



# 2018 APS Workshop

Institute on  
Teaching and Learning

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## Special Abstract Issue

### New Post-Doc: Relocating with Children

Ida T. Fonkoue



Ida T. Fonkoue

*Postdoctoral Fellow, Emory University*

“Take a deep breath! It won’t be easy but you will make it.” This might sound like a cliché, but I wish I had told myself this when I moved across the country a year ago to start a postdoctoral fellowship with two young children. When my academic journey began 6 years ago, I knew that moving—possibly multiple times—was going to be a part of my career. What I did not know was that my journey as a wife and a mother would not fit into the typical scientist pathway that I had

read about. I did not know that finding a good school for my children was going to weigh more in my decision-making process than a great program or a great research environment. I was far from imagining that before considering a postdoctoral offer, I needed to first research “niche” or “great schools” before looking at the future lab’s webpage. I was lucky to hit the jackpot, because I got both a great school for my children and a great research environment. Although a postdoctoral position is supposed to be temporary, a stepping-stone for your academic/non-academic career, the issues that arise when relocating with a family often do not differ.

#### How May Your Move Affect Your Finances?

Moving is ridiculously expensive, and doing so with a family adds to the financial burden. Going from the tip of Michigan’s Upper Peninsula to the southern state of Georgia was costly. It was not the first time my

family had relocated for a job, but it was the first time none of the expenses were covered or reimbursed. Moving a family that includes children across the U.S. can cost anywhere from \$5,000 to \$12,000 or more (4). As a post-doc, you will have to keep in mind that there is likely no moving allowance, start-up funds, or hiring bonuses included in your contract to help offset your moving expenses. Given that you may not be able to afford private schools for your children, you will need to find housing in a district with good public/charter schools. As you can imagine, this does not necessarily come cheap. Furthermore, a post-doc job requires 40+ hours of work per week; this means that you also need to think about childcare (after school or summer camp programs) for your children while you are at work. A post-doc relocating alone could probably live on rice and beans until the first salary comes, but as a scientist and a parent, you know that feeding your children a well-balanced meal and keeping them healthy is a requirement! To avoid going in the red before your first salary—which you will

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# APS News

## Renamed Travel Fellowship Honors Martin Frank's Commitment to Diversity in Physiology



Martin Frank

APS has renamed its longstanding Minority Travel Fellowship program after one of the program's greatest boosters: former APS Executive Director Martin Frank. Since its inception in 1987, the program—now known as the Martin Frank Diversity Travel (MFDT) Awards program—has made more than 800 travel awards to 542 undergraduate, graduate, and postdoctoral students and to faculty members.

During his tenure as executive director, Frank was a tireless advocate for advancing diversity and inclusion within APS. In addition to many efforts to increase opportunities for underrepresented researchers in physiology, Frank has also pledged funds to support future MFDT Awards and offered to match contributions up to \$40,000.

Travel fellowships are an effective model that allows professional societies to make a real difference. They catalyze the development of important professional networks for graduate and postdoctoral students in physiology that can increase retention in the field. The specific intent of the MFDT Awards is to increase active participation in and networking at APS meetings among trainees and early career faculty in groups traditionally underrepresented in STEM.

The MFDT Awards provide funds to attend EB and APS conferences. The next round of awards will be selected for the APS annual meeting at EB 2019 (application deadline November 21). Eligible researchers include graduate students, postdoctoral fellows, and early career faculty members (within 5 years of obtaining a PhD). Abstract submission is not required to apply.

Learn more information, including how to apply, on the MFDT Awards webpage ([the-aps.org/mfdt](http://the-aps.org/mfdt)). ●

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## A Note from Justin Chen, 2018 APS-Sponsored AAAS Mass Media Fellow



Justin Chen

*Justin Chen was chosen as the 2018 APS-sponsored AAAS Mass Media Fellow. He recently completed his PhD in the department of biology at Massachusetts Institute of Technology (MIT), where he used frog embryos to model human craniofacial development.*

*As part of the Fellowship, Chen spent his summer in the newsroom of science media outlet STAT News ([www.statnews.com](http://www.statnews.com)). At the end of his assignment, he wrote to let us know how it went and what he learned. His full letter follows.*

Dear American Physiological Society,

Thank you for sponsoring me as a AAAS Mass Media Fellow at STAT News. Writing for STAT, as well as discussing journalism with editors and reporters, has opened a new world to me. As a graduate student interested in science writing, it is unlikely that I could have found a similar experience on my own or through any other program.

Over the past 10 weeks, I not only improved technically as a writer but also learned to be more inquisitive and assertive. I believe that my work helped contribute to STAT's mission of informing the public of advances and controversies in life science and health news. Working at STAT and being an AAAS Mass Media Fellow has been a transformative experience, and I hope that you continue to sponsor fellows in the future.

I first heard of the AAAS Mass Media Science and Engineering Fellows Program during my third year at MIT as a PhD candidate in the biology department. The program seemed perfect for me. As an undergraduate, I had studied biology and creative writing and was conflicted on what kind of career to pursue; combining my two interests never occurred to me. I eventually decided to pursue research as a graduate student but soon realized that I preferred writing about science to performing experiments. I also felt that, although my research had the potential to help patients in the distant future, I was far removed from directly impacting

people or helping to inform the public on pressing issues involving biotech and health care.

Despite my interest in the program, it took 3 years (which were spent completing my PhD and navigating a difficult lab experience) for me to apply. During this time, the idea of science writing and becoming an AAAS Mass Media fellow buoyed me. I had made a few writing connections, but, in general, many of my advisors were either unable or unwilling to help me transition to a career outside of academia. I knew that the Fellowship was competitive and that the chances of my acceptance were slim, but it gave me something to work toward and the belief that I could pursue writing as a career.

Writing for STAT News has been worth the wait and surpassed my expectations. I have published a variety of articles on a broad range of topics. I covered studies on developing new treatments, including an oral form of insulin, smart pills that can help people take their medication on time, and cochlear implants that use light to activate auditory neurons. For longer pieces, I profiled companies and universities changing society and described the way science is performed. The subjects of these articles were a start-up company monitoring opioid use by measuring drug levels in city sewers, a biotech company screening mail-order DNA to increase safety, and Emory University's initiative to teach science to monks and nuns. There was also time for fun, as evidenced by an oral history of gene names that explained the story behind Sonic Hedgehog, Ken and Barbie, and Pray for Elves.

Through writing these articles, I learned to sift through information and prod interviewees to identify and concisely convey the heart of a story. I became more confident in my writing while also practicing how to improve through constructive criticism. My editor at STAT, Jason Ukman, empowered me to chase stories that I found interesting and was an amazing editor. Sometimes Jason would crystallize my thoughts, which I had struggled to convey over a few paragraphs, in just a few sentences. This was an eerie experience—it felt like he knew what I was trying to say better than I did—but it inspired me to constantly interrogate my writing.

My immediate plans after this summer are to start full-time employment as an external affairs associate at OpenBiome—a nonprofit stool bank. OpenBiome’s dual mission is to enable fecal microbiota transplantation, an unusual but life-saving procedure for patients with antibiotic-resistant *C. difficile*, and support research on the microbiome.

In my new position, I will help communicate OpenBiome’s mission to a variety of audiences, including the public, patients, doctors, government officials, and scientists. I will help write social media posts, newsletters, white papers, and academic articles. During these activities, I will rely on the confidence and skills I’ve learned during the Fellowship.

I have also spoken with editors at STAT who are interested in maintaining a relationship through freelance opportunities.

Finally, through the Fellowship program, I have gained a support network comprised of other past and present

Mass Media Fellows. Although [my current Fellowship colleagues and I] have only spent a few days together, we have been communicating ideas, hopes, failures, successes, and support via [the Slack app]. Together, we’ve written or produced more than 350 articles and videos. To us, science is not only a tool for solving global issues like climate change and new epidemics but also a source of wonder and inspiration that can encourage readers to be more curious and adventurous in their own lives.

Thank you again for sponsoring me and making this summer possible. Please let me know if you’d like to me write more about my experience for your newsletter or website. I’d be happy to help out in any way that I can.

**Sincerely,  
Justin Chen**

Read a selection of articles that Chen wrote for STAT News below. For a full list of all 13 of the articles he penned this summer, visit [www.statnews.com](http://www.statnews.com) and search “Justin Chen.”

1. With new advances, scientists and drug makers reach for ‘holy grail’ of diabetes treatment. <https://www.statnews.com/2018/06/25/insulin-diabetes-oral-delivery>
2. Adherence to PrEP, the HIV prevention drug, is low. A new study suggests a pill with a tiny sensor might help. <https://www.statnews.com/2018/07/24/digital-pill-prep-truvada>
3. For life’s big questions, Tibetan Buddhist monks and nuns try a scientific approach. <https://www.statnews.com/2018/07/26/tibetan-buddhist-monks-and-nuns-try-a-scientific-approach>
4. Sonic hedgehog and Beethoven: an oral history of how some genes got their names. <https://www.statnews.com/2018/07/16/gene-names-oral-history>
5. Scientists can track the spread of opioids in sewers. But do cities want to know what lies below? <https://www.statnews.com/2018/06/26/wastewater-epidemiology-biobot-opioids>

## Arthur C. Guyton Educator of the Year Award 2018

Jonathan D. Kibble



Jonathan D. Kibble

### Teaching Philosophy

The nearest I came to interacting with Dr. Guyton was through his medical physiology textbook. Winter evenings in 1989 were spent with his weighty seventh edition, trying to wrap my mind around all those pressures, volumes, and feedback loops. Like millions of other students, my first tentative steps in

physiology included Dr. Guyton

as a guide. I still enjoy my Guyton & Hall textbook, which is now in a lean 13th edition with all manner of engaging supplements. Thank you to the book's publisher, Elsevier, and to the APS for maintaining a Guyton Award that recognizes the work of physiology educators, and thank you to the selection committee for this honor.

I have been teaching physiology for 22 years, which is not long enough to have a conclusive teaching philosophy. Nevertheless, if you join me for this half-time talk, I will happily share a few thoughts. I quickly learned that a lot of clever people had been thinking about teaching and learning before I came along. As a result, the core of my philosophy is *Stand on the Shoulders of Giants*. In my first year as a full-time physiology educator, I became a colleague of Penny Hansen, one such friendly giant, and a former Guyton awardee, who shared three golden nuggets: 1) telling is not teaching, 2) it is not about me, and 3) my classroom is my laboratory. Fifteen years later, my philosophies are continuously being shaped by the process of unpacking these gems. Let's see what progress I am making.

*Telling is not teaching* seemed to suggest that lecturing was not the way to go. That burned. I was getting pretty good at lecturing. I knew this must be so because student evaluations confirmed I was providing exactly what they needed to know. How disappointing to find out a year later that students had forgotten most of what I had covered. I had taught but they had not learned. Ergo, had I taught? I discovered the work of Joel Michael and Harold Modell, and countless other investigators, who were confirming

the truth in Penny's statement. Well, if telling is not teaching, then what is? Tackling this in a literal way has led me to experiment with several different active-learning pedagogies and up a steep learning curve to reach three philosophical positions:

- 1) The purpose of teaching is to optimize conditions for learning.
- 2) If I am the hardest working person in the room, something has gone wrong (see student-centered learning below).
- 3) If learning has occurred, then I should be able to detect a lasting change in student knowledge, skills, or behavior.

These days, I try to start by reading about best practices in the area of interest, and I rely less on the feelings from my small intestine to inform my level of success. I have included a *Reading List* of few favorite papers at the end of this article that I have found to be helpful.

Onward to the second Hansenism: *It is not about me*. On the face of it, this seems simple: the good teacher cares first about student success; the good teacher is focused on student learning outcomes, not personal performance; and the good teacher wants to facilitate personal growth in learners, perhaps even for the betterment society. When it is not about me, the learning becomes student-centered. In this philosophy, our goal is to develop learner independence and problem solving. Learners need some autonomy to determine their own path of learning, instead of us dictating what, where, when and how something must be learned. However, we must be careful not to confuse a student-centered approach with a student-as-customer approach. Entitlement and a lack of student experience of active learning are among the challenges we often face when attempting to foster student-centered learning. Students pay high tuition fees, and the implicit deal is that the teacher is responsible for their success and that learning should not be too onerous, right? The discoveries that learning is likely to be a struggle and that the teacher is not always going to tell you what you need to know can jeopardize ratings. If I take over the responsibility for student learning or, worse,

if I lower standards to bolster my ratings, it becomes about me again, and student learning suffers. There are darker sides still when education becomes all about the teacher. What if I disrupt the appropriate learning sequence by changing class activities to fit my research commitments? What if I undermine the defensibility of a test result by keeping questions that should be thrown out because, darn it, I taught that material even if those defective students did not learn it? Given the obvious power imbalance in the classroom, what lasting impact does it have if I close a class discussion down by interjecting a definitive opinion or, worse, expose biases I might harbor about race, gender, or politics? Truly, it must not be about me or learning will suffer. Okay, Penny was right in so many ways here, but I am preaching. I will let you into a secret. I do sometimes enjoy being the “Sage on the Stage.” I find it flattering when students laugh at my jokes and I do like it when they say nice things about me on evaluations. In fact, you are positively making my head swell by naming me Guyton Educator of the Year! But here lies the danger, because whenever my ego takes over, my decisions become tainted by the fear of personal failure and I lose my focus on student learning.

