.	2
Education	27
Finance	6
International	30
Membership	0
Perkins	3
PIC	0
Porter	15
Publications	12
Science Policy	15
Women	42
TOTALS	**228***

*This includes candidates who applied for more than one committee.

Table 1B. Total Number of Applicants by Section

CV	58
Cell	22
CNS	9
Comparative	7
EEP	19
Endocrinology	9
GI&L	9
NCAR	19
Renal	20
Respiration	6
Teaching	15
WEH	27
TOTAL	**220**

Table 1C. Total Number of Applicants by Section
(Based on 228 applications)

	CV	Cell	CNS	Comp.	Endo.	EEP	GI&L	NCAR	Renal	Resp.	Teach.	WEH	None	Total
ACE	5	2	1	0	1	2	1	0	1	0	1	2	1	17
Awards	4	2	1	0	0	1	1	6	3	0	1	2	2	23
Careers	2	0	0	0	0	3	1	0	0	1	0	3	1	11
Communications	7	2	1	0	0	0	0	0	1	1	1	4	0	17
Conference	1	1	0	0	1	1	1	1	1	0	0	1	0	8
Daggs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distinguished	0	0	1	0	0	0	0	0	0	0	0	1	0	2
Education	4	2	1	0	3	2	0	2	2	1	6	2	2	27
Finance	2	0	0	0	1	0	0	0	2	0	0	1	0	6
International	7	7	1	3	1	1	2	2	3	1	0	2	0	30
Membership	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perkins	1	0	0	1	0	0	0	0	0	0	0	1	0	3
PIC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Porter	6	0	0	0	1	2	0	1	2	0	2	0	1	15
Publications	3	2	1	1	1	1	0	1	1	0	0	1	0	12
Science Policy	5	0	0	1	0	1	1	2	1	1	0	3	0	15
Women	11	4	2	1	0	5	2	4	3	1	4	4	1	42
TOTALS	58	22	9	7	9	19	9	19	20	6	15	27	8	228

Table 2A. Section Affiliation of Applicant Pool and New Appointees
(Based on 228 applications, does not include alternates)

Section	2012	2013	2014	2015	All APS Members*
Cardiovascular	25 (19.5%)	5 (12.2%)	6 (11.8%)	9(18.8%)	22%
Cell & Molecular	10 (7.8%)	3 (7.3%)	5 (9.8%)	0	13%
Central Nervous System	7 (5.5%)	5 (12.2%)	2 (3.9%)	0	9%
Comparative	5 (3.9%)	2 (4.9%)	4 (7.8%)	4(8.3 %)	4%
Endocrine & Metabolism	2 (1.6%)	2 (4.9%)	2 (3.9%)	1 (2.1%)	8%
EEP	12 (9.4%)	2 (4.9%)	2 (3.9%)	4(8.3%)	10%
Gastrointestinal & Liver	5 (3.9%)	3 (7.3%)	3 (5.9%)	4(8.3%)	6%
NCAR	10 (7.8%)	4 (9.8%)	4 (7.8%)	4(8.3%)	6%
Renal	15 (11.7%)	2 (4.9%)	7 (13.7%)	7 (14.6 %)	7%
Respiration	9 (7.0%)	5 (12.2%)	4 (7.8%)	2 (4.2 %)	8%
Teaching	6 (4.7%)	4 (9.8%)	2 (3.9%)	4(8.3%)	4%
WEH	20 (15.6%)	3 (7.3%)	10 (19.6%)	9 (18.8 %)	2%
TOTAL	128	40	51	48	11,215

*Does not include honorary or affiliate members.

Table 2B. Other Characteristics of the Applicant Pool and New Appointees
(Based on 228 applications, does not include alternates)

	2013	2014	2015	All APS Members
Under age 45	21 (16.4%)	30 (52.6%)	22(9.6%)	37%
*Women	19 (14.8%)	22 (38.6%)	31(3.6%)	28%
Reside outside of US	6 (4.7 %)	1 (1.8%)	2(0.9%)	27%
**Student	0	2 (3.5%)	1(0.4%)	15%

*Not all members indicate gender. **This number refers to student members only (undergraduate and graduate, not postdocs).

Table 3A. Section Affiliation of 2015 APS Standing Committee Members
(Does not include Chapter Advisory Committee, Committee on Committees, Joint Program Committee, Physiologists in Industry Committee, Section Advisory Committee, and Trainee Advisory Committee)

Section	2012	2013	2014	2015	All APS Members**
Cardiovascular	22 (14.1%)	23 (15.2%)	20 (12.5%)	57 (25.9%)	22%
Cell & Metabolism	12 (7.7%)	11 (7.3%)	12 (7.5%)	21(9.5%)	12%
Central Nervous System	6 (3.8%)	9 (6.0%)	9 (5.6%)	9 (4.1%)	9%
Comparative	7 (4.5%)	5 (3.3%)	9 (5.6%)	7 (3.2%)	4%
Endocrine & Metabolism	6 (3.8%)	5 (3.3%)	7 (4.4%)	9 (4.1%)	8%
EEP	10 (6.4%)	9 (6.0%)	13 (8.1%)	19 (8.6%)	9%
Gastrointestinal & Liver	15 (9.6%)	13 (8.6%)	9 (5.6%)	9 (4.1%)	5%
NCAR	15 (9.6%)	17 (11.3%)	18 (11.3%)	20 (9.1%)	5%
Renal	17 (10.9%)	14 (9.3%)	17 (10.6%)	20 (9.1%)	7%
Respiration	12 (7.7%)	12 (8.0%)	15 (9.4%)	6 (2.7%)	8%
Teaching	10 (6.4%)	10 (6.6%)	8 (5.0%)	16 (7.3%)	3%
WEH	23 (14.8%)	23 (15.2%)	23 (14.4%)	27 (12.3%)	2%
TOTAL	155	151	160	220	11,215*

*Does not include honorary or affiliate members.

Table 3B. Other Characteristics of 2015 APS Standing Committee Members
(Does not include Chapter Advisory Committee, Committee on Committees, Joint Program Committee, Physiologists in Industry Committee, Section Advisory Committee, and Trainee Advisory Committee)

	2012	2013	2014	2015	All APS Members
Under age 45	45 (29%)	72 (48%)	76 (47.5%)	103 (46.8%)	39%
*Women	75 (48.3%)	73 (48%)	77 (48.2)	81 (36.8%)	27%
Reside outside of US	8 (5.1%)	9 (6.0%)	9 (5.7%)	11 (5%)	26%
**Students	7 (4.5%)	6 (4.0%)	10 (6.4)	2 (0.9%)	16%

*Not all members indicate gender. **This number refers to student members only (undergradutes).

Council accepted the report of the Committee on Committee ●

Communications Committee

Barbara Goodman, Chair

The APS Communications department promotes the science of physiology to the public. We do so by developing and implementing clear, consistent, and engaging content strategies designed to enhance public understanding about our branch of science. Our strategy is to use traditional media (press), new media (social), and the public-friendly *PhysiologyInfo.org* (PIO) website to disseminate physiology-related information and content to a variety of audiences including the general public, researchers, funding organizations, stakeholders, and current and potential APS members.

Press Release Program

The main focus of the Communications Department is raising the awareness of physiology and physiological research, and specifically highlighting research published in APS journals. The department is continuing to develop press releases to spotlight journal articles in final publication, including a monthly press release on an APSselect article.

Promoting Physiological Research on Social Media

As social media use becomes more widespread, the need for traditional media outlets to act as a go-between – curating and distilling science news – is diminishing, and organizations are better able to take information and messages directly to their target audiences. The Communications Department is experimenting with using social media to quickly promote new research released in Articles in Press and amplify the efforts of individual journal promotions via retweets and Facebook shares.

Expanding APS Social Media Platforms

In line with the APS strategic plan to "Develop strategies for using social media to promote an understanding of the discipline of physiology," the Society has jumped into social media with both feet. To date, we have ~40 social media profiles – 13 for APS journals and the rest related to APS and its departments. Current social media profiles are being monitored and evaluated to be sure that we are optimizing staff resources to get the best ROI on the time spent on social media.

Communications staff has begun to develop and implement plans and strategies to increase engagement with APS members and stakeholders who use social media and to better promote APS and physiology. Since February, we've significantly beefed up our social media offerings to include:

- new APS national Twitter feed (*www.twitter.com/APSPhysiology*)
- A new YouTube page (*www.youtube.com/APSPhysiology*)
- A streamlined strategy for Facebook posting (*www.facebook.com/AmericanPhysiologicalSociety*)

The Communications Office has also worked with several of the APS journals – including *AJP-Heart and Circulatory Physiology* and the *Journal of Neurophysiology* – to discuss their goals for social media and how the national office can help promote their efforts. A formal discussion/workshop on social media with journal editorial assistants took place in late summer.

Communications Committee

PIO relaunched at the end of 2013 and was the culmination of concerted efforts among the Communications Committee and internal APS Communications and IT staff. In addition to a redesigned look, the site now features expanded content including quizzes, blogs, milestones, new timelines, and expert bios. Future PIO-related tasks will include regular maintenance and expansion of the PIO website, evaluation of site usability, and the development of plain-language physiology content in Spanish.

At the Communications Committee meeting at EB 2014, the committee discussed ongoing PIO content development and increasing awareness of the site among the general public and APS members.


Randy Olson

Led by Chair Barb Goodman, the Committee also organized the 2014 communications symposium: "Storytelling: Mandatory Training for Today's Scientists." Scientist-turned-filmmaker Randy Olson discussed why storytelling is crucial to the scientific community today and helped attendees hone skills to improve communications with job recruiters, university alumni fundraisers, and the public. The symposium was extremely well received, and Olson spoke to a standing-room-only crowd.

The Committee is currently making arrangements for their EB 2015 symposium with the Alan Alda Center for Communicating Science. The symposium is entitled "Connecting with the Community."

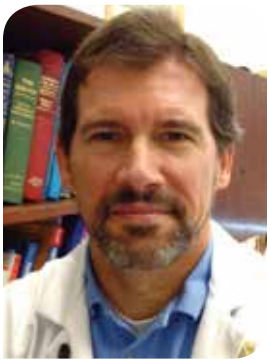
AAAS Mass Media Fellow


Elizabeth Roth-Johnson

APS supports one individual for the AAAS Mass Media Science and Engineering Fellowship each year. This year, the committee selected Elizabeth Roth-Johnson of UCLA as their first-choice candidate. Roth-Johnson spent her summer at KQED in San Francisco.

Council accepted the report of the Communication Committee

Conference Committee


Michael Brands, Chair

Summary of Committee Activities

The Committee held their annual meeting in Bethesda on October 9, 2013. The Committee discussions included introduction of Michael Brands as new Chair; the role of an APSCC liaison to each conference; revision of the website and utilizing it to advertise the conference program; potential conference topics; the upcoming 2014 conferences; final approval of the 2015 Endothelin conference; and strategies to strengthen the conference proposal pipeline. In 2014 the committee embraced an e-mail discussion format that has facilitated the proposal, critique, revision, and approval process for conferences. A list of carryover and new proposal ideas was refined quickly to yield several viable and exciting options for 2015 and 2016. The Committee is reviewing cross-sectional symposia proposals as potential APS conferences.

2014

APS Conference: ***APS Institute on Teaching and Learning,*** **June 23-27, 2014, Bar Harbor, ME.**

APS Intersociety Meeting: ***Comparative Approaches to Grand Challenges in Physiology,*** **October 5-9, 2014, San Diego, CA.**

2015

APS Conference: ***14th International Conference on Endothelin: From Physiology to Therapeutics,*** **September 2-5, 2015, Savannah, GA.**

APS Conference: ***Physiological Bioenergetics: From Bench to Bedside,*** October.

APS Conference: ***Cardiovascular, Renal and Metabolic Diseases: Physiology and Gender,*** November 17-20, Annapolis, MD.

Council accepted the report of the Conference Committee

Distinguished Physiologists Committee

Margaret Anderson, Chair

The Distinguished Physiologists Committee started the year with only 4 members, but it was increased to 10 members after the 2014 Experimental Biology meeting. One of the primary duties of each committee member is to "develop and maintain liaison with emeritus members and members about to retire." This liaison is accomplished by submitting, on behalf of the Society, a personal 70th, 80th, 90th, or 100th birthday greeting. Each greeting includes an invitation for the senior recipient to inform APS about his or her current activities, interests, and whereabouts, and requests "words of wisdom" for younger colleagues. The historical and philosophical commentaries evoked by this invitation provide the material subsequently published in "News From Distinguished Physiologists" in each issue of *The Physiologist*. By the end of 2013, the Senior Physiologist Committee members sent birthday wishes to 97 members reaching age 70, 53 members reaching age 80, 40 members reaching age 90, and 1 member reaching the age of 100! Eight response letters were received and published in *The Physiologist*.

Another responsibility of the Senior Physiologists Committee is to review applications and recommend to Council the annual awardees of the $500 G. Edgar Folk, Jr., Senior Physiologists Award. This award is designed to support the scientific activities of a senior member. Unfortunately in 2013, no applications were received for the award. In 2014, we received three applications.

Council accepted the report of the Distinguished Physiologist Committee

Education Committee

J. Michael Wyss, Chair

ADInstruments Macknight Progressive Educator Award

The Education Committee received six applications for 2014 and recommended that APS member Aaron Bunker of Morningside College receive the 2014 award. His application included a description of a laboratory activity entitled "Laboratory Group Research Project" that he developed to use in conjunction with his General Physiology class.

EB Refresher Course

The 2014 Refresher Course focused on Exercise Physiology. Consistent with previous years, the sessions were well attended. Session feedback rated the sessions highly.

Professional Skills Courses

The Education Office again offered the live Writing and Reviewing for Scientific Journals course in January. The new Professional Skills Course on Professional Integrity / Publication Ethics was debuted this January to 25 early graduate students and was received very well. Another new course on Becoming an Effective Teacher began in April and ran through August with a face-to-face component in June in Bar Harbor, ME. The Education Office continues to offer at least one online or blended PST course most months of the year and has begun collaborations with Adams State University to offer graduate credits for its PST courses.

Medical Physiology Learning Objectives (MPLO) Project

In collaboration with the ACDP, the learning objectives were updated and republished in 2012. They are available in PDF format at the APS website. Also, Life

Science Teaching Resource Community (formerly the APS Archive of Teaching Resources) resources are coded and searchable by each MPLO, when applicable. A new project is underway to define competencies for medical students that can be used in conjunction with the MPLOs.

Human Anatomy and Physiology Society (HAPS) Collaboration

The 2014 HAPS Conference was held May 24-26 in Jacksonville, FL. APS member Anne Schreihofer, University of North Texas Health Science Center, gave a presentation entitled "Cardio-respiratory integration by the caudal ventrolateral medulla: Insights from acute and chronic intermittent hypoxia." APS exhibited at the meeting and for the first time. It also held two workshops for HAPS attendees highlighting educational materials produced by APS Frontiers in Physiology program participants as well as materials from the Life Science Teaching Resource Community. The 2015 HAPS Annual Conference will be held May 23-28 in San Antonio, TX. APS President-Elect Patricia Molina, Louisiana State University Health Sciences Center, will serve as the APS sponsored speaker.

National Association of Biology Teachers (NABT) Professional Development Conference

The 2013 NABT Professional Development Conference was held November 20-24 in Atlanta, GA. APS member Gordon Giesbrecht, University of Manitoba, gave the presentation, "Goal Setting: Lessons Learned from 100 Nights on Lake Winnipeg." "Ideas for Using Next Generation Science in Your Classroom," an activity developed by an APS Education Office to help teachers focus on student-centered activities, gave teachers a chance to try four hands on labs from the LifeSciTRC. This year's conference celebrated the NABT 75th Anniversary, which helped bring in a record number of attendees to the meeting. The APS booth had a steady stream of traffic and there were four past Frontiers Teachers in attendance. The 2014 conference will be in Cleveland, OH in mid-November. Merry Lindsey, University of Mississippi, will serve as the APS keynote speaker.

APS Archive of Teaching Resources/Life Science Teaching Resource Community

In April 2014, the APS Archive of Teaching Resources relaunched as the Life Science Teaching Resource Community (LifeSciTRC). This transition marked a culmination of efforts by APS and the partnering professional societies to advance beyond an online library to a community of practice for life science educators. The LifeSciTRC now offers community pages, blogs, forums, resource ratings, resource comments, and a monthly newsletter specific to life science educators. In addition to the new name, the LifeSciTRC also added three new scientific society partners: The Physiological Society, Genetics Society of America, and American Society of Plant Biologists.

The LifeSciTRC added 88 new resources since January 1, 2014 and now includes more than 6,900 peer-reviewed teaching resources. From these resources, more than 200 collections of items have been created by LifeSciTRC Partners and Community Members. More than 7,500 individuals have registered to use the LifeSciTRC, but many more use the site (registration is not required).

Archive Scholars Program

With support from NSF, the LifeSciTRC has implemented online professional development programs for K-12 and undergraduate educators. In the LifeSciTRC Scholars program, educators learn how to find and use digital resources to enhance student-centered learning in their classrooms. To date, 54 undergraduate educators and 18 high school educators have been LifeSciTRC Scholars, whereas 5 undergraduate educators and 2 high school educators have been LifeSciTRC Fellows. The final NSF-sponsored LifeSciTRC Scholars and Fellows Programs will run this fall.

David Bruce Awards

In 2014, 88 applications were received, and 30 Undergraduate Abstract Awardees were selected. From these awardees, a subcommittee organized by Committee member Andrew Roberts selected 14 Undergraduate Research Awardees. In addition to support from the APS, the David S. Bruce Award program has received generous contributions from the Association of Chairs of Departments of Physiology and individual APS members John M. Horowitz, Barbara A. Horwitz, Ida J. Llewellyn-Smith, and J. Michael Wyss. This support is gratefully acknowledged.

Experimental Biology Undergraduate Orientation and Poster Session

In 2014, for the first time, the undergraduate students participating in four of the APS undergraduate programs (IOSP, STRIDE, UGSRF, and UGREF) all attended an Undergraduate Orientation Session to introduce them to the EB meeting. At the 2014 Undergraduate Poster Session, approximately 200 APS members came to see a record 167 undergraduate physiology posters (including those from APS students) and to talk with the students. In addition, students from the American Association of Anatomists (AAA) presented their research. This year, 13 institutions and departments paid a $250 fee for table space to promote their graduate programs to the undergraduate students at the session, providing $3,250 to help cover the session costs. Students and departments came 30 minutes early to allow uninterrupted time for the departmental representatives to discuss their graduate opportunities with the students.

APS Frontiers in Physiology Professional Development Program for Teachers

The 2013 Frontiers in Physiology Professional Fellows completed their fellowship at this year's Experimental Biology meeting in San Diego with a luncheon in their honor on Tuesday. Seventeen middle and high school teachers from across the nation began this fellowship in April 2013 and progressed through the online professional development lessons for 9 months. Teachers participated in reading, sharing of resources, experimental design, poster sessions, discussion boards, lesson development, peer reviews, production of Bench-to-Bedside Primers, pre- and post-fellowship content surveys, and physiology tests. Overall, teachers from nine states completed this rigorous professional development course, learning about physiology and the best ways to help their students learn science via the scientific method.

Physiology Understanding Week

In 2013, PhUn Week engaged a record 14,732 students at 83 event sites across the nation, including Puerto Rico. This effort involved 62 APS member lead coordinators and a total of 478 scientists presenting and partnering with 351 classroom teachers and educators. Students were distributed across the grades with nearly 26% in high school classrooms, 55% in the primary and elementary classrooms, and 25% in middle school classrooms.

International Science and Engineering Fair (ISEF)

The 2014 Intel ISEF was held in Los Angeles, CA May 11-16th. More than 1,700 students presented their independent research projects and competed for over $5 million in scholarships and cash prizes. This year's APS judging team included Lila LaGrange, University of the Incarnate World; Johana Vallejo-Elias, Midwestern University; Kim Henige, California State University, Northridge; and Oliver Loson, California Institute of Technology. The APS judging team evaluated 75 projects based on students' abstracts and selected 22 candidates to interview at their posters.

The first-place APS award ($1,500) was presented to Divya Koyyalagunta from Clear Lake High School, Houston, TX. The second place APS award ($1,000) was presented to Sanjana Rane from DuPont Manual High School, Louisville, Kentucky. The third place APS award ($500) was won by Garrett Elijah McGrady, also from DuPont Manual High School. The APS Exceptional Science Award ($500) was won by Giuseppe Dall'Agnese from Liceo Scientifico E. Vendramini, Pordenone, Italy. Giuseppe is APS's first international ISEF winner.

Council approved The Education Committees requests to support the participation of two Committee members in the 2015 NDGS meeting and to recognize the 5- and 10-year PhUn Week participants during the APS Business meeting at Experimental Biology ●

Finance Committee

Jeff Sands, Chair

During the summer meeting of Council, the Finance Committee reported that the Society's financial condition remains relatively strong through sound management and investment practices.

Current and Pending Grants

The current grant activity totals $4.2 million, and there are two pending grant requests totaling $1.4 million.

Managed Accounts

It was reported that, at December 31, 2013, the combined annual return for the Society's five equities investment managers and the two fixed income was +21.9%, which was higher than the Society's composite benchmark index of +18.3%.

Three-Year Financial Forecast

The forecast projects a surplus of $720,000, $905,000, and $1,092,000 in 2015, 2016, and 2017, respectively. The projection shows revenue growing at annual rates of 2.7% and expenses growing at a rate of 1.9%, from 2014 to 2017. By comparison, the March 2013 projection showed revenue and expenses growing at rates of 2.0% and 2.1%, respectively, and projected surpluses of $458,000, $413,000, and $364,000 for the years 2014, 2015, and 2016, respectively.

2013 Financial Results

Revenue was $19.1 million, which included $1.4 million from reserves, and expenses over the same period were $17.8 million, resulting in a surplus for the year of $1.3 million. Note that the 2013 budget called for a projected surplus of $505,000, so the Society was approximately $800,000 over budget at year-end. Revenue for the year was $600,000 under budget, and expenses were $1.4 million under budget.

2014 Budget

Increases in revenue of $148,500 and decreases in expenses of $334,500 resulted in a $483,000 increase in the 2014 budget surplus from $49,500 to $532,500.

2013 Audit

The Committee reported that the Society's financial statements were audited in accordance with general accepted auditing standards. The Society's audit firm, Rogers & Company, rendered an unqualified opinion that the Society's statements presented fairly, in all material respects, regarding the financial position of the Society at December 31, 2013 and 2012. What follows are facsimiles of the Society's audited financial statements.

Council accepted the report of the Finance Committee ●

Statements of Financial Position
December 31, 2013 and 2012

Assets	2013	2012
Cash and cash equivalents	$ 824,168	$ 924,534
Investments	59,377,450	49,382,148
Certificates of deposit	394,480	294,698
Accounts receivable, net	945,261	950,883
Pledges receivable, net	711,893	161,436
Accrued interest receivable	113,948	120,982
Advances to section editors	147,681	197,237
Prepaid expenses	191,482	222,148
Inventory	44,168	47,236
Property and equipment, net	1,539,379	1,572,416
Total assets	$ 64,289,910	$ 53,873,718
Liabilities and Net Assets		
Liabilities		
Accounts payable and accrued expenses	$ 1,976,269	$ 1,781,895
Deferred subscriptions	6,004,937	5,102,250
Deferred dues and other	469,628	664,136
Capital lease obligations	72,581	101,944
Total liabilities	8,523,415	7,650,225
Net Assets		
Unrestricted	54,310,412	45,544,269
Temporarily restricted	973,749	666,724
Permanently restricted	482,334	12,500
Total net assets	55,766,495	46,223,493
Total liabilities and net assets	$ 64,289,910	$ 53,873,718

Statement of Activities
For the Year Ended December 31, 2013

Operating Revenue	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Subscriptions	$ 11,057,286	$ -	$ -	$ 11,057,286
Author charges	3,046,434	-	-	3,046,434
Membership dues	1,053,884	-	-	1,053,884
Grants and contracts	739,792	-	-	739,792
Conferences and meetings	957,609	-	-	957,609
Contributions	-	473,983	469,834	943,817
Advertising	238,030	-	-	238,030
Other income	367,553	-	-	367,553
Released from restrictions	157,297	(157,297)	-	-
Total operating revenue	17,617,885	316,686	469,384	18,404,405
Operating Expenses				
Publications	11,876,717	-	-	11,876,717
Society general	3,113,723	-	-	3,113,723
Society programs	1,168,242	-	-	1,168,242
Education	1,556,914	-	-	1,556,914
Marketing	498,772	-	-	498,772
Total operating expenses	18,214,368	-	-	18,214,368
Operating Change in Net Assets	(596,483)	316,686	469,834	190,037
Net realized gain on investments	1,858,231	-	-	1,858,231
Net unrealized gain on investments	7,085,698	-	-	7,085,698
Interest and dividends	1,001,900	149	-	1,002,049
Investment management fees	(593,013)	-	-	(593,013)
Total investment income	9,352,816	149	-	**9,352,965**
Change in Net Assets	8,756,333	316,835	469,834	9,543,002
Net Assets, beginning of year	45,554,079	656,914	12,500	46,223,493
Net Assets, end of year	$ 54,310,412	$ 973,749	$ 482,334	$ 55,766,495

International Physiology Committee

Michael Hill, Chair

APS members hail from 88 countries over 6 continents, and over a quarter of the Society's membership is international. International members represent a large and important constituency within the Society and one that is growing – over 30% of new members are internationals. The role of the International Physiology Committee (IPC) is to assist APS by identifying and implementing ways in which APS can best serve its international members; achieve globally its goals of fostering education, scientific research, and dissemination of information in the physiological sciences; and raise its global stature.

The IPC assists APS in the review of international awards programs. The International Early-Career Physiologist (IECP) travel awards program provides support for students, trainees, and junior faculty working outside the U.S. to attend Experimental Biology (EB). The IPC reviewed 38 applications, and APS made 12 awards of $1,000 each for EB2014 (awardees are named on the APS website).

The IPC also reviewed applications for APS travel awards to support individual attendance at the Pan American Congress of Physiological Sciences ("Physiology Without Borders") held in Iguassu Falls, Brazil in August 2014. Criteria for the awards included strength of the applicant, quality of submitted abstract, career stage, and geographical location. Twenty-four applications were received for the first round and 15 for the second round. Applicants from South America were awarded $750, and applicants from all other countries were awarded $1,000 each. Names and details of the successful applicants are available on the APS website.

Following the recent expansion of the former Latin-America Initiative (LAI) to the International Opportunities Program (IOP), the IPC reviewed six applications to support symposia, workshops, and short courses. The aim of the IOP is to strengthen ties between APS and international societies on a global level, with a particular emphasis on underrepresented regions. Five applications were supported (of up to $7,500 each), with three from Brazil, one from Morocco, and one from Vietnam. The applicants and programs supported were:

1) Vagner Antunes, University of Sao Paulo: "Workshop on Writing and Editing Scientific Manuscripts," University of São Paulo, Brazil July 29 to August 1, 2014.

2) Faadiel Essop, Stellenbosch University: full-day symposium, "Cardio Metabolic Diseases in Africa: Prevalence, Mechanisms and Treatments," September 3, 2014 as a satellite meeting to the International Society for Pathophysiology congress, September 4-7, 2014, Rabat, Morocco.

3) James Hicks, University of California Irvine: an International Graduate Course: "The Physiology of Air-Breathing Fish in the Mekong Delta-Basic, Applied and Conservation" at Can Tho University, Vietnam, to be held December 1-12, 2014.

4) Fernanda Marcondes, University of Campinas: the second "Workshop in Active Methods used in Physiology Teaching" at the University of Campinas, Piracicaba, Brazil, April 24-25, 2014.

5) Gina Yosten, Saint Louis University: course titled "Novel Technologies for the Study of Cardiovascular Biology and Fluid Homeostasis," held August 27-29, 2014, São Paulo State University, Araraquara, Brazil.

How can APS better serve its international members? How can APS serve in outreach to the international physiology community? If you have suggestions, ideas, or concerns, please contact Michael Hill, Chair of the APS International Physiology Committee, at *hillmi@missouri.edu*

Council accepted the report of the International Physiology Committee ●

Joint Program Committee


Robert Hester, Chair

Experimental Biology 2014

The 2014 EB meeting was held in San Diego, CA April 26-30. The scientific and poster sessions were well attended, and overall enthusiasm for the meeting remains high. The other participating societies included ASPET (pharmacology), ASN (nutrition), ASBMB (biochemistry), ASIP (pathology), AAA (anatomy). The APS hosted six guest societies: The Microcirculatory Society (MCS), the Biomedical Engineering Society (BMES), the American Federation for Medical Research (AFMR), the Society for Experimental Biology and Medicine (SEBM), The Physiology Society (UK), and the International Research Network on Cerebral Hemodynamic Regulation (CARnet).

The meeting opened with several unique sessions on Saturday, April 26, including the traditional *Refresher Course: The Role of Exercise in Disease Prevention, Treatment, and Optimal Aging,* which attracted an average attendance of 250 people. APS sponsored two unopposed Techniques and Technology in Physiology Workshops on Saturday entitled *Multiscale Computational Modeling and Simulation for Studying Physiological Processes* and *Translation of Cardiovascular Endpoints across Species.* The workshops attracted an average audience of 75 individuals. In addition, Saturday featured *Physiology in Perspectives: The Walter B. Cannon Memorial Award Lecture* presented by James Anderson of NIH. The lecture was followed by an opening reception free to all physiology registrants.

The *Henry Pickering Bowditch Memorial Award Lecture* was presented by Kazuhiro Nakamura, Kyoto University. During the week, 12 section-sponsored Distinguished Lectures were presented. APS also sponsored four Cross-Sectional Symposia: *Sex Differences in Physiology and Pathophysiology; New Perspectives on Regulation, Interaction, and Noise Found in Physiological Systems; Sleepless in San Diego: Is Sleep Deprivation the New Silent Killer; Origins of Hypertension: The CNS, the Kidney and Beyond; Sialic Acids: How Glycans Impact Human Physiology and Disease.*

The APS President's Symposium Series was organized by APS President Kim Barrett and focused on the theme "Multiscale Physiology: Linking Cellular and Molecular Insights to the Health of Organisms by Populations." The program consisted of three symposia and one lecture, which included *Early Life Origins of Adult Disease; Physiological Relevance of the Intestinal Microbiome: Moving Beyond the Gut; Life at Extremes: Adaptations to Diverse Challenges to Normal Homeostasis.* The Nobel Prize in Physiology or Medicine Lecture was presented by Bruce Beutler, University of Texas Southwestern Medical Center.

There were ~1,000 more paid scientific registrants in attendance compared with the EB12 meeting, including 1,673 in the high school student/teacher and undergraduate student categories, an increase of about 100 from 2012. However, there were 45 fewer exhibitors, continuing a trend of fewer companies paying to exhibit at EB meetings.

APS programmed 375 sessions in total: 223 poster sessions, 76 symposia, 46 featured topics, 18 lectures, 2 workshops, 1 refresher course, 2 awards sessions, and 7 special sessions. The programming continued to be organized using the Clustering of Sectional Programs for the fourth year.