Reflective practice is a good way to avoid some of the aforementioned pitfalls. Let me give an example. During this past year, I replaced a block of lectures in my first-year medical school class with some online self-learning resources. I planned and team-taught a session with a physician at the end of the block in which teams of students were made accountable for their independent learning by working with a real patient. Using skills learned in their clinical skills course, students first completed a medical interview and proposed differential diagnoses. After some debriefing from the physician, students had two further tasks: first, to explain to the patient the nature of their disease and why they were experiencing symptoms and, second, to provide a telephone summary of the case to another physician. Looking at the success of this change in pedagogy through the student lens, evaluation scores were 10–15% lower than prior years. Some specific improvements were suggested, but some students were just annoyed at the lack of lectures. Looking through the faculty lens, it took a similar amount of work to create and plan the session and self-learning resources as a lecture sequence would take. Team-teaching was also a lot of fun and gave me the precious opportunity to debrief with a colleague. We directly observed students transfer knowledge into action as well as their application of clinical skills. Of note, a few weeks later the students performed as well as before on

the traditional multiple-choice final exam. On reflection, I concluded that my three benchmarks were met: conditions for meaningful learning had been created, students were the ones working hard in the classroom, and evidence of learning gains was gathered. The sum of my reflection was that the learning outcomes justify staying with the active-learning approach for future classes, despite some decline in student ratings.

To both of my remaining readers, thank you for indulging me, but it is really time you got back to work, so let's finish up with the third law of Hansen: *My classroom is my laboratory*. As trained scientists, we should bring our innate sense of curiosity to the classroom. We should apply the same level of scholarly preparation to our teaching as we do to our bench research. We might even consider our educational interventions as experiments, designed to seek answers about what really works. However, I have discovered this is harder than it sounds. As scientists, we were trained in the ways of positivism, meaning the only valid knowledge derives from empirical data and measurable observation. This leads us to develop null hypotheses, compare quantitative differences between treatment and control groups, declare logical conclusions, and demand the reproducibility and generalizability of findings. All fine things in science, but students are people, and people are complicated. We usually do not have the luxury of control groups during a real class, and many of the variables are hard to quantify (e.g., affect, motivation, and professionalism). Accessible measures of learning outcomes such as test scores are the result of the interaction of numerous sources of variance, making it hard to interpret the effect size of our experimental intervention. As physiologists, we are faced with a need to add more strings to our bows, or even the need to learn to play a whole new instrument! We need to embrace the learning theories behind what we are doing, and learn different non-experimental research designs and how to write surveys or apply qualitative research methods. Joel Michael did a qualitative study more than 10 years ago asking about barriers to active learning (Michael J. *College Teaching* 55: 42–47, 2007). He identified general pedagogical barriers such as the nature of classrooms as well as student and teacher characteristics. Among his conclusions was a call to increase the scholarship of teaching: “Teaching needs to be treated like any other scholarly activity, carried out in a public arena in which ideas and innovations are open to scrutiny and debate. This way, each of us as teachers can draw on the collective wisdom and insights of our colleagues to make our classrooms more effective

in helping students learn.” Evidently, the philosophies of giants align on the importance of scholarship in teaching. As usual, this is not my idea, but placing scholarship at the center of teaching practice has become a guiding principle. Building on those who have gone before, I see community standards and best practices now emerging for pedagogy, instructional design, and assessment.

I will end with a thank you to one last giant, my PhD supervisor Roger Green, without doubt a giant of intellect, integrity, humor, and professionalism. The learning environment he provided not only allowed me to learn a lot about kidneys but forever changed me as a person. Now that’s a teacher!

That is the end of the philosophy part but, as promised, below are a few favorites from my reading list.

### Reading List

1. Sweller J, Van Merriënboer JJ, Paas FGWC. Cognitive architecture and instructional design. *Educ Psychol Rev* 10: 251–296, 1998. [Sweller describes Cognitive Load Theory, which relates to leveraging the processes of how memories are formed by minimizing “extraneous load” and maximizing “germane load.”]
2. Mayer RE. Applying the science of learning to medical education. *Med Educ* 44: 543–549, 2010. [Mayer applies cognitive learning theory to multimedia learning and introduces the idea that there are verbal and pictorial pathways for information processing that we can leverage in designing effective learning materials].
3. Brown PC, Roediger (III) HL, McDaniel MA. *Make It Stick: the Science of Successful Learning*. Cambridge, MA: The Belknap Press of Harvard Univ. Press, 2014. [Great overview of learning techniques that enhance memory, including retrieval practice, spacing effect, and mixed practice effect. Good chapters on reasons why effortful learning is so important and includes some nice practical advice for learners.]
4. Bjork, RA, Dunlosky J, Kornell N. Self-regulated learning: beliefs, techniques, and illusions. *Ann Rev Psychol* 64: 417–444, 2013. [Covers some similar ground to *Make it Stick* but elaborates on ways in which learners’ judgements of their learning are often wrong and why this can lead to poor decisions about how to study. Concepts of self-monitoring and self-regulated learning are introduced.]
5. Zimmerman BJ. Self-regulated learning and academic achievement: an overview. *Educ Psychol* 25: 1, 3–17, 1990. [This is the first paper I read about self-regulated learning when I was thinking about data showing that students who did poorly in my class tended not to use self-assessment quizzes. It introduced me to the idea of metacognition, i.e., the knowledge a learner has about their cognitive activities during the learning process as well as the level of skill they have in regulating cognitive activity. Ideal learners have high levels of intrinsic motivation, set goals, monitor progress through self-assessments, and embrace feedback to guide regulation of their effort and study strategies. As Harold Modell rightly reminds us, *Helping the Learner to Learn* is where the action is!].
6. Ericsson KA, Krampe RT, Tesch-Römer C. The role of deliberate practice in the acquisition of expert performance. *Psychol Rev* 100: 363–406, 1993. [I was drawn to this paper seeking a fast track to improving my expertise as a novice faculty member, but it proves to be valuable in many learning contexts. Observed performance is not a function of longevity of professional experience but can be linked to a commitment to engage in deliberate practice—the intentional focus on improving task performance, receptivity to feedback, time to problem solve, and opportunities to repeatedly practice. If at first you do not succeed...]
7. Brookfield SD. *Becoming a Critically Reflective Teacher* (2nd ed.). San Francisco, CA: Jossey-Bass, 2017. [Recently updated second edition, suggests we view our teaching practice through four lenses: student feedback (ideally during a course not after it), faculty feedback, personal experience, and learning theories. I especially like the part noting that this balanced reflection has a protective effect against “self-laceration,” i.e., not feeling guilty for our self-perceived “pedagogic incompetence.”]
8. Kay D, Kibble JD. Learning theories 101: application to everyday teaching and scholarship. *Adv Physiol Educ* 40: 17–25, 2016. [Shameless self-promotion! Actually, I just sprinkled in some physiology context to a nice introduction to learning theories that Denise Kay mapped out. I include this paper because I personally found “Educationese” a hard language to follow when first trying to read about learning theory, and I think Denise has produced an accessible starting point in this short review.]



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#### 2019

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## Continued from page 263: New Post-Doc: Relocating with Children

get probably after being on the job for a month—you will have to think strategically, plan accordingly and accept all the help you can get from your family and friends (3). I was fortunate to have my husband's support throughout the moving process, financially and physically. We cut down on moving costs by packing our house ourselves with the help of great friends. Most importantly, my husband took a sabbatical for a year and worked from home to take care of the kids; this gave them a better transition into their new lives, allowed us to save money on childcare, and gave me more time to spend at work. Fellow post-docs, your situation might be different from mine, but I can tell you that it gets better, and, in the end, it's all worth it.

### How May Your Move Affect You?

When you move, you leave your social support network—friends and family—behind. When I started my PhD program with two children under the age of 4, I needed a lot of extra help and support in addition to what my husband provided, and fortunately for me, my friends and church community stepped in. Without them, I don't think I could have completed my dissertation. Moving away for my post-doc severed those connections that I had relied on for years, which opened the door to anxiety. Moving and changing jobs are major life stressors (1, 2), and without a network of support, they can result in depression or health issues. My advice is that, despite the demands of a new job and a new environment, you should stay connected to your family and friends via mail, phone, and new technologies. In the meantime, it is important to make connections with other post-docs in your department or university—old and new—and learn how they cope with the stress of the job. Talk to parents you meet at the park and if your children are in school, make time to attend parents' meetings, and connect with other working parents. You might be surprised to find out that you are not the only post-doc or parent who recently moved far from everybody they knew and depended on. Be patient and get to know the people you meet. Be open to making new friends and embrace your new environment. One year later, I have been able to build some good friendships, and you will too!

### How May Your Move Affect Your Family?

As hard as the move could be for you, it cannot compare to the feeling of "rupture" your family will feel. You moved for the job while they moved for you. My children felt ripped from their friends and the only community they knew, and they reminded me of this for months following our move. But you shouldn't worry too much about this. Children tend to adapt faster and better.

Mine have since made new friends and best friends. Whether your partner is in academia or not, moving is logistically difficult for families that depend on two incomes. Finding a job for your spouse can be difficult to impossible, thereby putting a strain on your relationship and finances. I had a different situation because my husband was still receiving a salary while on leave, but I am aware that this is more of an exception than the rule. Although a post-doc position does not come with help for spousal accommodation, your new principal investigator (PI) might be able to connect you with people who can help. Just remember to express your needs and ask for help as soon as you start considering the offer. Your partner might also join you on your campus visit to explore the area for opportunities. Don't forget to check the weather! If you are a family that enjoys outdoor activities and the weather in your new town is drastically different from that of the previous location, as in my case, you will have to learn as a family to adapt to the change and find new hobbies. Just remember that every change is an opportunity for discovery, and this one is not different. My family and I have been enjoying all the great attractions our new community has to offer. We feel lucky to have moved to a place with great diversity, vibrant cultural life, great food, and great scenery. The challenges and frustration your nuclear family will face, if they are not addressed, could be an added stress that will affect your productivity at work.

### How May Your Move Affect Your Position/Job?

It is not a secret that your state of mind dictates the state of your work. I spent a lot of time at work wondering whether I had made the right decision for my family. I had found a great school district for my children, but would that be enough? How would they adjust to their new school and their new environment? Would they make friends? Would their teachers be a good match? Thinking about those challenges, at times, took my focus away from my new job. Furthermore, the anxiety caused by uncertainty and lack of social support network threatened to cost me the job I had left everything for. I later found out that, while I was worrying, my family was having fun exploring the parks and trails, swimming, biking, and going on walks. As I said in the beginning, remember to take a deep breath and tell yourself that everything will be fine. You have been through challenging moments before (birth of your children, early parenthood, graduate school, dissertation, etc.), and you made it. This family relocation for your post-doc will soon be another challenge you conquered in your quest for the advancement of your career. Express your needs and obstacles early on to your partner, your PI, or the mentors you have. They all want you to succeed!

## What Did I Learn?

Start with the end in mind before accepting the position. Once you do, dive in and do not worry too much.

Do not get too excited, and do not make any promises. We all know the “what am I going to do when I graduate?” feeling, and because of that, we get very excited if we are lucky to meet a PI interested in us before our graduation. Be excited, but hold off on making promises you might not be able to keep if you don’t want to burn some bridges. Remember that even though the post-doc position is about you, your family’s needs and priorities are an important part of the decision-making process. If you are lucky enough to have more than one offer, pick the right one for your family, because if they are happy, chances are you will be happy too, and your productivity at work will really show it.

Talk to your family and make sure your partner and children are on-board. No matter how prestigious a PI, lab, or university is, your success there will depend in part on the support of your family. You will have to learn how to work in a new environment, with new people, and on new projects. It might come with a lot of frustration and uncertainty. Thus home needs to be a safe and happy place, because when you move, your nuclear family initially will be the only social network you will have for a while. Be supportive of each other! Relocating is difficult in many ways, especially for someone leaving everything for a partner’s new job.

Consult your advisor and mentors and listen carefully. It is true that not all graduate students have a great relationship with their advisors. If this is the case for you, my hope is that, during your PhD training, you met a great mentor who can guide you through this process. I was very fortunate to have an advisor who has been a role model for me as a scientist. His advice and gift to me was “work hard and dream big.” The training and work ethic he instilled in me have made this journey less difficult and a very rewarding one so far. Knowing that he is always one text or phone call away relieved some of my earliest anxiety. Through the American Physiological Society (APS) and Michigan Physiological Society, I also bonded with amazing female scientists who have become mentors and role models to me. One of them helped me figure out the type of questions I could ask before accepting an offer. She will remain a lifelong mentor.

Finally, choose a flexible PI. Regardless of her/his family situation, your post-doc mentor should be one who understands the complexities of who you are—parent first and scientist second. An amazing assistant professor I met recently told me something that described so well the physiologist I want to be. She said that she doesn’t want to be just a woman with children, but she wants to be a mother! There is a saying that “if you want to know somebody, ask the people they hang out with.” If you want to know a prospective boss, ask the people they work(ed) with (research coordinators, graduate students, and previous post-docs) and listen. The impression and feedback I got about my now post-doc mentor when I did the job interview and site visit remain the same 1 year later. We have a great working relationship and friendship. My PI understands that sometimes I can be late or absent for personal or family reasons. However, there is always an understanding that work needs to be done, papers have to be written, and grants submitted. After all, your own career depends on it.

In conclusion, I wish you, my fellow post-docs, the best of luck on your new and exciting academic journey. May you think about your family well-being, plan well, listen well, and carefully choose your new location, program, lab, and future mentor!

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# Committee Reports

## Awards Committee



Alexander Staruschenko, Chair

### Young Investigator Awards

APS Young Investigator Awards (YIA) comprise the Arthur Guyton Award for Excellence in Integrative Physiology, the Lazaro J. Mandel Award, the Shih Chun Wang Award, and the Dean Franklin Award. Only one award in each category is

given annually to an early career professional. In 2017,

the Committee received 22 applications for all four awards. The awards were presented at the 2018 Experimental Biology meeting. Many of the applicants for the YIAs were very impressive. The winners of the 2018 YIAs were:

- **Arthur C. Guyton Award for Excellence in Integrative Physiology:** Lauro Vianna (University of Brasília)
- **Dean Franklin Young Investigator Award:** Tengis Pavlov (Henry Ford Health System)
- **Lazaro J. Mandel Young Investigator Award:** Aaron Polichnowski (East Tennessee State University)
- **Shih-Chun Wang Young Investigator Award:** Colin Young, PhD (The George Washington University)

The number of applications has remained relatively stable over the past 3 years, but some decline was observed.

	2015	2016	2017
Arthur Guyton Award	7	9	7
Lazaro J. Mandel Award	7	2	4
Shih Chun Wang Award	8	5	7
Dean Franklin Award	13	8	7
<b>Total</b>	<b>35</b>	<b>25</b>	<b>22</b>

### Career Enhancement Awards

The RCEA (\$20,000) and TCEA (\$10,000) are offered once a year (deadline for this year was May 31, 2018) and are reviewed by the Awards Committee. In 2018, we have received 14 applications for RCEA and 9 applications for TCEA (to be reviewed).

**2017 RCEAs (total number of applications = 16).** The winners of the 2017 RCEA were:

- Eunhee Chung (University of Texas at San Antonio)
- Paige Geiger (University of Kansas Medical Center)
- Jaume Padilla (University of Missouri)
- William Schrage (University of Wisconsin-Madison)
- Alexander Staruschenko (Medical College of Wisconsin)

**2017 TCEAs (total number of applications = 4).** The winner of the 2017 TCEA were:

- Josef Brandauer (Gettysburg College)

**Award Committee Discussion** (during in person committee meeting at EB in San Diego). Main points of the discussion covered:

- 1) Promotion of the YIAs and RCEA/TCEA (APS listserv, Social media, personal communications).
- 2) Outcome and impact of the awards program.
- 3) Review of YIAs (ranking over scoring; discontinue detailed letters to applicants).

Council accepted the report of the Awards Committee. ●



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## Career Opportunities in Physiology Committee



Thomas A. Pressley, Chair

The Career Opportunities in Physiology Committee (COPC) serves as a resource for current information regarding career options in physiology, professional development at diverse levels, and fostering career interest in physiology.

### APS Careers Poster

Since 2012, COPC has been providing a poster promoting careers in physiology to encourage students to visit the APS website and attract students to physiology graduate work. A digital copy of the poster is available on the APS website.

### APS Career Cards

Based on feedback from teachers, the Committee replaced a career brochure previously distributed by the APS with trading cards describing the work of diverse physiologists (career stage, research area, gender, and racial/ethnic group). During each calendar year, a different group of scientists are featured in a new set of cards. These career cards provide an opportunity for greater interaction with students. If students go to the website on the card, they can answer a question about the physiologist on the card, unlocking an additional biography card that they can print out. Teachers also use 8"x11" versions when constructing STEM career bulletin boards. Overall, the cards offer a way to be more interactive with the students who receive them.

The APS has now published over two dozen career cards featuring members. Feedback has been very positive from both physiologists and teachers about the trading cards. They are distributed on demand when APS is contacted by members, teachers, and students. COPC coordinates with the Education Committee so that career cards can be distributed as part of PhUn Week activities. They are also given out at various education conferences and workshops. These distributions are usually followed by a spike in web traffic on the APS careers website, suggesting that links on the cards were used. In the past year, committee members John Henry Dasinger and Kelly Hyndman developed a Physio-Facts card featuring renal physiology. It joins the completed card on gastrointestinal physiology published last year.

Unfortunately, continued funding of the career cards was cut in 2018 as part of the change in priorities outlined in the recent APS Strategic Plan.

### Career Outreach Resources

The APS Careers Website was developed by the COPC and launched in March 2003. It provides extensive resources for two major purposes: 1) to assist students and new and experienced physiologists in the development of their careers; and 2) to help the general public gain a better understanding of the work that physiologists do. The site includes resources for elementary, middle/high school, undergraduate, graduate/professional, postdoctoral fellows, new investigators, established investigators, and the general public. Within each section, the user finds resource categories customized to their needs. The specific resources (such as biographies, hands-on experiments, career resources, etc.) are written at the appropriate educational level. It also serves as a dissemination site for the recordings of EB career-related sessions developed by the COPC, Women in Physiology, and Trainee Advisory Committees. It also includes hyperlinks for career development resources associated with each skill listed in the APS-ACDP List of Professional Skills. All resources on the site are cataloged in the Life Sciences Teaching Resource Community digital library and pushed to the website as a folder of resources, allowing new materials to easily be added to individual pages. Along similar lines, the Committee has developed APS Career Presentations that consist of downloadable PowerPoint files for use at the middle and high school levels, as well as lower and upper undergraduate levels.

### Career Development at Experimental Biology

In 2018, the APS adopted a new "Trainee Hour" format that consisted of three concurrent sessions for each of Sunday, Monday, and Tuesday mornings. Committee members Josef Brandauer and Bryan Becker chaired the COPC sessions collectively titled "Hallmarks of and Ground Rules for Productive Collaborations in Science." The sessions targeted scientists interested in initiating or optimizing active collaborations, and they were focused on addressing common challenges and conflicts inherent in collaborative work. Over the 3 days, a diverse panel of six experts with varied academic and industry experience spoke for about

20 minutes each (two panelists per session) and then participated in an ~20-min panel discussion/Q&A session. Given the early start time (7 AM), the sessions drew a good-sized group of about 120 attendees in total.

For 2019, Committee members Bryan Becker and Christopher Trimby will co-chair the COPC Symposium “The Hidden Job—Parts of a Physiology Career That You Might Not Know About.”

### Undergraduate Orientation Session at EB

Since 2008, all undergraduates who submit a first-author abstract to APS are invited to a special Saturday session. It is a joint project of COPC, Education, and Trainee Advisory Committees. The session includes “how-to” presentations on making the most of the EB meeting, giving a poster presentation, and introducing oneself. It has served as the formal recognition session for the fellowship programs, including UGSRF, UGREF, STRIDE, and IOSF Fellows. It also serves as informal recognition for the Barbara A. Horwitz/John M. Horowitz Abstract Awardees, as well as for the Video Contest award winners.

The EB 2018 orientation session was organized by committee members Kelly Hyndman and Josef Brandauer and attracted well over 100 undergraduate students. Members of the APS Executive Cabinet welcomed the undergraduate students and presented certificates to the UGSRF, UGREF, STRIDE, and IOSF Fellows. All three committees were well-represented, with multiple members attending to talk with the students during and after the session and to assist in distributing materials.

### Career Presentations at APS Conferences

Since 2006, the Committee has worked with the organizers of APS conferences and chapters to include career development sessions and/or activities at those meetings. These have included both informal sessions at the APS table/booth and formal sessions with a room assignment. The committee receives support from the APS for a workshop at one APS conference per year. COPC member Bryan Becker hosted a career/education workshop at the “Physiological and Pathophysiological Consequences of Sickle Cell Disease” conference held in Washington, DC, November 6–8, 2017. Several members of the Committee attended the “APS Institute on Teaching and Learning” held June 18–22, 2018 in Madison, WI. Much of this conference was devoted to career development and professional skills.

### Undergraduate Summer Research Fellowship Program

The APS Undergraduate Summer Research Fellowship (UGSRF) Program was established in 2000 with the goal “to excite and encourage undergraduate students worldwide to pursue a career as a basic research scientist.” It has developed into a flagship APS program with measurable objectives and influences hundreds of undergraduates. In its current form, the UGSRF Program supports up to 24 full-time undergraduate students annually to work in the laboratories of established investigators. Faculty sponsors/advisors must be active members of the APS in good standing. These fellowships provide a \$4,000 summer stipend to the student (10 weeks of support), a \$300 grant to the faculty sponsor/advisor, and a \$1,300 travel award/reimbursement for the students to attend and present their data (if appropriate) at EB. Financial support for the program is provided by the APS and the host laboratories. In addition to their laboratory work, the UGSRFs complete interactive online assignments that explore how to structure a research project/series of experiments and that explore/discuss physiology-related careers. These online activities and conversations are run on an online course management platform and have proven exceptional, with students discussing not only their research but also their hopes and concerns about their future careers and families.

In the application cycle for 2018, 75 eligible applicants were reviewed by the Committee, and the names of 24 suggested awardees were forwarded to Council for approval, along with a ranked list of alternates. Over the nearly 20-year history of the program, the program has received well over 1,000 applications with an average funding rate of 33%. In addition, two fellows were funded in 2018 with support of the Hearst Foundations. The Hearst program is intended to support U.S. undergraduate students from disadvantaged backgrounds, from underrepresented racial and ethnic groups, and students with disabilities. Evidence that the program is indeed encouraging interest in research is provided by the continued involvement of UGSRF students in APS activities. Most of the 2017 cohort of UGSRF students attended EB in 2018. Seven were awarded 2018 Barbara A. Horwitz/John M. Horowitz Outstanding Undergraduate Abstract Awards, and four went on to win 2018 David S. Bruce Excellence in Undergraduate Research Awards.

Unfortunately, funding for this program has been reduced by half as part of the revised priorities outlined in the recent Strategic Plan.

### **Undergraduate Research Excellence Fellowship Program**

The APS Undergraduate Research Excellence Fellowship (UGREF) Program was launched in 2013 with the goal “to encourage undergraduate students worldwide who are already involved in research to continue on that track toward a career as a basic research scientist.” The UGREF Program supported up to six full-time second- to fourth-year undergraduate students who have more than 9 months of research experience to continue working in the laboratories of established investigators. Both students and faculty sponsors/advisors must have been active members of the APS in good standing. UGREF offered financial support to the fellows and faculty sponsor/advisor comparable to that of the UGSRF program. This funding was provided by the APS and the host laboratories, and awardees were selected by the Committee with subsequent approval by Council.

The UGREFs completed interactive online assignments exploring how to structure a research project/series of experiments and exploring/discussing physiology-related careers. The UGREF activities were built on UGSRF activities, developing UGREF’s writing and presentation skills. UGREFs were also required to submit an abstract to EB.

In the application cycle for 2018, 21 applicants were reviewed by the Committee, and the names of 6 suggested awardees were forwarded to Council for approval, along with a ranked list of alternates. Over the 6-year history of the program, the program has received well over 100 applications with an average funding rate of 21%. Evidence that the program is indeed sustaining interest in research is provided by the involvement of UGREF students in APS activities. Two members of the current cohort, Winston Guo and Shao Yang Zhang, received Horwitz/Horowitz Outstanding Undergraduate Abstract Awards at this year’s EB meeting. Similarly, two of last year’s cohort, Maleeha Ahmad and Alexandra Carl, received both Outstanding Undergraduate Abstract and Research Awards at EB 2018.

Unfortunately, this program has been discontinued as part of the revised priorities outlined in the recent Strategic Plan.

### **Physiology Video Contest for Undergraduate and Graduate Students**

In 2011, COPC launched the APS video contest, “APS Presents...Phantastic Physiology Voyage: Function Follows Form,” which was designed to engage undergraduate and graduate students by creating engaging, accurate, informative, and entertaining physiology videos for the general public.