Experimental Biology 2015

The JPC met to begin organizing EB 2015 (March 28 to April 1, 2015) in Boston, MA. The JPC began scheduling rooms by day and time for the platform sessions, and, at the same time, tried to minimize scientific overlap. The number of APS posters programmed for Wednesday will be maintained lower than other days to optimize the time provided for individual poster discussion.

Two Techniques and Technology workshops will be scheduled on the first day of EB 2015: *Big Data Workshop* and *Proteomics for the Physiologist.*

The President's Symposium Series "Physiology: Answers to Big Questions" will feature a series of three symposia on the future of obesity research, hypertension research, and diabetes research; additionally the Nobel Prize in Physiology or Medicine Lecture will be presented by Robert J. Lefkowitz of Howard Hughes Medical Institutes at Duke University Medical Center on *Seven Transmembrane Receptors* on Wednesday, April 1, 2015.

As is customary, the meeting will also feature sessions organized by the APS Publications, Careers in Physiology, Public Affairs, Women in Physiology, Trainee Advisory, Physiologists in Industry, and Education Committees.

Council accepted the report of the Joint Program Committee ●

Membership Committee

Robert Brock, Chair

The Membership Committee, in collaboration with the Career Opportunities in Physiology Committee, has leveraged a number of the key priorities that emerged from the Society Strategic Plan to propose development of a Society-wide Fellows Program. Not only will this Program recognize the valued contributions and accomplishments of more established members, but it will also play a key role in actively engaging these members within the leadership of the Society. With this, we have also asked the Council to consider establishing a Fellow Selection Committee to evaluate candidates or, in the least, to continue re-purposing the Membership Committee for this role.

Of note over the previous couple of years is the apparent drop in retention when Student Members transition to Regular Member status. It is believed that this is due, in part, to a poorly communicated member benefit already in place, wherein the first year of Regular membership is free for Students transitioning to Regular status, which subsequently becomes a 50% discount for those who obtained their PhD within 5 years. The Committee believes that an aggressive advertising campaign to better communicate this benefit will be a positive step toward more effectively retaining this target membership subgroup; such advertising could include narratives in Section newsletters and *The Physiologist,* individual letters, etc.

Membership Statistics

The Chair reviewed the spring membership status report. The total number of members is 11,312 [1,303 (809 Regular) members were dropped on April 1, 2014 as a result of unpaid dues]. There was a net gain of 433 Regular, 240 Graduate Student, and 52 Undergraduate Student members since the fall status report.

Council accepted the Membership Committee's proposal in principle to implement an APS Fellows Program (FAPS) with a request to revise the criteria for membership before the program is formally announced to the membership ●

The John F. Perkins Memorial Award Committee

Esther E. Dupont-Versteegden, Chair

The John F. Perkins, Jr. Memorial Award for International Physiologists promotes cultural exchange and scientific collaborations by providing supplementary aid to families of foreign scientists working for a minimum of 3 months in the U.S. In this way, young scientists are able to bring spouse and children and thus make full use of the cultural exchange as well as the scientific benefits associated with an international collaboration. This award is intended to support the spouse's and children's visit to the U.S. for postdoctoral fellows and junior faculty from overseas. Application for the Perkins Award must be made jointly by the host, who must be an APS member, and the visiting scientist. The recipient receives funds generally not exceeding $5,000.

Applications for the award are accepted in the spring and fall, with application deadlines of April 15 and October 15. For the April 2014 deadline, the Committee received two applications and did not fund any of the applicants. For the October 2013 deadline, the Committee received three applications and funded one. The recipient is Eduardo A. Sanabria; host member is Robert E. Espinoza, California State University-Northridge. The committee decided after the April 15 applications to reword the award to clarify that the award is intended to bring over a family consisting of a spouse and children.

Council accepted the report of the John F. Perkins Committee

Physiologists in Industry Committee

Eugene Shek, Chair

EB2014 PIC Symposium

The 2014 symposium, entitled "NO, CO and H2S: Toxic Gases, Gasotransmitters and Therapeutic Targets" was chaired by Kenneth R. Olson and Catharine G. Clark. Feedback from PIC attendees as well as others indicates that the topic was well received.

EB2014 Novel Disease Awards

The Novel Disease Award recognizes one postdoctoral and one predoctoral trainee who submit the best abstracts describing a disease model at Experimental Biology. Although the model may be cellular or in vivo, the applicant must clearly emphasize the novelty of the model and the potential utility of the system for future research related to a disease process. Applicants do not have to be APS members, and there are no restrictions on how the award is spent. Awardees can only receive the Novel Disease Model Award once as a postdoctoral fellow and once as a predoctoral student. Awardees are recognized at the APS Business Meeting. The PIC Novel Disease Model Award is sponsored by Novo Nordisk Research Centre China. The award is $500 for the predoctoral student and $800 for the postdoctoral fellow. The awardees are Ellen Gillis of University of Mississippi Medical Center (predoctoral) and Suttira Intapad of University of Mississippi Medical Center (postdoctoral).

Physiologists in Industry Committee Mixer

The Annual Physiologists in Industry Committee Mixer is traditionally a great opportunity to network with industry and academic APS members alike. It is designed

to attract trainees and engage them in discussion about careers, research, and opportunities in industry positions. The 14th annual mixer was held Sunday, April 27 at the San Diego Marriott Marquis & Marina Hotel. The mixer attracted over 50 individuals across all levels of training.

EB2015 PIC Symposium

This symposium will focus on Targeting Gut Microbiome in Human Diseases and as Novel Therapeutics. The session is being coordinated and chaired by Carol Moreno Quinn and Suttira Intapad. Quinn is member of the Committee, and Intapad is the 2014 Novel Disease Model Award recipient at the postdoctoral level.

Council accepted the report of the Physiologist in Industry Committee ●

Porter Physiology Development and Minority Affairs Committee

Margarita Curras-Collazo, Chair

Porter Physiology Development Fellowship Program

The goal of the Porter Physiology Development Program is to encourage diversity among students pursuing full-time studies toward the PhD in the physiological sciences and to encourage their participation in the American Physiological Society. The program provides 1- to 2-year, full-time graduate fellowships. The program is open to underrepresented ethnic minority applicants who are citizens or permanent residents of the U.S. or its territories. Fellows are expected to be/become APS members, participate in EB, complete specific professional development activities, and participate in K-12 outreach. Since 1967, the program has provided more than 228 fellowships to 111 trainees.

2013-2014 Porter Physiology Development Fellowship Program

In 2012-2013, the program provided funding for eight fellows.

2014-2015 Porter Fellowships: New and Renewal Applications

A total of 19 new and 1 renewal applications were submitted for the January 15 deadline and reviewed by the Committee. The stipend paid to the Porter Fellows for 2014-2015 will again be $28,300, consistent with the NIH scale. The Porter Fund allowed for a total of four awards (down from eight in 2013), as recommended by the Business Office and the Committee for the 2014-2015 Fellowship period.

The Porter Physiology Development Fund (Financial Status)

The Committee expresses its sincere appreciation for the continued support of the William Townsend Porter Foundation, APS member contributions, and the APS Council that makes these fellowships possible.

Porter Facebook Fan Page

The committee manages two Facebook pages to promote networking among minority physiologists. The committee posts news related to professional development opportunities two to three times monthly. The group currently has 47 members.

Minority Travel Fellowship Award Program

2014 Travel Awards

The Porter Committee reviewed and recommended 31 award recipients for Minority Travel Fellowships to attend EB 2013 from April 26 to 30 in San Diego, CA. Again this year, the Committee was pleased that eight former Porter Fellows and past Travel Fellows volunteered to be mentors for the younger Travel Fellows.

2014 Porter Reception

As in the past, the Committee held a reception for Travel Fellows, their meeting mentors, and past and current Porter and Travel Fellows. This reception builds

stronger connections between minority students and the larger community of APS scientists, especially other minority scientists. The Porter reception again this year was extremely successful. We were pleased to welcome Pamela Gunter-Smith to the meeting. Gunter-Smith is a past Porter Fellow and past Porter Committee chair. She currently serves on the Board of the Porter Physiology Development Foundation, which provides funding for the Porter Fellowships.

2014 Travel Fellows Luncheon

The Travel Fellows Luncheon was held on Wednesday of the EB meeting. The Fellows heard from keynote speaker Dexter L. Lee, Director of Graduate Studies and Associate Professor in the Department of Physiology and Biophysics at the Howard University College of Medicine. Lee's talk, "From Minority Travel Fellow to Associate Professor and All of the Steps In Between," highlighted his career path and the importance of continuing to network with Minority Travel Fellows and APS Members along the way.

Annual Biomedical Research Conference for Minority Students (ABRCMS)

The APS exhibited at the November 2013 meeting in Nashville, TN to promote undergraduate programs, graduate study in physiology, and the APS programs for minority students. The APS was pleased to again provide $2,500 for cash awards for the most outstanding undergraduate presentations in physiology research. Eight undergraduate students received APS-sponsored awards for the best oral and poster presentations in the physiological sciences. Students also received a complimentary 1-year print subscription to the APS journal *Physiology* and an APS "Life, Logic, Study" shirt. Awardees were added to the APS Minority Physiologists and APS Trainee Listservs.

Society for the Advancement of Chicanos & Native Americans in Science (SACNAS) National Conference 2013 APS Exhibit

In 2013, the theme for the SACNAS annual conference was "Strengthening the Nation Through Diversity, Innovation & Leadership in STEM." APS exhibited at this conference, which took place from October 3 to 6 in San Antonio, TX. Over 3,450 attendees participated in the conference: 1,362 undergraduates, 88 post-baccalaureate students, 556 graduate students, 104 postdocs, and 1,192 professionals. More than 1,200 posters and nearly 70 oral presentations were given at this national conference. There were also more than 345 exhibitors.

K-12 Minority Outreach Fellows Program

Thanks to Council approving funds at the 2012 meeting to continue to support Fellows, the program did accept applications again this year. Five (up from three the previous round) students submitted applications for this fellowship. The review panel consisted of Heidy Contreras and Keisa Mathis (Porter Committee members and past K-12 Minority Outreach Fellows), as well as Anne Joy and Leslie Worton (past Frontiers Research teachers) and Patricia Halpin (long-time PhUn Week participant recommended by Margaret Shain, Program Manager, K-12 Programs). The reviewers selected one awardee for 2014-2015: Kristine DeLeon-Pennell, University of Mississippi Medical Center.

"Be Counted" Campaign

The Porter Committee continued the campaign during EB 2014. Support and enthusiasm of APS Council and Society membership remains genuine for the campaign and for all APS programs to promote diversity. Incentives for updating membership profiles were advertised during EB. Members who updated their profile during the days of the meeting were given a Starbucks gift card. However, only seven members did so. At the upcoming fall meeting, the committee will review the efficacy of the campaign and will determine future directions. However, the Committee plans to continue the Be Counted campaign through 2015.

Council accepted the report of the Porter Physiology Development and Minority Affairs Committee ●

Publications Committee

Hershel Raff, Chair

Journal Statistics

Impact Factor. The 2013 Journal Impact Factors (IF) published by ISI Web of Knowledge (Thomson Reuters) has APS Journals generally holding their rankings. Our review journals have performed well, with *Physiological Reviews* once again ranked #1 in the field of physiology, with an IF of 29.041 and *Physiology* ranked #4 with an IF of 5.645.

Accepted manuscripts. Time to first decision averaged 19 days in 2013 across all of the original research journals, 3 days fewer compared with 2012. Of note, *AJP-Cell* time to first decision was fastest at 14.2 days, followed by *AJP-Heart* at 18.2 days. The average rejection rate for all journals was 54% in 2013 compared with 58% in 2012.

Manuscript submissions. Manuscript submissions in 2013 decreased overall by 3% vs. 2012 for original research articles compared with 2012 and overall, including all manuscript types, decreased by 1% compared with 2012. Year to date 2014 manuscript submission have decreased 4% compared with 2013.

Articles and pages published. The number of regular research articles published decreased by 12% from 3,140 in 2012 to 2,753 in 2013; published invited articles decreased by 6% from 514 in 2012 to 480 in 2013. In 2013, 178 articles were published in *Physiological Reports.* The number of records accepted for AiPS decreased by 4% from 3,096 in 2012 to 2,968 in 2013. Journal pages published decreased by 13% compared with 2012. The number of published pages was 18% under the 2013 page cap limit.

Supplemental data. A total of 190 data supplements were published in 2013, 52 of which were video clips. This represents a 3% decrease in total data supplements from 2012; the number of video supplements decreased by 32%.

Color figures. In 2013, 8,457 color figures were published in APS journals, of which 5,908 were published by APS member authors at no charge to them, so that 70% of the color figures were free to members.

Podcasts. *AJP-Heart* released 28 podcasts, *JAPPL* released 4 podcasts, and *AJP-Renal* released 9 podcasts in 2013, highlighting published articles.

Peer review system. Enhancements to the system are implemented as requested by the EICs and as needed by staff. These enhancements are ongoing. In 2013, there were approximately 40 enhancements developed.

Publications Ethics

NSF grant. The Publications and the Education Departments jointly submitted a successful application to the NSF for the development of modular course materials on publication ethics. Additional collaborators on the project are the Biomedical Engineering Society (BMES) and the Society of Biological Engineers (SBE).

2013 Project Progress

Draft teaching modules (6) were developed (Fall 2012-Spring 2013).

Grant Advisory Board (scientists, biomedical engineers, ethicists, and higher education faculty) met in La Jolla, California for 2.5 days to review the draft materials and suggest revisions (April).

Draft teaching modules were revised and prepared for primary field test (June-December).

Primary field test of the draft teaching modules was held on January 2014, in conjunction with another APS PST Course.

2.5 day course in Lake Buena Vista, Florida.

5 instructors invited to facilitate the field test.

43 students applied to participate in the field test.

25 early career graduate students selected to participate in the field test

Ethics cases. After increasing steadily for many years, the total number of ethics cases arising during peer review and production has plateaued over the past 2 years: 158 cases in 2012 and 156 cases in 2013. As in previous years, the largest number of cases in 2013 involved figure manipulation (125 cases), followed by duplication of data (10 cases), and human/animal subject protocol (8 cases).

In 2013, 68% of all cases were identified in the accepted stage before manuscripts were sent to AiPS. This compares to 63% in 2012. In 2013, the percentage of cases identified in AiPS was 7% (vs. 5% in 2012), and the number identified in the review stage increased slightly (30% vs. 27% in 2012). In 2013, 8 cases (5%) were identified after final publication compared with 6 cases (4%) in 2012. Location of corresponding authors' institutions of 2013 ethics cases was 56% U.S. vs. 44% non-U.S. institutions. In 2013, sanctions were applied for 7 cases (4%). In August 2013, APS introduced screening of all commissioned review articles (excluding editorials and Editorial Focus articles) for textual similarity. On submission, the plagiarism detection software CrossCheck is used to do the screening. This workflow was introduced to *PRV* in July 2011 and to *Physiology* in July 2012. Now, authors of invited reviews in all APS journals have an opportunity to revise minor textual overlap (self-plagiarism) before the articles are sent for review.

Communications

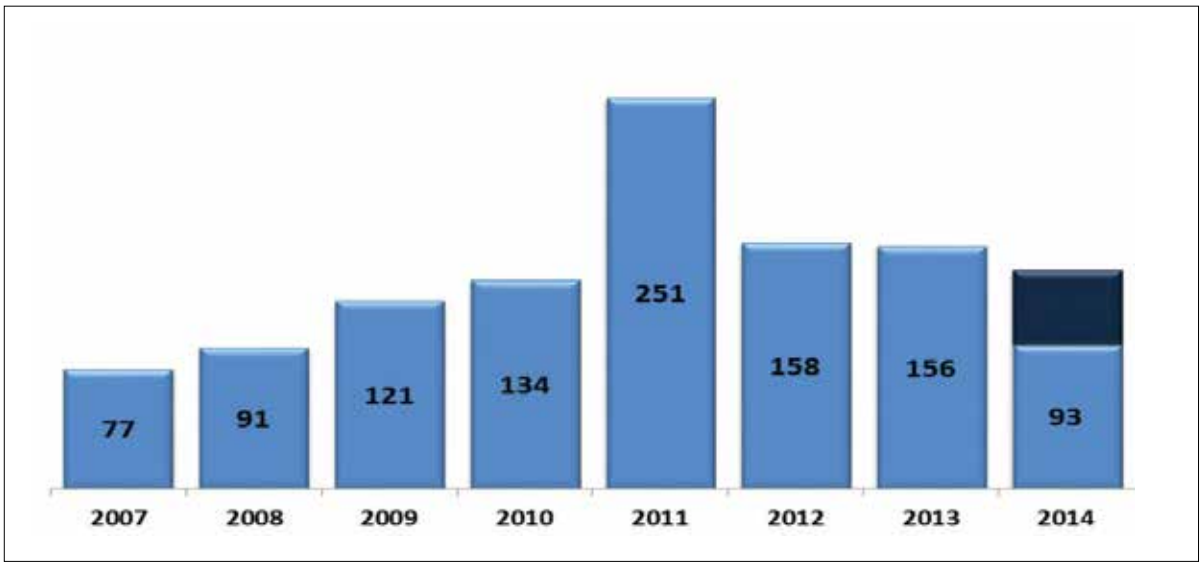
The APS Communications Department issued 29 press releases (*http://www.the-aps.org/mm/hp/Audiences/Public-Press/For-the-Press/releases/13*) in 2013. Of these:

- 45% (27 were related to APS journal studies)
- 20% (9 were related to the EB meeting)
- 14% (63 were related to APS news and announcements)

The most popular releases in 2013 addressed aerobic vs. resistance exercise, fish oil to combat cardiovascular and mental stress, and fetal alcohol syndrome-related heart defects.

The Marketing/Communications Department filmed the APS Editors in Chief in "Meet the Editors" promotional videos. Several of these videos have been posted to YouTube, and the remainder will be posted in coming weeks (see: *http://www.youtube.com/playlist?list=PLW3R7lwluzveOWwvfBg1XjeX9Hl3IeR3W*).

Physiology in Medicine. Eight articles were published in PIM series in 2013, and an additional eight have been have been commissioned since 2012.



APS journals ethics cases by year 2007-2014

Annual Reviews *Award for Scientific Reviewing*

The *Annual Reviews* Award for Scientific Reviewing was introduced in 2012. The Award is to be given for excellence in providing systematic, periodic examinations of scholarly advances, and provoking discussion that will lead to new research activity. The award recognizes an APS member who has written scientific reviews and has helped provide an enhanced understanding of the area of physiology reviewed. The 2014 Award recipient was Mordecai P. Blaustein, Professor of Physiology & Medicine, Director, Center for Heart, Hypertension and Kidney Disease, Department of Physiology at the University of Maryland School of Medicine. The 2013 Award recipient was Frank W. Booth of the Department of Biomedical Sciences at the University of Missouri-Columbia.

Reviewer CME

The APS implemented a pilot program in 2013 offering CME credit to U.S.-based physician reviewers for manuscript reviewing services for *AJP-Endo*. The APS is partnering on the initiative with The Endocrine Society (TES), which is administering the CME on its behalf. Of the 19 eligible *AJP-Endo* reviewers, 15 reviewers participated who successfully completed reviewing 19 manuscripts for CME credit. The program may be rolled out through another vendor to other APS journals that have a reasonable cohort of physician reviewers (see *www.the-aps.org/mm/Publications/CME*).

APS*select*

APS*select* (*http://apsselect.physiology.org/*) launched January 2014. APS*select* is a monthly collection of high-impact original research papers selected by the APS Editors in Chief and, subsequently, by an APS Selection Committee. APS*select* originated with a proposal by Joe Metzger to create a virtual journal, highlighting and promoting the top APS original research papers that are published each month across all 10 APS original research journals. The initiative was approved by the Publications Committee at its March 2013 meeting and subsequently by Council at its summer 2013 meeting.

Selection process. The process starts with recommendations for consideration by the editor-in-chief, who nominates two articles for consideration by the Selection Committee, the final arbiter. The Publications Committee plus Christina Bennett comprises the Selection Committee, headed by Joe Metzger (EIC) and Linda Samuelsson (AE). A certificate is awarded to the authors of each selected article.

Comprehensive Physiology

The first issue of *Comprehensive Physiology* (*www.comprehensivephysiology.com*) was published in January 2011 and included the complete, latest edition of the printed *Handbook*, digitized as ("Classic Content") and 25 new articles. The contract for publication of the work was signed in January 2009 with Wiley-Blackwell, now Wiley.

Comprehensive Physiology, edited by David M. Pollock, is published as a quarterly journal. Invited articles are organized into 13 sections covering 17 topics; "topics" correspond to a volume of the published, printed *Handbook*.

The Journal has been accepted in all of the major Abstract and Indexing services including Scopus, PubMed, and TSRI (formerly ISI). In February 2013, the Journal was notified that beginning with volume 1, issue 1, it will be indexed and abstracted in Science Citation Index Expanded (also known as SciSearch®); Journal Citation Reports/Science Edition; BIOSIS Previews; BIOSIS Reviews Reports and Meetings. *Comprehensive Physiology* received a "preliminary" Impact Factor (based on one year instead of two) of 0.807 in June 2013. Its first real Impact Factor should be released summer 2013. The Journal was accepted into PubMed in 2012, but indexing did not begin until July 2013.

From April 2014 to March 2015, *Comprehensive Physiology* is once again freely available to the APS membership. It was freely available at launch in 2011, and now there is significantly more new content.

Book Monograph Series

The APS and Springer signed an agreement for Springer to publish books in its monograph series on behalf of the APS. These series are: Perspectives in Physiology, Methods in Physiology, Physiology in Health and Disease. As part of the agreement, 33 backlist monograph titles have been digitized and are now freely available to APS Members (see *http://www.the-aps.org/mm/Publications/Books*). The books are hosted on the Springer website and can be downloaded as a PDF or viewed in the reader's browser.

The first book in the partnership, *The Rise of Fetal and Neonatal Physiology* by Lawrence D. Longo, was published in September 2013. There are currently 10 new books accepted for publication. All new titles are published in print and electronic format as part of Springer's "Physiology eBook Collection." All ebooks published in the program – both new and backlist titles – are freely available to APS members via login at the APS website. The print version of each new title published under the agreement is available to APS members at the special price of $40.

The Physiologist redesigned

The APS newsletter *The Physiologist* was redesigned to update the format and to print in full color. The redesign was launched with the January 2014 issue.

Physiological Reports

Physiological Reports is a general physiology open-access journal published in collaboration with The Physiological Society and published on behalf of the societies by Wiley. *Physiological Reports* uses a "cascading peer review model," whereby manuscripts considered unsuitable for publication in an APS/TPS journal, but yet deemed to be of publishable value, are "referred" to *Physiological Reports*, with author agreement – "transfer." Peer review for de novo submissions is comparable to that for the APS journals, and manuscripts transferred from APS journals to *Physiological Reports* should require no more than minor revisions, which the author must subsequently address.

Susan Wray, University of Liverpool, is Editor-in-Chief, and Thomas Kleyman, University of Pittsburgh, is Deputy Editor-in-Chief. Associate Editors are Mrinalini (Meena) C. Rao, University of Illinois at Chicago; Julian R.E. Davis, University of Manchester; Larissa A. Shimoda, John Hopkins University; Gareth Leng, University of Edinburgh. The Editorial Board is composed of over 100 members. Journal oversight is by a Joint Managing Board composed of representatives of the leadership from both societies and staff serving ex officio.

Current Status of *Physiological Reports*. *Physiological Reports* launched in March 2013. The first article appeared online in May 2013, and the first issue was compiled in June 2013. Since then, issues have been compiled monthly (at the end of the month). As of August 2014, 372 articles have been published. The cascading peer review model accounts for ~82% of the total submissions, with ~73% of these articles being accepted for publication. See cumulative breakdown in table below.

Council accepted the report of the Publications Committee ●

Referring Journal	# Referrals	# Author Transfers
Advances		
AJP-Cell	93	39
AJP-Endo	60	13
AJP-GI & Lung	51	15
AJP-Heart	132	43
AJP-Lung	40	17
AJP-Regu	86	51
AJP-Renal	105	37
JAPPL	291	90
JN	109	27
PG	21	8
J Physiol	353	40
Exp Physiol	100	24
TOTAL	**1,441**	**404**
Direct submissions	**86**	
Total submissions	**562**	
Accepted/rejected	**403/71**	
Published articles YTD August 2014	**372**	

Physiological Reports submissions and published articles through August 2014

Section Advisory Committee


Ann Schreihofer, Chair

The Section Advisory Committee (SAC) is composed of the elected chairs of each of the APS Sections. The duties of SAC include: *1)* assisting the Joint Program Committee in the organization of scientific meetings, *2)* serving as the Society's Long-Range Planning Committee, and *3)* making recommendations to Council regarding the strengthening of the Sections' roles in programs, publication, public affairs, and governance of the Society. Below are summarized SAC's primary activities over the past year.

Awards

New section-based awards have been established over the last year through generous donations of section members and corporate sponsors. The Respiration Section established the Hermann Rahn Award for junior faculty members, which is sponsored by Sadis Matalon. In addition, they have finalized plans to establish a series of industry-sponsored poster presentation awards that will be presented at the EB meeting. The NCAR section obtained a 5-year commitment from Data Sciences International to fund the Data Sciences International Outstanding Graduate Student Award. In addition, NCAR has obtained a 10-year commitment to fund a Best Trainee Poster Award, which will be judged at their new session, Data NCARnation. The Comparative and Evolutionary Physiology Section created a new abstract and blog-based travel award for a graduate student through a generous donation from Dr. Dolittle, the comparative physiologist blogger on *Life Lines*. The winner of this unique award has their photo and blog posted on Dr. Dolittle's website. The APS is committed to establishing a Beverly Bishop award to recognize a junior neuroscientist beginning at the 2015 EB meeting, and members from several sections will serve on the judging committee to be chaired by Sue Barman.

Engaging Members in Your Section Operations

Sections communicate with their members through newsletters, ListServ e-mails, social media, and personal contact at the EB meeting and beyond. Many sections are particularly engaged in growing participation by trainees in their section. For example, the NCAR section has changed the format of their trainee-based featured topic session to promote NCAR award winners as speakers and the NCAR TAC representative as a chair of the session. In addition, NCAR has established a new session on the Saturday of the EB meeting called NCARnation, which combined a social event with brief presentations of selected trainee posters that would later be presented at the EB meeting. The WEH section has established a "mentoring on the go" program in conjunction with their Trainee Advisory Committee to match up mentors and mentees at the EB meeting. Many sections recruit members for their section and other APS activities during their business meetings by use of announcements, sign-up sheets, and personal invitations. The CEP section recently expanded their steering committee to include several councillor-at-large positions. Sections are also strengthening ties with APS journals to engage members and award winners to publish in the journals.

Section Finances

Sections fund their programs through support from the APS (e.g., ancillary funds for interactions with Distinguished Lecturer, funds for EB sessions) and donations from individuals and industry. Such funds have either remained stagnant or declined over recent years, while costs of holding section-based events have risen significantly. Although a few sections have been successful in maintaining their industry sponsorships to fund section-based events and awards, several sections have curtailed their events or increased costs to members to avoid deficit spending. Many sections are actively seeking new avenues of fund raising within the membership and outside the society. Some express a lack of expertise in fund raising from companies and seek advice from the APS regarding approach, appropriate amounts, and understanding how to successfully attract short- or long-term donors. It was noted by several that a significantly higher proportion

of personal donations comes from junior members relative to long-standing senior members. Some sections are considering publicly acknowledging donations in their newsletters (with permission of donors). Although the APS established an endowed matching-funds program to allow sections to raise money that would be matched by the APS, the Respiration Section is the only section to have been successful in obtaining new funds to participate in the APS matching-fund program to support a trainee-oriented event. Several sections have expressed difficulty in participating in the APS matching-funds program, with the daunting task of raising a large sum of money that would yield little in the short term when it is needed. SAC will be exploring new investment strategies for section funds and avenues of financial support at their fall meeting with APS leadership.

Interaction With APS and Other Sections

Several sections report concerted efforts by their programming representatives to work with other sections to reduce overlap of sessions of potential common interest at the EB meeting. In addition, several sections open their reception events to all APS members to enhance intersection networking. Cross-sectional symposia continue to bridge research presentations across sections at the EB meeting. Most sections actively recruit their members to apply for APS committees, which bring members from many sections together to work for a common cause.

Programming for the Section

Comments were made about the small room sizes at the Boston venue for EB 2013, with overcrowded rooms at many of the sessions. Several sections expressed improved coordination of programming after relaxing the clustering of program by sections, such as RESP, CNS, and NCAR. Other sections, such as Renal, preferred to continue clustering their programming and coordinate with sections such as WEH, CAMP, and the Epithelial Transport Group. The GIL Section continued to feel clustered toward the end of the meeting, reducing their ability to interact with other sections and have their sessions optimally attended. It was expressed that smaller sections may have a more difficult time maintaining a critical mass on the last day of the meeting. Larger sections, such as CV and RESP, program on all days of the meeting.

To ensure diversity of speakers at the EB meeting, CV is instituting a new policy of not having invited speakers from the EB meeting also give a talk at the next EB meeting. Several sections are holding trainee-only sessions that are either presented as featured topics (CEP and NCAR) or special poster sessions (like Data Diuresis for WEH, Highlight Breakfast for RESP, a Poster Symposium for GIL, and Posters with Professors for Renal). Several sections were involved in APS meetings outside of the EB meeting. Members of the EEP section participated in the planning of an Integrative Biology of Exercise meeting in Denver, CO in October 2012. Members of NCAR and CNS sections participated in the Autonomic Regulation of Cardiovascular Function in Health and Disease in Omaha, NE in July 2012 and in the FASEB Summer conference Neural Mechanisms in Cardiovascular Regulation in Oregon, July, 2013.

Recruitment and Retention of Section Membership and Leadership Roles in the APS and Section

The membership numbers by section have been mixed, with some losing members (mostly regular and emeritus members), some remaining stable, and others growing. The sections received contact information for members who have not renewed their dues. Some sections are contacting these members to find out why they dropped membership and to encourage renewal of membership with APS. Most sections are actively engaging members to nominate for APS committees and working to help produce effective applications. During the fall SAC meeting, SAC viewed the data regarding APS committee memberships by section, numbers of applications for each committee and by each section, and discussed strategies for helping members interested in serving on APS committees to complete a competitive application.