A selection committee consisting of members of COPC and invited past APS Summer Research Teachers evaluated nine submissions in the 2018 cycle. The applicants included both undergraduate and graduate students. The Committee selected and forwarded to Council for approval “Superbug Blues” by Noah Resnick of Kean University. The video is an animation produced by Noah under the pen name Arbor Vitae, and describes the risks of improper antibiotic use. “Physiology of Memory and Learning” by May Elsayed of the Misr University of Science and Technology received the Viewer’s Choice award, which was selected by the general viewing public.

One of the advantages of the video contest is that the videos continue to promote physiology long after the contest has ended. Each video remains on YouTube (unless the video creator deletes it), and it can be accessed with links from other sites. For example, each video is cataloged in the Life Science Teaching Resource Community with an embedded YouTube link. An awardee from 2013, “Hillbilly Hypoglycemia,” by Michael Ridlehoover, Alexis Wren, and Zachary Minter of Augusta University, has accumulated nearly 5,000 views and inspired the development of a lesson plan by faculty members at Georgia Regents University, who use the video as its basis.

These encouraging results notwithstanding, the consistently small number of applicants has prompted the discontinuation of the video contest.

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

The APS Excellence in Professional Student (MD or DO) Research Travel Award Program was launched in 2013 with the goal “to encourage MD or DO students to attend, present their research, and participate fully in the Experimental Biology (EB) meeting.” The award supported up to 10 MD or DO students who were first authors on

abstracts to attend EB, present their research, and attend an orientation session. Applicants were reviewed by the Committee, and suggested awardees were submitted to Council for approval.

In the 5 years of the program, COPC received 75 applications, and over 40 medical students received travel awards and attended the orientation at EB. However, the relatively small number of applicants and the higher-than-expected success rates for the award were of concern to both COPC and Council. The program has been discontinued.

### 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. Advertisements are posted in *The Physiologist* and the All-APS News e-mail updates for members and sent to all past participants. The judge (or judges) must be an APS member in good standing who is willing to present the award on behalf of the APS to the student with the best physiology project (one winning student per science fair). Standard conflict of interest policies apply. After the science fair, the judge reports the winner’s name and school via an online report form. Winners’ names and pictures are posted on the APS Local and Regional Science Fair website.

During the 2017–2018 academic year, 12 requests for a Science Fair Award Packet were received from APS members. COPC is currently working with chapters in Michigan, Puerto Rico, Indiana, Nebraska, and Ohio to increase the number of science fair packets requested in the coming year.

*Council accepted the report of the Career Opportunities in Physiology Committee.* ●

## Chapter Advisory Committee



Mari K. Hopper, Chair

During the fiscal year July, 2017 through June, 2018, the Chapter Advisory Council met three times. Discussions included a vast array of topics including methods of best practice, mission impact, assisting newly forming chapters, and improving connections with the APS. When asked by the

APS what chapters bring to the APS, the following list was assembled.

- Chapters share APS's goals of fostering education, scientific research, and dissemination of information in physiological sciences, and are able to reach faculty and students who do not currently engage at the national level (participation in chapter annual meetings exceeds 1,000 participants with fewer than 50% being current APS members).
- APS assistance with chapter meeting registration will provide contact lists for potential membership and easy access to data important to furthering the mission of APS.
- Chapters provide local contacts for "grassroots" organization promoting advocacy efforts.

**HIGHLIGHTS 2017**

**Arizona** – APS grant support to involve high school teachers  
**Greater DC** – science policy speaker; “Minute to Win It” poster ads  
**Indiana** – multiple session tracts including Teachers as Learners & Networking  
**Iowa** – invites neighbor states; over 70 abstracts and 160 attendees  
**Kentucky** – targets large, small, public and private colleges and universities  
**Michigan** – High School Teachers Workshop - collaboration with national office  
**Nebraska** – 20th Anniversary Meeting featured “The Great Debates”  
**Ohio** – 6 trainee awards to support attendance at EB 2018  
**Oklahoma** – 36<sup>th</sup> Annual Meeting!!!  
**Puerto Rico** – REBUILDING – post hurricane  
**Tennessee** – soon to hit the 10 year mark  
 –\***Birmingham Network** – Managed completely by trainees



Highlights from the 2017 meeting

- Chapters advertise and promote the benefits of APS membership at annual meetings and on websites.
- Chapters provide opportunities for trainees of all levels (high school through postdoctoral) to develop scientific presentation skills, network with colleagues, practice leadership skills, and establish mentorships and support as they prepare for futures in academia and healthcare.
- Chapters draw from small and regional colleges and universities, as well as high schools. Therefore, Chapters provide a mechanism to reach students early and to encourage careers in physiology (science in general).
- Chapters are willing to work closely with APS education staff to expand training of educators and students. For example, chapters could be mobilized to increase participation in training teachers, developing new and expanded community outreach (Phun week, science fairs) and support for all APS initiatives.

### CAC Goals for Coming Year

**1) Build collaborative and integrative relationship with the APS**

**2) Establish a strategic plan that informs all APS members of chapter work and value**

Dust vs. Gold Report

- Chapters Usage: 24%; same percentage of states that currently have chapters.

**3) Establish chapters serving members in all 50 states: low cost-high impact**

Broaden impact of important outcomes accomplished by chapters.

As chapter program grows, the following challenges will be addressed in cooperation with the APS National office: opportunities will be addressed.

- **Challenge:** Establishment of new chapters and existing chapters as non-profit organizations; business entity within the state; tax filing annually.
- **Challenge:** Establish institutional memory for chapters and provide training for new leaders.

- **Challenge:** Assist chapters in avoiding critical errors: contracts, bank account, affiliations, travel, etc.
- **Challenge:** Address cost of registration management (use of third-party vendors to manage meeting registration).
- **Challenge:** Cost and expertise needed for chapters to establish up-to-date web presence.

**4) Finalize Recommendations for Chapter Governance**

APS has charged a subcommittee to follow up on governance task force report and report back to APS council before the fall Council meeting.

*Council accepted the report of the Chapter Advisory Committee.* ●

CHAPTER ACTIVITY SUMMARY - 2017	
Meetings	12
Attendees	1259
Trainee Oral Talks	108
Trainee Posters	458
Postdoc Awards	21
Grad Student Awards	40
Undergrad Student Awards	27
High School Awards	4
National Lecturers	23

Chapter activity summary

## Committee on Committees



Charles Lang, Chair

The Committee on Committees (CoC) is comprised of one representative appointed by each of the 12 APS Section Steering Committees plus two Councilors who serve as the chairperson and incoming chairperson. The responsibility of the CoC is to nominate individuals to serve on APS committees as well as outside bodies where

APS is represented. The CoC members are responsible for identifying motivated and qualified members of their section who can serve on APS committees. The responsibility of the CoC as a group is to weigh the expertise and diversity of the applicant pool to identify the strongest representative for each committee and to minimize the number of section representatives on each committee, when possible.

### Summary of Experimental Biology Deliberations – 2018

The CoC meeting deliberations started with a summary of the types of diversity considerations that each APS section representative should consider as they review the applications. Lisa Leon summarized diversity

as including geography (same state or institution), ethnicity, gender, or APS section. Dr. Leon emphasized, where possible, it is especially important to only have one representative from each state on the lobbying committees (e.g., ACE).

The CoC meeting was attended by a representative from each of the APS sections. Kudos to Lisa Leon, out-going chair of CoC, who implemented last year’s Committee suggestion regarding the need for subcommittees to decrease the overall workload of each CoC member to review all applications. This past year, each CoC representative was responsible for reviewing an average of 39 applications representing 3–4 different committees. No one was specifically assigned to review applications for Publications or Distinguished Physiologist since the former had only a single qualified candidate and the latter received only one application. The following is a list of the Section Representative and their Committee assignments:

- Teaching: Education, International, Porter
- Renal: Porter, COPC, ACE, Finance
- E&M: COPC, Communications, Conference, Awards
- CNS: International, ACE, Communications, Finance
- CV: Women, SPC, Conference, Awards
- Cell: COPC, ACE, Awards
- WEH: Education, ACE, SPC, Conference

- NCAR: Women, Communications, SPC
- Respiration: Education, COPS, Conference, Finance GI: International, Women, Communications, SPC Teaching: Education, International, Porter
- EEP: Porter, Women, Awards, Finance

Additionally, CoC requested additional information be provided prior to application review. It was requested by section representatives that the CoC chairperson provide a separate list to the section representatives with the following: 1) applicants who applied to multiple committees; 2) trainee applicants only; 3) chairperson applicants only. This recommendation was implemented by Leon at the last meeting where an Excel file was generated and distributed that summarized key demographics and qualifications for each applicant for each committee. For example, for each applicant, the file included type of appointment (trainee or regular), position, <45 years of age, home affiliation, primary and secondary section affiliation, citizenship, gender, year of degree, ethnicity/race, whether they had previously applied, previous committee involvement, and EB attendance. The CoC expressed their thanks to Leon for implementing these suggested changes, and it is strongly recommended that these processes be carried over for future CoC meetings.

A final recommendation from last year was to have a list of how many people are needed for each committee, in addition to information of the end date for all committee members. Kudos to Scarlett Whitsett (APS executive assistant), who amended the summary sheets provided to the CoC to include this requested information.

Overall, the CoC representatives are enthusiastic about serving on the committee and are able to identify highly qualified and motivated section members to fill the

**Table 1.** List of vacant positions at EB 2018 and current section affiliations

Committee	No. of Vacant Positions	Current Section Affiliations on Committee
Animal Care and Experimentation	Chair, 3 members, 1 trainee	WEH, NCAR, CV, EEP, Respir, Endo/Metab, CEPS
Awards	2 members	Renal (2), NCAR, CV (2), EEP, Endo/Metab, Teaching (2), CNS, Cell Molec
Career Opportunities in Physiology	Chair, 4 members	Renal, NCAR, CNS, EEP, WEH (2), Teaching
Communications	Chair, 1 member	Endo/Metab (3), Respir, CEPS, Teaching, CV (2), WEH
Conference	2 members	Renal, CaMPS, EEP, CNS, WEH, Respir
Daggs	0	NCAR, EEP, GI WEH (2)
Distinguished Physiologists	Chair, 2 members	CaMPS, Respir (2), WEH, EEP (2), Renal
Education	Chair, 4 members	Renal, CV, CNS, GI (2), NCAR (2), Respir (2), Teaching, Cell Molec
Finance	Chair, 1 member	CNS, EEP, Respir, GI, CV
International	2 members, 1 trainee	NCAR, Resp, Teaching, CNS, WEH CV, CEPS, Cell and Molec, EEP
Membership	CoC does not select membership for this committee	
Perkins	0	WEH, Renal, CNS, CV
Physiologist in Industry	1 member	CV (2), Renal (2); Endo/Metab, GI, Teaching, Cell Molec, NCAR
Porter Physiology Development	1 member, 1 Porter Fellow	GI (2), Endo/Metab (2), NCAR, CNS (2), WEH, Respir, Teaching
Publications	2 members	WEH, CV, Resp (2), Renal
Science Policy	2 member	Cell Molec, Teaching, CV (2), WEH, CEPS, Endo Metab, Respir, Renal (2)
Women in Physiology	3 members	CV, CEPS, EEP (3), Respir, CNS, Cell Molec, Renal WEH

vacancies, but the large workload and short time spans compromises their ability to review the applications as thoroughly as may be needed.

Table 1 provides a list of the positions that were filled by the CoC during their deliberations at the Experimental Biology meeting. This type of list was also provided

by APS staff to the Chairperson in an effort to help streamline the process.

Table 2 provides a summary of the number of applications for each committee position. A total of 117 completed applications were submitted and reviewed; this number is increased from the 108 reviewed the previous year.

### Actions Approved by Council

At the last Council meeting two recommendations were made and approved:

- The Council endorsed the Committee's recommendation that senior postdocs (4 or more years post-PhD) be considered for appointment as regular (non-trainee) members.
- An applicant is eligible for committee membership as long as there is a 1-year gap (i.e., appointment ends December 2017 and reappointment occurs January 2019) between original committee appointment and appointment to a new committee.

Council also encouraged APS to enable the members of the CoC to have access to the scores and rankings for candidates prior to the CoC meeting at EB.

The Council reviewed the recommendations for each committee and approved the majority of the Committee's recommendations, making a few adjustments. The Council approved the suggestion that Caroline Appleyard be appointed as chair of the Career Opportunities Committee and that Anne Crecelius be appointed as chair of the Communications Committee. It approved the recommendation to extend the terms of Kim Barrett and Thomas Pannebecker on the Conference Committee by 1 year and to add Jennifer Sullivan to the Committee as a replacement for David Mattson, who was elected to Council. The Council approved the appointment of Ulla Kopp as chair of the Distinguished Physiologist Committee and the reappointment Jeffrey Osborn as chair of the Education Committee. The Council reaffirmed the appointment of Paul Welling as chair of the Finance Committee to replace Meredith Hay, who is now president-elect. The Council accepted the recommendations for the Porter Physiology and Minority Affairs Committee, including the appointment of Maria Alarcon Fortepiani as the replacement for Larissa Shimoda, who was elected to Council.