Interactions With Publications Representative

AJP-Regu wins the prize for most APS Section liaisons. Among the sections that actively align with this journal under the editorship of Rick Samson are the Comparative and Evolutionary Physiology Section, Central Nervous System Section, Neural Control of Autonomic Regulation Section, and the Water and Electrolyte Homeostasis Section. Some sections have strong interactions with multiple APS journals. The Respiration Section maintains strong ties with *AJP-Lung*,

JAPPL, and the new open-access journal *Physiological Reports.* The editor-in-chief for the *JAPPL,* Peter Wagner, actively engages with the Environmental and Exercise Physiology Section as well as the Respiration Section. The Water and Electrolyte Homeostasis Section maintains interacts with *AJP-Regu,* and will be interacting more with *AJP-Renal* and incoming editor-in-chief Darwin Bell. The Teaching Section is supported by the APS *Advances in Physiology* journal with fruitful discussions on ideas for sharing resources of the section sponsored new Institute on Teaching and Learning with the Editor, Doug Everett. According to the Cell and Molecular Physiology Section, the outgoing Editor of *AJP-Cell,* Paul Insel, oversaw the first *AJP-Cell*-sponsored symposium at EB, which will be continued by the incoming Editor-in-Chief, Jo Adams. In general, most sections reported positive interactions with APS journals in terms of taking suggestions for editorial board members, interacting at the EB meeting, publishing EB presentations, and encouraging section members to publish invited reviews and in conjunction with Calls for Papers. The Central Nervous System Section is hopeful for increased interactions with the *Journal of Neurophysiology* with the July, 2014 appointment of new Editor-in-Chief Bill Yates.

Engaging Trainee, Industry, and International Members With Steering Committee

A noted strength of the APS is its commitment to involving and mentoring trainees, which happens most effectively at the section level. Most sections reported EB meeting sessions targeted for trainees, such as featured topics and poster sessions. Trainees are given the opportunity to plan and chair such sessions. Many sections are engaging previous award winners to actively participate in upcoming EB sessions. Awards targeted to trainees continue to be on the rise, and application numbers and quality appear to be growing stronger for many sections. Several sections have trainee committees or subcommittees as part of their steering committee in addition to a Trainee Advisory Committee (TAC) representative. The CEP trainee subcommittee organized its first annual CEP section trainee mixer before the section dinner at the EB 2013 meeting. CaMP trainees were invited to attend a breakfast with the Hugh Davson Distinguished Lecturer. Several sections are now including a trainee section in their newsletters, which is written by trainees (TAC reps) and targeted toward issues of interest to trainees. Some sections are currently looking for new trainee representatives for their section (GIL, CNS, TEACH).

Many sections are increasing international member participation either by establishing an international member position on their steering committee or informally working to have international members on their steering committees. Several sections are working to best define the roles and goals for their international steering committee members. Interactions with industry members have been mixed. The EM section is chaired by Josh Anthony, from the Campbell Soup Company, and many sections have members from industry as part of their steering committees. These members are encouraged to participate in programming, mentoring of trainees for industry-related careers, and fund-raising in the world of industry.

Council approved the request for APS Endowed Matching Funds accounts for the following four sections: Cardiovascular Section (CV), Central Nervous System (CNS), Cell and Molecular Physiology (CaMP), and the Water and the Electrolyte Homeostasis Section (WEH) ●

Science Policy Committee


Kevin Kregel, Chair

In 2013-2014, the SPC committee's activities included advocacy for federal funding of research, building relationships with the APS chapters through the Chapter Advocacy Outreach program, and fostering communication between the APS and federal funding agencies. We also provided comments to the Senate Homeland Security and Government Affairs Committee on how travel restrictions placed on government employees have hindered the work of federal scientists.

Advocacy Activities

APS Early Career Advocacy Fellows

The APS Early Career Advocacy Fellowship Program was initiated in 2013. Although the original plan was to select three fellows per year for a 1-year term, it was subsequently modified so that two fellows are selected each year to serve 2-year terms. This allows the fellows to gain more experience with the committee and advocacy activities, and also allows the second-year fellows to act as mentors to the first-year fellows The committee now works with a total of four fellows: two first-year fellows and two second-year fellows.

In 2013, the committee was pleased to select Elissa Carney of Georgetown University and Ann Stowe of the University of Texas Southwestern as Early Career Advocacy Fellows. Carney and Stowe join second-year fellows Mitsi Blount of Emory University and TanYa Gwathmey of Wake Forest University School of Medicine.

Fall Committee Meeting Hill Visits

On October 1, 2013, 23 APS members went to Capitol Hill with the message that increased federal support for research is critical to advancing science and innovation and to fostering the next generation of scientists. Our other message was that sequestration is having a devastating effect on the scientific workforce. We therefore asked Congress to find a permanent solution to replace the across-the-board cuts scheduled for the next 10 years.

Unfortunately, our visits were scheduled on the very day that the government (including congressional offices) had to shut down because Congress had failed to approve fiscal year 2014 appropriations. Nevertheless, SPC members were able to meet with staff in the offices of 17 members of Congress from 13 states, from California to Maine.

Most offices expressed support for biomedical research. However, many expressed concerns about the overall level of federal spending and the need to reduce the federal deficit. Some offices also stated that federal research agencies need to focus their resources on the most pressing areas.

APS Leadership Visits Capitol Hill With FASEB

On March 5, 2014, eight APS members participated in FASEB's annual Capitol Hill Day. Representing APS were Past-President Sue Barman, FASEB Board Member Hannah Carey, SPC representative John Chatham, 3 SPC committee members, and FASEB President J.R. Haywood. This year, FASEB reached out to the societies to request help identifying members in key states. Because they were from states on this list, we asked for help from SPC members Amy Davidoff (Maine), Mark Weiss (Kansas), and Alicia Schiller (Nebraska), who readily agreed to participate. The main focus of FASEB's Capitol Hill Day was to inform congressional offices about the negative impacts of sequestration on biomedical research.

Federal Employee Travel Restrictions

In 2012, the White House Office of Management and Budget imposed new restrictions on travel for federal employees. The memo directed agencies to cut their travel budgets by 30% and imposed restrictions and oversight on conference spending. The driving force behind the new rules was media coverage of several extravagant conferences for government employees.

The Senate Homeland Security and Government Affairs Committee held a hearing in January 2014 to assess the impact of these regulations and to consider legislation codifying a similar set of regulations in law. To determine the impact of the current and proposed restrictions, the APS conducted a short online survey with members who work for the federal government. The results were

used to draft a letter to the committee, outlining the negative effects the restrictions have had on the ability of government scientists to carry out their work, and how continuing these restrictions would further erode their ability to carry out their missions.

Chapter Advocacy Partnerships

Last year was the first year of the APS Chapter Advocacy Outreach program. Three speakers attended Chapter meetings to address topics such as advocacy for biomedical research and the humane use of animals in research. The 2010 strategic plan called upon these two committees to promote advocacy among APS members and noted that the Chapters represent an "underutilized resource."

Research Reproducibility at EB 2015

Research reproducibility was selected as the topic for the Public Affairs Symposium at EB 2015 in Boston. Committee member Carrie Northcott has agreed to chair the session entitled "Reproducibility in research: What are the problems? How can we fix them? What happens if we don't?" The session will focus on the NIH's efforts to improve reproducibility in pre-clinical research.

Meetings With Funding Agencies

On March 31, 2014, the APS leadership met with National Institute for General Medical Sciences Director Jon Lorsch as well as several members of his staff. Discussion focused on research training, sustainability of careers in the biomedical workforce, and NIGMS's plans to maximize the efficient use of constrained resources and experiment with new ways of training and funding scientists. Lorsch answered a series of questions in an article for *The Physiologist,* which appeared on the front page of the July issue.

Leadership Interactions with FASEB

The APS is currently represented on the FASEB Board of Directors by Hannah Carey. John Chatham continues to serve as the APS representative to the FASEB Science Policy Committee (SPC), and Kevin Kregel is continuing service as the Chair of FASEB's Animals in Research and Education Committee. J.R. Haywood is the current FASEB President. Hannah, John, JR, and Kevin all attended the FASEB SPC and Board face-to-face meetings in Arlington, VA on June 1-2, which included a symposium on the importance of science communication.

The APS is represented on a number of FASEB SPC subcommittees by the following individuals: John Chatham, J.R. Haywood, Bill Talman, Tim Musch, Bill Yates, R. Brooks Robey, Virginia Miller, Carrie Northcott, Michael Portman, Zhongjie Sun, Gina Yosten, Tom Pressley, and Phil Clifford. Hannah Carey represents the APS on the newly formed Research Enterprise Evaluation subcommittee.

Council accepted the report of the Science Policy Committee

Trainee Advisory Committee

Jennifer Sasser, Chair

TAC Trainee Survey

The Training Advisory Committee (TAC) began planning for the 2015 survey, including discussion of topics and objectives. The design of the survey will be completed this fall, and the survey will be distributed in early 2015. Special efforts will be made to reach out to HBCUs and HHCUs and to undergraduate physiology departments. The survey will include some questions from the previous surveys so that we can continue to track responses over time, and new topics will also be included in this survey

EB Symposia

EB14

The 2014 TAC Symposium was entitled, "The Other Side of the Submit Button: The Ins and Outs of the Manuscript Review Process." This symposium was co-sponsored by the APS Publications Committee, and it included presentations on "How to become a reviewer," "What are the responsibilities of a reviewer?" and "What is included in a review?" The presentations were followed by an open forum discussion panel with the invited speakers (Kay Lund, Jerry Dempsey, and Irving Zucker). Attendance at this Wednesday morning symposium was moderate, and the speakers received high ratings from the attendees.

EB15

In 2015, the TAC symposium will focus on the development of supervisory and management skills. Committee members Megan Greenlee and Chris Banek are organizing the session. The session will include talks on the following topics: *1)* Hiring and Firing: Finding the Right Employees (Mike Reid), *2)* Effectively Managing People and Resources (Kim Barrett), and *3)* Dealing with Difficult Situations and People (Francine Montemurro).

Future Experimental Biology Planning

As part of ongoing strategic planning discussions, TAC has discussed possible new session types at EB. The TAC plans to discuss these ideas with JPC and SAC to develop specific recommendations for future EB meetings. In 2015, the TAC will hold a Trainee Cross-Sectional Featured Topic, "Research Advances in Obesity Research," that will be open to trainees and early career investigators from all APS sections. At future EB meetings, the TAC will begin hosting Early Morning Career Development Sessions.

APS Trainee Facebook Site and Twitter

The APS Trainee Facebook page currently has 444 Facebook "Likes," and the twitter account has 110 followers. Postings come from staff, TAC members, and APS Twitter feeds, providing regular communication to the trainee fans from the APS and the TAC. At the fall meeting, TAC establishes monthly topics relevant to trainees and assigns members responsible for posting materials.

Dale J. Benos Early Career Professional Service Award

The TAC received 10 completed applications for a 2014 award. The Committee selected Karen L. Sweazea, Assistant Professor, School of Nutrition and Health Promotion, Arizona State University, as the 2014 awardee. Sweazea has a remarkable level of professional service, outreach, and mentoring/teaching activities with students at the graduate/professional, undergraduate and K-12 levels, as well as with members of her community. She has been nominated for or won awards for both her mentoring and research throughout her career to date. This service was visible during her time as a graduate student and postdoctoral fellow and continues now as a faculty member.

The TAC has begun to follow up with past award winners to determine whether they have continued their service activities and to ask about the impacts of receiving the award on their careers and professional activities.

Outreach to Undergraduates

TAC members continue to use social media tools (Facebook and Twitter) along with the APS website and newsletter to engage both undergraduate students and physiology trainees. TAC business cards were distributed again at EB 2014 to increase awareness of these social

media websites. TAC members attended the EB 2014 Undergraduate Poster Session and engaged many of the undergraduate students in discussions of their research, encouraged them to become APS members, and promoted the APS social media sites (Facebook, etc.).

Undergraduate Focus Group

Because of the growing involvement of undergraduates in APS, the TAC feels it is important to have undergraduate input into TAC activities. Since APS summer undergraduate research fellows are a good target group from whom to gain insights into the undergraduate population regarding their needs and their impressions of the APS and EB, a TAC subcommittee held a focus group meeting at EB2013 with five undergraduates who participated in APS Summer Research programs and attended the Undergraduate Orientation Session on Saturday afternoon. These responses were used to design a survey that was sent to all undergraduates who presented a poster at the 2014 EB meeting. Nearly half of the undergraduate students who had first-author posters at EB responded to the survey, and the TAC is currently in the process of evaluating these responses to guide future activities for undergraduates.

Communication With Sections

TAC representatives updated their section activity information in 2013-2014 and shared information with their Section Steering Committee. The most common trainee activities for Sections were research awards for trainees and junior faculty, discounted banquet tickets for trainees, involvement of junior faculty as symposia speakers, and e-media use. About two-thirds of the Sections have a trainee section in their newsletter and have trainees co-chair symposia or featured topics at EB, and some sections also include trainee-driven sessions at EB, trainee subcommittees within the section, and awards for undergraduate students.

Council approved funding of $4,000 for a networking breakfast session at the annual Experimental Biology meeting for all trainees who are members of the APS Committees and Section Steering Committees; Council also approved the proposal to create career-related webinars jointly with the Career Opportunities Committee and the Porter Physiology Development and Minority Affairs Committee ●

Women in Physiology Committee

Angela Grippo, Chair

Bodil Schmidt-Nielsen Distinguished Mentor and Scientist Award

Twelve excellent nominations were received for the 2014 Bodil Schmidt-Nielsen Distinguished Mentor and Scientist Award. The Women in Physiology (WIP) Committee selected Michael J. Joyner (Mayo Clinic) as the awardee. At the award lecture and reception, Joyner gave a talk on mentoring, entitled, "Reflections on Mentorship," which focused on five lessons he has learned about mentoring, being mentored, and being successful. An article based on his lecture will be published in *The Physiologist* in 2015, and the multimedia presentation has been posted on the APS web site.

APS Professional Opportunity Awards: Caroline tum Suden/Frances Hellebrandt, Steven M. Horvath, Fleur L. Strand, and Gabor Kaley Awards

The WIP Committee received 145 applications for the 2014 tum Suden Professional Opportunity Awards, which is 18% higher than the number of applications received in 2012. The Committee was able to fund 36 tum Suden Awards, 2 Horvath Awards (given to the top two underrepresented minority applicants), and 1 Strand Award (given to the top applicant) for a total of 39 awards (27% of applicant pool).

MentorNet Mentoring Program

MentorNet recently redesigned its organizational structure and its website. The Committee continues to monitor the changes made to MentorNet to ensure that we can continue a productive and beneficial relationship with the organization. The Committee also is continuing

its efforts to encourage trainees and mentors to join MentorNet, and will continue to provide information about MentorNet on APS listservs and Facebook pages, and other social media sites.

Experimental Biology Mentoring Workshop

For EB 2014, the workshop was entitled, "Ahead of the Curve: Taking the Lead." The workshop was held on Wednesday from 8:00 AM to 10:00 AM. The workshop was well attended with ~75 attendees. Fifty attendees (~66%) completed a survey. Based on survey responses, the audience was primarily made up of graduate students and junior faculty; however, there was a wide range of audience members, including postdoctoral researchers, senior faculty, and undergraduate students. The speaker presentations were rated highly, and there were several questions and issues raised during the discussion period (30 minutes after the three presentations) as well as for several minutes following the end of the symposium.

Representation of Women in APS and Scientific Community Leadership

One of the charges of the WIP Committee is to support advancement of women in APS and in the scientific community at large. The WIP Committee annually reviews the number of women serving on APS committees and section steering committees.

In reviewing the membership of the APS Section Advisory Committee (SAC) and other Society committees, the Committee found that the representation of women on the APS committees continues to be very good. The WIP Committee commends the Committee on Committees for its ongoing attention to gender diversity when making committee appointments. The WIP Committee is also pleased to note that, in 2014-2015, the APS Council has three women members out of nine (33%) as well as women in both the past-president and president positions. Overall, five (42%) of the 12 elected members of the council are women. The Committee believes this continues to reflect the increasing role of women in the Society as a whole and especially in both section and committee leadership positions, which provide important visibility and service opportunities.

Development of a Women's Listserv/ Facebook Page

The WIP Committee has developed a Facebook page, which launched on June 10, 2013. The specific goals of this page are to share information that is relevant to the mission of the WIP Committee with both men and women, including content on gender issues in science, promotion of physiology to early career scientists, and mentoring. The page is at *https://www.facebook.com/APS.WIPC*.

The WIP Committee continues to work to promote women within the Society and the scientific community and to provide mentoring for early career investigators and trainees. We look forward to additional involvement in new APS programs and activities, and we will strive to remain instrumental in the implementation of the New Strategic Plan developed by Council.

Council accepted the report of the Women in Physiology Committee ●

Experimental Biology

Physiology and Experimental Biology 2014

Experimental Biology 2014 was held April 26-30 in San Diego, California and was a joint meeting of six societies: APS, American Association of Anatomists (AAA), American Society for Biochemistry and Molecular Biology (ASBMB), American Society for Investigative Nutrition (ASIP), American Society for Nutrition (ASN), and American Society for Pharmacology and Experimental Therapeutics (ASPET). In addition, the six primary participating societies hosted a total of 30 guest societies. The APS hosted seven guest societies: American Federation for Medical Research (AFMR), Association of Latin American Physiological Societies (ALACF), Biomedical Engineering Society (BMES), International Research Network on Cerebral Hemodynamic Regulation (CARnet), Microcirculatory Society (MCS), Society for Experimental Biology and Medicine (SEBM), and The Physiological Society (Physoc).

The Society's programming was organized using the clustering of sectional programs for the fourth year and included 375 total sessions: 223 poster sessions, 76 symposia, 46 featured topics, 18 lectures, 2 workshops, 1 refresher course, 2 award sessions, and 7 special sessions. This clustering program allows sections and interest groups to program sessions in a clustered, compact manner so that each day highlights a particular area of research. The attendees benefit by a more targeted program where they can select the most appropriate days to attend.

The APS EB meeting opened with several unique sessions on Saturday, April 26 including the traditional *Refresher Course* this year focusing on *The Role of Exercise in Disease Prevention, Treatment, and Optimal Aging*, which attracted an average attendance of 250 people. APS sponsored two unopposed Techniques and Technology in Physiology Workshops on Saturday, April 26 entitled: *Multiscale Computational Modeling and Simulation for Studying Physiological Processes* and *Translation of Cardiovascular Endpoints across Species*. The workshops attracted an average audience of 75 individuals. In addition, Saturday featured *Physiology in Perspectives: The Walter B. Cannon Memorial Award Lecture* presented by James Anderson of NIH. The lecture was followed by an opening reception free to all physiology registrants. APS also held the *Henry Pickering Bowditch Memorial Award Lecture*, featuring Kazuhiro Nakamura of Kyoto University and 12 section-sponsored Distinguished Lectures. APS also sponsored five Cross-Sectional Symposia: *Sex Differences in Physiology and Pathophysiology*; *New Perspectives on Regulation, Interaction, and Noise Found in Physiological Systems*; *Sleepless in San Diego: Is Sleep Deprivation the New Silent Killer?*; *Origins of Hypertension: The CNS, the Kidney and Beyond*; and *Sialic Acids: How Glycans Impact Human Physiology and Disease.*

The APS President's Symposium Series was organized by Kim Barrett around the theme *Multiscale Physiology: Linking Cellular and Molecular Insights to the Health of Organisms by Populations* and included three symposia:

Table 1: Abstract submissions by society (On-time and Late-breaking)

	2014 (San Diego)	2013 (Boston)	2012 (San Diego)	2011 (D.C.)	2010 (Anaheim)
APS	2,528	2,917	2,875	2,739	2,416
ASBMB	1,595	1,649	1,573	1,616	1,442
ASPET	714	930	682	622	577
ASIP	426	506	411	422	432
ASN	1,908	2,129	1,847	1,745	1,500
AAA	669	635	583	532	449
EB	67	64	46	53	39
Total	7,907	8,830	8,017	7,729	6,855

Table 2: EB Registration by Registration Category (All Participating Societies)

	2014 (San Diego)	2013 (Boston)	2012 (San Diego)	2011 (D.C.)	2010 (Anaheim)
Scientific	9,814	11,238	10,329	10,624	9,124
High School/ Undergrad	2,046	1,673	1,590	1,332	1,379
Exhibitors/Guests	1,516	1,682	1,768	1,602	1,493
Total Registration	13,376	14,593	13,687	13,558	11,996

"Early Life Origins of Adult Disease;" "Physiological Relevance of the Intestinal Microbiome: Moving Beyond the Gut;" and "Life at Extremes: Adaptations to Diverse Challenges to Normal Homeostasis." The culminating Nobel Prize in Physiology or Medicine Lecture presented by Bruce Beutler, University of Texas Southwestern Medical Center, was held on the last day of the meeting and included a time for autographs and pictures during the post-lecture trainee reception.

The APS closing banquet was held the final evening of EB and was open to physiologist registrants for a nominal fee. Entertainment was provided by GI Distress, a cover band comprised of many APS members, and the FASEBettes.

A total of 7,907 abstracts were programmed by the six EB14-sponsoring societies. Table 1 provides a breakdown of on-time and late-breaking abstracts programmed over the past 5 years. Total abstracts submitted for EB 2014 fell by slightly more than 11% over EB 2013, which received a total of 8,830 abstracts.

Table 2 provides the breakdown of total attendance at EB over the past 5 years. EB 2014 represented 1,424 fewer scientific registrants than EB 2013.

The American Physiological Society gratefully acknowledges financial support provided for APS-sponsored scientific sessions through educational grants from Elliott Scientific, Ltd.; Lightspeed Technologies, Inc.; Nikon Instruments, Inc.; Y. Prakash; Sucampo AG; S&R Foundation; ADInstruments, Inc.; Data Sciences International, Inc.; Novo Nordisk, Inc.; Hemoshear, LLC; AbbVie, Inc.; GlaxoSmithKline, PLC; Takeda Pharmaceuticals International, Inc.; Kent Scientific Corporation; Campbell Soup Company; and University of California, Irvine.

EB 2015 Distinguished Lectures

Physiology in Perspectives: The Walter B. Cannon Memorial Award

Masashi Yanagisawa
"Solving the mystery of sleep: from orphan receptors to forward genetics"
Saturday, March 28, 2015,
5:30 PM

Henry Pickering Bowidtch Award Lecture

Babette B. LaMarca
Univ. of Mississippi Med. Ctr.
"Role of immune mechanisms in the pathophysiology of hypertension in preeclampsia"
Sunday, March 29, 2015,
5:45 PM

Claude Bernard Distinguished Lectureship

Anthony Macknight
ADInstruments
"Adventures in education"
Sunday, March 29, 2015,
10:30 AM

Carl Ludwig Distinguished Lectureship

Jere H. Mitchell
Univ. of Texas Southwestern Med. Ctr.
"Abnormal cardiovascular response to exercise in hypertension: contributing neural factors"
Monday, March 30, 2015,
8:00 AM

Hugh Davson Distinguished Lectureship

Anita Chatarina Aperia
Karolinska Inst.
"Identification of Na,K,ATPase as a signal transducer that regulates mitochondrial function"
Sunday, March 29, 2015,
2:00 PM

Solomon A. Berson Distinguished Lectureship

Grahame Hardie
Univ. of Dundee Col. Life Sci.
"AMP-activated protein kinase: promoting energy homeostasis at the cellular and the whole-body levels"
Monday, March 30, 2015,
10:30 AM

Ernest H. Starling Distinguished Lectureship

Jane Reckelhoff
Univ. of Mississippi Med. Ctr.
"Sex and hypertension"
Sunday, March 29, 2015,
3:15 PM

Edward F. Adolph Distinguished Lectureship

M. Harold Laughlin
Univ. of Missouri, Columbia
Monday, March 30, 2015,
2:00 PM

Carl W. Gottschalk Distinguished Lectureship

David H. Ellison
Oregon Hlth. Sci. Univ.
"WNKs, SPAK, and NCC: an emerging consensus at last"
Monday, March 30, 2015,
3:15 PM

Robert M. Berne Distinguished Lectureship

Peipei Ping
UCLA Sch. of Med.
"Understanding pathogenesis of human heart failure: from molecular pathways to phenotype characterizations"
Tuesday, March 31, 2015,
2:00 PM

Joseph Erlanger Distinguished Lectureship

Karl Deisseroth
HHMI, Stanford Univ.
Monday, March 30, 2015,
3:15 PM

August Krogh Distinguished Lectureship

Arthur L. DeVries
Univ. of Illinois, Urbana-Champaign
"The role of antifreeze proteins in the survival of polar fishes"
Tuesday, March 31, 2015,
3:15 PM

Julius H. Comroe, Jr. Distinguished Lectureship

Usha Raj
Univ. of Illinois at Chicago
"Unique aspects of the pathobiology of pulmonary hypertension in the developing and mature lung"
Tuesday, March 31, 2015,
10:30 AM

Horace W. Davenport Distinguished Lectureship

Pauline K. Lund
Univ. of North Carolina, Chapel Hill
"Mediators of intestinal adaptation in health and disease: *stem cells, hormones, nutrients, and bugs"*
Tuesday, March 31, 2015,
3:15 PM

APS Nobel Prize in Physiology or Medicine Lecture

Robert J. Lefkowitz
Howard Hughes Med. Inst., Duke Univ. Med. Ctr.
"Seven transmembrane receptor"

Wednesday, April 1, 2015, 4:45 PM

Science Policy

APS Members Urge Congress to Invest in Research, Regulate Sensibly

In July, members of the APS Animal Care and Experimentation (ACE) went to Capitol Hill to meet with their Senators and Representatives. Members of the Science Policy Committee (SPC) held its Capitol Hill Day in September.

Participants in both Hill Day events used the Twitter hashtag #HillDayAPS to reinforce their messages.

ACE Committee Hill Day: July 23, 2014

The ACE committee participated in 20 meetings with 11 Republican and 9 Democratic offices. They discussed the important role of non-human primates in crucial areas of research and conveyed the Society's concern that Air France is the only commercial airline willing to transport non-human primates for research. (See the APS new position statement on research animal transportation to learn more about this issue: *the-aps.org/AnimalTransport*.)

Richard Nichols, Barbara Hansen, Gaylen Edwards, and Anne Deschamps outside the office of Senator Bill Nelson (D-FL)

SPC Capitol Hill Day: September 9, 2014

The SPC had 21 meetings with 11 Republican and 10 Democratic offices. The SPC reminded legislators of the need to provide federal research agencies such as the National Institutes of Health and the National Science Foundation stable and predictable funding growth in order to sustain the U.S.'s research enterprise. The SPC also discussed the need to address regulatory burden and the complexities of incorporating sex as a biological variable in preclinical research. To learn more about the APS position on this issue, see *the-aps.org/HR4879*.

To learn how you can be an advocate for research, see *the-aps.org/SciencePolicy*. ●

Senator Barbara Boxer (D-CA), *center*, with Mike Wyss, Diane McClure, Claire Edwards, and Sonnet Jonker in the Senate Reception Room of the Capitol Building

The Animal Care and Experimentation Committee prepares to depart for Capitol Hill

Senator Roy Blunt (R-MO), *second from the right,* with Jeff Henegar, Dan Warren, and Mike Ryan

Rep. Grace Napolitano (D-CA 32), *second from left,* poses with Sonnet Jonker, Diane McClure, and Mike Wyss

2014 Early Career Advocacy Fellow Ann Stowe with Rep. Pete Sessions (R-TX 32)

The Science Policy Committee, accompanied by APS Executive Director Marty Frank, prepares to depart for Capitol Hill

APS President David Pollock, Roy Sutliff, 2013 Early Career Advocacy Fellow Mitsi Blount, and APS Executive Director Marty Frank at the Capitol

Gaylen Edwards and Pieter de Tombe in the Hart Senate Office Building

Jeff Henegar with Rep. Vicky Hartzler (R-MO 4)

FASEB President JR Haywood, Laura McCabe, and Alicia Schiller standing in front of the office of Senator Carl Levin (D-MI)

APS Issues Statement on Sex Representation in Animal and Cell Studies

In May, National Institutes of Health (NIH) Director Francis Collins announced that NIH would formulate plans to address concerns that there has been an overreliance on male cells and animals in preclinical research. On September 11, NIH issued a Request for Information to assist NIH in developing a policy regarding the inclusion of sex as a biological variable in research studies involving animals and cells.

This issue has garnered significant attention in the press and from Congress. On June 17, 2014, Representatives Cooper and Lummis introduced a bill that would amend the Public Health Service Act to require the NIH to "determine when it is appropriate for basic research projects to include both sexes and issue guidelines to ensure the inclusion of both sexes and the analysis of sex differences, as appropriate." H.R. 4879 would require the NIH to work with stakeholder groups, including the scientific community and NIH's Office of Laboratory Animal Welfare, and to issue the new guidelines within 1 year. In response to the proposed legislation, the APS issued the following statement in support of the bill. The statement is available online at *www.the-aps.org/HR4879*.

The APS Statement on H.R. 4879

The APS supports the efforts of Representative Cooper and the co-sponsors of this legislation to promote high-quality research through H.R. 4879, the "Research for All Act of 2014." H.R. 4879 calls upon the NIH to establish guidelines for the appropriate representation of both male and female animals, cells, and tissues in the basic research the agency supports.

The APS believes that transparent reporting of sex and gender is part of the solution. In 2012, APS journals instituted a requirement for manuscripts submitted for publication to specify the sex of experimental animals, the sex/gender of humans subjects, and the sex/gender (as appropriate) of the source of cells, tissues, or other specimen materials.

Sex and gender inclusiveness is but one aspect of broader efforts to improve the translational relevance of our nation's biomedical research investment. The APS is pleased that the legislation has been written so that NIH can implement it in a thoughtful fashion. H.R.4879 encourages the NIH Director to work with stakeholder groups, including members of the scientific community, to develop a consensus about when and how to incorporate sex/gender inclusiveness in basic research. To date, these questions have been more thoroughly addressed in some areas of research than in others, so it is essential to develop sound approaches about how best to proceed.

We urge careful consideration of the implementation timetable. Grant applications require time to develop because of the need to gather preliminary data and formulate the proposal. Therefore, once NIH adopts specific sex/gender inclusiveness policies, lead time will be necessary so researchers can incorporate new parameters into experimental design. In addition, given the significant time and resources already devoted to regulatory compliance, new reporting requirements should be harmonized with existing ones.

We applaud the efforts of Representatives Cooper and the co-sponsors of H.R.4879 to promote appropriate inclusion of both sexes in basic and preclinical research. To ensure that these efforts are successful, Congress must also provide the resources needed so that the NIH can implement these important policies without detriment to current research activities. ●

Education

New Professional Skills Training Course on Becoming an Effective Teacher Held in Bar Harbor

APS launched a new Professional Skills Training (PST) course on "Becoming an Effective Teacher" in 2014. Part 2 of this course blended live and online course was held in-person on June 23-28 at the College of the Atlantic in Bar Harbor, ME in conjunction with the APS Institute on Teaching and Learning.

A total of 12 participants from a variety of career stages and backgrounds registered and joined 3 instructors and APS staff at the in-person portion of the course. Below is a list of instructors and participants.

Participants and instructors at "Becoming an Effective Teacher" PST Course

Instructors	Institution
Erin Keen-Rhinehart	Susquehanna Univ.
Johanna Krontiris-Litowitz	Youngstown State Univ.
Thomas Schmidt	Univ. of Iowa Carver College of Medicine

Participants	Institution
Reem Alkahtani	Virginia Commonwealth Univ.
Krista Blackwell	Rutgers Univ.
Xiang Cai	Southern Illinois Univ.
John Clemmer	Univ. of Mississippi
Melanie Fraites	U.S. Environmental Protection Agency
Ashley Guillory	Univ. of Texas Medical Branch
Alexis Jones	Oklahoma State Univ.
Steven Miller	Univ. of California, San Diego
Mohammed Nayeem	West Virginia Univ.
Patricia Silveyra	Pennsylvania State Univ. College of Medicine
Kelsey Stevens	Univ. of South Dakota
Matt Valdez	Univ. of California Riverside

Participants spent the week reviewing material covered in the Part 1: Online portion of the course (held April 7 to June 22), developing plans for a micro-teach presentation that will be the culminating project from the course, getting feedback on teaching philosophies and portfolios, and discussing issues they have or are likely to face during the courses they'll be teaching as they progress in their careers.