**Table 2.** Number of applicants for each committee

Committee	# Applications	Applications per Open Position
Animal Care & Experimentation	10	3.3
Awards	14	7
Career Opportunities in Physiology	15	3.75
Communications	6	6
Conference	4	2
Distinguished Physiologists	1	0.5
Education	17	4.25
Finance	5	5
International	12	6
Porter Physiology Development	6	3
Publications	3	1.5
Science Policy	5	2.5
Women in Physiology	13	4.3
Trainee International Committee	3	3
Trainee Animal Care & Exp Comm	2	3
Chair of Communications	1	1
<b>TOTAL</b>	<b>117</b>	

### Areas for Improvement

The only substantial recommendation by the membership of the Committee was to develop a standard operating procedure (SOP) for the CoC covering the roles and responsibilities for both the Committee's members and chair. This document has been generated by the current chair, and amended based on comments and suggestions made by the Committee's members.

*Council accepted the report of the Committee on Committees.* ●

## Communication Committee



Barbara Goodman, Chair

### Membership

In 2018, the Committee welcomed five new members (Doug Curran-Everett, Jeffery Tessem, Amanda Leblanc, Sandy Martin, and Yasina Somani) in addition to continuing members (Barb Goodman, Ben Miller, Grant Kolar, Megan Rhoads, Nicholas Stylopoulos, and Audrey Vasauskas). Merry Lindsey joined the committee

as our new Council representative.

The Committee is supported by APS marketing and communications staff (Stacy Brooks, Coleen Kitaguchi, Erica Roth, and Veronica Purvis).

### Ongoing Activities

The Communications Committee continues to serve in an advisory role to the Communications Office staff. In addition, the ongoing tasks for the Communications Committee members include:

- Communications symposia at EB
- I Spy Physiology blog
- PhysiologyInfo (PIO) website
- AAAS Mass Media Fellowship
- Special projects and science communication educational activities

### EB 2018 Communications Symposium Wrap-Up

This year's Communications Committee symposium, "Social Media for the Professional Scientist," was presented by Barb Goodman and Stacy Brooks. Megan Rhoads was the session co-chair. The session was well attended, with approximately 50–60 attendees. The shortened 90-minute session was planned as a "Social Media 201"-style session that used social media how-to and trivia to inform scientists about the platforms that scientists frequent (Facebook, Twitter, Instagram, LinkedIn, and Research Gate) and strategies to reach them there. We received lots of questions and got

great participation, with many attendees sharing their successes and failures with their colleagues.

### I Spy Physiology Blog

While the APS Communications Office handles day-to-day planning and management of the I Spy Physiology blog, current and past Communications Committee members continue to play a major role in the blog as ongoing contributors. Since launching in 2015, the Communications Committee and other APS members have become much more involved in contributing. In 2017, APS members contributed 80% of posts (up from 45% in 2015). We've also made strides in diversifying the author base for the blog and now have more contributors who are male or people of color. Audrey Vasauskas serves as the volunteer blog editor. In this role, she helps find new contributors and regularly contributes posts herself. She also served as the APS EB 2018 photo blogger.

The blog was a finalist for an EXCEL Award in the Digital Media-Blog (Overall) category and received the bronze medal. The EXCEL Awards recognize the best and brightest in association content and are given out by the Association Media & Publishing (AM&P) group.

As of June 2018, we have published 29 posts and have had nearly 26,000 views from more than 20,000 visitors. Since launching in February 2015, we have published 180 posts garnering more than 78,000 views from more than 58,000 unique visitors!

### AAAS Mass Media Fellowship

Earlier this year, the Committee reviewed 2018 fellowship applications in physiology or related fields sent by AAAS. Justin Chen was selected to receive this year's fellowship. He recently received his PhD in developmental biology from Massachusetts Institute of Technology (MIT) and will spend his summer at STAT News.

*Council accepted the report of the Communication Committee.* ●

## Conference Committee



David Pollock, Chair

The APS Conference Committee continued its effort toward reviewing and overseeing the conference program outside of Experimental Biology and joint meetings with other societies. We held a face-to-face meeting at APS headquarters in September 2017, where we reviewed reports from recent conferences as well as updates from pending conferences. As of

this report, we have approved the following conferences:

- *Cardiovascular, Renal and Metabolic Diseases: Sex-Specific Implications for Physiology*, Crowne Plaza Hotel in Knoxville, TN, September 30 to October 3, 2018
- *Intersociety Meeting, Comparative Physiology: Complexity and Integration*, Astor Crowne Plaza French Quarter, New Orleans, LA, October 25–28, 2018
- *Control of Renal Function in Health and Disease*, Boars Head Resort, Charlottesville, VA, June 23–29, 2019
- *The Interface of Mathematical Models and Experimental Physiology: Organ Function from the Microvascular Perspective*, Scottsdale, AZ, September 2019
- *9th Annual International Conference of Aldosterone and ENaC in Health and Disease: The Kidney and Beyond*, Estes Park, CO, October 2–5, 2019
- *11th International Conference on Heme Oxygenase & Related Enzymes: From Physiology to Therapeutics*, time and location to be determined, 2020

In that meeting, we also asked our Council liaison, David Gutterman, to spend some time updating the committee on the status of the new Strategic Plan and how it would be implemented. Although there were many new ideas and options discussed for how to improve the conference program, no firm decisions were made as we awaited the APS Conference Task Force recommendations.

The committee also met briefly at the EB meeting in San Diego shortly after we received the Task Force Recommendations (below). Merry Lindsey, the Task Force chair, came and explained the highlights of this report. We scheduled a conference call in May to follow up since we did not have time or enough members present to discuss

our next steps. Although many of the recommendations will take some time to implement and will require time at our annual fall meeting, we did develop the recommendations below for Council to consider at their July 2018 meeting. Furthermore, we have made inroads toward partnerships with other organizations where APS members are very active. Thus far, the American Society of Nephrology has agreed to help finance the 2019 Renal Conference.

### **ACTION ITEM #1: The committee asks Council to provide a set budget for the Scientific Conference Program (non-EB)**

- We recommend \$150,000 per year to support approximately five conferences per year for the next 5 years. (This is based on the typical \$30K per conference we have been using).
- Unused budgets can be carried over from year to year during this initial period.
- The conference budget can be reviewed and revised, if necessary, by Council every year during the normal budget process.
- Future budgets will be contingent on Council's review of the overall success of the program and the conferences that the committee has chosen to support.

### **ACTION ITEM #2: The committee asks Council to facilitate more efficient and timely development of new conferences by removing the requirement to have each individual conference approved by Council**

- The process of having Council approve each individual conference one at a time typically results in a delay in the approval of many months as the committee waits for the next council meeting followed by time waiting for an approval letter.
- Over the many years, Council has approved all conferences coming from the committee, so this step only serves to delay the process.
- Given that the committee's activities and budgets are reviewed every year, Council still maintains oversight and fiduciary responsibility while allowing the committee more flexibility in how they develop the conference program in the future.

*Council accepted the report of the Conference Committee.* ●

## Distinguished Physiologists Committee



Peter Lauf, Chair

The Distinguished Physiologists Committee consists of 10 members. 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 2017, the Senior Physiologist Committee members sent birthday wishes to 127 members reaching age 70, 80 members reaching age 80, 53 members reaching age 90, and 7 members reaching the age of 100! Seven response letters were received and published in *The Physiologist*.

Another responsibility of the Distinguished 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. In 2017, we did not receive any applications for this award.

*Council accepted the report of the Distinguished Physiologists Committee.* ●

## Finance Committee

### APS Budget

The Finance Committee met in March to review 2017 financial activity and to review the Society’s 2018 budget. 2017 revenue was \$18.8 million, which included \$1.9 million from reserves, and expenses over the same period were \$18.9 million resulting in a deficit for the year of \$159,645. Note that the 2017 budget called

for a projected surplus of \$91,500. Thus the Society was approximately \$250,000 over budget at year-end due primarily to lower revenue in several categories, including page charges, grant income, color fees, meetings income (conferences), and permissions and royalties.



Paul Welling, Chair

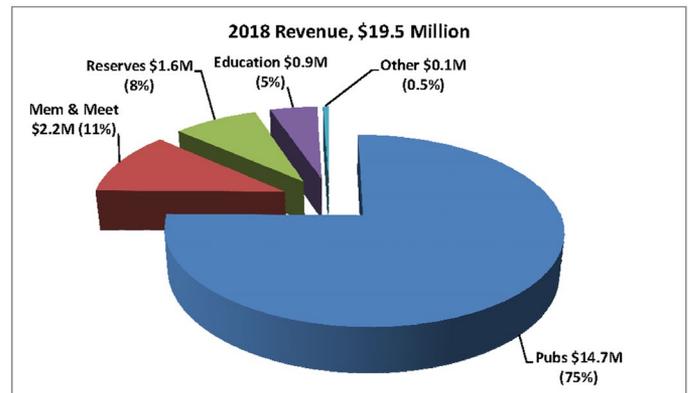


Figure 1. 2018 revenue

The 2018 operating budget has revenue of \$19.5 million and expenses of \$19.5 million for a break-even budget. Figures 1 and 2 below represent the sources of revenue and the allocation of expenses, respectively, in the 2018 operating budget. The 2017 report and 2018 budget were approved by Council at its spring meeting.

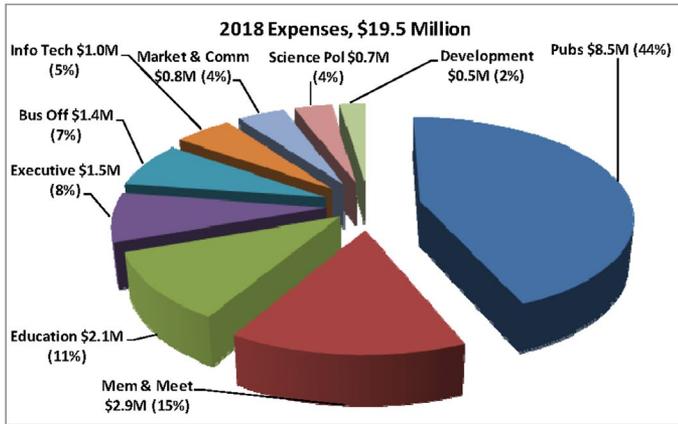


Figure 2. 2018 expenses

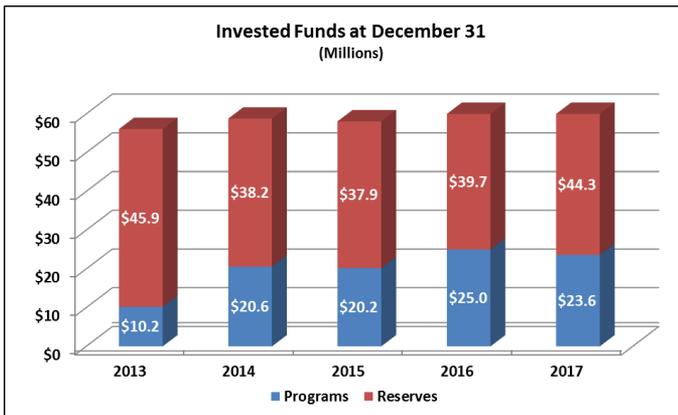


Figure 3. Invested funds

### Investments

The Society’s long-term invested funds at December 31, 2017 totaled approximately \$68 million. Of those invested funds, \$44.3 million is set aside as reserves, a portion of which is used to support the annual operating budget. The remaining \$23.6 million is used to support the Society’s numerous award programs and the sections. From that \$23.6 million, there was \$1.02 million expended on awards in 2017. Figure 3 below reflects both the distribution between reserves and the award and section funds, along with the overall growth of the Society’s investments from \$56 million at the end of 2013 to \$68 million as of December 31, 2017.

### Elimination of Color Fees

Rita Scheman presented a proposal from the Publications Committee to eliminate charges to authors for color figures in journal articles. She explained that the Committee was concerned about the continuing decline in article submissions to the APS journals, and they believe that a reduction in author fees would help to increase submissions. In addition, the Publications Committee recommended that the Society add a page charge discount of \$10 per page for APS members. The member fee would be \$75 per page, and the non-member fee would remain \$85 per page. Scheman presented a financial analysis that estimated that the loss in annual revenue from the elimination of color fees and page charge member discount would be from \$350,000 to just over \$600,000. The proposal to eliminate color fees was approved by the Finance Committee and later by Council at its April meeting.

### Increase 2019 Subscription Prices

Rita Scheman presented the proposed subscription price increases for 2019, which are being recommended by the Publications Committee. The recommendation is for increases in online subscriptions of 5.0% for Tier 1 (smallest organizations), Tier 2, and Tier 3 (larger organizations, representing over 70% of the Society’s subscribers). For Print + Online and Print Only subscriptions, the proposed increases were 9%. The proposed increase for individuals and members was 2%, and the proposed increase for Legacy content was 10%. The proposal to increase 2019 subscription prices was approved by the Finance Committee and later by Council at its April meeting.