Speakers included the three instructors plus Marsha Lakes Matyas (APS Director of Education Programs), Kimberly A. Henige (California State Univ., Northridge), Melanie Fraites (participant), Margaret Shain Stieben (APS Program Manager, K-12 Education Programs), and Melinda Lowy (APS Senior Programs Manager, Higher Education Programs).

Participants are continuing with the course in the Part 3: Online portion (June 29 to August 30), finalizing both their teaching philosophies and portfolios and then presenting and evaluating each other's and their micro-teach presentations.

Participants who successfully complete all three portions of the course can receive 3 graduate credits as part of an arrangement with Adams State University.

The "Becoming an Effective Teacher" course was developed with the assistance of an Advisory Board, as are all APS PST courses. Special thanks to Advisory Board members Dee U. Silverthorn (Univ. of Texas, Austin) and Barbara E. Goodman (Univ. of South Dakota School of Medicine) for their assistance in providing additional materials and feedback on course content.

Future plans for holding the blended "Becoming an Effective Teacher" course are under consideration. In addition, the course will be transitioned to be an online-only course, allowing for a greater number of people to participate. As plans are finalized, announcements will be made in *The Physiologist*, APS electronic newsletter, and online. For more information about "Becoming an Effective Teacher" and other PST courses, see www.the-aps.org/pst or contact Melinda Lowy, Senior Programs Manager, Higher Education, or Miranda Byse, Program Manager, PST Programs at *education@the-aps.org*. ●

APS and the Brazilian Society of Physiology Hold Writing and Reviewing for Scientific Journals Course in Brazil for Second Year

In 2013, APS and the Brazilian Society of Physiology (SBFis) held their first collaborative Professional Skills Training (PST) course in Ribeirão Preto, Brazil. The success of this course lent itself to organizing a second course in 2014. From July 29 to August 1, students, observers, and instructors met at the Institute of Biomedical Sciences, University of São Paulo, São Paulo, Brazil. Students learned the essentials of manuscript writing and had many excellent discussions with APS journal editors on topics ranging from authorship to responding to reviews. Additionally, five invited observers from various institutions in Brazil interacted with the instructors and students to learn how to lead future courses. Vagner Antunes, President-Elect of SBFis, coordinated and hosted the course with assistance from APS staff member Miranda Byse. Funding for this course was provided by the APS Latin American Initiative, SBFis, and CCEx of the Institute of Biomedical Sciences, University of São Paulo.

APS would like to thank the following members for serving as course instructors:

Kim Barrett, Univ. of California San Diego
Sue Barman, Michigan State Univ.
Patricia Molina, Louisiana State Univ. Health Sciences Center
Jane Reckelhoff, Univ. of Mississippi Medical Center
Irving Zucker, Univ. of Nebraska Medical Center

APS would also like to thank the following faculty members from Brazil who took time to serve as course observers:

William Lara Festuccia, Univ. of São Paulo
Renata Frazão, Univ. of São Paulo
Simone Motta, Univ. of São Paulo
Rodrigo Peliciari, Univ. of São Paulo
Maria Camila, Federal Univ. of ABC

Twenty students from Brazil received certificates of completion for the Writing and Reviewing for Scientific Journals course. They are:

Luciene Azevedo, Univ. of São Paulo
Leila Buttler, Univ. of São Paulo
Guilherme Campos, Univ. of São Paulo
Laiali Chaar, Univ. of São Paulo
Andrea De Lima-Pardini, Univ. of São Paulo
Antonio Diaz Tula, Univ. of São Paulo
Lorenzo Fagotti, Univ. of São Paulo
Cleide Falcone, Univ. of São Paulo
Cesar Fuziwara, Univ. of São Paulo
Maria Jordão, Univ. of São Paulo
Rafael Lambertucci, Cruzeiro do Sul Univ.
Eduardo Lemes, UNESP
Lucas Marques, Univ. of São Paulo
Vitor Mori, Univ. of São Paulo
Carla Rocha-Santos, Univ. of São Paulo
Adriana Ruggeri, Univ. of São Paulo
Caroline Serrano Do Nascimento, Univ. of São Paulo
Sebastião Silva, Univ. of São Paulo
Rafael Silva, Mauá Institute of Technology
Juan Zuniga-Hertz, Univ. of São Paulo

Instructors, observers, students, and staff of the 2014 Writing and Reviewing for Scientific Journals Course at Institute of Biomedical Sciences, University of São Paulo, São Paulo Brazil

APS Presents... Phantastic Physiology Voyage: "Function Follows Form"

Deadline for Applications: December 15

2 Awards:

- $750 for 1st Place
- $250 for Viewer's Choice

Undergraduate and graduate students are encouraged to creatively connect with physiology and to engage with the broader public through a short video contest.

- Videos should creatively demonstrate and/or explore a specific physiological function in five minutes or less (including credits).
- The target audience is the general public.
- Video can be staged as a short play, commercial, news broadcast, talk show, music video, documentary etc.

For more information, see the-aps.org/video

Apply at the-aps.org/awardapps

Professional Development Symposia at Experimental Biology 2015

Mark your calendars for professional development symposia at Experimental Biology 2015!

It's All in Your Head – A Refresher Course on the Brain and Systems Control
(Medical Education Refresher Course)

Get an update on content from leading experts in the field: The Brain and the Cardiovascular System (Roger Dampney, Univ. of Sidney), The Brain and the Immune System (Francois Abboud, Univ. of Iowa), The Brain and the Respiratory System (Gordon Mitchell, Univ. of Wisconsin-Madison), and The Brain and the Gut (Michael Gershon, Columbia Univ.).

Saturday, March 28, 8:00 AM to 12:00 PM
Boston Convention Center, Rm. 210A

Scientists as Supervisors: Hiring, Firing, and Beyond
(Trainee Symposium)

Supervisory and management skills are essential for scientists' success both inside and outside of research. Learn about *1)* hiring and firing (finding the right employees), *2)* resource and personnel management, and *3)* conflict resolution.
the-aps.org/supervisor

Wednesday, April 1, 10:30 AM to 12:30 PM
Boston Convention Center, Rm. 206A

Resilience is Power: Dealing with the Ups and Downs of Your Scientific Career
(Career Symposium)

A career in science is filled with challenges that can often have nothing or little to do with the research itself. Hear from experts in the psychology of resilience as well as scientists who can offer advice on adaptability and resilience specific to the discipline.
the-aps.org/resilience

Tuesday, March 31, 8:00 AM to 10:00 AM
Boston Convention Center, Rm. 207

Mentoring for Diverse Careers: Mentor and Protégé Perspectives
(Mentoring Symposium)

Get information on how to approach your mentor or advisor about taking "alternative" career paths and how to handle these situations if a mentee approaches you for advice on a non-traditional career path.
the-aps.org/mentoringdiversecareers

Wednesday, April 1, 8:00 AM to 10:00 AM
Boston Convention Center, Rm. 205B ●

Fellowships and Awards

K-12 Minority Outreach Fellowships

Application deadline: December 30, 2014
http://www.the-aps.org/k12minorityoutreach
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. Funds are provided to attend two EB meetings and one fall conference (ABRCMS or SACNAS), a value of $5,400. Apply online at *https://www.the-aps.org/awardapps*.

Porter Physiology Development Fellowships

Application deadline: January 15, 2015
http://www.the-aps.org/porter
The goal of the Porter Physiology Development Program is to encourage diversity among students pursuing full-time studies toward a PhD in the physiological sciences and to encourage their participation in the Society.

The Porter program provides a full-time graduate fellowship ($28,300 during the academic year) to students in programs leading to a PhD in the physiological sciences at U.S. institutions. The program is open to underrepresented racial and ethnic minority applicants who are citizens or permanent residents of the United States or its territories and student members of the Society. Apply online at *https://www.the-aps.org/awardapps*.

Undergraduate Summer Research Fellowships

Application deadline: February 1, 2015
http://www.the-aps.org/summerresearch
APS is proud to offer five programs that allow undergraduate students to participate in research during the summer. Recipients spend an average of 10 weeks in the laboratory of an established scientist and APS member. Each program recruits undergraduate students nationwide, one internationally. Some programs are open to students from disadvantaged backgrounds, students from underrepresented racial and ethnic groups, and students with disabilities. Each Fellow receives a stipend plus additional funds for travel to present his or her research at a scientific meeting. Research hosts receive funds for student lab supplies. See the website for more details and apply online at *https://www.the-aps.org/awardapps*.

ADInstruments Macknight Early Career Innovative Educator Award

Application deadline: December 1, 2014
the-aps.org/adi
The ADInstruments Macknight Early Career Innovative Educator Award honors an early career APS member who demonstrates the greatest potential for incorporating innovative teaching techniques and effectively utilizing technology resources in engaging undergraduate students in physiology education. The awardee receives a $1,500 travel award and complimentary registration to attend the Experimental Biology meeting and an institutional grant providing the awardee's institution with a PowerLab PTB4152 Physiology Teaching Bundle or equivalent. See the website for more details and apply online at *the-aps.org/awardapps*.

Dale J. Benos Early Career Professional Service Award

Application deadline: January 23
the-aps.org/benos
The Dale J. Benos Early Career Professional Service Award honors an early career stage (graduate student, postdoctoral fellow, assistant professor, or equivalent position) member of APS. The award will honor someone who is judged to have made outstanding contributions to the physiology community and demonstrated dedication and commitment to furthering the broader goals of the physiology community. This can be by serving on professional committees, participating in K-12 education outreach, participating in scientific advocacy and outreach programs, or otherwise strengthening and promoting the physiology community. See the website for more details and apply online at *the-aps.org/awardapps*.

David S. Bruce Awards for Undergraduates in Research

Abstract deadline: November 6, 2014
Application deadline: January 12, 2015
the-aps.org/bruce

The David S. Bruce Undergraduate Awards are presented annually to undergraduate students who are 1st authors on an Experimental Biology (EB) abstract and presenting their research at the EB meeting. There are two types of Bruce Awards that students can apply for through a single application. See the website for more details and apply online at *the-aps.org/awardapps*.

David S. Bruce Outstanding Undergraduate Abstract Awards

This award provides $100 and a 2-year complimentary membership with APS. The student must be enrolled as an undergraduate at the time of the abstract submission, be the first author on a submitted abstract for the EB meeting, and be working with an APS member. Selection of awardees is based on the abstract, letter of application, and letter of support from the research host. Receipt of the award is contingent upon presenting the research at EB.

David S. Bruce Excellence in Undergraduate Research Awards

To be considered for this award, students must be a David S. Bruce Outstanding Undergraduate Abstract Awardee and must attend and present a poster at the EB meeting. The recipients receive $400 and a certificate. The highest ranked awardee receives another $250, thanks to the generous contribution of an APS member. Selection of awardees is based on the quality of the poster and oral presentation of the poster to the David Bruce Award Selection Committee. ●

EB 2014 Career-Track Symposia Online

If you missed any of the EB 2014 career-track symposia, the audio and PowerPoint files are synched and now available online!

Career Symposium: *Conscious Choice and Serendipity in Your Career Trajectory*

the-aps.org/careersymp

Presentations include:

- *A government physiologist's perspective:* Kathy Ryan, U.S. Army Institute of Surgical Research
- *Career opportunities for scientists in big pharma:* Michael Statnick, Lilly Research Laboratories
- *Application of physiology in product innovation and business strategy:* Brad Wilkins, Nike, Inc.
- *Transitioning from faculty to professional advisor:* Lori Seischab, Michigan State University
- *Physiologists role as medical school curriculum architects:* Anthony T. Paganini, Michigan State University College of Human Medicine

Mentoring Symposium: *Ahead of the Curve: Taking the Lead*

the-aps.org/mentorsymp

Presentations include:

- *Why are leadership skills important?* Elizabeth L. Travis, University of Texas MD Anderson Cancer Center
- *How do you obtain leadership skills?* Anne Wright, University of Arizona College of Medicine
- *How do you demonstrate leadership skills?* Patricia E. Molina, Louisiana State University Health Science Center

Trainee Symposium: *The Other Side of the Submit Button: The Ins and Outs of the Manuscript Review Process*

the-aps.org/traineesymp

Presentations include:

- *How to become a reviewer?* P. Kay Lund, University of North Carolina at Chapel Hill
- *What are the responsibilities of a reviewer?* Jerome A. Dempsey, University of Wisconsin
- *What is included in a review?* Irving H. Zucker, University of Nebraska Medical Center

Publications

Calls for Papers

Physiological Genomics

- Gut Microbiota in Health and Disease
- Systems Biology and Polygenic Traits
- Mitochondrial Metabolism

Journal of Neurophysiology

- Neurobiology of Deep Brain Stimulation *(Submission deadline: March 1, 2015)*
- Decision Making: Neural Mechanisms *(Submission deadline: March 1, 2015)*
- Correlating Neuronal Activity and Neural Imaging *(Submission deadline: March 1, 2015)*
- Neurophysiology of Tactile Perception: A Tribute to Steven Hsiao *(Submission deadline: June 1, 2015)*

Advances in Physiology Education

Teaching and Learning of Professional Ethics

American Journal of Physiology – Cell Physiology

- Omic and Systems Biology Approaches in Neurodegenerative Diseases *(Submission deadline: December 31, 2014)*
- STIM and Orai Proteins in Calcium Signaling *(Submission deadline: December 31, 2014)*
- Cellular Mechanisms of Tissue Fibrosis *(Submission deadline: December 31, 2014)*
- Stem Cell Physiology and Pathophysiology *(Submission deadline: December 31, 2014)*
- Physical Biology of Cancer *(Submission deadline: December 31, 2014)*
- Endoplasmic Reticulum Stress *(Submission deadline: December 31, 2014)*

American Journal of Physiology – Endocrinology and Metabolism

- Islet Biology (*Submission deadline: December 31, 2014)*
- Novel Aspect of Adipocyte Biology *(Submission deadline: December 31, 2014)*
- CNS Control of Metabolism *(Submission deadline: December 31, 2014)*
- Endocrine and Metabolic Dysfunction during Aging and Senescence *(Submission deadline: December 31, 2014)*
- Metabolic Control by Inflammation and Immunity *(Submission deadline: December 31, 2014)*
- Mitochondrial Dynamics and Oxidative Stress in Disease *(Submission deadline: December 31, 2014)*

American Journal of Physiology – Gastrointestinal and Liver Physiology

- Physiology and GI Cancer
- Intestinal Stem Cells in GI Physiology and Disease
- Innovative and Emerging Technologies in GI Physiology and Disease

American Journal of Physiology – Heart and Circulatory Physiology

- Autophagy in the Cardiovascular System *(Submission deadline EXTENDED: December 1, 2014)*
- Cardiac Regeneration and Repair: Mechanisms and Therapy *(Submission deadline: January 15, 2015)*
- Impact of Sympathoexcitation on Cardiovascular Function in Humans *(Submission deadline: January 15, 2015)*

American Journal of Physiology – Lung Cellular and Molecular Physiology

- Sex Differences in the Respiratory System
- Translational Research in Acute Lung Injury and Pulmonary Fibrosis
- Biomarkers in Lung Diseases: From Pathogenesis to Prediction to New Therapies
- Real-Time Visualization of Lung Function: From Micro to Macro *(Submission deadline: January 1, 2015)*
- Bioengineering the Lung: Molecules, Materials, Matrix, Morphology, and Mechanics
- Nanoparticles and the Lung: Friend or Foe? *(Submission deadline: March 1, 2016)*

American Journal of Physiology – Regulatory, Integrative and Comparative Physiology

- Central Control of Fluid and Electrolyte Homeostasis *(Submission deadline: December 31, 2014)*
- Central Control of Cardiovascular Function *(Submission deadline: January 31, 2015)*
- Oxygen as a Regulator of Biological Systems *(Submission deadline: April 30, 2015)*

American Journal of Physiology – Renal Physiology

- Renal Hypoxia *(Submission deadline: December 31, 2014)*
- Sex and Gender Differences in Renal Physiology *(Submission deadline: December 31, 2014)*
- Developmental Origins of Health and Disease *(Submission deadline: December 31, 2014)*
- Lower Urinary Tract Symptoms *(Submission deadline: December 31, 2014)*

For a complete list of current Calls for Papers, visit the APS homepage and click on the tab for Calls for Papers.

Meetings

APS Conference
2014 APS Workshop

The APS Institute on Teaching and Learning
Bar Harbor, Maine, June 23-27, 2014

The 2014 APS Workshop. The APS Institute on Teaching and Learning was held at the rustic College of the Atlantic campus located in the beautiful resort town of Bar Harbor, ME. The workshop was based solely on teaching physiology, and the first of an APS series of teaching-related workshops, was organized by Workshop Chair Barbara Goodman, University of South Dakota, along with an Organizing Committee that is equally dedicated to the art of teaching. The committee members included: Sydella Blatch, Stevenson University; Robert Carroll, East Carolina University; Douglas Curran-Everett, National Jewish Health; Lynelle Golden, Bastyr University; Chaya Gopalan, St. Louis College of Pharmacy; Latanya Hammonds-Odie, Georgia Gwinnett College; Kim Henige, California State University, Northridge; Erin Keen-Rhinehart, Susquehanna University; Marsha Lakes Matyas, American Physiological Society; Jenny McFarland, Edmonds Community College; Joel Michael, Rush Medical College; Dee Silverthorn, University of Texas at Austin; and Mary Pat Wenderoth. The committee organized a program that included a packed schedule of dynamic plenary lectures, workshops, interactive poster sessions, and networking opportunities that made the workshop a valuable experience not only for those who are interested in teaching physiology but also for attendees who wanted to learn some new teaching techniques to engage their students.

The 2014 APS Institute on Teaching and Learning Organizing Committee. *Left to right:* Erin Keen-Rhinehart, Herb Janssen, Barb Goodman, Lynelle Golden, Jenny McFarland, Dee Silverthorn, Robert Carroll, Mary Pat Wenderoth, William Cliff (Speaker), Chaya Gopalan, Marsha Lakes Matyas, and David Osborne (Speaker).

Table 1. Registration Statistics

Registration Type	Number of Attendees (%)
APS Member	51 (57%)
Nonmember	28 (31%)
Invited Chairs/Speakers	11 (12%)
Total	**90 (100%)**

Table 2. Registration Geographic Region Statistics

Region	Number of Attendees (%)
USA	82 (91%)
Canada	5 (6%)
Australia	1 (1%)
Brazil	1 (1%)
Mexico	1 (1%)
Total	**90 (100%)**

The conference was attended by 90 total registrants, of whom 51 (57%) attendees identified themselves as APS members, 28 (31%) registered as nonmembers, and invited chairs and speakers made up the remaining 11 (12%) attendees. Table 1 shows the breakdown of the different registration types. This workshop mainly attracted professors from the U.S.; however, out of the 90 registrants, 8 (9%) represented countries from Australia, Brazil, Canada, and Mexico. Table 2 depicts the breakdown of the different regions that attendees came from.

The workshop program consisted of 1 keynote lecture, 8 plenary lectures, and 12 workshops on a wide variety of topics related to the teaching of physiology and classroom teaching techniques. The audience was

Hands-on Workshop Organizer Barb Goodman has a turn at the registration desk during the workshop.

encouraged to share their ideas and thoughts with the speakers at the end of their talks. The workshop also had several social activities including a Welcome and Opening Reception, which was designed to give attendees a chance to meet with long-time colleagues, create new friendships, and enjoy some desserts and beverages before the opening keynote lecture. There were three afternoon poster sessions where scientists presented their work and discussed their teaching styles and techniques with other attendees.

A total of 40 abstracts were submitted for the conference. Twenty-nine of these abstracts were programmed as poster presentations. The remaining 11 abstracts were submitted by invited speakers. Of the abstracts submitted for the workshop, 29 (72%) were submitted by a female first author; 6 (10%) were submitted from institutions outside of the U.S., including 3 abstracts from Canada, and 1 abstract each from Australia, Brazil, and Mexico.

At the workshop, the following attendees, Adrienne King, Southern Polytechnical State University, and Carmen Ortiz-Sanchez, Ponce School of Medicine, Puerto Rico, were the recipients of the American Physiological Society Minority Travel Fellowship Award, which is provided to encourage participation of underrepresented minority individuals in the physiological sciences. The fellowship provides reimbursement of all expenses associated with travel and participation in the workshop.

Moreover, due to the excitement generated from the workshop attendees, a planning committee for the second workshop began forming during the event. The new committee made up of the current organizing committee members met on the last day of the workshop to discuss their strategy for a second Institute of Teaching Workshop.

The American Physiological Society and the Organizing Committee gratefully acknowledge the financial support provided though generous educational grants from the National Science Foundation and ADInstruments. ●

"Workshop Program and Abstracts" for the APS Institute on Teaching and Learning begins on p. 339.

Plenary lecturer Jenny McFarland presents her teaching techniques to the audience

Workshop attendees discussing teaching techniques during a poster session

People and Places

Kregel Accepts Associate Provost Position


Kevin Kregel

APS member Kevin Kregel, professor and chair of the Department of Health & Human Physiology in the College of Liberal Arts and Sciences, became the University of Iowa's new Associate Provost for Faculty, effective September 15, 2014. As associate provost for faculty, Kregel will work on the development, implementation, and administration of faculty-related policies and procedures. He will oversee the annual review of probationary and clinical track faculty members, provide advice on promotion and tenure decisions, provide management and direction to the Cluster Hire Initiative, and coordinate a broad range of other faculty-related activities at the University of Iowa.

Kregel earned his undergraduate and doctoral degrees from the University of Iowa, and has served on the faculty of the College of Liberal Arts and Sciences since 1993. He chaired his department for 5 years, during which time health and human physiology has grown rapidly, tripling its faculty numbers and becoming one of the college's most-enrolled majors. He serves on the steering committees for two faculty clusters under the Cluster Hire Initiative, the Aging Mind and Brain Initiative, and the Obesity Research and Education Initiative. Kregel has also been very active in leadership positions at the national level and currently serves as chair of the American Physiological Society's Science Policy Committee and the Federation of American Societies of Experimental Biology's Committee on Animals in Research. ●

Steele Receives Prestigious Pratt-Heins Faculty Award


Janet Steele

University of Nebraska at Kearney (UNK) professor and APS member Janet Steele received the prestigious Pratt-Heins Faculty Award on August 22 during the Faculty/Staff Convocation. Steele, a professor of biology, received the Pratt-Heins Foundation Teaching Award based on peer evaluations from faculty, chair, and dean of the nominee's department, and student comments from course evaluations. Her primary teaching responsibility is a two-semester, sophomore-level anatomy and physiology course sequence, one of the largest classes on campus with over 200 students enrolled, and she uses humor to make the large class feel like family. Steele joined the UNK faculty in 1993 and now also serves as director of the online master's program in biology. Pratt-Heins winners receive a plaque and $1,000. ●

Membership

New Regular Members

***transferred from student membership**

Zsolt Ablonczy
Medical University of South Carolina, Charleston, SC

Hala M. Alshayeb
Joan C. Edwards School of Medicine, Huntington, WV

Siddhartha S. Angadi
Arizona State Univ., Phoenix, AZ

Ninitha Margret Julfiya Asirvatham-Jeyaraj*
Univ. of Minnesota, Minneapolis, MN

Yara Bernaldo De Quiros
Texas A&M Univ.-Corpus Christi, Corpus Christi, TX

Paola Binda
Universita' Di Pisa, Pisa, Italy

K. C. Brennan
Univ. of Utah, Salt Lake City, UT

Kevin Brix
Univ. of British Columbia, Vancouver, Canada

Jason Lee Burkhead
Univ. of Alaska-Anchorage, Anchorage, AK

Carlos Michel Castorena*
UT Southwestern, Dallas, TX

Dionysios Chartoumpekis
Univ. of Pittsburgh, Pittsburgh, PA

Kavaljit H. Chhabra
Univ. of Michigan, Ann Arbor, MI

Cosima Ciuhandu
Univ. of Exeter, Exeter, UK

Ernest Cutz
The Hospital For Sick Children, Toronto, Canada

Glauber Da Silva
UNESP/FCAV, Jaboticabal, Brazil

Goggy Davidowitz
Univ. of Arizona, Tucson, AZ

Barbara Ehrlich
Yale Univ. Sch. of Med., New Haven, CT

Chi-An W. Emhoff
Saint Mary's College of California, Moraga, CA

Emily R. Esposito
Sullivan Univ. College of Pharmacy, Louisville, KY

Eric Feraille
Univ. of Geneva, Geneva, Switzerland

Vincent Peter Ferrera
Columbia Univ., New York, NY

Brooke Flammang
NJIT/Rutgers, Newark, NJ

Teppei Fujikawa
UT Southwestern Med. Ctr., Dallas, TX

Joel C. Geerling
Beth Israel Deaconess Med. Ctr., Harvard, Med., Boston, MA

Ravi Goyal
Loma Linda Univ., Loma Linda, CA

Jody L. Greaney
The Pennsylvania State Univ., University Park, PA

Tracy Cannon Grikscheit
Children's Hosp., Los Angeles, Los Angeles, CA

Arati Gurung
Univ. of Colorado-Denver, Auroroa, CO

Yoshiaki Habara
Hokkaido Univ., Sapporo, Japan

Ion Hobai
Massachusetts General Hosp., Boston, MA

Walter Holbein
Mayo Clinic, Rochester, MN

Zhongkui Hong
Univ. of Missouri, Columbia, MO

James H. Jones
Univ. California-Davis, Davis, CA

Steven J. Kleene
Univ. of Cincinnati, Cincinnati, OH

Christopher S. Kovacs
Memorial Univ. of Newfoundland, St. John's, Canada

Romesh D. Kumbhani
New York Univ., New York, NY

Greg Matthew Landry
Mayo Clinic Coll. of Med., Rochester, MN

Daniel Stephen Lark
Vanderbilt Univ. Med. Ctr., Old Hickory, TN

Roman Leischik
Univ. Witten/Herdecke, Hagen, Germany

Jennifer F. Linden
Univ. College London, London, UK

Christopher Michael Lockwood
4life Research, Sandy, UT

Ke Ma
Houston Methodist Res. Inst., Houston, TX

Michael R. Markham
The Univ. of Oklahoma, Norman, OK

Marsha Lakes Matyas
APS Staff, Bethesda, MD

James R. McDonald*
Auburn Univ., Auburn, AL

David McKinnon
Stony Brook Univ., Stony Brook, NY

Colleen X. Munoz
Univ. of Connecticut, Storrs, CT

Kalidou Ndiaye
Univ. of Montreal, Saint-Hyacinthe, Canada

Thomas J. O'Dell
Univ. of California-Los Angeles, Los Angeles, CA

Donata Oertel
Univ. of Wisconsin SMPH, Madison, WI

Benjamin Michael Owen
Morehouse Sch. of Med., Atlanta, GA

Christina Pacak
Univ. of Florida Coll. of Med., Gainesville, FL

Stephen J. Pandol
Cedars-Sinai Med. Ctr., Los Angeles, CA

Sanjay W. Pimplikar
Cleveland Clinic, Cleveland, OH

Matthew J. Potthoff
Univ. of Iowa, Iowa City, IA

Yinusa Raji
Univ. Ibadan Coll. of Med., Ibadan, Nigeria

Supratim Ray
Indian Inst. of Sci., Bangalore, India

Robert Mark Richardson
Univ. of Pittsburgh, Pittsburgh, PA

Stephen David Roper
Miller Sch. of Med., Univ. Miami, Miami, FL

Amy Ross
Georgia State Univ., Atlanta, GA

Bernhard Ross
Rotman Res. Inst., Baycrest Centre, Toronto, Canada

Andrew Schwaderer
Nationwide Children's Hosp., Columbus, OH

Francisco V. Sepulveda*
Centro De Estudios Cientificos (cecs), Valdivia, Chile

Cameron Shields
Cal Poly San Luis Obispo, San Luis Obispo, CA

Roy Vincent Sillitoe
Baylor Coll. of Med., Houston, TX

Laura Chernak Slane
Univ. of Wisconsin-Madison, Madison, WI

Jill A. Slater
Univ. of Michigan-Flint, Flint, MI

Jared Brent Smith
Pennsylvania State Univ., University Park, PA

Fenghua Sun
The Hong Kong Institute of Education, Hong Kong

Kyle Sunderland
High Point Univ., High Point, NC

Bosco S. Tjan
Univ. of Southern California, Los Angeles, CA

Lisa Tucker-Kellogg
Duke-NUS Med. Sch., Singapore

John Vandenbrooks
Midwestern Univ., Glendale, AZ

Kristine Vesterdorf
Univ. of Western Australia, Crawley, Australia

Alfred A. Vichot
Yale Univ., New Haven, CT

Jehng-Kang Wang
National Defense Med. Ctr., Taipei, Taiwan

Daniel Weiss
Univ. of Vermont, Burlington, VT

Daniel Wayne Wesson
Case Western Reserve Univ. Sch. Med., Cleveland, OH

Daniel W. White
Univ. of Illinois at Chicago, Chicago, IL

Michael Willers
Children's Heart Ctr., Holyoke, MA

Viravuth Yin
MDI Biological Lab., Salsbury Cove, ME

Li I. Zhang
Univ. of Southern California, Los Angeles, CA

Xiaoli Zhao
The Ohio State Univ., Columbus, OH

New Graduate Student Members

Olumuyiwa Abiola Adejumobi
University of Ibadan Oyo, Oyo State, Nigeria

Jonas Lembcke Andersen
Aarhus University, Aarhus, Denmark

Luke Norman Belval
University of Connecticut, Tolland, CT

Britani Nicole Blackstone
The Ohio State Univ., Columbus, OH

Reid Brennan
Univ. of California-Davis, Davis, CA

Jacob Campbell
Arizona State Univ., Tempe, AZ

Paige Nicole Chandler
Pennsylvania State Univ. Coll. of Med., Harrisburg, PA

Chris Chen
York Univ., Toronto, Canada

Chun Chih Chen
York Univ., Toronto, Canada

Jennyfers Chong
Univ. Autonoma de Baja California Ensenada, Baja California, Mexico

George Austin Crabill
Case Western Reserve Univ., Reisterstown, MD

Tung Van Dao
Case Western Reserve Univ., Stow, OH

Koofreh Godwin Davies
Univ. of Uyo, Uyo, Nigeria

Wagner Garcez De Mello
Univ. Estadual Paulista, Araçatuba, Brazil

Cory Robinson Elowe
California Polytechnic State Univ., San Luis, San Luis Obispo, CA

Tamás Dávid Fehérvári
Osaka Univ. Suita, Osaka Japan

Anders Findsen
Aarhus Univ., Aarhus, Denmark

Aubrie Nicole Fowler
California Polytechnic State Univ., San Luis, San Diego, CA

John James Guers
Univ. of Delaware, East Stroudsburg, PA

Christopher Michael Hardy
Univ. of Nevada-Las Vegas, Las Vegas, NV

Sierra Hill
Univ. of Colorado-Boulder, Boulder, CO

James Matthew Hinkley
East Carolina Univ., Greenville, NC

William Edward Hughes
Univ. of Iowa, Iowa City, IA

Nadia Hussain
UAE Univ., Al Ain, United Arab Emirates

Tania R. Iqbal
Michigan State Univ., East Lansing, MI

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Kanakeswary Karisnan
Univ. of Western Australia, Crawley, Australia

Matan Karklinsky
Weizmann Inst. of Sci., Rehovot, Israel

Josh Keller
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Amy Kirkham
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Vanina Alejandra Netti
Univ. De Buenos Aires, Buenos Aires, Argentina

Sean Roy Notley
Univ. of Wollongong, Wollongong, Australia

Dean Thomas Odegard
Saint Louis Univ., Saint Louis, MO

Dalay Hirsch Olson
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Univ. of Tsukuba, Tsukuba, Japan

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LSU Health Sciences Ctr., New Orleans, LA

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Amadou Tidiane Sow
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Imperial Coll., London, UK

Sabine Steinbach
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Stephen Tamm
Univ. of Idaho, Moscow, ID

Henry Vu
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Mathieu Weitten
CNRS, Strasbourg, France

Alex Wu
Univ. of Toronto, Toronto, Canada

Peng Yin
China Agricultural Univ., Beijing, China

Yufeng Zhang
Univ. of South Dakota, Vermillion, SD

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Univ. of Wisconsin, Fitchburg, WI

April Dawn Makukhov
California State Univ., Monterey Bay Marina, CA

Brittney A. McCormick
Univ. of Arizona Coll. of Med.-Phoeni, Tempe, AZ

Cynthia Marie McKee
California State Polytechnic Univ., Laguna Beach, CA

Derek Nelson
Univ. of North Texas, Garland, TX

Joaquin Nunez
Univ. of Miami, Miami, FL

Tim Podlogar
Univ. of Ljubljana, Trzin, Slovenia

Dylan Cole Sarver
Millersville and West Chester Univ., Millersville, PA

Eddie Xinzhe Shen
Li Ka Shing Knowledge Inst. at St. Michael's Hosp., Toronto, Canada

Michael Harris Warren
Univ. of Chicago, Saint Petersburg, FL

Yalun Zhang
Yale Coll., Walnut, CA

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Grand Valley State Univ., Allendale, MI

Nasrin Habibolahy
Tehran Hospital, Houston, TX

Vinay Kumar Kondeti
Univ. of Akron, Akron, OH

Christoffer Laustsen
Aarhus Univ., Aarhus, Denmark

Roman Leischik
Univ. Witten/Herdecke, Hagen, Germany

Edward Anthony Lemmo
Touro Coll., Staten Island, NY

Thomas Victor Smallman
Upstate Med. Univ., Syracuse, NY

News from Distinguished Physiologists

Letter to Claude Bouchard


Thomas Moon

Thomas Moon writes: "I would like to thank the American Physiological Society for their best wishes on my 70th birthday! As a Canadian member of APS since 1977, I have not taken advantage of all that APS has to offer, but nonetheless the APS has been important to my research career. The APS meetings I attended shaped much of the research I have done over the years, and the Society has been and will continue to be into the future an important voice for functional research and teaching. I am now an Emeritus, Distinguished University Professor at the University of Ottawa where I spent >40 years teaching and doing research with numerous trainees (undergraduate, graduate, and postdoctoral fellows) in the area of fish physiology, biochemistry, and toxicology. How is this possible? When you really enjoy what you are doing and are challenged daily by bright minds and have been given a huge number of opportunities to collaborate with colleagues from across the world, how much better could it get? Although officially 'retired,' I intend to continue collaborating with colleagues while keeping my fingers in the training of graduate students. Clearly, the field of comparative physiology is now using techniques that passed me by sometime ago and that graduate students now take for granted. This explosion of new techniques and model systems/organisms allows researchers to address questions of adaptive mechanisms, and with all the new, young talented scientists being trained today, it is important that they be given the opportunity to explore these areas. Giving up one's research grants (I was continuously funded for my entire career) and laboratory space this year was difficult but appropriate. I was fortunate over the past decade to act as Vice-Dean Research, Faculty of Science where I could help some of the best and brightest achieve their goals, and this was extremely satisfying.