### Development Office

John Van Ness (APS Director of Development) will report on the activities of the Development Task Force at the Council meeting.

Council accepted the report of the Finance Committee. ●

## International Physiology Committee



Eric D. Lazartigues, Chair

APS members represent 88 countries from 6 continents with over a quarter of the Society's membership being international. International members represent a large and important constituency within the Society and one that is growing—over 30% of new members are internationals. At the recent EB meetings, international registrants comprised over 20% of the total registration (some two-thirds of which are APS members). These figures clearly indicate the international nature of APS.

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 EB. The IPC reviewed 33 applications and recommended support of \$1,000 be given to the top 13 ranking applications. The recommended applications are listed below. APS gave 13 awards of \$1,000 each for EB2018 (awardees are named on the APS website and listed below). Successful applicants represented diverse regions. South, Central, and North America contributed for more than half of the funded applications, which actually appears to be a smaller proportion compared with last year.

The International Opportunity Program (IOP; formerly the Latin-America Initiative) aims to strengthen ties between APS and international societies on a global level, with a particular emphasis on underrepresented regions. We had only one round for 2017–2018, following a deadline extension due to lack of applications. The committee recommended the five following application with each receiving \$7,500:

Last Name	First Name	Country
Russell-Hallinan	Adam	Ireland
Sabino-Carvalho	Jeann	Brazil
Weinrauch	Alyssa	Canada
Paula-Ribeiro	Marcelle	Brazil
Iwamoto	Erika	Japan
Mahapatra	Chitaranjan	India
Teixeira	André	Brazil
Luo	Beibei	China
Wilson	Calum	United Kingdom
Rousseau	Jean-Philippe	Canada
Moller	Sophie	Denmark
Garcia-Pelagio	Karla	Mexico
Patrone	Luis Gustavo	Brazil

- **Mark Bayley**, Aarhus University, Denmark. *Project:* Acid-Base and Ion regulation in a Hypercapnic World, Vietnam, December 2018
- **Angela Danborno**, Bingham University, Nigeria. *Project:* Workshop on Measurement of Vascular and Smooth Muscle Functions in Isolated Tissue Studies using PowerLab hardware and LabChart Software, Nigeria, May 30 to June 1, 2018
- **Rajan Pandit**, Nepal Medical College, Nepal. *Project:* PSN Conference 2018: Exploring research fields in Nepal, February 11–12, 2018
- **Ricardo Pena Silva**, Universidad de los Andes, Colombia. *Project:* International symposia on education and research in physiology and medicine, Colombia, September 27–28, 2018
- **Hector Rasgado-Flores**, Rosalind Franklin University, Illinois. *Project:* Course of Music and Science: An Interdisciplinary Approach, Mexico, August 10–12, 2018

Sincere thanks are extended to Esther Samuel for her excellent administrative support. Thanks are also given to the (participating) members of the International Committee for review and ranking of the various submissions and for attending the annual meeting.

Council accepted the report of the International Physiology Committee. ●

## John F. Perkins, Jr. Memorial Award for International Physiologists Committee



Catherine Uyehara, 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 October 2017 deadline, the Committee received one application, and it was not funded. For the April 2018 deadline, the Committee received two applications and funded one applicant.

*Council accepted the report of the The John F. Perkins, Jr. Memorial Award for International Physiologists Committee.* ●



**I SPY PHYSIOLOGY BLOG**

Spotting Physiology in Everyday Life

**ispyphysiology.com**

Content is written by APS members and staff. Interested in contributing? Contact [communications@the-aps.org](mailto:communications@the-aps.org).



## Physiologists in Industry Committee



### EB2018 PIC Symposium

The 2018 symposium, entitled “Biosensors Advancing Health and Disease Research,” was organized and chaired by Brandon Bucher (ADInstruments) and co-chaired by T. Dylan Olver, (postdoctoral recipient of 2017 PIC Novel Disease Award). Topics for the symposium included

Matthew R. Zahner Ph.D., Chair “Emerging Technologies, The Use of Telemetry to Study Glucose Metabolism” by Patrick Tso (University of Cincinnati Medical Center); “Wearable Technology for Injury Prevention and Optimal Performance” by Mark Buller (U.S. Army Research Institute of Environmental Medicine); and “Closed-Loop Neuromodulation in Physiological and Translational Research” by Stavros Zanos (Fienstein Institute for Medical Research).

The winner of the 2018 postdoctoral award is Dr. Paramita Pati (University of Alabama at Birmingham) for the project entitled “Evidence for Circadian Control of Endothelial Function in Mice on a High Fat Diet.” The winner of the predoctoral award is Jianxiang Xue (University of South Florida) for the project entitled “Inducible Intestinal Epithelial Cell-Specific NHE3 Knockout Causes Diarrhea and More Alkaline Luminal Content.”

### Physiologists in Industry Committee Mixer

The 17th annual PIC mixer was held on Sunday, April 22nd at 6:45 PM in the Marriott Oceanside Room at the EB conference. The mixer attracted individuals across all levels of training. This year, we included a cash bar and free hors d'oeuvres. The mixer was very well attended, and the room was filled from 6:45 until the event closed. The mixer provided a great chance for meaningful discussions on industry career opportunity, and trainees received good feedback from attendees.

### EB2018 Translational Research Awards

The Physiologists in Industry Committee Translational Research Award is given to one postdoctoral fellow and one doctoral student each year. This award recognizes a trainee who performed research that is translatable to industry applications and has been designated by the Physiologists in Industry Committee as an outstanding example of experimental research. This award was previously named the Novel Disease Award but was changed to Translational Research Award for 2018. The PIC felt that the term “novel disease” limited the number of applicants who apply for the award and has limited interest in providing funding for the award. In an effort to increase the number of applications and reach a wider group of potential applicants as well as to broaden the potential funder base, APS council approved changing the name of the PIC Award from Novel Disease Model to Translational Research Award.

### EB2018 PIC Symposium

To foster greater interaction among sections, academia, and industry, the 2018 PIC symposium will focus on basic sciences topics with preclinical stages of development and translation that has broad appeal to cross-sectional APS members. The title of 2019 PIC symposium is “SGLT2 Inhibitors: From Basic Physiology to Clinical Success.” The session will be coordinated and chaired by Romer Gonzalez and co-chaired by Pati Paramita. Gonzalez is a member of the PIC (Renal rep), and Paramita is our 2018 Translational Research Award recipient at the postdoctoral level.

*Council accepted the report of the Physiologists in Industry Committee.* ●

**Life Lines by Dr. Dolittle Blog**  
 Penned by a comparative physiologist and proud member  
 of the American Physiological Society

[LifeLinesBlog.com](http://LifeLinesBlog.com)



## Porter Physiology Development And Minority Affairs Committee



Layla Al-Nakkash, Chair

### Clifford Barger Underrepresented Minority Mentorship Award

The Porter Physiology Development and Minority Affairs Committee (PPD-MAC) was pleased to present the second Annual A. Clifford Barger Underrepresented Minority Mentorship Award ([www.the-aps.org/barger](http://www.the-aps.org/barger)) at

the APS Business meeting during EB 2018. The award promotes and embodies the APS goal of broad diversity among physiologists by recognizing mentoring as a highly valued professional activity that makes significant impacts on diversity in physiology. In its second year, the award received numerous outstanding applications. The committee selected Patricia Molina from Louisiana State University Health Sciences Center as the 2018 recipient.

### The Porter Physiology Development Fellowship Program

This program encourages diversity among students pursuing full-time studies toward the PhD in the physiological sciences as well as encouraging their participation in the APS by providing 1- to 2-year full-time graduate fellowships and professional development activities. 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 professional development activities, and participate in K-12 outreach. Since 1967, the program has provided more than 274 fellowships to 153 trainees. For 2017–2018, the PPDMAC selected eight fellowships to be awarded. The Committee noted the high quality of applications received. The stipend paid to the Porter Fellows for 2018–2019 will again be \$28,300, consistent with the NIH scale. Of the eight Porter fellowships awarded this year, Naiomy Rios-Arce was designated as the Eleanor Ison Franklin Fellow for having the highest-ranked renewal application. In the spring of 2018, the Porter Physiological Development Fund received the following contributions: \$113,000 from the William Townsend Porter Foundation and \$80,000

from the APS. The Committee sincerely appreciates the continued support of the William Townsend Porter Foundation, APS member contributions, and the APS Council that makes these fellowships possible.

### Minority Travel Fellows Program

The PPD-MAC reviewed and recommended 41 award recipients for Minority Travel Fellowships to attend EB 2018. This year, 6 of those 41 travel fellows were supported with funding from Janssen Pharmaceutical Companies of Johnson & Johnson. This additional funding was largely the outcome of efforts made by past Porter fellow, Raul Camacho, a scientist at Janssen. Since its inception in 1987, the APS Minority Travel Fellowship Program has awarded 995 travel fellowships to 612 undergraduate students, graduate students, postdoctoral fellows, and faculty members at minority institutions.

In addition to travel support, the Travel Fellows Program provides meeting mentors, an EB meeting orientation session, the Porter Reception (networking), a networking lunch, and a luncheon with a guest speaker that honors the Travel Fellows. This year, PPD-MAC had a successful Networking Lunch during EB. APS Past Presidents Jane



Barger Award presentation (left to right): Jeff Sands, Layla Al-Nakkash, Patricia Molina, and Dennis Brown at the APS Business Meeting during EB 2018



Layla Al-Nakkash with the past and current Porter Fellows at EB 2018

Reckelhoff and Patricia Molina, President-Elect Jeff Sands, President Dennis Brown, and APS Executive Director Martin Frank welcomed the Fellows to EB during the Porter Networking reception. APS President Dennis Brown along with current and past presidents and Council members actively participated in the Networking Breakfast. The Travel Fellows Luncheon was held on Wednesday of the EB meeting. The Fellows heard from keynote speaker Martin Frank, past Executive Director of APS. Frank's talk, "Reflections—The Role of APS in Promoting Diversity," highlighted the history of diversity and inclusion initiatives within the APS. His presentation can be viewed at [https://youtu.be/MUUIWsBjpt\\_M](https://youtu.be/MUUIWsBjpt_M).



Martin Frank at the Travel Fellow Luncheon at EB 2018

With the help of the APS Development Office, the PPD-MAC initiated a fundraising effort (to honor Marty Frank for his dedication to diversity and inclusion within the APS Society; [the-aps.networkforgood.com](http://the-aps.networkforgood.com)). Thus far, this effort has resulted in donations totaling \$3,400, and we plan to continue to sequester donations. The PPD-MAC is pleased to note that Council will rename the Minority Travel Fellows as the Martin Frank Diversity Travel Awards.

### Society for the Advancement of Chicanos & Native Americans in Science National Conference

Society for the Advancement of Chicanos & Native Americans in Science (SACNAS) provides conference activities for students, postdocs, educators, administrators,

and researchers in all disciplines of science, mathematics, and engineering. APS exhibited at SACNAS during October 19–21 in Salt Lake City, UT. Over 3,845 attendees participated in the conference. Most attendees were undergraduates. Chris Mendias (PPD-MAC member) and Brooke Bruthers (Senior Programs Manager, Diversity Programs) staffed the APS booth (situated on the same row as other FASEB societies) to promote APS diversity programs, K-12 resources and materials, and Undergraduate Summer Research Fellowships, as well as other APS awards, grants, fellowships, trainee and career information, and APS membership. APS was pleased to provide funding for awards for the first time this year. Judges awarded the best undergraduate poster presentations in physiology to Rufus Sweeney, a Native American undergraduate student at the University of Utah, and Kenny Veliz, a Hispanic/Latino undergraduate student at the University of California, Merced.

### Annual Biomedical Research Conference for Minority Students

Annual Biomedical Research Conference for Minority Students (ABRCMS) continues to be the largest professional conference for minority students to pursue advanced training in science, technology, engineering, and mathematics (STEM). More than 4,000 individuals attended the 2017 ABRCMS in Phoenix, AZ, November 1–4. The APS exhibited at the 2017 meeting 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. APS was represented by Lindsey Stavola (Yale University; Minority Outreach Fellow) and Adrienne Bratcher (PPD-MAC member). Sixteen



EB 2018 Travel Fellows

undergraduate students received APS-sponsored awards for the best oral (3) and poster (13) presentations in the physiological sciences. Awardees were added to the APS Minority Physiologists and APS Trainee communities in APS CONNECT.

### Minority Outreach Fellows Program

The APS Minority Outreach Fellowship fosters communication between minority graduate and postdoctoral students and middle/high school minority life sciences students. Outreach Fellows must be past Porter Fellows or Minority Travel Fellows. The 2018–2019 Minority Outreach Fellows are Anberitha Matthews (University of Tennessee Health Science Center) and Crystal Taylor (University of Alabama-Birmingham). The Outreach Fellowships will no longer be offered.