"As for words of wisdom, I constantly tell my students and anyone who will listen that the position of university professor is the best 'job' in the world. If you want to achieve such a position, you must work hard, collaborate with the best, be patient but determined, and be considerate of all those individuals you interact with along the way, regardless of who they are or what position they hold. It is truly amazing what one can achieve with a positive attitude and a smile." ●

Positions Available

Pathogenic Mechanisms of Pulmonary Arterial Hypertension: 2-year, NIH-funded position with possibility of extension at the University of Arizona, Department of Medicine. The Department of Medicine is seeking a highly motivated, ambitious, and talented scientist to join an enthusiastic and collaborative team of outstanding scientists. The successful applicant will hold a PhD or equivalent from an accredited institution in the area of cellular and molecular biology, genetics, or cell physiology and have a strong track record of, and potential for, success. The applicant should have a keen research interest in the role of microRNA, cell signaling, inflammasome, gene expression regulation, or autophage in cardiovascular research. He/she should be self-motivated in the assigned research projects. He/she should be willing to receive training that enhances the individual's professional development and future formation of his/her own career. He/she should have experience of working in a research team environment and have experience writing research reports, publications, or other relevant outputs. Qualified individuals with experience working with cellular and molecular biology of pulmonary hypertension and heart failure are preferred. The position is in the laboratory of Dr. Jason Yuan as part of a collaborative environment in The University of Arizona (UA). The overall interest of Yuan's laboratory is pulmonary vascular pathophysiology and pathogenic mechanisms of pulmonary arterial hypertension and right heart dysfunction, with particular emphasis on *1)* regulation of excitation-contraction coupling in vascular smooth muscle; *2)* cellular and molecular mechanisms of hypoxic pulmonary vasoconstriction; *3)* pathogenic and therapeutic mechanisms of idiopathic pulmonary arterial hypertension and chronic thromboembolic pulmonary hypertension, as well as pulmonary hypertension associated with chronic obstructive pulmonary disease, obstructive sleep apnea, interstitial pulmonary fibrosis, sickle cell disease, and scleroderma. A multidisciplinary approach combining genetics, biochemistry, and molecular biology are used to evaluate the effect of changes in ion channels in pulmonary arterial smooth muscle cells and its physiological consequences are studied. The candidate will evaluate GPCR-mediated activation of cation channels and its contribution to cell proliferation, migration, contraction, and apoptosis using cellular and molecular biological approaches, patch-clamp techniques, or digital imaging fluorescent microscopy in human and animal cells. Applicants must possess good communication skills and be fluent in both spoken and written English. Applicants should be highly motivated and have a doctoral level degree with <3 years of postdoctoral research. This post is available immediately. Contact info: Department of Medicine, Medical Research Building, 1656 East Mabel St., Rm. 120, P.O. Box 245215, Tucson, AZ 85724-5072; Tel: (520) 626-8461; Fax: (520) 626-7400; e-mail, *rubyf@email.arizona.edu*.

Postdoctoral Research Scientist – Physiologist in Vascular Biology: The Victor Chang Cardiac Research Institute, established in 1994, is recognised as an international center of excellence in biomedical research with a focus on heart disease and cardiovascular biology. Employing a staff of 200, the institute conducts research into the prevention of heart disease and undertakes cutting-edge research. We are seeking an enthusiastic postdoctoral scientist to join an international team and who wants to forge a career in vascular physiology in the laboratory of Professor Roland Stocker, who leads the Vascular Biology Division. The project extends previous studies by Professor Stocker's laboratory (*Nat Med* 16: 279, 2010; *Crit Care Med* 39: 2678, 2011) and aims at characterizing the mechanism underlying indolamine 2,3-dioxygenase-dependent regulation of vascular tone. The successful candidate will be highly motivated, have experience in vascular biology, and be sufficiently dynamic to move the project forward while working in a multidisciplinary research team. The successful applicant will hold a PhD in physiology or related subject and have proven experience in wire and/or pressure myography. Experience with small animal handling and microsurgery is essential. Knowledge of cell and molecular techniques is desirable, and familiarity with redox biology is an advantage. Salary is commensurate with qualifications and experience. Salary packaging and superannuation options also apply. Further information is available from Prof. Roland Stocker (*r.stocker@victorchang.edu.au*). Include a cover letter, current CV, proof of qualifications and details of three referees with your application. E-mail all applications to *recruitment@victorchang.edu.au* or apply online at our website.

Research Scientist: The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc. (HJF) is seeking a Research Scientist to support basic science research in the Department of Military and Emergency

Medicine at Uniformed Services University of Health Services (USUHS). Incumbent will be responsible for initiating and carrying out research projects in collaboration with a research team. HJF provides scientific, technical, and programmatic support services to USUHS. Responsibilities include *1)* conducting experiments involving cultured cells and small animals; *2)* collecting and handling samples, and keeping detailed records of experiments; *3)* performing laboratory analyses on tissues/samples; *4)* preparing presentations and manuscripts; *5)* training laboratory staff as needed; *6)* managing laboratory maintenance; and *7)* providing administrative support as assigned. Knowledge of molecular biology, cell biology, genetics, and/or mouse models, ability to perform specialized assays including ELISA required. Experience with mouse surgical techniques including telemetry implantation is desirable. PhD in physiology or a closely related discipline, with minimum experience of 1-2 years is required. Position requires long periods of standing and sitting; performing intricate work under a microscope; carrying of light and moderately heavy laboratory equipment. Position may provide guidance to laboratory staff, and laboratory environment occasionally may require working on weekends. Please apply online at *http://www.hjf.org/careers/* (click "Advanced Search" and enter job number 209471 in the Job Opening ID box) or fax your resume to 240-694-3151. Please specify title and job number on fax. Any qualifications to be considered as equivalents, in lieu of stated minimums, require the prior approval of the Vice President of Human Resources. HJF is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability, protected veteran status, or other status protected by law.

Postdoctoral Position: The Extremity Trauma and Regenerative Medicine Task Area at the United States Army Institute of Surgical Research (USAISR) is seeking candidates for postdoctoral positions. Experience with large and small animals, tissue culture, histology, and molecular biological techniques are essential. The successful candidate will be joining a research program

FACULTY AND VICE-CHAIR OF RESEARCH POSITION
DEPARTMENT OF SURGERY
CARDIOVASCULAR-RENAL RESEARCH CENTER
University of Mississippi Medical Center

The Department of Surgery and the Cardiovascular-Renal Research Center (CRRC) at University of Mississippi Medical Center invites applicants for a state supported, tenure track faculty position at the rank of Assistant, Associate, or full Professor. The applicant must have a Ph.D. and/or M.D. degree with appropriate research experience and extramural research funding. Special consideration will be given to candidates with strong backgrounds in one or more of the following areas: 1) vascular biology, 2) ischemia-reperfusion injury 3) organ transplantation biology. The successful candidate is expected to develop a nationally recognized research program, manage departmental research activities and mentor post-doctoral M.D. and Ph.D. fellows within the Department of Surgery. The large group of CRRC scientists offers excellent opportunities for collaboration at molecular, cellular or systems levels of integration. The department offers generous laboratory space in a new state-of-the-art building and excellent core facilities within the CRRC. New faculty members receive highly competitive salaries and start-up packages. Applicants should send a curriculum vitae, a statement of research plans, previous and current extramural research funding, and the names of at least three references to: Dr. Joey Granger, Director, Cardiovascular-Renal Research Center, University of Mississippi Medical Center, 2500 North State Street, Jackson, MS 39216-4505. E-mail: ***jgranger@umc.edu***. Equal opportunity employer, M/F/D/V

that focuses on the repair of skin, muscle, or bone injuries to improve extremity trauma outcomes. Emphasis is placed on transitioning products from preclinical to clinical testing in a collaborative environment involving researchers and clinicians. The USAISR is colocated with San Antonio Military Medical Center (SAMMC) in San Antonio, TX, which enables the research organization to have a unique in-depth understanding of combat injuries and civilian trauma, and the clinical challenges faced by the physicians and surgeons who treat them. There are also extensive collaborations with private industry and academia. This mixture of researchers, clinicians, private industry, and academia creates a unique environment for translational research and exceptional opportunities for postdoctoral fellows. Qualified candidates must be highly motivated, independent individuals with a PhD in bioengineering, physiology, cell biology, or related field. Candidates must have exceptional laboratory and written communication skills and the ability to work both independently and cooperatively within a team. To apply, applicants must submit their curriculum vitae, brief description of research interests and career goals, and e-mail contact information for three references to: *usarmy.jbsa.medcom-aisr.list.regenerativemedicine2@mail.mil*; fax: 210 539-3877.

Postdoctoral Research Assistant: Postdoctoral research assistant positions in neuroscience and in molecular biology/biochemistry are available to study the mechanism for the fetal origin of adult disease, focusing on psychological disorders in children and childhood leukaemia. Our current research projects have shown that the placenta responds to altered oxygen or toxin by secreting molecules that cause altered embryonic neuronal development and DNA damage in cord blood. We now wish to test whether this occurs in in vivo models, whether it might be prevented, and what molecules are responsible. We collaborate with Professor Sandra Davidge at the University of Alberta. For the neuroscience position, applicants should have good training in immunohistochemical approaches to brain structure. Candidates who apply for the biochemist/molecular biologist position should have good experience in analytical techniques, ideally of proteins, microRNAs, and/or cytokines. If interested, please e-mail the application letter and curriculum vitae to *c.p.case@bristol.ac.uk* for the attention of Dr. Patrick Case, Learning and Research Building, University of Bristol, Bristol, BS10 5NB, UK.

Tenure-track Assistant Professor: The Biology Department of Hamilton College seeks a tenure-track assistant professor, effective July 1, 2015. PhD, postdoctoral research, and teaching experience required. The successful applicant's teaching load will include a lab course in vertebrate physiology, a course in a related sub-discipline (e.g., immunology, endocrinology), participation in a team-taught introductory biology program, and supervision of senior thesis research. An ongoing research program involving undergraduates is expected. Research support includes start-up funds and conference travel, a research laboratory, departmental facilities for tissue culture and imaging with confocal and scanning electron microscopes, and a vivarium in the modern Taylor Science Center. Send cover letter, curriculum vitae, statements about teaching and research with undergraduates, and arrange for submission of three letters of recommendation to Interfolio at (*http://apply.interfolio.com/25613*). Please include a statement in your cover letter that addresses the ways in which you would further the college's goal of building a diverse educational environment. Previous experience teaching or working with diverse student populations would be an asset. Learn more about the Biology Department at *http://www.hamilton.edu/academics/departments?dept=Biology*. Questions may be directed to William Pfitsch, Chair, Biology Department, Hamilton College, 198 College Hill Rd., Clinton, NY 13323-1292 (*wpfitsch@hamilton.edu*). Review of application materials will begin October 15, 2014 and continue until the position is filled. Hamilton (*www.hamilton.edu*) is a residential liberal arts college located in upstate New York. Applicants with dual-career considerations can find other Hamilton and nearby academic job listings at www.upstatenyherc.org. Hamilton provides domestic partner benefits. Hamilton College is an affirmative action, equal opportunity employer and is committed to diversity in all areas of the campus community. Candidates from underrepresented groups in higher education are especially encouraged to apply.

Research Position: A research position is available for an epithelial/renal physiologist in the Epithelial Systems Biology Laboratory in the Division of the Intramural Research of the National Heart, Lung, and Blood Institute (NHLBI). The selected candidate will work with the Laboratory Chief, Mark Knepper, MD, PhD, to manage the research program of the Epithelial Systems Biology Laboratory (ESBL) and will provide day-to-day

supervision of trainees. The ESBL uses modern systems biology and physiological approaches to investigate intracellular mechanisms involved in the regulation of water excretion in the kidney through actions of the peptide hormone vasopressin. Applicants should have a PhD degree (or equivalent) with significant experience in epithelial and/or renal physiology. He/she should have one or more publication(s) demonstrating these skills. Expertise in studies of transgenic mice, genetic manipulation of cultured cell lines, protein mass spectrometry, next-generation DNA sequencing, and/or bioinformatics is desirable. Fluent command of both spoken and written English is imperative. The applicant must have experience in day-to-day direction of trainees in a laboratory. The successful candidate will be offered salary and benefits commensurate with experience and accomplishments. To apply, e-mail a single PDF document containing *1)* your curriculum vitae, *2)* a brief summary of your qualifications vis-a-vis the criteria stated above, and 3) contact information for at least three references to *NHLBI_KnepperCTRecruit@mail.nih.gov*. Applications will be considered starting 9/1/14, but applications can be submitted any time until the position is filled. HHS and NIH are equal opportunity employers.

Tenure-Track Position: The Department of Kinesiology at California State University, Fullerton invites applications for a tenure-track position in Biomechanics/Performance Enhancement (10-mo academic year appointment). Teaching responsibilities will include undergraduate and graduate classes in biomechanics and one or more of the following areas: anatomy, introduction to kinesiology, motor control, motor learning, statistics, and/or research methods. Successful applicants will be expected to conduct research and engage in other scholarly activities; participate in curriculum development; advise and direct student research and graduate theses/projects/exams; provide department, college, and university service; and provide academic advisement. Positive tenure and promotion decisions require excellent teaching, high-quality research, and participation in university and professional activities. Qualifications include: earned doctorate in kinesiology, exercise science, or relevant sub-discipline; focused ongoing scholarly/creative activity with a record of peer-reviewed publications and potential to attract external funding; successful teaching performance in relevant courses; evidence of professional and leadership activities; and ability to work successfully within a culturally diverse university and community. Experience in both applied and basic research in both laboratory and field-based settings aimed at delivering proven performance enhancement feedback to both elite and recreational athletes. Experience in development of high performance-training practices that utilize a trans-disciplinary approach capable of translating evidence-based research into consumer-based services. The department (with over 2,000 majors) offers B.S. and M.S. degrees in kinesiology, providing students with several concentrations related to specific career objectives and sub-disciplinary specializations. The department houses several laboratories, including a dedicated 1,700-sq. ft., state-of-the-art biomechanics laboratory featuring a nine-camera motion-capture system, two force plates, tethered and wireless EMG systems, portable indoor-outdoor ball-flight and launch monitor, and a golf simulator. The department offers multiple opportunities for collaboration in its research centers, including the Center for Sport Performance, the Center for Successful Aging, and the Center for the Promotion of Healthy Lifestyles and Obesity Prevention. Visit the kinesiology (*http://hhd.fullerton.edu*) and university websites (*http://www.fullerton.edu*) for additional information about our offerings and faculty. Position is at the rank of assistant professor or associate professor, depending on the candidate's qualifications. Salary is highly competitive and commensurate with rank, experience, and qualifications. Periodic salary adjustments are enacted by the state legislature. Additional teaching in summer and intersession is often available. An excellent comprehensive benefits package is available, which includes health/vision/dental plans; spouse, domestic partner, and/or dependent fee-waiver; access to campus child care; and a defined-benefit retirement program with optional tax sheltering opportunities. For a detailed description of benefits visit *http://hr.fullerton.edu/documents/benefits/Faculty* Unit 3.pdf. All application materials should be sent electronically via e-mail (preferably as a single PDF file). Required materials include: *1)* letter of application, *2)* curriculum vita, *3)* brief (2-page) narrative regarding your views on trends and future directions in main area of research, *4)* transcripts of graduate work, *5)* up to three examples of scholarly work, and *6)* copies of teaching evaluation summaries for all courses taught over the past 2 years. In addition, three letters of recommendation must be sent via e-mail directly from your chosen recommenders/referees. Please send all application materials to Dr. G. Noffal, Chair, Biomechanics/Performance Enhancement

Search Committee at *gnoffal@fullerton.edu*. The position will remain open until filled. Expressions of interest will be held in confidence, and references will not be contacted without the candidate's permission. The person holding this position is considered a "mandated reporter" under the California Child Abuse and Neglect Reporting Act and is required to comply with the requirements set forth in CSU Executive Order 1083 as a condition of employment. California State University, Fullerton celebrates all forms of diversity and is deeply committed to fostering an inclusive environment within which students, staff, administrators, and faculty thrive. Individuals interested in advancing the University's strategic diversity goals are strongly encouraged to apply. EEO employer. Reasonable accommodations will be provided for qualified applicants with disabilities who self-disclose.

Tenure-Trace Position: The Department of Kinesiology at California State University, Fullerton invites applications for a tenure-track position in Athletic Training (10-mo academic year appointment). The responsibilities of the position include teaching athletic training classes for the CAATE accredited program, with possible teaching assignments in related areas; conducting and publishing research/scholarly activities in areas of expertise; advising students in their academic degree pursuits and career development plans; directing graduate students with theses, projects, and/or comprehensive exams; providing professional service to the university, profession and/or community; and working with the ATEP director and AT faculty in the maintenance and further development of the AT major. Applicants should have a doctorate in kinesiology, exercise science, or related area (ABD considered; doctorate to be completed by start date), be a BOC Certified Athletic Trainer (in good standing), with an ability to successfully teach athletic training and related courses. Applicants should have a focused scholarly agenda with record of research publications I presentations, an ability to collaborate with colleagues in the advancement of the AT major. Evidence of practical/clinical athletic training experience is desirable. Applicants have the potential to develop/obtain grants and external funding. Record of professional leadership is desirable, as well as an appreciation of a diverse and

RESEARCH FACULTY POSITION
DEPARTMENT OF EMERGENCY MEDICINE
CARDIOVASCULAR-RENAL RESEARCH CENTER
University of Mississippi Medical Center

The Department of Emergency Medicine and the Cardiovascular-Renal Research Center (CRRC) at University of Mississippi Medical Center invite applicants for a state supported, tenure track faculty position at the rank of Assistant, Associate, or full Professor. The applicant must have a Ph.D. and/or M.D. degree with appropriate research experience and extramural research funding. Special consideration will be given to candidates with strong backgrounds in one or more of the following areas: 1) vascular/endothelial biology, 2) microcirculation (in vitro flow based and in vivo techniques to monitor and assess), 3) mitochondrial function (tissue prep, oximetry, individual complex assays), 4) platelet function/coagulation (TEG, platelet mapping). The successful candidate is expected to develop a nationally recognized research program, manage departmental research activities and mentor post-doctoral M.D. and Ph.D. fellows within the Department of Emergency Medicine. The large group of CRRC scientists offers excellent opportunities for collaboration at molecular, cellular, or systems levels of integration. The department offers generous laboratory space in a new state of-the-art building and excellent core facilities within the CRRC. New faculty members receive highly competitive salaries and start-up packages. Applicants should send a curriculum vitae, a statement of research plans, previous and current extramural research funding, and the names of at least three references to: Dr. Joey Granger, Director, Cardiovascular-Renal Research Center, University of Mississippi Medical Center, 2500 North State Street, Jackson, MS 39216-4505. E-mail: ***jgranger@umc.edu***. Equal opportunity employer, M/F/D/V

multicultural population. The Department (with over 2,000 majors) offers a B.S. degree in athletic training, as well as B.S. and M.S. degrees in kinesiology, with several concentrations related to specific career objectives and sub-disciplinary specializations. The department houses several laboratories including the Athletic Training Research Lab, Biomechanics Lab, Exercise Physiology Lab, Motor Behavior Lab, and Human Performance Lab, among others. There are multiple opportunities for collaboration with research centers, including the Center for Sport Performance, the Center for Successful Aging, among others. Visit the athletic training (*http://hhd.fullerton.edu/at*), kinesiology (*http://hhd.fullerton.edu*), and university (*http://www.fullerton.edu*) websites for additional information on department programs, laboratories, and faculty. This is a tenure-track position at the rank of assistant/associate professor. Salary is competitive and commensurate to rank, experience, and qualifications. Periodic salary adjustments are enacted by the state legislature. Additional teaching in summer and intersession is often available. An excellent comprehensive benefits package is available, including health/vision/dental plans, spousal and/or dependent fee-waiver, access to campus child care, defined-benefit retirement through the state system, along with optional tax-sheltering opportunities (*http://hr.fullerton.edu/documents/benefits/FacultyUnit3.pdf*). All application materials should be sent electronically via e-mail (PDF files). Required materials include: *1)* letter of application, *2)* curriculum vita, *3)* 1- to 2-page narrative regarding the future of athletic training education as it relates to the required professional degree level, *4)* transcripts of graduate work, *5)* up to three samples of scholarly work, and *6)* copies of teaching evaluation summaries for all courses taught in the past 2 years. In addition, three letters of recommendation must be sent via e-mail directly from your chosen recommenders/referees. Please send all application materials to Robert Kersey, PhD, ATC, Chair: Athletic Training Search Committee at *rkerseyfullerton.edu*. In addition, please also complete an Applicant Flow Form entering the job control number 23603G-I5-011 via the following secured website: *https://diversity.fullerton.edu/appdataflow*. The position will remain open until filled. The person holding this position is considered a "mandated reporter" under the California Child Abuse and Neglect Reporting Act and is required to comply with the requirements set forth in CSU Executive Order 1083 as a condition of employment. California State University Fullerton celebrates all forms of diversity and is deeply committed to fostering an inclusive environment within which students, staff, administrators, and faculty thrive. Individuals interested in advancing the university's strategic diversity goals are strongly encouraged to apply. EEO employer. Reasonable accommodations will be provided for qualified applicants with disabilities who self-disclose.

Assistant Professor of Biology (Physiology): Washburn University's Biology Department invites applications for a 9-mo, tenure-track faculty position (assistant professor) in Biology (Physiologist) beginning August 2015. Qualifications include PhD in physiology or related field, commitment to quality undergraduate education. Preference is given to candidates with demonstrated teaching excellence at the university level. ABD candidates will be considered. Successful candidate will teach courses in human physiology (majors/allied health students), develop course(s) in area of expertise, and be capable of teaching Introductory Biology and upper-division anatomy and physiology courses. Candidate must help maintain and prepare physiology labs as part of a team and establish a successful research program involving undergraduate students. Salary: mid-$40K range. Screening of applications begins October 22, 2014 and will continue until suitable candidate is identified. Please send the following: current CV, teaching and research philosophy statements, undergrad/grad transcripts, and three current letters of reference to Chair, Physiology Search Committee, Biology Department. Washburn University, 1700 SW College Ave., Topeka, KS 66621 or electronically (as a single PDF file) to *biosearch@washburn.edu* (use PHYSIOLOGY in the e-mail subject line). The successful candidate will be required to submit to a background check prior to hire. Washburn University is an EOE. Women and minorities are encouraged to apply.

Physiologist: The Biology Department at Hope College (Holland, MI) is seeking a physiologist for a 1-year term position beginning July/August 2015. The individual will need to be able to teach courses in physiology, including an introduction to human physiology and Intro to Neuroscience to both majors and non-majors as well as an upper-level, majors-only course in advanced physiology or the evolution of physiological systems. Candidates should have completed a PhD in physiology or related field and have 2-4 years of postdoctoral experience. Any questions should be directed to the Chair of the search committee, Dr. Greg Fraley (*fraley@hope.*

edu). A full job description can be found at *http://www.hope.edu/academic/biology/downloads/PhysiologistSearch.pdf*, and application instructions can be found at *http://www.hope.edu/employment/faculty.*

Assistant Professor: The Department of Integrative Physiology and Health Science at Alma College (Michigan) invites applications for position of assistant professor with emphasis in motor control/motor behavior. This is a full-time, tenure-track faculty position beginning August, 2015. The successful candidate will *1)* demonstrate commitment to quality undergraduate education through excellent teaching within the classroom and quality advising/mentoring of students; *2)* pursue an externally recognized research agenda engaging undergraduate students in the research process; and *3)* demonstrate commitment to institutional service activities. Teaching responsibilities will include participation in the two-semester Human Physiology sequence; Human Anatomy; Biomechanics; an upper level course in Motor Control/Behavior. Full-time teaching load is six courses per year; salaries, benefits, and support for professional development are competitive. An earned doctorate in exercise science kinesiology, or physiology prior to appointment date is required. Review of applicants will begin on November 1, 2014 and continue until the position is filled. To apply, send a cover letter, curriculum vitae, official transcripts (unofficial copies are acceptable initially), statements of teaching and research interests and expertise, and three letters of reference to Dr. Karen Ball, Chair, Department of Integrative Physiology and Health Science, Alma College, 614 W. Superior Street, Alma, MI 48801. A Phi Beta Kappa institution, Alma is a selective, baccalaureate liberal arts college committed to academic excellence and an equal opportunity employer committed to recruiting and retaining a diverse faculty, staff, and student body. For more details regarding the department and position, visit the departmental website at *http://www.alma.edu/academics/integrative-physiology-health-science*.

Assistant/Associate Professor: The Basic Reproductive Sciences Division in the Department of Obstetrics and Gynecology at the University of Colorado Denver School of Medicine is building a collaborative team of exceptional researchers to address critical issues in the field of reproduction. We are seeking to expand our research base through the recruitment of several highly meritorious PhD faculty at the assistant or associate professor level with active research programs. Individuals with translational or basic science research expertise in cancer biology, gametogenesis and fertility determination, male reproduction, and/or perinatal and maternal-fetal biology are especially encouraged to apply. Minimum qualifications are PhD or equivalent, active peer-reviewed basic or translational science grant funding, a substantial publication record in recognized professional journals. Required competencies/knowledge, skills, and abilities include conduct of mechanistic translational or basic science research related to gynecologic oncology and maternal-fetal biology reproductive endocrinology fertility/infertility; collaborative working style; successful experience in training graduate students, and clinical and postdoctoral fellows; research models that extend or complement those of existing faculty. Applications are accepted electronically only at www.jobsatcu.com (refer to posting F01763) or go directly to *http://www.jobsatcu.com/postinqs/88299*. Salary is commensurate with skills and experience. The University of Colorado is committed to diversity and equality in education and employment. ●

Department of Molecular Biophysics and Physiology Chairperson
Rush Medical College/Rush University Medical Center

Rush University Medical Center, a nationally recognized clinical and academic institution, invites nominations and applications for the position of Chairperson of the Department of Molecular Biophysics and Physiology. The Department is engaged in scientific research and teaching activities within Rush Medical College, the College of Nursing and the Graduate College, while offering graduate studies leading to the PhD degree in physiology. Faculty members in the Department of Molecular Biophysics and Physiology have active research programs in a variety of areas including the functions of cell membranes and ion channels. The department has one formal Section, Cellular Signaling, and several other informal interest groups.

The successful candidate will demonstrate a strong record of research achievement, commitment to education, and leadership. Requirements include PhD or MD/PhD (or equivalent), substantial administrative experience, and credentials that merit appointment at the rank of Professor. The successful candidate will demonstrate high standards of integrity, trust, and ethics, and is a creative leader with a strong record of collaborative leadership and commitment to academic excellence. As a department leader, the Chairperson will provide an energetic and inventive vision for maintaining and growing a departmental educational and research program, develop strategic interdisciplinary research teams for furthering research, basic and translational, and help its faculty secure external funding through innovative and traditional sources.

Rush Medical College was established in 1837 and is one of the oldest medical colleges in the U.S. Rush University Medical Center (RUMC) is one of the largest private academic medical centers in Illinois. Rush is a thriving center for basic and clinical research, boasting state-of-the-art facilities with over 1,600 on-going research projects. RUMC has completed the most comprehensive construction and renovation program in its history. The "Rush Transformation" process has invested in new technology and facilities, culminating in a new Tower hospital that opened in January 2012, uniquely designed to deliver patient care safely and efficiently. Rush University has over 2,000 students and offers more than 30 degree or certificate options throughout its four colleges. Rush is consistently ranked as one of the nation's top hospitals by U.S. News & World Report, and is one of the two top ranked hospitals in Illinois.

We encourage women and minorities to apply.
Applications will be accepted until position is filled.

Jochen Reiser, MD, PhD; Chair, Molecular Biophysics and Physiology Search Committee
Rush Medical College at Rush University Medical Center

Nominations or letters of interest that include curriculum vitae should be sent to:
Courtney_Kammer@rush.edu, Director Faculty Recruitment

Rush is an equal opportunity / Affirmative Action employer

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Nutritional Insufficiency

meeting and also to the earlier FASEB Meeting. ASN joined with APS, ASPET, ASIP, and AAI to take over the FASEB annual meeting. The decision came after FASEB held its 1989 strategic planning retreat in Williamsburg, where it was decided that FASEB would no longer hold an annual meeting for its member societies since many of the new members of FASEB were already meeting at other times during the year. Their focus shifted to science policy, and as a result FASEB is now comprised of 27 member societies representing over 120,000 scientists.

It was decided that the new meeting would be called "Experimental Biology." An agreement was reached between APS, ASPET, ASIP, ASN, and AAI to trademark the name and to begin meeting under the EB umbrella starting in 1993. However, all the signatories to the agreement did not meet annually with EB, but on occasion met on their own or with others. AAA joined the EB Meeting as a participating society in 1994. ASBMB did not join until 2005 but participated as a guest society from 2001 to 2003. Although AAI was a signatory to the establishment of EB, their participation ebbed and flowed as they experimented with their own meeting. Initially, they were out once every 3 years, than twice every 3 years, and in 2008 they decided to meet alone every year, although they did retain membership in the Experimental Biology Board.

The challenge is how to continue the cross fertilization of nutrition research so that it benefits the researchers attending EB and, ultimately, the discoveries that will be made as a result of such interactions. Will APS and ASBMB members working in areas of nutritional physiology, metabolism, metabolomics, microbiome, etc. continue to come to EB or will they migrate to a more nutritionally oriented meeting? Will the nutritional insufficiency caused by the departure of ASN have a negative impact on the EB meeting?

Unfortunately, we do not have answers for those questions at this time. However, the goal of APS is to shape its program to meet the needs of all our members, including those working in nutrition science. This year, we have programmed a number of sessions in the areas of nutrition physiology and microbiome. ASBMB is also identifying sessions designed to appeal to their nutrition-oriented members. As we move forward toward 2018, the remaining EB societies (APS, ASBMB, ASPET, ASIP, and AAA) will be working to better coordinate programming across the topic areas common to our societies and to provide programming to meet the needs of our nutritionally oriented members. However, the societies cannot do it alone, and we call on each of you to help us decide the important areas for inclusion in the EB program. You can do so by making program recommendations through your section steering committee. Not only don't we want the EB meeting to suffer from nutritional insufficiency, but we also don't want it to suffer from an insufficiency in areas important for physiology. Make EB your meeting by helping to shape its program in the future. In the meantime, check out the EB meeting site and plan to join us in Boston, March 28 to April 1, for an outstanding meeting. ●

Martin Frank

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Surviving Parenthood and Science: It Can Be Done

have confidence in my decisions. The insightful blogger Dr. Isis (2) describes this process the best: "There is no such thing as work-life balance. There's the stuff I can get done in a day and the stuff I can't and being a professional woman means constantly weighing the cost and benefit of completing or not completing something."

Integrating work and personal lives involves a great deal of creative thinking, cost-benefit analysis, and tough decisions. Some days I succeed at accomplishing everything associated with my career and parenthood, but those days are rare. The majority of the time, one of the two wins, and I have to cope with the outcomes. My ability to weigh the cost and benefit of not completing something has improved over time, but some of my decisions are accompanied by feelings of failure, guilt, or both. Learning to cope with these unfounded feelings is an important skill, and two mechanisms have helped me deal with them: *1)* listen to the voice of truth and *2)* have an ultra-fine filter for advice.

Voice of truth. When you make a decision not to complete something, misleading thoughts can emerge, such as, "You aren't good enough," "I'm such a disappointment," or "They must think I am so helpless." When this happens, I seek out a voice of truth to muffle the false, imposter thoughts in my head. Usually it is a fellow coworker, friend, or mentor who knows me, my capabilities, and my previous experiences, and can put me back in touch with reality. A scenario comes to mind from about a year into my new parenthood journey. I felt bombarded with life and feelings of how I wasn't enough – "I wasn't working, publishing, getting ahead enough." I shared those feelings with one of my mentors, and that person's words of wisdom brought me back to reality: "Continue to do your best with your everyday tasks, but don't become weighed down by your current season of life. When you are on your deathbed, you are never going to wish that you had worked more. The important things will be your relationships, especially with your children." That illustration deflated my misleading thoughts and motivated me to keep a long-term perspective about life.

Filter advice. The second mechanism that helps me cope with misleading feelings of guilt is to finely filter the advice I accept and apply to my life. Please don't misunderstand me; I believe advice is imperative to my growth as a scientist and parent. However, too much advice can become overwhelming and make you guilt-ridden over every decision. This happened to me 6 months into my pregnancy. I became overwhelmed by parenting books and the endless lists of what I should or shouldn't do: co-sleep vs. crib, store bought vs. homemade baby food, cry it out vs. comfort, epidural vs. natural birth. So, I did the only thing any emotionally charged pregnant woman would do and threw every last book in the trash. In a more coherent state, I would not advise going to that extreme, but I would encourage other parents to not rely solely on parenting books. Use your analytical skills to find out what works best for you and your child. Rely on your natural instincts and realize each of us will have our own individual story with no right answer.

2) Make Priority-Driven Choices

An article written last year by Allison Vailancourt for The Chronical of Higher Education (4) outlined a series of questions that she used to evaluate where to invest her time and energy, such as "Will this activity move me toward my long-term goals?" To survive both a professional career and being a parent, it is imperative that we strategize our time. As I described above, managing all aspects of our lives involves a lot of tough decisions, and Allison touches on this with her last question in the article, "Are you disappointing the right people?" Trying to answer that question forces you to clearly outline your life priorities and define what is important. This process lays the groundwork for helping you make a tough decision about what to complete or not on a day-to-day basis.

While defining and outlining your priorities, it is important to make sure your expectations are realistic. A dear friend of mine occasionally likes to remind me of my life plan I created on a long flight to Experimental Biology, pre-parenthood. I had clearly outlined the next 20 years of my life: exactly when my three children would be born, my first R01 grant funded, when I would become APS President – most of it happening by the time I turned 30. My naive ways persisted with the coming of my first child. I had grand plans for maternity leave – learn Spanish, write a book chapter, re-decorate my bedroom. In my newbie parent mind, I was going to

have loads of free time to accomplish everything while my perfect cherubim slept for hours on end. Parenthood makes you face reality, head on. During those first few months with my daughter, the only writing I accomplished were 2 AM texts to my friends wondering whether I would get to shower that day. I can laugh about it now, but learning how to be realistic with my newfound parenthood and career was a tough lesson. I still make 5-year plans, but when doing so I focus on being pragmatic and adapting to the inevitable changes on the horizon.

The answer to "Are you disappointing the right people?" will vary depending on your stage of life. The adaptations that came with parenthood changed my answer. My thought process when making a decision switched from "Will this outcome disappoint my peers?" to "Will my choice let down my child?" I hope the majority of the time I can answer "No" to both, but the parent question always seems to surface first when faced with a situation. How you answer this question is highly personal; the important part is that you spend time thinking about it. Asking myself on a regular basis if I'm disappointing the right people keeps me focused on my priorities and my goals for my current season of life. My current answer and definition of success will likely change as my daughter grows up. If anything, being a parent has taught me to have realistic expectations and to adapt. The key is to define success for you right now and outline rationally how to get there. Then make your choices and don't look back.

3) Be a Fellow Comrade

Bonds created in stressful situations run deep between individuals. Training and pursuing a scientific career can be stressful, with the potential to create genuine companionships. During my doctoral studies, there was a core group of graduate students and postdoctoral fellows who were my support network. They were the people who could relate first hand to the challenges of getting those three letters behind my name. We cried together over botched experiments, rejoiced when a manuscript made it to major revisions, and vented about our professors. This group was my stability, my go-to knowledge center where I could soak up all the education from their previous successes and failures. What made the group strong was each member's willingness to be vulnerable and open. We all shared our past mistakes and talked openly about what we would have done differently if given the chance. The support network began with one common theme – surviving graduate school – and grew over time into a deep, lasting friendship.

Parenting platoon. Now that I am a parent, I've found myself surrounded by individuals who make up what I call my parenting platoon. They are my support network and help me survive this journey. Our relationships initiated with one common theme – surviving parenthood – and continue to grow from there. Each member offers his or her own perspective, usually interwoven with words of encouragement and the wisdom her or she has gained – mainly through trial and error. These amazing individuals keep me posted about the local kid entertainment, share recipes that appease the extra picky eater, and reveal magical secrets on how to get your baby to sleep through the night. What I appreciate most is their authenticity and frankness. They refuse to sugar coat the obstacles that lay ahead for me, such as the impending terrible twos or the potty-training boot camp. They allow me to learn from the challenges in their own lives, such as redefining your relationships after a small child or coping with the slowing of your career. I appreciate how I never feel judged by members of our parenting platoon. They usually see me at my most vulnerable – dark circles under my eyes, spit-up on my 3-day-old shirt, and ready to cave at any moment from the constant juggling. During these messy, stressful times, they are quick to offer me an adult beverage and tell me this too shall pass.

Other support networks. These types of support networks, consisting of genuine relationships, are vital to surviving the combination of a professional career and parenthood. I find the most frustrating part of establishing a support network is the time it takes to create them. My Type A unwillingness to wait sometimes stands in the way of creating a true support network. Add in miniscule free time to meet people, and I find myself at a road block. Over the years, a few activities and programs have helped me overcome these barriers. National platforms such as MentorNet and LinkedIn are great resources to connect and begin building a support network. Attending career-development sessions at scientific meetings is a terrific way to meet people in similar seasons of life. Reach out to individuals who are scientists and parents; they can offer words of wisdom and creative ideas for managing the chaotic periods. Find local groups in your current environment, whether in your work place, children's school, or just a group of folks you see at the park every weekend. If you can't find a group, organize one. Be creative, even if you just meet once a month for happy hour. Every encounter will lay the groundwork and begin to build a strong and supportive network.

Final Thoughts

Surviving parenthood and science is like learning to walk again, falling down on numerous occasions and learning how to maintain your balance. Having confidence in your decisions and being gracious to yourself, clearly outlining your priorities and surrounding yourself with supportive individuals, are valuable tools that will keep you upright on your journey. The greatest lesson I've learned on my brief journey is how to adapt, and with each new obstacle you find out that you are stronger than you think. If I could travel back in time to my first days of parenthood, I would tell myself to just relax and heed the advice of author Lisa-Jo Baker (1): "I would do some things differently. I would throw away the parenting books that made me feel like I was somehow failing this important test of womanhood – being a mother. I'd throw out the advice about what I was doing wrong or should be doing differently or should aspire to be doing. I'd just revel in the daily, sleep-deprived merry-go-round and eat a lot more chocolate cake."

References

1. Baker L-J. *Surprised by Motherhood: Everything I Never Expected about Being a Mom.* Eugene, OR: Tyndale House, 2014.
2. Dr. Isis. *Leaning On VS Leaning In.* Medium.com (July 2013). *https://medium.com/@drisis/leaning-on-vs-leaning-in-8b147ccbcc53*.
3. Merriam-Webster. "Survive" (Online). *http://www.merriam-wester.com* (11 Aug 2014).
4. Vaillancourt A. Are you disappointing the right people? *Chronicle of Higher Education Blogs-On Hiring* (Sept 2013). *http://chronicle.com/blogs/onhiring/are-you-disappointing-the-right-people/40793*.

Laura Gilliam is a Research Health Scientist in the Department of Veterans Affairs at the Cincinnati VA Medical Center. She received her PhD in Physiology from the Center for Muscle Biology at the University of Kentucky and completed her postdoctoral training at the East Carolina Diabetes and Obesity Institute in Greenville, North Carolina. When not making wild animal noises or scrubbing crayon sketches off the wall, she participates as an active member of the American Physiological Society and is the Environmental and Exercise Physiology Section Trainee Representative to the APS Trainee Advisory Committee. ●

To view or submit comments or questions on this article, please see the-aps.org/forum-parenthood.

Meetings & Congresses

2014

November 5-8
25th International Symposium on the Autonomic Nervous System, Rio Grande, Puerto Rico. *Information:* Anita Zeller, AAS Executive Secretary, American Autonomic Society, 18915 Inca Ave., Lakeville, MN 55044; tel.: 952-469-5837; fax: 952-469-8424; e-mail: *zeller.anita@mayo.edu*; internet: *http://www.americanautonomicsociety.org*

November 14-16
IOF Regionals 5th Asia-Pacific Osteoporosis Meeting, Taipei, Chinese Taipei. *Information:* internet: *http://www.iofbonehealth.org/taipei-2014*

December 14-16
ICI 2014 Meeting, Tel Aviv, Israel. *Information:* internet: *http://www.iofbonehealth.org/taipei-2014*

2015

March 18-22
AD/PD 2015, Nice, France. *Information:* internet: *http://www2.kenes.com/adpd/Pages/Home.aspx*

March 28 to April 1
2015 Experimental Biology, Boston, MA.

June 6-11
International Neuromodulation Society 12th World Congress, Montreal, Canada. *Information:* internet: *http://www.neuromodulation.com/in-congress*

August 3-7
14th International Congress on Amino Acids, Peptides and Proteins, Sao Paulo, Brazil. *Information:* Professor Gert Lubec, c/o Medical University of Vienna, Wahringer Gurtel 18, A-1090 Vienna, Austria; e-mail: *icapp@meduniwien.ac.at*; internet: *http://www.meduniwien.ac.at/icaap*

September 2-5
APS Conference: 14th International Conference on Endothelin: Pathophysiology and Therapeutics, Savannah, GA. *Information:* internet: *http://www.endothelins.com/Conferences/ET-14/*. ●

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Acknowledgements

The Workshop Organizers and The American Physiological Society gratefully recognize the generous financial support from the following:

National Science Foundation
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2014 Teaching Workshop: The APS Institute on Teaching and Learning June 23—27, 2014, Bar Harbor, Maine

Monday June 23, 2014	Tuesday June 24, 2014	Wednesday June 25, 2014	Thursday June 26, 2014	Friday June 27, 2014
3:00—8:30 PM **Registration Opens** 5:30—6:30 PM **Dinner** 6:30—8:00 PM **Opening and Welcome Reception** 8:00—9:00 PM Keynote Lecture: **Reform in Physiology Education** Speaker: **Trish Schulte,** *Univ. of British Columbia, Canada*	7:00 AM—5:00 PM **Registration** 7:30—8:30 AM **Breakfast** 9:00—9:30 AM **Daily Orientation and Announcements** 9:30—10:30 AM Plenary I: **Developing and Using Core Concepts: Conceptual Change, Misconceptions, and Assessment** Speaker: **Jenny McFarland,** *Edmonds Comm. Coll.* 10:30—11:00 AM **Networking Break** 11:00 AM—12:00 Noon Concurrent Workshop I: **Using Core Concepts** Facilitator: **Jenny McFarland,** *Edmonds Comm. Coll.* Concurrent Workshop II: **Case-based Learning** Facilitator: **William Cliff,** *Niagara Univ.* 12:00 Noon—1:00 PM **Lunch** 1:00—2:00 PM Plenary II: **Implementing and Assessing Core Competencies in the Classroom** Speaker: **Dee Silverthorn,** *Univ. of Texas at Austin* 2:00—2:30 PM **Networking Break** 2:30—3:30 PM Concurrent Workshop III: **Using Core Competencies** Facilitator: **Dee Silverthorn,** *Univ. of Texas at Austin* Concurrent Workshop IV: **Transforming Cookbook Labs into Inquiry Labs** Facilitator: **Margaret Shain**, *APS* 3:30—5:00 PM **Poster Presentations and Group Discussions** 5:30—6:30 PM **Dinner**	7:00 AM—5:00 PM **Registration** 7:30—8:30 AM **Breakfast** 9:00—9:30 AM **Daily Orientation and Announcements** 9:30—10:30 AM Plenary III: **Designing Educational Research** Speaker: **Michelle Smith,** *Univ. of Maine* 10:30—11:00 AM **Networking Break** 11:00 AM—12:00 Noon Concurrent Workshop V: **Research Design--Intermediate** Facilitator: **Barbara Goodman,** *Univ. of South Dakota* Concurrent Workshop VI: **Research Design-Basic** Facilitator: **Michelle Smith,** *Univ. of Maine* 12:00 Noon—1:00 PM **Lunch** 1:00—2:00 PM Plenary IV: **Student Centered Learning: Practical Models** Speaker: **Barbara Goodman,** *Univ. of South Dakota* and **Chaya Gopalan,** *St. Louis Coll. of Pharmacy* 2:00—3:00 PM **Speed Collaborating Break** 3:00—4:00 PM Concurrent Workshop VII: **Designing Good Clicker Questions** Facilitator: **Mary Pat Wenderoth,** *Univ. of Washington* Concurrent Workshop VIII: **Best Practices for Undergraduate Research Experiences** Facilitator: **Kirsten Zimbardi**, *Univ. of Queensland, Australia* 4:00—5:30 PM **Poster Presentations and Group Discussions** 5:30—6:30 PM **Lobster Bake Dinner**	7:00 AM —5:00 PM **Registration** 7:30—8:30 AM **Breakfast** 9:00—9:30 AM **Daily Orientation and Announcements** 9:30—10:30 AM Plenary V: **Aligning Teaching and Assessment: Blooming Questions** Speaker: **Mary Pat Wenderoth,** *Univ. of Washington* 10:30—11:00 AM **Networking Break** 11:00 AM—12:00 Noon Concurrent Workshop IX: Blooming Questions Facilitator: **Mary Pat Wenderoth,** *Univ. of Washington* Concurrent Workshop X: Using Statistics Facilitator: **Douglas Curran-Everett, David Osborne, and Herb Janssen.** *Natl. Jewish Hlth., and Texas Tech Univ. Hlth. Sci. Ctr.* 12:00 Noon—1:00 PM **Lunch** 1:00—2:00 PM Plenary VI: **Publishing Your Educational Research** Panelists: **Rob Carroll,** *East Carolina Univ.,* and **Jean Cardinale,** *Alfred Univ.* 2:00—2:30 PM **Networking Break** 2:30—3:30 PM Concurrent Workshop XI: **Research Collaborations I** Concurrent Workshop XII: **Research Collaborations II** 3:30—5:00 PM **Poster Presentations and Group Discussions** 5:30—6:30 PM **Dinner**	7:00—11:30 AM **Registration** 7:30—8:30 AM **Breakfast** 9:00—9:30 AM **Daily Orientation and Announcements** 9:30—10:30 AM Plenary VII: **Funding for Educational Research: Perspectives from Funding Agencies and Principal Investigators** Panelists: **Kate Denniston,** *Natl. Sci. Fdn.* 10:30—11:00 AM **Networking Break** 11:00 AM—12:00 Noon Plenary VIII: **Where Do We Go From Here? Next Steps in Collaboration and Community Building—Open Discussion** 12:00 Noon—1:00 PM **Lunch**

GENERAL INFORMATION

Location:

The 2014 APS Workshop: The APS Institute on Teaching and Learning will be held June 23—27, 2014 at the College of the Atlantic located at: 105 Eden Street, Bar Harbor, Maine, 04609, telephone (207) 288-5015.

On-Site Registration Information:

On-site registration will be available daily for badge pick-up, receipts, housing assignments, program distribution, and general workshop information. The registration desk will be open daily in the Gates Center.

Onsite Registration Hours:

Monday, June 23……..……3:00—8:30 PM
Tuesday, June 24…….……7:00 AM—5:00 PM
Wednesday, June 25……7:00 AM—5:00 PM
Thursday, June 26……...7:00 AM—5:00 PM
Friday, June 27…….7:00—11:30 AM

On-Site Registration Fees:

On-site registration for this workshop will not be available.

Included in your Registration:

Your registration to this workshop includes entry into all scientific sessions, opening reception, poster sessions, socials, housing, and meals. **There are no substitutions or refunds.** You must pay the registration fee regardless of whether you stay on-site at the workshop venue or at a local hotel. The same applies if you are not able to stay for the entire workshop or have meals during the workshop program. Guests of attendees are not permitted in the scientific sessions.

If you are staying on the College of the Atlantic campus during the workshop you will be provided the following items to make your stay more comfortable: basic linens such as mattress pad, bed sheets, pillow, blanket, towels, and washcloths.

Meal Service:

Meals will be served promptly in the Blair Dining Hall according to the following schedule:

Breakfast ……..7:30—8:30 AM
Lunch ……12:00 Noon—1:00 PM
Dinner: ……..5:30—6:30 PM

Press Registration:

Press badges will be issued at the APS registration desk, only to members of the working press and freelance writers bearing a letter of assignment from an editor. Representatives of allied fields (public relations, public affairs, etc.) must register as nonmembers.

Parking:

Parking of a private vehicle is permitted only in designated parking areas. Please do not park on the campus lawns or access roads.

Program Objective:

The purpose of this workshop and the APS Institute on Teaching and Learning (ITL) is to engage educators (community/4-year college through professional school) in interactive sessions on best practices in teaching, learning, and assessment. Whether you are an experienced educator or new to teaching, it will challenge you to gain skills in designing and implementing educational research in your classroom and in learning how to share your findings with colleagues.

Target Audience:

The intended audience for this workshop includes educators teaching in community colleges, 4-year colleges, as well as those who are experienced educators or new to teaching.

Bar Harbor Airport Shuttle Bus Service:

There is affordable shuttle bus service from Bar Harbor that services both the local Hancock County Airport and Bangor International Airport with the Bar Harbor Shuttle company. **Reservations must be made in advance.** A one-way trip costs $40. To make a reservation, please quote the following code for APS attendees of the workshop: **APS14**. Reservations can be made via the telephone by calling: 1-207-479-5911. Make your reservations early to save your space on the shuttle bus!

Getting Around Bar Harbor:

Bar Harbor has a free bus service called the Island Explorer that will begin operating service on June 23, 2014. The Island Explorer has routes all over Mount Desert Island where Bar Harbor is located including the Hancock County—Bar Harbor Airport, College of the Atlantic, Arcadia National Park, and downtown Bar Harbor.

This workshop has been made possible through the generous support from:

National Science Foundation

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MONDAY, JUNE 23, 2014

Keynote Lecture

1.0 KEYNOTE LECTURE

Mon., 8:00—9:00 PM, Gates Meeting Hall.

8:00 PM **1.1** Reform in Physiology Education. **Patricia Schulte.** *Univ. of British Columbia, Canada.*

TUESDAY, JUNE 24, 2014

Orientation I

2.0 DAILY ORIENTATION AND ANNOUCEMENTS

Tues., 9:00—9:30 AM, Gates Meeting Hall.

9:00 AM **2.1** Daily Orientation and Annoucements.

Plenary I

3.0 PLENARY I

Tues., 9:30—10:30 AM, Gates Meeting Hall.

9:30 AM **3.1** Developing and Using Core Concepts: Conceptual Change, Misconceptions, and Assessment. **Jenny McFarland.** *Edmonds Comm. Coll.*

Concurrent Workshop I

4.0 WORKSHOP I

Tues., 11:00 AM—12:00 Noon, Gates Meeting Hall.

11:00 AM **4.1** Using Core Concepts. **Jenny McFarland.** *Edmonds Comm. Coll.*

Concurrent Workshop II

5.0 WORKSHOP II

Tues., 11:00 AM—12:00 Noon, McCormick Lecture Hall.

11:00 AM **5.1** Case-based Learning. **William Cliff.** *Niagara Univ.*

Plenary II

6.0 PLENARY II

Tues., 1:00—2:00 PM, Gates Meeting Hall.

1:00 PM **6.1** Implementing and Assessing Core Competencies in the Classroom. **Dee Silverthorn.** *Univ. of Texas at Austin.*

Concurrent Workshop III

7.0 WORKSHOP III

Tues., 2:30—3:30 PM, Gates Meeting Hall.

2:30 PM **7.1** Using Core Competencies. **Dee Silverthorn.** *Univ. of Texas at Austin.*

Concurrent Workshop IV

8.0 WORKSHOP IV

Tues., 2:30—3:30 PM, McCormick Lecture Hall.

2:30 PM **8.1** Transforming Cookbook Labs into Inquiry Labs. **Margaret Shain.** *American Physiological Society.*

Poster Session I

9.0 BEST PRACTICES IN MEDICAL PHYSIOLOGY

Tues., 3:30—5:00 PM, Blum Gallery.

Board #

1 **9.1** Stop the Squeeze! How to Overcome Time Compression for Physiology in the Integrated Preclinical Medical Curriculum. **B. E. Wright.** *Alabama Coll. of Osteopathic Med.*

2 **9.2** Aligning Assessment of Knowledge and Competencies in a Case-based Medical Curriculum. **S. E. Echtenkamp, and B. G. Kennedy.** *Indiana Univ. Sch. of Med.*

3 **9.3** Tools for Teaching Physiology Interprofessionally. **J. H. Becker, and S. S. Garber.** *Rosalind Franklin Univ. of Med. And Sci.*

4 **9.4** Demonstration the Revelance of First-Year Medical Cardiovascular Physiology Using a Simulation of Hemorrage. **T. A. Pressley, M. R. Howell, C. McClanahan, R. Alalawi, J. Kim, and J. C. Fowler.** *Texas Tech. Univ. Hlth. Sci. Ctr.*

5 **9.5** Use of Modeling and Dramatization in Physiology Teaching in Medical Education. **H. Carvalho.** *Virginia Tech.*

6 **9.6** Renal Pursuit Game: Student Reactions to a New Active Learning Tool. **A. Bichachi, C. Lupi, R. Bonnin, and S. Moulik.** *Herbert Wertheim Coll. of Med., and Mt. Sinai Med. Ctr., Miami, Florida.*

7 **9.7** Cyclophilin D Gene Ablation does not Prevent Chronic Alcohol-induced Mitochondrial Dysfunction in Liver. **A. L. King, T. M. Swain, M. J. Lesort, and S. M. Bailey.** *Southern Poly State Univ., and Univ. of Alabama at Birmingham.*

8 **9.8** "Read-Fill" Approach to Support Self Directed Learning of Threshold Concepts During Lecture-based Classes. **S. ElSayed, and S. Loftus.** *Oakland Univ.*

9 **9.9** The Life Science Teaching Resource Community—A Community of Practice and Online Library for Educators at all Levels. **M. Byse, and M. L. Matyas.** *American Physiological Society.*

10 **9.10** Increasing Academic Performance in a Public Mexican University. **P. Perez-Cornejo, A. Rodriguez-Menchaca, M. Knabb, and G. W. Fairchild.** *Autonomous Univ. of San Luis Potosi, Mexico, and West Chester Univ.*

Photography is Prohibited in all Session Rooms

DAILY SCHEDULE

WEDNESDAY, JUNE 25, 2014

Orientation II

10.0 DAILY ORIENTATION AND ANNOUCEMENTS

Wednes., 9:00—9:30 AM, Gates Meeting Hall.

9:00 AM **10.1** Daily Orientation and Annoucements.

Plenary III

11.0 PLENARY III

Wednes., 9:30—10:30 AM, Gates Meeting Hall.

9:30 AM **11.1** Designing Educational Research. **Michelle Smith.** *Univ. of Maine.*

Concurrent Workshop V

12.0 WORKSHOP V

Wednes., 11:00 AM—12:00 Noon, McCormick Lecture Hall.

11:00 AM **12.1** Research Design—Intermediate. **Barbara Goodman.** *Univ. of South Dakota.*

Concurrent Workshop VI

13.0 WORKSHOP VI

Wednes., 11:00 AM—12:00 Noon, Gates Meeting Hall.

11:00 AM **13.1** Research Design—Basic. **Michelle Smith.** *Univ. of Maine.*

Plenary IV

14.0 PLENARY IV

Wednes., 1:00—2:00 PM, Gates Meeting Hall.

1:00 PM **14.1** Student Centered Learning: Practical Models. **Barbara Goodman, and Chaya Gopalan.** *Univ. of South Dakota, and St. Louis Coll. of Pharmacy.*

Concurrent Workshop VII

15.0 WORKSHOP VII

Wednes., 3:00—4:00 PM, Gates Meeting Hall.

3:00 PM **15.1** Designing Good Clicker Questions. **Mary Pat Wenderoth.** *Univ. of Washington.*

Concurrent Workshop VIII

16.0 WORKSHOP VIII

Wednes., 3:00—4:00 PM, McCormick Lecture Hall.

3:00 PM **16.1** Best Practices for Undergraduate Research Experiences. **Kirsten Zimbardi.** *Univ. of Queensland, Australia.*

Poster Session II

17.0 BEST PRACTICES IN UNDERGRADUATE PHYSIOLOGY

Wednes., 4:00—5:30 PM, Blum Gallery.

Board #

11 **17.1** Measuring Dynamic Kidney Function in an Undergraduate Physiology Lab. **S. Medler, and F. Harrington.** *SUNY, Fredonia.*

Board #

12 **17.2** Impact of Co-enrollment in Computer-based Human Physiology Virtual Laboratory on Students' Final Lecture Course Grade: A Pilot Study. **A. R. Crecelius.** *Univ. of Dayton.*

13 **17.3** A Service-Learning Prject: Students Teaching a Body System Lesson in the Community. **C. Donmoyer.** *Allegheny Coll.*

14 **17.4** Learning is PHUN. **J. M. Ibarra.** *Univ. of the Incarnate Word, San Antonio, Texas.*

15 **17.5** Enhancing Student Learning in Human Physiology. **N. Palenske, A. Dean, R. Schmidt, J. Wachter, M. Welk, and J. White.** *Cental Coll., Pella, Iowa.*

16 **17.6** Addressing Gastrointestinal Physiology Learning by Means of Quick and Enjoyable Hands-on Activities. **C. Lellis-Santos, L. C. Pantaleão, J. L. Carvalho-de-Souza, M. Leonelli, A. C. Levada, D. C. Villela, L. C. Caperuto, and S. Bordin.** *Fed. Univ. of São Paulo, Univ. of São Paulo, and Cruzeiro do Sul Univ., Brazil.*

17 **17.7** The Trouble with the *Levator Labii Superiorsis Alaque Nasi*. **C. J. Urso, and E. G. Tall.** *Seton Hall Univ.*

18 **17.8** Characterization of a "Flipped" Version of Vertebrate Neurophysiology. **K. A. Wilkinson, M. Jimenez, K. Roseler, and C. Paul.** *San José State Univ., and Stanford Univ.*

19 **17.9** Negative Feedback in the Hypothalamic-Pituitary-Target Organ Axes: An Interactive Class Activity. **K. Hull.** *Bishop's Univ., Sherbrooke, Canada.*

20 **17.10** The "Disease Project": Bringing Meaning to Human Biology for Non-majors. **K. P. Seiler.** *Champlain Coll.*

THURSDAY, JUNE 26, 2014

Orientation III

18.0 DAILY ORIENTATION AND ANNOUCEMENTS

Thurs., 9:00—9:30 AM, Gates Meeting Hall.