### Local Undergraduate Research Awards in Physiology

The Local Undergraduate Research Awards in Physiology (LURAP; [www.the-aps.org/LURAP](http://www.the-aps.org/LURAP)) offers members additional opportunities to promote physiology on their

home campuses and aims to ensure awareness of, and advocacy for, the discipline of physiology. To date, 12 LURAP awards were awarded in 2018.

### APS Minority Physiologists Facebook Fan Page

The APS Minority Physiologists page, managed by the PPD-MAC, has over 535 people who have viewed, liked, and received the page's weekly updates (a 15% growth in the last year). PPD-MAC members submit monthly page postings covering topics including information about summer research programs, APS-sponsored workshops, mentoring, the National Research Mentoring Network (webinars), APS Living History project videos, and URM publishing, among many other postings. The direct link to the page is [www.facebook.com/APSMinorityPhysiologists](http://www.facebook.com/APSMinorityPhysiologists).

The PPD-MAC encourages all those interested in participating in these programs to contact the committee or the APS Education Office.

*Council accepted the report of the Porter Physiology Development And Minority Affairs Committee. ●*

## Publications Committee



Curt D. Sigmund, Chair

### Editor-in-Chief Appointments and Reappointments

At the March 27–29, 2018 Publications Committee meeting, the first terms of Editors-in-Chief (EIC) Nigel Bunnett (*AJP-Gastrointestinal and Liver Physiology*) and Bina Joe (*Physiological Genomics*) were evaluated for reappointment to a second and final 3-year term, effective July

1, 2018. The Publications Committee unanimously reappointed each editor-in-chief. Gary Sieck (EIC of *Physiology*) was also evaluated for reappointment for a third and final 3-year term from July 1, 2018. The Publications Committee unanimously reappointed Dr. Sieck, which was subsequently confirmed by the *Physiology* Journal Managing Board on April 23, 2018

at the Experimental Biology meeting. At the fall 2018 meeting, the Publications Committee will interview for the editorship of *Comprehensive Physiology*. Calls for nominations for the editorship of *AJP-Renal Physiology* and *AJP-Regulatory, Integrative and Comparative Physiology* have been deferred for 1 year, with the agreement of the Publications Committee and Council, to allow for a strategic review of the journal program in the fall of 2018, with consideration of partial consolidation of journal titles. Drs. Bell and Samson, current EICs of *AJP-Renal* and *AJP-Regu*, respectively, have agreed to an extension of their EIC roles for an additional year, i.e., through July 2020.

### Promoting Transparent Reporting to Enhance Data Reproducibility: Next Steps

In August 2016, two new sections were added to the Information for Authors (*Promoting Transparent Reporting in APS Publications to Enhance Data Reproducibility and Experimental Details to Report in Your Manuscript*) based on

the guidance of the EICs and the Publications Committee. These additions were intended to encourage authors to include more experimental details and provide supporting information so that reviewers, and readers, would be more informed about the rigor of the study. The intention of these guidelines was to require these guidelines, once it became accepted practice.

To assess how well authors are complying with the guidelines, we evaluated the author and reviewer responses in the manuscript submission system for 5–10 articles per journal that were submitted and published in 2017. Based on the findings, which showed weak compliance, the following queries were posted to the EICs and Publications Committee:

- Should any of the transparent reporting guidelines shift from being encouraged to required?
- Should the transparent reporting guidelines be updated to include additional/other reporting concerns?
- Should APS journals 1) require deposit of source data, 2) partner with a public data storage repository (e.g., Figshare or Dryad) to make it easier for authors to store, and readers to access, the source data used to develop the manuscript, and 3) define which source data should be required for their specific journal?
- Should the transparent reporting statements on the reviewer evaluation form be required?

Another question posed to the Committee and EICs addressed expanding the long-standing APS publications data supplement policy to be competitive with other journals and consistent with funding policies encouraging transparency: Should the data supplement policy be extended to allow for additional tables/figures and necessary explanatory text (e.g., <5 MB)?

### Decision

- 1) Figure legends will be required to include:
  - statistical test used
  - *n* value for each condition in every panel
  - sex, if not stated as only one sex in Methods
  - non-uniform image modifications declared in legends.
- 2) *Strongly* encourage data availability
  - Primary data may be requested upon review and should be provided.
  - Recommend that primary data be stored in a public repository linked to the paper

3) Methods are required to describe:

- How antibodies were validated. Experiments using new antibodies that have not been previously validated must submit verification of a validation experiment.
- Whether control and treatment groups for microscopy experiments were collected at the same time under the same conditions.

4) *Strongly* encourage dot-whisker plots instead of bar graphs.

5) Data supplements

- Extend the data supplement policy to allow for tables/figures (up to 10 multi-paneled figures/tables and explanatory text not to exceed 5 MB). As current policy states, "...such material must be submitted for peer review along with each version of the manuscript and must meet the approval of the journal Editor. For all supplemental materials, authors should include a caption for each file, explaining the purpose and content of the file." Audio/video files and long data sets remain covered under the existing policy.

These changes will be included in Information for Authors and in the information to reviewers before and after review of each paper, and will be described in an editorial to be published in one journal and highlighted in the others.

## 2017 Publications Department Annual Report with YTD May 2018 Updates

### Scientific Impact/Attractiveness to Authors

**Impact Factor.** The 2017 Journal Impact Factors (IFs) published in Journal Citation Reports by Clarivate Analytics in 2018 has APS Journals generally holding their rankings. Four journals had modest increases in IF, whereas the others saw a small decline. *Physiological Reviews* once again ranked no. 1 in the field of physiology, with an IF of 24.014 (although down from 27.312 in the prior year; see <http://www.the-aps.org/mmm/Publications/Journals/Impact-Factors.html>). *Physiological Reports* remains without an Impact Factor for 2017; it may be reviewed in July for an IF for 2018 (which would be released June 2019).

**Manuscripts received.** Manuscript submissions in 2017 decreased overall by 6% vs. 2016 across all original research journals and all manuscript types. As of YTD May 2018, original submissions increased overall by 8% vs. May 2017.

**Data supplements.** A total of 291 data supplements were published in 2017, 93 of which were video files, a 44% decrease in total data supplements from 2016 and a 55% decrease in video files specifically. Figure and table supplements decreased by 17%. It has been APS policy to accept as supplemental data only material that cannot feasibly be published in print (i.e., primarily audio/video files, very long tables, and/or computer code). The existing APS policy on data supplements is available at <http://www.physiology.org/author-info.data-supplements>. A total of 194 data supplements have been published so far in 2018 (January to May), an increase of 38% over the same time last year. It was agreed at the spring 2018 Publications Committee meeting to extend the data supplement policy to include tables and figures (see *Next Steps: Promoting Transparent Reporting to Enhance Data Reproducibility*).

**Podcasts.** In 2017, *AJP-Heart* released 29 podcasts, *JAPPL* released 12, *JN* released 16, and *AJP-Cell* released one podcast highlighting published articles. (*AJP-Renal* released no new episodes in 2017.) YTD May 2018, 26 podcasts have been published (*JN* 12, *AJP-Heart* 10, *JAPPL* 4).

**Time to first decision.** Time to first decision averaged 25 days in 2017 across all of the original research journals vs. 22 days on average in 2016. *AJP-Cell* time to first decision was fastest at 15 days, followed by *AJP-GI* and *Lung* at 17 days, and *AJP-Heart* at 18 days. The average time to first decision YTD May 2018 is 20 days.

**Peer review system.** Enhancements to the peer review system are made as requested by the EICs, and as needed by staff. In 2017, there were approximately 23. In 2018, there have been approximately 10 updates thus far.

### Preprint Servers

In May 2016, the *Journal of Neurophysiology* pre-print server exception to the APS prior publication policy was restored (after having been briefly removed). Subsequently, a direct transfer mechanism to *JN* from the bioRxiv preprint server (<https://www.biorxiv.org/>) was added to the eJournal Press submission system.

In March 2017, the NIH issued an announcement stating, "The NIH encourages investigators to use interim research products, such as preprints, to speed the dissemination and enhance the rigor of their work. This notice clarifies reporting instructions to allow investigators to cite their interim research products and claim them as products of

NIH funding." In consideration of this announcement, the Publications Committee, following consultation with the EICs, revised the prior publication policy to allow APS authors to post original research to preprint servers. The new policy applies to all APS original research journals and requests that the authors declare on submission whether or not the manuscript or a version had been posted to a preprint server to identify the server and the DOI (see the policy at <http://www.physiology.org/author-info.policy-on-posting-to-preprint-servers-prior-to-submission-to-aps-journals>).

### New EICs 2017

*AJP-Lung, Cellular and Molecular Physiology:* Rory Morty, Max Planck Institute for Heart and Lung Research, succeeded Sadis Matalon as of January 2018.

*Physiological Reviews:* Sadis Matalon, University of Alabama, Birmingham, succeeded Dennis Brown as of January 2018.

*Journal of Applied Physiology:* Sue C. Bodine, University of Iowa, succeeded Peter Wagner as of July 1, 2017.

*Physiological Reports:* As of January 2018, Thomas R. Kleyman, University of Pittsburgh, succeeded Sue Wray as EIC, and Morten B. Thomsen, University of Copenhagen, succeeded Thomas R. Kleyman as Deputy EIC.

### Physiology in Medicine

Three articles have been commissioned in 2017 in the Physiology in Medicine Series

Instructions to Authors for submission of such articles are located at <https://www.physiology.org/author-info.instructions-for-pim>.

### Annual Reviews Award for Scientific Reviewing

The *Annual Reviews* Award for Scientific Reviewing was introduced in 2012. The Award is 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 successful candidate, chosen by the Publications Committee, is awarded \$2,000 and up to \$2,000 reimbursement toward travel to attend the annual EB meeting to receive the monetary award and a

recognition plaque. The 2017 Award was given to David G. Harrison, Director, Division of Clinical Pharmacology, School of Medicine, Vanderbilt University.

*Annual Reviews* has informed the APS that they will not renew the award after 2017, having determined that “there are more cost-effective ways...to recognize and promote excellence in scientific reviewing.”

## Publications Integrity and Policy

### NSF Grant

In 2012, the Publications and the Education Departments jointly submitted a successful application to the NSF for the development of modular course materials on publication ethics. The materials are to be used in Responsible Conduct of Research courses in STEM graduate programs. Additional collaborators on the project are the Biomedical Engineering Society (BMES) and the Society of Biological Engineers (SBE). The amount of the grant was \$400,000 awarded over a 3-year period. After undergoing two 1-year, no cost extensions, the materials are now complete and the final report submitted in December 2017.

The seven professional development modules on publication ethics topics, entitled “Professional Integrity: Best Practices for Publishing Your Research,” are now available in the APS digital library, the Life Science Teaching Resources Community (<https://www.lifescitrc.org/collection.cfm?collectionID=4400>). Each module includes materials for use in classrooms and online courses including instructor guide, PowerPoint slide set, video presentation, and test/quiz.

### NIH Grant

In 2015, the Publications and the Education Departments received an NIH grant (RFA-GM-15-006; \$150,000) to develop a training module to enhance data reproducibility. The training module, entitled “Controls in Animal Studies Professional Skills Course,” utilizes APS expertise in developing professional skills training courses and the expertise of its Advisory Board in designing animal studies. The module focuses on the general factors that a researcher should consider when designing, analyzing, and reporting results from animal studies. Topics include sex, longitudinal studies, drug treatments, large animal models, and surgery.

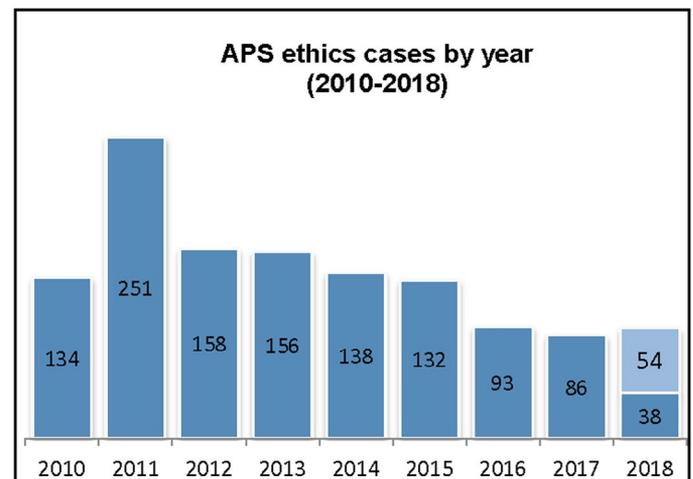
In 2016, the first version of the module was developed with guidance from the advisory board. In June 2017,

the first pilot test of the draft materials was run with a group of graduate students and postdocs in Bethesda, MD, with three instructors from the advisory board. Based on feedback from the participants and instructors, the materials have been revised during fall and winter 2017–2018 project development timeline

- Early 2018: Final revised materials with advisory board feedback
- Spring 2018: Field test final revised materials at other institutions and online
- Spring-Summer 2018: Prepare materials for distribution

### Ethics Cases

After a spike in 2011 (251 cases), the total number of ethics cases arising during peer review and production continues to decline, from 158 cases in 2012 to 86 cases in 2017. Consistent with ethics case activity in 2017, the total number of ethics cases for 2018 is projected to be 92. As of May, the majority of cases YTD were related to presentation errors that were fixed prior to early publication (31 cases). This was followed by cases categorized as duplicate submission (4 cases), duplication of data (2 cases), and miscellaneous/multi-issue (2 cases).