9:00 AM **18.1** Daily Orientation and Annoucements.

Plenary V

19.0 PLENARY V

Thurs., 9:30—10:30 AM, Gates Meeting Hall.

9:30 AM **19.1** Aligning Teaching and Assessment: Blooming Questions. **Mary Pat Wenderoth.** *Univ. of Washington.*

Photography is Prohibited in all Session Rooms

DAILY SCHEDULE

Concurrent Workshop IX

20.0 WORKSHOP IX

Thurs., 11:00 AM—12:00 Noon, Gates Meeting Hall.

11:00 AM **20.1** Blooming Questions. **Mary Pat Wenderoth.** *Univ. of Washington.*

Concurrent Workshop X

21.0 WORKSHOP X

Thurs., 11:00 AM—12:00 Noon, McCormick Lecture Hall.

11:00 AM **21.1** Using Statistics. **Douglas Curran-Everett, David Osborne, and Herb Janssen.** *Natl. Jewish Hlth., and Texas Tech. Univ. Hlth. Sci. Ctr.*

Plenary VI

22.0 PLENARY VI

Thurs., 1:00—2:00 PM, Gates Meeting Hall.

1:00 PM **22.1** Publishing Your Educational Research. **Rob Carroll, and Jean Cardinale.** *East Carolina Univ. Sch. of Med., and Alfred Univ.*

Concurrent Workshop IX

23.0 WORKSHOP XI

Thurs., 2:30—3:30 PM, Gates Meeting Hall.

2:30 PM **23.1** Research Collaborations I.

Concurrent Workshop XII

24.0 WORKSHOP XII

Thurs., 2:30—3:30 PM, McCormick Lecture Hall.

2:30 PM **24.1** Research Collaborations II.

Poster Session III

15.0 ASSESSMENT, PROGRAM, COURSE

Thurs., 3:30—5:00 PM, Blum Gallery.

Board #

21 **25.1** Developing Freshman Research Skills and an Appreciation of the Scientific Method Via a Research-based Seminar Course. **M. B. French.** *Univ. of Toronto, Canada.*

22 **25.2** An Historical Study of Teaching Physiology to Science-Illiterate Students in the Eighteenth Century France. **T. L. Witt.** *Germanna Comm. Coll.*

23 **25.3** Curriculum Restructuring for a Systems Physiology Major. **S. L. Cargill.** *San José State Univ.*

24 **25.4** A Nationwide Assessment and Comparison of Curriculumm Requirements in Undergraduate Physiology Programs. **E. A. Wehrwein, J. M. Poteracki, D. J. McCann, E. J. Henriksen, M. L. Matyas, and J. R. Halliwill.** *Michigan State Univ., Univ. of Arizona Coll. of Med., Gonzaga Univ., Spokane, Univ. of Oregon, and American Physiological Society.*

25 **25.5** (Sanders 2009) Personal Development Review (PDR): An Effective Strategy to Enhance Deeper Learning. **S. K. Pinjani.** *Aga Khan Univ., Karachi, Pakistan.*

Board #

26 **25.6** Undergraduate Physiology Students Successfully Self-assess Oral Final Exam Performance. **K. M. S. Johnson.** *Beloit Coll.*

27 **25.7** Science Literature Searching Skills in First-year and Senior Undergraduate Biology Majors. **J. M. Blank, K. J. McGaughey, E. L. Keeling, and J. M. Scaramozzino.** *California Poly. State Univ.*

28 **25.8** Animal Physiology from Scratch. **K. B. Beason-Abmayr, and D. R. Caprette.** *Rice Univ.*

29 **25.9** Assessing Anatomy and Physiology Laboratory Learning in a Multi-section Laboratory Setting Using a Blackboard-based Backward Design. **M. Sah, D. Graesser, R. Filipovic, J. Medved, and X. Chen.** *Univ. of Connecticut.*

30 **25.10** Group Peer Evaluations Using Blackboard. **D. U. Silverthorn.** *Univ. of Texas at Austin.*

FRIDAY, JUNE 27, 2014

Orientation IV

26.0 DAILY ORIENTATION AND ANNOUCEMENTS

Fri., 9:00—9:30 AM, Gates Meeting Hall.

9:00 AM **26.1** Daily Orientation and Annoucements.

Plenary VII

27.0 PLENARY VII

Fri., 9:30—10:30 AM, Gates Meeting Hall.

9:30 AM **27.1** Funding for Educational Research: Perspectives from Funding Agencies and Principal Investigators. **Kate Denniston.** *Natl. Sci. Fdn.*

Plenary VIII

28.0 PLENARY VIII

Fri., 11:00 AM—12:00 Noon, Gates Meeting Hall.

11:00 AM **28.1** Where Do We Go From Here? Next Steps in Collaboration and Community Building—Open Discussion.

Don't Forget to Attend…

Opening and Welcome Reception (Turrets Building)

Poster Session Socials

The Traditional Maine Lobster Bake Dinner

2014 APS Workshop
APS Institute on Teaching and Learning

Abstracts of Invited and Contributed Presentations

1.0 KEYNOTE LECTURE

1.1
REFORM IN PHYSIOLOGY EDUCATION

Patricia M. Schulte
Carl Wieman Sci. Edu. Initiative and Dept. of Zoology, Univ. of British Columbia, Vancouver, Canada.

Traditional didactic lecturing still dominates many undergraduate physiology courses, despite the fact that didactic lectures have been repeatedly shown to be less effective than more active modes of learning. Here I outline how we have made a transition from didactic lecturing towards a more active and student-centered approach in several large-enrollment undergraduate physiology courses, facilitated by the Carl Wieman Science Education Initiative at the University of British Columbia [1]. In particular, I will highlight a small number of easy to apply and effective changes that maximize student learning including pre-reading assignments, just in time teaching, in-class problem solving, peer discussion and collaborative testing [2,3]. One critical feature of this evidence-based approach to teaching and learning is the incorporation of timely and targeted feedback to students in every class. Here I will provide examples of multiple ways in which this feedback can be delivered even in a large-class setting. Funded by the Carl Wieman Science Education Initiative. **References:** 1. Wieman, C., Perkins, K. and Gilbert, S. 2010.Transforming Science Education at Large Research Universities: A Case Study in Progress**.** *Change*: 7-14. 2. Welsh, A. 2012. Exploring Undergraduates' Perceptions of the Use of Active Learning Techniques in Science Lectures *Journal of College Science Teaching* 42: 80-87. 3. Gilley, B. and Clarkston, B. 2014. Collaborative Testing: Evidence of Learning in a Controlled In-Class Study of Undergraduate Students**.** *Journal of College Science Teaching* 43: 83-91.

3.0 PLENARY I & WORKSHOP I

3.1
"DEVELOPING AND USING CORE CONCEPTS: CONCEPTUAL CHANGE, MISCONCEPTIONS, AND ASSESSMENT" & "USING CORE CONCEPTS"

Jenny McFarland, Ph.D.
Edmonds Community College, Lynnwood, WA

Teaching and learning of physiology involves the development of an enduring understanding and ability to apply the core concepts of our discipline. Scientific Foundations for Future Physicians (2009) and Vision and Change (2010) are just two of many reports that call for the development of understanding of disciplinary core concepts in students. Identifying and agreeing on the core concepts of a discipline is a necessary step in this process as is the development of meaningful and validated instruments to assess conceptual understanding. Concept inventories (CIs) are validated tests to evaluate student ability to appropriately apply conceptual knowledge. Identification of student conceptions (naïve conceptions, alternative conceptions, or misconceptions) regarding core concepts and their application is also required for CI development. CIs are valuable for assessing student learning gains, diagnosing common student misconceptions, evaluating instructional changes and curricular reform. Adams & Wieman have described the process of CI development and validation. The talk "Developing and Using Core Concepts: Conceptual Change, Misconceptions, and Assessment" will provide a brief overview of concept inventories (CIs) as conceptual assessment instruments for physiology teaching and learning. A set of identified physiology core conceptions will be described. The development of a physiology concept inventory for homeostasis and the useful teaching and learning products (conceptual frameworks and misconceptions) that have been developed will also be presented. There will be time for questions and discussion and applications in physiology teaching and learning. The following workshop "Using Core Concepts" will engage participants in the application of core concepts, conceptual assessment, conceptual frameworks and student "misconceptions" to undergraduate physiology education in their courses. **References:** Adams, W.K. and Wieman, C.E. 2011. Development and validation of instruments to measure learning of expert-like thinking. International Journal of Science Education 33:1289-1312. American Association for the Advancement of Science. 2011. Vision and Change in Undergraduate Biology Education: A Call to Action, Washington, DC: American Association for the Advancement of Science. Association of American Medical Colleges. 2009. D'Avanzo, C. 2008. Biology concept inventories: overview, status, and next steps. Bioscience 58:1079-1085. Fisher, K.M and Williams, K.S. Concept Inventories/Conceptual Assessments in Biology (CABs): An annotated list. 2012 http://www.sci.sdsu.edu/CRMSE/files/Concept_Inventories_in_Biology_20110325.pdf. Marbach-Ad, G.,V. Briken, N. El-Sayed, K. Frauwirth, B. Fredericksen, S. Hutcheson, et al. 2009. Assessing student understanding of host pathogen interactions using a concept inventory. J. Microbiol. Biol. Educ. 10:43–50. Michael, J. and McFarland, J. (2011. The core principles ("big ideas") of physiology: results of faculty surveys. Advances in Physiology Education. 25:336-341. Michael, J., Modell, H., McFarland, J., and Cliff, W. (2009). The "core principles" of physiology: what should students understand? *Advances in Physiology Education*, 33: 10. Villafane, S.M., Bailey C.P., Loertscher J., Minderhout V., Lewis J.E. 2011. Development and analysis of an instrument to assess student under-standing of foundational concepts before biochemistry coursework. Biochemistry and Molecular Biology Education. 39(2):102-109.

5.0 WORKSHOP II

5.1
CASE-BASED LEARNING

William Cliff
Dept. of Biology. Niagara Univ.

Case study analysis has been shown to be an effective means for learning in the biomedical sciences (1). This workshop will explore ways to incorporate case-based teaching and learning into life science courses offered at different academic settings. The presenter will discuss strategies for constructing case studies (2) and evidence for student learning (1). Following the dictums of Wiggins and McTighe (3), a "backward" design approach will be offered as the preferred means to promote effective case-based learning. Guided by a planning template that identifies a series of issues and concerns central to the effective use of cases, participants will be encouraged to create a favorable strategy for managing case-based learning in the classroom. Participants will have the opportunity to use this approach to begin devising or reengineering a case study of their own. A final discussion will provide opportunity for comparison of case-based learning methods, assessment tools, and student learning outcomes. Participants should expect to leave the workshop better equipped to develop satisfactory approaches for integrating case-based teaching and learning into their own courses. **References:** 1.Thistlethwaite JE et al. The effectiveness of case-based learning in health professional education. A BEME systematic review. BEME Guide No. 23. Medical Teacher 34(6): e421-e444, 2012. 2. Kim S et al. A conceptual framework for developing teaching cases: a review and synthesis of the literature across disciplines. Medical Education 40:867-876, 2006. 3. Wiggins G and McTighe J. Understanding by Design. 2nd Ed. Alexandria, Virginia: Association for Supervision and Curriculum Development, 2005.

6.0 PLENARY II & WORKSHOP III

6.1
IMPLEMENTING AND ASSESSING CORE COMPETENCIES IN THE CLASSROOM

Dee Silverthorn
Univ. of Texas at Austin

The move to competency-based education in the United States is gaining momentum, but there are still many institutions, particularly at the undergraduate level, that are hesitant to move away from traditional courses. The revision of the Medical College Admissions Test (MCAT) in 2015 has now focused attention on the premedical curriculum and its rigid course requirements in biology, chemistry, physics, and mathematics. Some universities are beginning to explore the use of competency-based education to condense these course requirements, thereby creating space in the curriculum for more behavioral science and liberal arts classes. What are the competencies we should be focusing on? In 2009 the Association of American Medical Colleges-Howard Hughes Medical Institute report, *Scientific Foundations for Future Physicians*, described eight broad competencies that were fundamental background for beginning specialized medical education. These competencies include basic quantitative reasoning skills and scientific competencies as well as core concepts from the life sciences. Are these competencies more broadly applicable to all life science students? The challenge many schools face is mapping competencies onto existing courses and using the map to find opportunities for developing innovative interdisciplinary courses. This talk will examine how some institutions have initiated competency-based curricular and will discuss some of the obstacles to implementation and assessment.

8.0 WORKSHOP IV

8.1
TRANSFORMING COOKBOOK LABS INTO INQUIRY LABS

Margaret Shain
American Physiological Society

This workshop will give participants a hands-on approach to transforming existing lessons to help implement Vision and Change in their classrooms. Transformations focus on practical approaches to student-centered learning. Attendees will apply APS Six Star Science principals for student-centered learning to labs they currently conduct in their courses. Participants are encouraged to bring a lab from a current course which they would like to adapt or use a sample provided. Take home "tool kits" will enable participants to apply Six Star Science principals to additional lessons.

9.0 BEST PRACTICES IN MEDICAL PHYSIOLOGY

9.1
STOP THE SQUEEZE! HOW TO OVERCOME TIME COMPRESSION FOR PHYSIOLOGY IN THE INTEGRATED PRECLINICAL MEDICAL CURRICULUM

Bruce E. Wright
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Challenge: In medical education, replacing preclinical education on a discipline basis with an integrated systems basis has become widespread. To increase clinical exposure, basic science teaching content and time has been reduced. Reducing topic overlaps between disciplines can cut time, but if not done well can result in loss of critical content within each discipline, potentially leaving knowledge gaps. Solution: Five steps preserve physiology education in ACOM's integrated curriculum. First, basic science faculty must work together within body system courses to identify those topics that belong to basic sciences and that complement clinical topics for that system, and vice versa. Second, for multisystem topics (e.g., water balance), one primary system must be designated, and one discipline to lead its discussion. Third, essential presystem topics must be clustered in an introductory course to provide a sufficient foundation for students to succeed in their systems courses. Fourth, within both presystem and system courses, the most essential physiology topics must be presented by physiologists, while yielding to other specialists their essential topics. Finally, review of physiology content over all systems must be ongoing to prevent "holes" and provide an adequate level of physiology preparation for board exams and beyond. Conclusion: Having everyone within basic sciences support each other's specialties in a cooperative manner with thorough review procedures will cut content delivery time with minimal content loss in the integrated preclinical curriculum.

9.2
ALIGNING ASSESSMENT OF KNOWLEDGE AND COMPETENCIES IN A CASE-BASED MEDICAL CURRICULUM

Stephen F. Echtenkamp and Brian G. Kennedy
Indiana Univ. Sch. of Med. Gary, IN.

Indiana University School of Medicine (IUSM) is a competency-based curriculum conducted at nine distinct campuses. This study analyzed student assessment in a first year medical Physiology course at the IUSM-NW campus, located in Gary Indiana which utilizes active case-based learning, integrated with traditional lectures. The course grade derives from four different assessments: faculty-written multiple choice exams, clinical case-based quizzes, evaluation of performance during clinical case discussions, and standardized National Board (NBME) subject exams. We analyzed over five consecutive years how these multiple measures yield an integrated assessment of performance. Each class was divided into quartiles, based on final course grade. Performance in each of the four quartiles was analyzed with respect to the four assessments, listed above. The separation of high- versus low performing students was greatest in the traditional multiple-choice question exams, either faculty written or NBME. The clinical case quizzes, showed a higher overall performance, but a lower degree of separation. This may be due to the active-learning group focus on clinical problems. The assessments of case discussions also showed a higher overall performance and a smaller divergence between students. This may be due to a more subjective assessment method, but the student-directed case discussions could also have elicited a higher performance. In conclusion, the four assessments of student performance were all capable of discriminating high vs. low performing students. The absolute performance varied by assessment method.

9.3
TOOLS FOR TEACHING PHYSIOLOGY INTERPROFESSIONALLY

John H. Becker, Ph.D. and Sarah S. Garber, Ph.D.
Rosalind Franklin Univ. of Med. and Sci.

Many Health Professions schools, including Rosalind Franklin University of Medicine and Science (RFUMS), have embraced interprofessional education in response to national initiatives predicting that medical practice in the future will use more interprofessional teams. Physiology is a discipline that underpins the education of many health professionals. At RFUMS, many early didactic courses were multi-professional for economic, scheduling, and programmatic needs. Those courses gradually evolved into interprofessional sessions as RFUMS faculty became aware of interprofessional education (IPE), and the university incorporated it into in its mission statement. In 2014, RFUMS has several courses that include IPE, and a new program (College of Pharmacy) that designed its entire curriculum with IPE objectives. The authors have experience with IPE in two physiology courses and a neurosciences course with a physiology section, and the instructors agree that IPE can succeed if carefully designed. Best practices include collaborative course directors from representative programs, interactive student activities, articulated interprofessional course objectives, active teaching methods, and liberal use of case studies. Assessment tools must also address IPE course objectives.

9.4
DEMONSTRATING THE RELEVANCE OF FIRST-YEAR MEDICAL CARDIOVASCULAR PHYSIOLOGY USING A SIMULATION OF HEMORRHAGE

Thomas A. Pressley, Martha R. Howell, Chris McClanahan, Raed Alalawi, Jongyeol Kim, and John C. Fowler
Depts. of Med. Edu. and Int. Med. and the F. Marie Hall Sim*Life* Ctr., Texas Tech. Univ. Hlth. Sci. Ctr., Lubbock, TX.

Many first-year medical students struggle to recognize the relevance of the basic sciences to their future work as physicians. The availability of high fidelity simulators in our institution allowed us to develop a scenario that encouraged students to correlate physiological concepts with clinical experience. Students studied material on low cardiac output the night before the simulation, but no specific information on the simulated case was provided. Once in the simulation center, students completed a short quiz and then participated in a case in which the victim of an automobile accident had lost an unknown quantity of blood. Faculty adjusted the physiological condition of the simulated patient as the students evaluated the situation and conducted therapeutic interventions. A large-group debrief the following day reinforced the physiological concepts demonstrated in the simulation. Pre- and post-activity evaluations assessed students' opinions on the value of the simulation. Additionally, students' performances on examinations were compared with previous years in which such an activity was not available. There was improvement on some questions and similar outcomes for others despite less time invested in formal lecture. We conclude that the use of clinical simulation is an effective strategy for reinforcing critical concepts in cardiovascular physiology during first-year medical training.

9.5
USE OF MODELING AND DRAMATIZATION IN PHYSIOLOGY TEACHING IN MEDICAL EDUCATION

Helena Carvalho
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This work summarizes several models that engage the millennial generation students in learning human physiology. Due to the importance of physiology for medical education, and its central role in disciplines such as pharmacology and pathophysiology, it is necessary to implement activities that make the learning meaningful and lasting lifelong. Here is a very brief description of models where the students actively manipulated and become part of the learning process: 1) to demonstrate fluid movement in the gastrointestinal (GI) system a series of syringes were mounted in a vertical support allowing students to add or remove fluid that simulated a variety of conditions such as excess or lack of fluid ingestion; 2) secretion and reabsorption of electrolytes in renal physiology were taught using a paper manipulative of the nephron and its major cell types allowing students to move the 'electrolytes' in different segments of the nephron; 3) to study a movement and maintenance of muscle tone a wooden manipulative of motor unit was built that demonstrate the action of a muscle across a joint with sensory input and motor output; 4) the cardiac cycle were taught with a dramatization where each student acted as a cell and the group formed the cardiac chamber during normal and altered functions. Create innovative ways to convey complex information can be

done with inexpensive material, creativity and student involvement. Those manipulatives and a video of the cardiac cycle will be available during the poster session.

9.6

RENAL PURSUIT GAME: STUDENT REACTIONS TO A NEW ACTIVE LEARNING TOOL

[1,2]Abraham Bichachi, MD, [1]Carla Lupi, MD, [1]Rodolfo Bonnin, PhD, and [1]Saby Moulik, PhD

Herbert Wertheim Coll. of Med. (FIU HWCOM), Miami, FL[1]; Mt. Sinai Med. Ctr., Miami Beach, FL[2]

The competent physician is an effective self-directed learner who works well in teams. Aligned with this philosophy, the second-year Renal Module at FIU HWCOM integrates gaming into active-learning in the course. Students are required to pre-read textbook chapters, and the class is divided into groups of 6 students at each of the ten three-hour long Renal Pursuit game sessions. Assessments are based on answering MCQs. Student perception of the Renal Pursuit Game was assessed after the last iteration of the course. Seventy-six students rated the course. "Agree" and "Strongly Agree" response anchors provided strong evidence for this type of learning. Response rates indicated that 72% of students found games provided an environment for effective interactive learning, 72% found the games developed their ability to learn and teach in groups; 74% indicated that the assigned readings helped them prepare for every activity; 79% indicated that the volume of assigned reading was appropriate for each gaming session; 57% indicated that the course format served as a motivator to study; and 71% indicated that the Renal Games were enjoyable. However, only 30% preferred gaming over lecture formats, while 29% preferred gaming in other courses. We conclude that the majority of students perceive that the Renal Pursuit Game supports self-directed and group learning. A significant minority prefer learning from gaming formats. More research is needed to identify the student factors and game elements that correlate with these perceptions.

9.7

CYCLOPHILIN D GENE ABLATION DOES NOT PREVENT CHRONIC ALCOHOL-INDUCED MITOCHONDRIAL DYSFUNCTION IN LIVER

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Liver mitochondria from chronic alcohol exposed animals have increased sensitivity for mitochondrial permeability transition (MPT) induction. While the mechanism for this increased sensitivity is unclear, studies indicate that high cyclophilin D (CypD) content may contribute to increased MPT pore formation and mitochondrial damage in disease. Previously, we reported that chronic alcohol increased CypD gene expression and protein content in liver. Based on this, we hypothesized that the absence of CypD may be protective against alcohol-mediated mitochondrial dysfunction. To test this, male wild-type (WT) and CypD knockout (CypD KO) mice were fed alcohol and control diets for 6 wk. Liver mitochondria were isolated and calcium-mediated MPT pore induction (i.e., calcium-mediated mitochondrial swelling) and mitochondrial bioenergetics were measured. Liver histology and triglycerides were assessed as indicators of alcohol-dependent liver injury. Steatosis was equally present in livers of WT and CypD KO mice fed the alcohol diet. Moreover, liver triglycerides were increased in WT and CypD KO mice fed the alcohol diet compared to controls. Mitochondrial state 3 respiration (ADP-dependent) was unaffected by alcohol consumption in both WT and CypD KO mice. However, state 4 respiration (ADP-independent) was increased in both WT and CypD KO mice fed the alcohol diet, suggesting uncoupling. In addition, the respiratory control ratio (RCR=state 3/state 4) was significantly decreased in both alcohol groups compared to controls. Mitochondria isolated from livers of WT mice fed control and alcohol diets were sensitive to swelling by calcium, with mitochondria from the alcohol group being the most sensitive group. Mitochondria isolated from livers of CypD KO mice fed control and alcohol diets were much more resistant to calcium-mediated swelling compared to WT mitochondria. However, mitochondria from alcohol-fed CypD KO mice still had increased sensitivity to calcium-mediated swelling than mitochondria from control-fed CypD KO mice. In summary, we found that CypD KO mice were not protected against bioenergetic defects and steatosis from alcohol even though mitochondria from CypD KO mice fed alcohol were more resistant to induction of the MPT. These findings strongly suggest that CypD-independent mechanisms are likely changed by chronic alcohol and responsible for increased MPT pore sensitivity, mitochondrial dysfunction, and liver injury.

9.8

"READ – FILL" APPROACH TO SUPPORT SELF DIRECTED LEARNING OF THRESHOLD CONCEPTS DURING LECTURE-BASED CLASSES

Suzan ElSayed and Stephen Loftus.

OUWB Sch. of Med., Oakland Univ., MI.

The Read-Fill approach is a technique to enhance self-directed learning of threshold concepts and to make didactic lectures more interactive. Threshold concepts are key ideas needed to understand a topic but which may be difficult to learn, requiring special efforts by teachers to ensure students engage a topic with the depth required. A week before the lecture, students are provided with copies of the PowerPoint slides to be used. At strategic points some of the slides will have only headings and/or subheadings. The students are instructed to fill in the slides appropriately. For example, a number of bullet points of relevant material might be expected. During the lecture the teacher will ask the students what answers they were able to provide. The responses from students can be compared and contrasted with each other and then with the teacher's version. The strategic slides are chosen in order to focus attention on aspects of threshold concepts, which require students to actively process information rather than simply recall facts. The technique can be used to identify and dispel common misunderstandings and be the focus of short interactive discussions. This exercise has a number of advantages. For example, by requiring students to engage with material in advance, active self-directed learning is promoted. In addition, the positioning of the slides throughout the lecture can also maintain students' arousal and interest throughout the teaching session.

9.9

THE LIFE SCIENCE TEACHING RESOURCE COMMUNITY – A COMMUNITY OF PRACTICE AND ONLINE LIBRARY FOR EDUCATORS AT ALL LEVELS

Miranda Byse and Marsha Lakes Matyas

APS Education Office.

The Life Science Teaching Resource Community (LifeSciTRC) is a collaborative digital library and online educator community involving nine scientific societies – APS, HAPS, SDB, AAA, MSMR, NWABR, PhySoc, GSA, and ASPB. The goal of the LifeSciTRC is to impact scientific education and learning by fostering a com-munity where scientific educators can collaborate and improve on their pedagogy. The LifeSciTRC contains over 6,500 free and scientifically accurate teaching resources for life science educators at the K-12, undergraduate, graduate, and professional levels. The LifeSciTRC also serves as an online community where educators can share their teaching strategies and expertise through participation in blogs and forums, commenting and rating resources, and taking part in online LifeSciTRC Scholars and Fellows Programs.

9.10

INCREASING ACADEMIC PERFORMANCE IN A PUBLIC MEXICAN UNIVERSITY

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Each year we select 145 students (out of 1,500 applicants) to be admitted into Medical School. This rate of admission is considered ideal, however the students we receive for the Human Physiology course fail to get good grades and the passing rate for this course is low. Poor class attendance and poor class performance are also common problems. Because we had poor attendance we wanted to work on engaging the students by presenting the course material in more appealing ways. A case study is a compelling story that presents information and then asks the reader to answer several question in order solve a problem, here we used case studies dealing with endocrine pathologies. In a large class the student-teacher interactions are greatly reduced and the opportunity to give on-time help to individual students is lost. Therefore, in this study we included case studies and clickers to assess the impact of interactive classroom technology in: a) increasing student engagement, and b) achieving higher exam scores. Our data indicates that classroom attendance and performance were improved, however, clickers did not help the students achieve better grades. Despite of this, engaging students is an important step to increase active participation of students during lectures. *Funding: SEP.*

11.0 PLENARY III & WORKSHOP VI

11.1

INSPIRING EDUCATION RESEARCH WITH THE QUESTION: WHAT DO I WANT TO LEARN MORE ABOUT IN MY CLASSROOM?

Michelle Smith
Univ. of Maine, Sch. of Biology and Ecology, Maine Ctr. for Res. in STEM Edu.

Faculty members often want to know more about student learning in their classrooms but taking the leap from curiosity to performing education research can be difficult. In this talk we will consider a general question: "Do students learn anything when they discuss clicker questions with their peers?" and explore how this question has inspired several quantitative, qualitative, and mixed methods research studies. We will also examine different methods researchers use to compare experimental and control groups, and the benefits and drawbacks of comparing data between and within courses.

14.0 PLENARY IV

14.1

STUDENT CENTERED LEARNING: PRACTICAL MODELS

Barbara Goodman and Chaya Gopalan
Univ. of South Dakota and St. Louis Coll. of Pharmacy.

Instant access to information is revolutionizing teacher-centered instruction and student-centered active learning is gaining more class time. Latest educational technology as well as a variety of teaching methodologies such as *flipped classroom*, discussion-based learning (DBL), team-based learning (TBL), problem-based learning (PBL) and case studies as a way of teaching allows students to actively participate in their learning process. In addition, a variety of hands-on activities and/or simulations can be used in order to promote successful learning. Diverse learning styles are supported in a student-centered classroom which provides students with a variety of tools, such as task- and learning-conscious methodologies, creating a better environment for students to learn. With the use of these valuable learning skills, students are capable of achieving lifelong learning goals, which can further enhance student motivation in the classroom. The purpose of this presentation is to provide concrete and practical ideas for implementing active learning strategies in the classroom. These strategies include but are not limited to clinical scenarios in case discussions, *flipped classroom*, DBL, PBL, and TBL while incorporating the latest teaching technologies. Student surveys suggest that the students are changing the way they study and will come to class more prepared and be more engaged in the classroom during the student-centered teaching models compared to didactic teaching. **References:** 1. Tune, J.D., Sturek, M. and Basile, D.P. Flipped classroom model improves graduate student performance in cardiovascular, respiratory, and renal physiology, *Adv. Physiol. Educ.* **37** (2013): 316-320. 2. McLoughlin, C., Luca, J. A learner-centered approach to developing team skills through web-based learning and assessment. *British Journal of Educ. Technology* **33** (2002): 571-582. 3. Rawekar, A., Garg, V. Jagzape, A., Deshpande, V., Tankhiwale, S. and Chalak, S. Team Based Learning: A controlled trial of active learning in large group setting, *IOSR J. Dental and Med. Sci.* **7** (2013): 42-48.

15.0 WORKSHOP VII

15.1

WRITING GOOD CLICKER QUESTIONS

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"Clickers" or student responders are devices that provide students with an anonymous way to answer questions posed by the lecturer. Clicker questions and the answers generated by students can serve several functions for both lecturer AND students. Participants will be asked to bring sample or proposed clicker questions to the workshop. Small groups of participants will critique one another's questions. We will then attempt to derive some of the attributes of good clicker questions from the critiques that were generated.

16.0 WORKSHOP VIII

16.1

BEST PRACTICES FOR UNDERGRADUATE RESEARCH EXPERIENCES: DEVELOPING AUTHENTIC LARGE- SCALE UNDER-GRADUATE RESEARCH EXPERIENCES (ALURES) IN YOUR PHYSIOLOGY COURSE

Zimbardi, K.[1] Rowland, S.[2] Lawrie, G.[2] Wang, J.[2] Myatt, P.[3] Worthy, P.[2]
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Undergraduate research experiences (UREs) during which students undertake a research project over an extended period of time under the direct supervision of a researcher, are associated with high levels of student engagement, academic success (Kuh 2008) and a wide range of student benefits (Hunter et al. 2006). In physiology education, practicals that incorporate physiological research can be used to promote active learning (Michael 2006), and teach students key skills in critical evaluation of complex data alongside important physiological concepts (Zimbardi et al. 2013, Luckie et al. 2012). Following an extensive investigation of diverse ways that research experiences are successfully embedded into undergraduate curricula (Zimbardi and Myatt 2012), we have developed a model for up-scaling UREs to cohorts of several hundred students. We are now leading a national project in Australia to support the uptake of these Authentic Large-Scale Undergraduate Research Experiences (ALUREs) and provide the benefits of research experiences to thousands of undergraduate students. During this workshop, examples of ALUREs from the biosciences will be used to highlight key considerations for ALURE design and implementation. Workshop participants will be engaged in developing their own ALURE using a detailed checklist derived from our extensive experience supporting faculty in developing, implementing and evaluating ALUREs. *This project is supported by an Australian Office of Teaching and Learning Office Leadership for Excellence Grant (LE12-2279).* **References:** Kuh, G. 2008. High impact educational practices: What they are, who has access to them, and why they matter. New England Association of Schools and Colleges. http://www.neasc.org/downloads/aacu_high_impact_2008_final.pdf., A.-B., Laursen, S.L. and Seymour, E. (2006) Becoming a scientist: The role of undergraduate research in students' cognitive, personal, and professional development. Science Education 91: 36–74. Michael J. (2006) Where's the evidence that active learning works? Advances in Physiology Education 30: 159–167. Zimbardi, K., Bugarcic, A., Colthorpe, K., Good, J.P. and Lluka, L.J., (2013) A set of vertically integrated inquiry-based practical curricula that develop scientific thinking skills for large cohorts of undergraduate students. Advances in Physiology Education 37: 305-315. Luckie, D.B, Aubry, J.R., Marengo, B.J., Rivkin, A.M., Foos, L.A. and Maleszewski JJ. (2012) Less teaching, more learning: 10-yr study supports increasing student learning through less coverage and more inquiry. Advances in Physiology Education 36: 325–335. Zimbardi, K., and Myatt, P (2012). Embedding undergraduate research experiences within the curriculum: a cross-disciplinary study of the key characteristics guiding implementation. Studies in Higher Education, doi:10.1080/03075079.2011.651448.

17.0 BEST PRACTICES IN UNDERGRADUATE PHYSIOLOGY

17.1

MEASURING DYNAMIC KIDNEY FUNCTION IN AN UNDERGRADUATE PHYSIOLOGY LAB

Scott Medler and Frederick Harrington
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Most undergraduate physiology labs are very limited in how they treat renal physiology. It is common to find teaching labs equipped with the capability for high-resolution digital recordings of physiological functions, but most urinary labs still rely on a 'dip-stick' approach of urinalysis. Although this technique can provide some basic insight into the functioning of the kidneys, it overlooks the dynamic processes of filtration, reabsorption, and secretion. In recent paper, we provided a straightforward approach of using renal clearance measurements to estimate glomerular filtration rate (GFR), fractional water reabsorption (FWR), glucose clearance, and other physiologically relevant parameters (Medler and Harrington, 2013). The estimated values from our measurements were in close agreement with those anticipated based on textbook parameters. For example, we found GFR to average 124 ± 45 mL/min, serum creatinine to be 1.23 ± 0.4 mg/dL, and FWR to be about 96.8%. Furthermore, analyses for the class data revealed significant correlations between parameters like FWR and urine concentration, providing opportunities to discuss urine concentrating mechanisms and other physiological processes. In the current presentation, we will provide additional data from our lab measurements, and will discuss trouble-shooting approaches for educators who are interested in implementing this lab exercise at their home institutions. **Reference:** Medler S, and Harrington, F (2013) Measuring dynamic kidney function in an undergraduate physic-ology laboratory. Advances in Physiology Education 37: 384-391.

17.2

IMPACT OF CO-ENROLLMENT IN COMPUTER-BASED HUMAN PHYSIOLOGY VIRTUAL LABORATORY ON STUDENTS' FINAL LECTURE COURSE GRADE: A PILOT STUDY

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At the University of Dayton, not all students who enroll in the upper-level Human Physiology lecture course are required to take the accompanying computer-based virtual laboratory (lab) course. This retrospective pilot study was conducted with institutional approval to examine if co-enrollment in lab had an impact on the final grade received in lecture. Final lecture course grades (as a percentage), lecture instructor, major, class year, and overall grade point average (GPA) were obtained for all students enrolled in both sections of lecture in Fall 2013 (n=55). Students were divided into four groups based on lecture instructor (I) and co-enrollment in lab: I-1, no lab (n=18); I-2, no lab (n=13); I-1, lab (n=13); I-2, lab (n=11). There was a significant main effect (P<0.05) of lecture instructor, but not enrollment in lab (P=0.79) on mean lecture grades; however, a trend was observed for the interaction of lecture instructor and enrollment in lab (P=0.10). This potential interaction may reflect a beneficial effect of continuity of lecture and lab format and presentation, as I-1 was also the instructor of both lab sections. GPA was highly correlated with lecture grade (ρ=0.81, P<0.001) whereas enrollment in lab was not (ρ=0.04, P=0.75). This initial small sample pilot study does not suggest a significant beneficial impact of co-enrollment in lab on lecture grades. However, a trend towards increased performance in lecture when enrolled in lab with the same instructor was identified and merits further examination with a larger sample.

17.3

A SERVICE-LEARNING PROJECT: STUDENTS TEACHING A BODY SYSTEM LESSON IN THE COMMUNITY

Christy Donmoyer
Allegheny Coll.

For five semesters, undergraduate students in Animal Physiology at Allegheny College have performed a 2- or 3-person service-learning project that involves presenting a lesson on a body system in a local classroom. This project is the culmination of three projects entitled Communicating Physiology, in which students practice explaining physiology concepts to others. The service-learning lesson is arranged with one of about six local teachers, often health and physical education elementary school teachers. To prepare students for their service, they are introduced to service-learning (our working definition: a combination of classroom learning and meaningful community service). We ask students to be ambassadors of the college during their presentations (be professional and treat community members with respect), and we discuss perceptions of and interactions between college and community members. Students consult with the local teacher and plan the age-appropriate lesson using various resources; activities are encouraged but using Powerpoint is not allowed. By combining critical thinking and personal reflection, this project develops a heightened sense of community, civic engagement, and personal responsibility. In their graded reflection essays, students comment on their expectations as well as what they learned from the experience.

17.4

LEARNING IS PHUN

Ibarra, J.M.
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Academic service learning projects (SLP) provide a service to a community, while simultaneously offering students service experience, enhancing their understanding of course concepts, providing a valuable learning experience, and encouraging discussion. More importantly, SLP help to cultivate the development of the whole person and foster life-long learning, in line with university missions seeking to educate students to become concerned and enlightened citizens. To introduce service learning to undergraduates, physiology students were invited to participate in Physiology Understanding (PhUn) Week, a K-12 science outreach program of the American Physiological Society. The goal was to take students outside the walls of the classroom and place them in two very diverse middle school environments to conducting science outreach with 7-8th grade students. During the events, physiology undergraduate students directed PhUn Week participants, organized into small groups, with physiology, hands-on activities lasting 10-15 minutes each. The service experience permitted students to deepen learning, apply concepts learned in the classroom, work with diverse students in the community, increase their knowledge of self and their community, test their values and beliefs, and challenged them to live out the mission of the university. In conclusion, PhUn Week placed physiology students in situations where learning and personal growth occurred.

17.5

ENHANCING STUDENT LEARNING IN HUMAN PHYSIOLOGY

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This project was undertaken to expose undergraduate students to human physiological experiments and to expand student learning beyond labs performed during our weekly laboratory setting. Honors students enrolled in Human Physiology at Central College were given the opportunity to register for and receive an additional honors credit for laboratory experiments they performed above and beyond regular lab sessions during the semester. Students were able to further utilize physiological systems and learn about experiments beyond concepts that are discussed during lecture. Students were able to utilize lab techniques learned in the regular class time and apply them to experiences outside of class. Students performed labs on electromyography, electroencephalography, muscle contraction, and the cardiovascular effects of exercise using a wireless heart rate device. The data and reports from the labs conducted by the Honors students have been compiled to determine the feasibility of adding additional labs to the regular semester schedule. Through this project, the goal was to have students continue to be interested in physiology and collect viable data that could be used for future Honors Projects. Funding was provided by the Central College Research and Development Committee and the Biology Department at Central College.

17.6

ADDRESSING GASTROINTESTINAL PHYSIOLOGY LEARNING BY MEANS OF QUICK AND ENJOYABLE HANDS-ON ACTIVITIES

Camilo Lellis-Santos[1,2], Lucas Carminatti Pantaleão[2], João L. Carvalho-de-Souza[2], Mauro Leonelli[2], Adriana C. Levada[3], Darine C. M. Villela[2], Luciana C. Caperuto[1], Silvana Bordin[2].
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Most of the Gastrointestinal Physiology contents are reduced to memorization and the ability to precisely distinguish the function and integration of each gastrointestinal segment is lacking in several short courses, such as Physical Education. This work shares ideas to encompass the major topics of Gastrointestinal Physiology (digestion, secretion, and motility) through dynamic, enjoyable and ludic hands-on activities. In order to emphasize and allow comprehension of the sources of synthesis and target organs/cells of digestive secretion (enzymes, hormones and HCl), photos of the students carrying colored balloons and posters representing respectively substances and organs/cells were taken before and after a simulation of food translocation along the tract. Pre- and post-pictures were displayed for comparison and discussion. Regarding intestinal absorption and secretion, after small intestine segment isolation from rats, luminal liquid was quantified after injection of distilled water, 0.9% or 3% sodium chloride. Finally, gastrointestinal motility was observed after gavage of starch porridge and activated carbon in mice previously treated with saline, pilocarpine and adrenaline. Photos were taken to avoid further euthanasia. The enrollment of students was massive due to its elucidative and dynamic integration of theory topics and practical lessons. Funding sources: FAPESP and CNPq.

17.7

THE TROUBLE WITH THE LEVATOR LABII SUPERIORIS ALAQUE NASI

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For many students, the sheer volume of unfamiliar terms, lengthy Latin epithets and other jargon are the greatest challenges of studying anatomy. Moreover, a trending decline in the study of Classics likely exacerbates the linguistic impediment. The semantics of anatomical language are often marginalized in course curricula; yet, instructors believing that students benefit from an understanding of etymology still emphasize root meanings to develop anatomical fluency. The anatomy instructor is in this sense a teacher of foreign language. The teaching of anatomy has become a focus of scholarship and renovation, especially in the last decade. This recent trend in pedagogical consideration is mirrored in the field of foreign language education too, where dramatic advances have been made with astounding success. As

linguistic apprehension may represent a rate-limiting obstacle in anatomy learning, we looked to the literature of foreign language education for best practices which can be adapted for anatomy instruction. Herein we describe repurposed best practices for the anatomy classroom and report success in using these approaches.

17.8
CHARACTERIZATION OF A 'FLIPPED' VERSION OF VERTEBRATE NEUROPHYSIOLOGY

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Here we assess a 'flipped' upper level undergraduate elective, Vertebrate Neurophysiology, at San José State University (45 students, Spring 2014). Students watched 12 video lectures at home (10-20 min each). Class time was used to review material that students struggled with, as assessed by their responses to an online quiz due after every video. The remainder of time was spent reinforcing the material using virtual lab activities, discussing primary research or popular science articles related to the topic and group problem solving. We will report data collected with the Real-time Instructor Observation Protocol (RIOT)(*1*) that quantitatively describes the amount of time spent in different forms of student engagement. Preliminarily, about half the class time is spent reviewing content to the whole class using closed dialogue (teacher controlled conversation using questions instead of direct explanations) and the remainder of time on collaborative group work. We will also report video usage data from YouTube and student self-reports. Videos are predominantly viewed a few days before the quiz is due (~69 views) and a few days before the exam (~42 views). Student opinions of the effect of the flipped classroom on their perception of the learning climate will be assessed using modified items from the Learning Climate Questionnaire. This work was funded by a SJSU Provost's Innovative Teaching Course Redesign Grant to KAW. **References:** 1.E. A. West, C. A. Paul, D. Webb, W. H. Potter, Variation of instructor-student interactions in an introductory interactive physics course. Physical Review Special Topics-Physics Education Research 9, 010109 (03/22/, 2013).

17.9
NEGATIVE FEEDBACK IN THE HYPOTHALAMIC-PITUITARY-TARGET ORGAN AXES: AN INTERACTIVE CLASS ACTIVITY

Kerry Hull
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Homeostasis and negative feedback are crucial, yet difficult, concepts for undergraduates. This interactive activity was designed to 1. Reveal how negative feedback can restore homeostasis following transient disturbances, and 2. help students predict the effect of over- or under-activity of one element on the other elements of the axis. Student volunteers used instruments to represent the output of the hypothalamus (drum), anterior pituitary (AP; clapper), and target gland (clanger). The other students were divided into three support groups. In the simulation, the hypothalamic output (say, two taps) determined the AP output, which, in turn determined the target gland output. The hypothalamus compared its set point (say, two taps) with the target gland output and modulated its output accordingly. Next, the instructor suggested perturbations to the system, such as an altered set point. Working with their support groups, volunteers predicted how each output would change, and restarted the simulation. To address the second goal, audience members simulated tumors by playing extra instruments, or one of the volunteers would cease to function. Again, students predicted how the system would respond. Students found the activity useful and enjoyable, and a subsequent exam question showed that 45/47 students were able to predict the effect of a perturbation in one element on the other axis elements. In summary, this simulation effectively promotes student understanding of negative feedback and homeostasis without consuming excessive lecture or laboratory time.

17.10
THE "DISEASE PROJECT": BRINGING MEANING TO HUMAN BIOLOGY FOR NON-MAJORS

Kathleen Petri Seiler
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Undergraduates who are required to take a science course as a graduation requirement often do not understand why they must take a science course and what benefit this has for them. In a general education Human Biology science course at Champlain College, students are given a semester-long research assignment called "The Disease Project," where they choose a human disease or disorder to research. Students are encouraged to choose a disease with personal relevance. The assignment proceeds in three stages: 1) choosing the disease topic and finding a reliable general overview article about the disease; 2) answering outline questions requiring literature-based research about all aspects of the disease including its biological basis, its medical diagnosis and treatment, societal perceptions of the disease and requiring the student to express how they would advocate for themselves or a loved one with the disease; and 3) a final written and oral presentation open in format to communicate the outline information to an audience of peers. Informal student feedback of the project shows that students find enormous personal benefit from the assignment and that they are able to use the assignment to apply concepts from the course lectures and laboratories into their understanding of disease and human health.

22.0 PLENARY LECTURE VI

22.1
PUBLISHING YOUR EDUCATIONAL RESEARCH

[1]Robert G Carroll, [2]Jean A. Cardinale, [3]Douglas Curran- Everett
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Conducting quality educational research provides insight into how to improve your teaching. Publication of that research in a peer reviewed journal extends its impact to a wider audience, documenting your educational scholarship. Peer review evaluation of submitted manuscripts focuses on the quality and novelty of educational question, the appropriateness of the experimental design, the ethical conduct of the study, analysis of the results, and the discussion of the results in context of the existing educational knowledge. The American Physiological Society has developed programs on "Writing and Reviewing for Scientific Journals" as part of their Professional Skills Training program. This workshop will expand on that program to provide specific guidance from the editors of two discipline-specific educational journals to guide authors preparing manuscripts for submission. The ups and downs of peer review. Dale J. Benos, Edlira Bashari, Jose M. Chaves, Amit Gaggar, Niren Kapoor, Martin LaFrance, Robert Mans, David Mayhew, Sara McGowan, Abigail Polter, Yawar Qadri, Shanta Sarfare, Kevin Schultz, Ryan Splittgerber, Jason Stephenson, Cristy Tower, R. Grace Walton and Alexander Zotov. Advan in Physiol Edu June 2007 31:145-152. This article traces the evolution of the peer review system and its role in evaluating the quality of submitted manuscripts. Doing and Reporting Educational Research. Joel Michael. Advan in Physiol Edu September 2006 30:99. This article provides insights into the priorities of the reviewers of submitted manuscripts focused on education.

25.0 ASSESSMENT, PROGRAM, COURSE

25.1
DEVELOPING FRESHMAN RESEARCH SKILLS AND AN APPRECIATION OF THE SCIENTIFIC METHOD VIA A RESEARCH-BASED SEMINAR COURSE

Michelle B. French
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Most undergraduate science programs begin with introductory survey courses followed by more specialized courses in later years. The introductory courses, however, frequently omit descriptions of the research process that was used to obtain the knowledge being presented. Our aim was to introduce students to the research process and to help them acquire research skills early in their studies. To achieve this, a freshman course, modeled on one previously described with modifications[1], was developed in which two researchers in physiology each delivered a 50-minute, high-level research seminar. Each seminar was followed by a series of lectures, in-class group work sessions, problem sets and a written assignment. Problem set questions included:
draw a model based on evidence, describe a pathway in your own words, interpret a result, create a figure or design an experiment. To assess the effectiveness of the course in developing research skills, a short-answer test was adminis-tered on both the first and last day of class. When the pre- and post-course scores were analyzed, students were found to have statistically significant im-provements in questions related to the format and content of scientific liter-ature and to the interpretation and analysis of data. In addition, two thirds of the students in the class applied to take a second-year independent research course. In course evaluations, all of the students stated that the course deepened their understanding of the subject matter and that it was intel-lectually stimulating. [1]Clark IE 2009 PLoS Biology 7:1.

25.2
AN HISTORICAL STUDY OF TEACHING PHYSIOLOGY TO SCIENCE-ILLITERATE STUDENTS IN EIGHTEENTH-CENTURY FRANCE

Trudy L. Witt, Ph.D.
Germanna Community Coll., Fredericksburg, VA

In August 1767 King Louis XV of France appointed Madame du Coudray, a 52-year-old midwife, to teach midwifery "throughout the whole extent of the Realm." In so doing, he acknowledged the "science and experience" and "high degree of perfection" that she had obtained in midwifery. For 20 years Madame du Coudray traveled throughout France teaching midwifery to thousands of illiterate peasant women. How did she teach women who had no previous experience with science? Could modern physiology educators learn from her methods? This study addresses these questions by studying her tools: a set of 26 teaching illustrations, a mannequin which served as an obstetric simulator, and a manual which contained her lectures. The illustrations were analyzed using Tufte's theory of graphic design. This analysis revealed that they are excellent examples of scientific graphic illustrations and surprisingly truthful according to modern medical standards. The features of the mannequin were studied for their potential use for active learning. This study revealed that the mannequin had good fidelity, and could have been used for active learning. The manual was content analyzed for teaching methods. This study revealed that Madame du Coudray's method of teaching relied heavily on applications to real-world situations. In *Vision and Change: A Call for Action*, the AAAS recommends that today's life science students be engaged as "active participants" and learn from "real-world examples on a regular basis". It appears that modern physiology instructors could learn much from Madame du Coudray.

25.3
CURRICULUM RESTRUCTURING FOR A SYSTEMS PHYSIOLOGY MAJOR

S.L. Cargill
San José State Univ., San Jose, CA.

The systems physiology major at San José State University traditionally has been a combination of courses pulled from offerings throughout our somewhat broad Biology Department curriculum. While this somewhat haphazard combination of courses has served students in the past, there was a strong desire by faculty to reorganize the degree into a physiology centered curriculum where a diverse population of students has the opportunity to select courses relevant to each student's career path. In addition to creating a degree with increased physiology content a second goal was to align the curriculum with the Vision and Change in Undergraduate Biology Education: A Call to Action final report of a national conference organized by the American Association for the Advancement of Science (Brewer and Smith, 2011). As part of this alignment we sought to offer students the opportunity to experience a deeper understanding into fewer topics reducing our number of survey courses and increasing our number of individual discipline courses. Lastly, we have developed a capstone course that incorporates scientific reading and writing skills where students will present a journal article, write a review paper, and work in a group to pitch a grant idea where group members will incorporate experimental design, problem solving and critical thinking to move the proposed field of interest forward. This capstone course will also provide our program with the ability to perform a final assessment of our graduating student's skills. This reorganization was completed within our university's unit cap of 120 units including our campus specific requirement of 9 units of upper division GE courses.

25.4
A NATIONWIDE ASSESSMENT AND COMPARISON OF CURRICULUM REQUIREMENTS IN UNDERGRADUATE PHYSIOLOGY PROGRAMS

E.A. Wehrwein[1]*, J.M. Poteracki[1], D.J. McCann[2], E.J. Henriksen[3], M.L. Matyas[4], and J.R. Halliwill[5]
Dept. of Physiology: [1]Michigan State Univ., East Lansing, MI, [3]Univ. of Arizona Coll. of Med., Tucson, AZ, Dept, of Human Physiology: [2]Gonzaga Univ., Spokane, WA, [5]Univ. of Oregon, Eugene, OR, [4]American Physiological Society, Bethesda, MD.

There has been a recent growth and evolution of physiology as a stand-alone undergraduate major. A long-term goal of the current study is to build collaboration among such programs. To this end, we have compiled data on the number of B.S. programs in physiology in the United States and have done a review of the curricula for each program. We only included in this analysis the programs that list "physiology" in the name of the undergraduate major or offer a clear specialization in that area. At this time we did not include programs in exercise physiology, kinesiology, or general biomedical/health science programs despite the obvious overlap. We have identified 25 programs for this study: 19 B.S. programs in physiology (physiology, integrative physiology, human physiology, etc) and 6 programs in biology with a track emphasizing physiology. The curricular assessment was done for entire programs including: introductory core curriculum requirements (biology and labs, chemistry and labs, physics and labs, anatomy and labs, physiology and labs, math, and other) and upper division requirements (physiology and labs, anatomy and labs, biochemistry, electives, and other). We hope that this assessment of programs is the start of a fruitful discussion and collaboration among peer programs, and offers useful information for the common benefit of all B.S. programs in the discipline.

25.5
(SANDARS 2009) PERSONAL DEVELOPMENT REVIEW (PDR): AN EFFECTIVE STRATEGY TO ENHANCE DEEPER LEARNING

Pinjani, S. K.
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To weave in critical thinking and reflection in a two week face-to-face component of 'Advance Level Course on Teaching and Learning'; PDR was introduced through MOODLE using five questions framework. 1. Was there any "A - Ha…" moment, and why do you think so? 2. What feelings/images or questions emerge in your mind as you think deeply about the A hah… moment? 3. What was/ were today's key message(s) for you and why? 4. How might you change teaching / learning practices based on today's learning? 5. What would you like to further look up into this area? All participants n=28 were asked to write a daily log. Written feedback was provided on the developmental aspects of reflection(Moon 1999) and in the areas of interest and improvement. Each participant was asked to write summary highlighting Aha moments, learning and good practice they will carry with them from the face-to-face component. Participants were encouraged to write back in three months' time of their achievements. Qualitative analysis of written log showed the development of deeper reflection in various stages from simple description to analysis, integration of viewpoints and analysis including context to propose solutions. At three months, sixteen participants out of 28 wrote of their promotions and new roles. Others shared experiences of improving teaching practices. All appreciated PDR, as a benefit to organize learning, value of feedback to focus on the needs and flexibility to write in own time. PDR combined with feedback helped participants to internalize learning and apply it in the context. It also helped them to identify the needs and seek further guidance. No funding was required. **References:** Moon, J. A. (1999). Reflection in learning & professional development: Theory & practice, Psychology Press. Sandars, J. (2009). "The use of reflection in medical education: AMEE Guide No. 44." Medical teacher **31**(8): 685-695.

25.6
UNDERGRADUATE PHYSIOLOGY STUDENTS SUCCESSFULLY SELF-ASSESS ORAL FINAL EXAM PERFORMANCE

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Human Anatomy & Physiology, a one-semester advanced biology course at a small Midwestern liberal arts college, is designed to build "physiology intuition" by focusing on the application of core physiological concepts, rather than the memorization of information. To evaluate student knowledge, ability to apply core concepts, and communication skills, students complete an oral final exam. This exam consists of a student-professor meeting, during which the student describes a human that is optimized for a particular task (e.g., living at high altitudes, playing basketball), and the student responds to follow-up questions from the professor. To determine if student performance on the oral exam is correlated with student ability to assess his or her performance, participants (n=60) were asked to self-assess their oral exam performance, after the completion of the exam, but before they were informed of the grade determined by the professor. All participants were undergraduate students enrolled in four sections of Human Anatomy & Physiology in the spring semesters of 2011-13, and all had previously completed a midterm oral exam. Self-assessment scores were correlated directly to performance on the oral exam ($r = 0.52$, $p < 0.001$), with students that received a lower grade predicting a lower score ($p = 0.008$). Therefore, students, independent of their performance, accurately assessed their performance during the final oral exam. This indicates that students had a clear understanding of professor

expectations and the metacognitive ability to evaluate their performance in relationship to those expectations.

25.7

SCIENCE LITERATURE SEARCHING SKILLS IN FIRST-YEAR AND SENIOR UNDERGRADUATE BIOLOGY MAJORS

Jason M. Blank*, Karen J. McGaughey^, Elena L. Keeling*, and Jeanine M. Scaramozzino#.

Dept. of Biological Sci.*, Dept. of Statistics^, and Robert E. Kennedy Library#, California Poly. State Univ., San Luis Obispo, CA.

The ability to find, evaluate and use scientific literature is vital to trained scientists, but the integration of scientific literacy training in science curricula is inconsistent. To evaluate gains in science information literacy in undergraduate biology majors, first-year and senior students were provided with a survey including an open-ended prompt requiring them to access the literature on a given topic and identify relevant, peer-reviewed resources. The resources identified were scored on the basis of relevance and quality by a scorer who was blinded to the academic year of the subjects. Answers to additional questions evaluating subjects' awareness of the scientific literature were also scored and incorporated into a numerical score for each subject. Preliminary analysis suggests that senior students find higher quality resources and are better able to cite resources properly compared to first-year students. The survey will enable longitudinal assessment of individual students and could also be used to evaluate specific interventions to improve information literacy training. In addition, the survey and scoring strategy can be adapted easily to other topics, providing a tool for quantitative assessment of information literacy across scientific fields. A parallel survey will evaluate the ability to read and understand primary scientific literature in the same population.

25.8

ANIMAL PHYSIOLOGY FROM SCRATCH

K. Beth Beason-Abmayr and David R. Caprette.

Dept. of Biochemistry & Cell Biology, Rice Univ.

We used backward design to create a new, entirely student-centered cell and molecular animal physiology course that takes a functional approach to the content. Using an integrated, comparative approach emphasizing primary literature, students learn strategies that animals use to meet their energy needs, take up and transport oxygen, and maintain hydration and salt balance, even in extreme environments. With introductory biology for majors as the sole prerequisite, this elective course is accessible to freshmen through seniors. This first year we aim to understand student expectations and perspectives and evaluate learning gain and the impact of teamwork. We ask 1) Does participation in group-work and class discussions correlate with higher exam scores? 2) Do early students differ from students with more biology background in the ability to read and understand primary literature? 3) Do our teaching methods help students develop confidence, express enthusiasm and interest, and understand content? 4) Do students learn and retain the material without formal lectures? Group-work by teams of 4 students counts 25% of the course grade and includes activities in/out of class, class discussions, and a team project. Formative feedback includes course surveys, reflections, clicker questions, and minute questions. Exams consist of short answer questions at higher Bloom's levels, and some of the questions are open-ended. As we collect this semester's data, preliminary feedback has been positive, and we will share our findings on the poster. *All procedures were approved by the Institutional Review Board of Rice University (Protocol Number: 14-101E).*

25.9

ASSESSING ANATOMY AND PHYSIOLOGY LABORATORY LEARNING IN A MULTI-SECTION LABORATORY SETTING USING A BLACKBOARD-BASED BACKWARD DESIGN

M. Sah, D. Graesser, R. Filipovic, J. Medved, and X. Chen.

Physiology and Neurobiology, Univ. of Connecticut.

Laboratory courses serve as important gateways to STEM education. However, one of the challenges in assessing laboratory learning is to conduct meaningful and standardized practical exams especially for those large, multi-section laboratory courses. Lab practicals are traditionally operated by asking students to move from station to station to answer questions and to identify various tissues, and organs using different specimens. Our Anatomy and Physiology laboratory courses accommodate more than 1000 students each semester and previously uses this traditional approach to practical exams. With more than 20 graduate teaching assistants (TAs) involved in teaching our laboratory sections, assessments are likely to be handled inconsistently among different lab sections due to the TAs' drastic different backgrounds and prior teaching experience. In this study, we report our effort in improving the assessment component of these courses by i) aligning the assessments with well-defined laboratory learning objectives, ii) "blooming" up the practicals by testing higher order thinking skills, and iii) adopting a Blackboard-based online practical exam system. Preliminary data indicates that this assessment approach allows for assessment of more quantitative and practical skills, provides more transparent two-directional feedback and vastly improves consistency in assessment and grading among all lab sections. Funding source: The University of Connecticut College of Liberal Arts and Sciences, Department of Physiology and Neurobiology, and eCampus.

25.10

GROUP PEER EVALUATIONS USING BLACKBOARD

D.U. Silverthorn.

Univ. of Texas at Austin.

Peer evaluation is an important component of student group work. Our goal was to develop a peer evaluation method that would allow timely and honest feedback, protect privacy of the student evaluator, and minimize faculty grading time. The evaluation system in Blackboard uses the test manager template and can be easily copied or modified. The scores and commentary students give their partners are visible only to the instructors. The results download into Excel, which simplifies compilation of data. Students like the online system because of its ease of use and anonymity, and they give honest feedback. Instructors can identify problematic students early and provide counseling.

27.0 PLENARY VII

27.1

NATIONAL SCIENCE FOUNDATION OPPORTUNITIES TO PROMOTE STUDENT SUCCESS IN PHYSIOLOGY

Katherine J. Denniston

Div. of Undergraduate Edu., Natl. Sci. Fdn.

Both *Vision and Change in Undergraduate Biology Education: A Call to Action* (http://visionand-change.org/files/2011/03/Revised-Vision-and-Change-Final-Report.pdf), and the Association of American Medical Colleges/Howard Hughes Medical Institute (AAMC/HHMI) *Scientific Foundations for Future Physicians* report (https://www.aamc.org/download/271072/data/scientific-foundationsforfuturephysicians.pdf) clearly emphasize the importance of concepts in physiology to students preparing for careers in the biological sciences or a health field. As educators, we have a responsibility to support the success of these students as they strive to understand critical concepts and develop core competencies. This can be done most effectively when evidence-based pedagogical, curricular, and co-curricular strategies are practiced. The Division of Undergraduate Education (DUE) within the Education and Human Resources (EHR) Directorate at the National Science Foundation provides funding for projects that develop, implement, and study effective instructional practices, faculty development, and co-curricular student support mechanisms, as well as those designed to facilitate the wider dissemination and implementation of those practices. Relevant DUE programs, as well as funding from the Directorate for Biological Sciences (BIO), will be discussed.

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