### Publication Ethics and Information for Authors Policies Updates

In 2017 to May 2018, APS policies were amended as follows:

#### Ethics Policy

- *June 2017*. Posting manuscripts to preprint servers prior to submission is no longer considered to be prior publication (<http://www.physiology.org/author-info.ethical-policies>)

### Information for Authors

- *February 2017.* Added computer simulation guidelines to the Promoting Transparent Reporting section (<http://www.physiology.org/author-info.promoting-transparent-reporting>)
- *June 2017.* Added policy on posting manuscripts to preprint servers (<http://www.physiology.org/author-info.policy-on-posting-to-preprint-servers-prior-to-submission-to-aps-journals>)
- *September to December.* The text in several sections to streamline content (manuscript composition, cost of publication, AuthorChoice; <http://www.physiology.org/author-info>)
- *December 2017.* Moved Instructions to Authors to Atypon website
- *January 2018.* Added new sections Peer Review Process (<https://www.physiology.org/author-info.peer-review-process>) and Publication Process (<https://www.physiology.org/author-info.publication-process>)
- Added Press and Social Media Policy to describe the APS embargo policy and how to promote publications on social media (<https://www.physiology.org/media>)

### Data Reproducibility in APS Journals

Since 2014, NIH and other funders have raised concerns about the lack of experimental reproducibility in basic and preclinical research. In 2015, FASEB hosted three roundtable discussions on experimental reproducibility, of which APS was an active participant. To support our authors in publishing studies that are transparent and reproducible, guidelines were developed, with input from the EICs and Publications Committee, and posted online in August 2016. The guidelines encourage better reporting of animal experiments, antibody validation, and experimental details in figures and legends. Guidelines for articles based on original computer simulation software were posted online in January 2017.

Two webpages were created to highlight the guidelines (see below), and others were updated.

- Promoting Transparent Reporting (<http://www.physiology.org/author-info.promoting-transparent-reporting>)
- Experimental Details to Report (<http://www.physiology.org/author-info.experimental-details-to-report>)

**Statistics Review.** APS collaborated with the American Statistical Association to identify a small group of statisticians that was interested in serving as statistics reviewers for APS journals. In December 2016, seven statisticians agreed to participate in this effort. In July

2017, a list of participating statisticians was added to the reviewer selection page in eJournalPress to make it easier for editors to facilitate a consultation. Nineteen invitations were issued to seven statisticians from four journals (*AJP-Heart*, *AJP-Cell*, *AJP-Renal*, and *JAPPL*), and 11 were accepted. From January to May 2018, 14 invitations were issued to seven statisticians from four journals (*AJP-Heart*, *AJP-Renal*, *JN*, and *JAPPL*), and 11 were accepted. All statisticians received high ratings from the reviewers.

### Finance

**Subscription pricing and sales 2017.** In 2012, a tiered pricing model was implemented for journals and the Legacy Content. Tiers were assigned based on the value of the journal to the institution. The goal was to have a pricing variance of 10% between tiers 1, 2, and 3 by 2014, which was achieved.

Online-only 2017 price for tier 1 was set at 1% increase; the tier 2 price was set at 1.5% increase; and tier 3 was set at a 2.5% increase. Print and Online journal prices for 2017 were set at a 5% increase for tier 1, a 5% increase for tier 2, and a 5% increase for tier 3. The print-only price increased by 5%. Subscription count decreased in 2017 by 1% compared with 2016. The number of institutions subscribed, based on consortia equivalents to individual institutional counts, are comparable to prior years. The APS continues to respond to requests from consortia of libraries or multi-site institutions, offering custom pricing for tiers 4 and 5 online subscriptions, if we are not losing subscription dollars by doing so. APS has arranged for sales agency representation in regions globally that were identified as having growth potential, based on institutional market analysis. Sales representation covers Europe, the Mideast, Brazil and Latin America, India, and China. APS offers a pay-per-view feature for single digitalized articles delivered through the journals' online platform.

**Color figures.** Authors continue to take advantage of the benefit of scientifically warranted color made free of charge to first or last authors of original research articles who are APS members. (Scientifically essential color is published free of charge in all review articles.) The number of color figures in research articles published in 2017 decreased by 17.7% from 4,888 in 2016 to 4,021 in 2017, of which 2,248 (56%) were free to APS members.

**Advertising.** The APS sells commercial advertising in its online and print journals through AdNet, a FASEB-

managed advertising group. Net APS journal advertising revenue was \$65,000 in 2017. AdNet gave notice on November 30, 2017 of its dissolution. APS Marketing is working on replacing this service.

**Author fees.** The author survey conducted by the Publications Department in 2014 raised several important issues that resulted in recommendations from the Publications and Finance Committees to implement the following revenue-neutral revisions to author fees, which were applied to manuscripts submitted as of January 1, 2016:

- Submission fees were eliminated.
- Page charges were increased from \$75 to \$85.
- Color fees for nonmembers were reduced to \$200 per figure (from \$400), made possible through cost savings from production changes and renegotiation of the APS contract with its composition and printing vendor.
- Elimination of page charges for the *AuthorChoice* option whereby only the fixed fee (\$2,000 for original research articles, \$3,000 for review articles) is payable.

As of 2019 submissions, color fees will be eliminated for all authors. The free color member benefit to first and last authors will be replaced by a 12% page charge discount (see *Eliminate Color Fees to Authors and Offer a Page Charge Discount to Members*).

**APS AuthorChoice.** The APS *AuthorChoice* program was introduced to all APS research journals in July 2007. For a fee of \$2,000 (\$3,000 for review articles) in addition to other author fees, an article is made freely available immediately upon payment and is delivered by the APS on behalf of the author to PMC, to be uploaded upon publication. Starting with manuscript submissions in 2016, author page charges additional to the \$2,000 (or \$3,000 for review articles) were eliminated. This change brings the APS within community norms. In 2017, APS received 68 requests for this option vs. 91 requests in 2016, which represents approximately 2.9% of all published articles during 2017 vs. 2.3% in 2016.

As of 2013, to enable authors to comply with the policies of many funding agencies, APS has instituted the application of the CC-BY Creative Commons attribution license (<http://creativecommons.org/licenses/>) to *AuthorChoice* articles governing reuse.

**Copyright and permissions.** Since 2011, the Copyright Clearance Center (CCC) has facilitated on behalf of APS

permissions for reuse of APS-copyrighted materials in electronic format. The CCC is the primary provider to academic publishers of copyright permissions services; the APS has been working with this organization for many years for administration of print copyright permissions. In total, 2017 revenue from CCC was \$176,237.

**Editor budgets.** The estimated expense for running the editors' offices remains at \$150 per manuscript. Almost all editors are in alignment, and some realize savings. The ability to make office funds "fungible" for other specific purposes was implemented as a 2-year trial as of 2013. The guidelines were reviewed and revised by the Publications Committee at its March 2014 meeting and again at its 2015 meeting, wherein it was agreed:

- Editors may use their expense budget to benefit the journal as they see fit.
- EICs are asked to include in their reports to the Publications Committee at each March meeting as to how their EIC and AE fungible budgets were used to benefit their journal.

## Strategic Planning

### **Publications Task Force**

In 2016–2017, the APS Council performed its 5-year strategic planning, guided by Minding Your Business, a marketing consultant firm. At the 2017 Spring Council meeting, it was noted by the Publications Chair that, in the absence of substantive discussion of the Publications Program during the strategic planning/rebranding process, a Publications Task Force (PTF) was recommended and was subsequently approved. The concept was approved prior to other strategic planning TFs. A PTF was invited to establish a vision statement and resulting 5+ big-picture strategic initiatives for APS Publications. Members of the PTF are Curt D. Sigmund (chair), Jo Adams, Kim Barrett, David Gutterman, Meredith Hay, Hershel Raff, Loren Wold, Rita Scheman (ex officio), and Christina Bennett (ex officio). To inform this activity, the EICs and Publications Committee (PC) were asked to provide recommendations. These initiatives were ranked on the basis of importance as determined by the frequency by which they were identified by the EICs, PTF, and PC.

### **Positioning Statement**

Position APS journals to provide a first-choice home for researchers in the physiological sciences, delivering flexibility and visibility in the publishing model; robust, fair and quick peer review; and a high-level of research

transparency, ethical rigor, and overall value to authors, readers, and the librarians who serve the scientific research community.

The overarching concepts that emerged were as follows:

- Develop a high-impact journal. Start de novo or transfer one of our current journals
- Consolidate existing journals to reduce internal competition
- Open access development

2017 fall Council gave its approval to

- 1) Pursue the high-impact journal concept and
- 2) Empower the EICs to explore the consolidation of existing titles.

## 2018 Council

At its 2018 spring and summer meetings, APS Council reaffirmed its approval of the concept of a high-impact journal. Council requested more details of the financial requirements, composition of the journal development team, and the process for appointing an editor, to be presented at the 2018 summer council meeting. An expanded proposal from the Publications Task Force was presented to Council. At the 2018 summer Council meeting, funds were allocated for market research to be carried out for the high-impact journal concept, with results presented at Fall 2018 Council prior for a “go” / “no-go” decision.

## Online Journals Hosting and New Initiatives

### Hosting Platform

The APS contract with HighWire for hosting APS-published journal articles ended on December 31, 2017, and the new site hosted on Atypon’s Literatum platform launched on December 7, 2017. During 2017, APS worked with Atypon on designing the new site, converting all APS journal content to meet Atypon’s specifications, and integrating the necessary systems (including Personify). Site testing was performed between September and December 2017.

Key features of the new platform:

- Responsive design: site adjusts to screen size regardless of the device
- Universal login: login to entire site with APS member credentials
- Multimedia: more prominent display of audio-visuals, e.g., video abstracts, podcasts

- APSelect slideshow: more prominent display of the monthly selections
- Linked content: article page direct links to related articles, podcasts, press releases, etc.
- PDF access: access article PDFs directly from the table of contents (TOC) and article page—no extra clicks!
- PDFplus: more interactive PDF—enlarge images, DOI, reference links, quicker download
- MathJax: a much better rendering of equations (and hover to enlarge)
- Altmetrics: article-level Altmetric scores (number of mentions in news, blogs, social media, etc.) and trending research lists
- Reviewer/Librarian/APS Member resources: all on one page

### Video Abstracts

*AJP-GI* was the first journal to implement video abstracts on the APS journal platform. These abstracts are 3- to 5-minute videos produced by authors that summarize their research outlined in their article. The videos are uploaded to the APS YouTube channel and in the new Atypon platform; they are embedded on the homepage as well as in the article’s “Related” tab. *AJP-GI* published eight video abstracts in 2017 and has published four so far in 2018.

## Editorial Initiatives

### Reviewer CME

Since 2013, APS has offered Continuing Medical Education (CME) credit to eligible reviewers; i.e., U.S.-based medical doctors, who serve as manuscript reviewers and meet qualitative criteria that have been set by our editors. As of 2017, administration of the program has been managed by the Washington University School of Medicine. Details about Manuscript Review CME are at <http://www.physiology.org/reviewers>.

Uptake of the program by the journals and their reviewers continues to be strong. In 2017, the program moved to issuing certificates during the fiscal year instead of the calendar year. Between July 2017 and May 2018, CME Credit for manuscript reviewing was requested by 196 reviewers for reviewing 259 papers as follows: 11 reviewers for 12 papers in *AJP-Endo*; 6 reviewers for 7 papers in *AJP-Heart*; 53 reviewers for 69 papers in *JAPPL*; 46 reviewers for 58 papers in *AJP-Lung*; 53 reviewers for 79 papers in *AJP-Renal*; 4 reviewers for 10 papers in *AJP-Cell*; and 23 reviewers for 24 papers in *AJP-GI*.

### Conference Proceedings Initiative

Publication of APS conference proceedings in APS journals was proposed by Hershel Raff, then APS Publications Chair, because of its potential for attracting new authors and readers, creating increased submissions, establishing a durable record of conferences, and as an overall aid in publicizing conferences and raising enthusiasm.

The key components of this initiative are:

- Selected participants are invited to submit short reviews or original research.
- Submission length up to 4 printed pages, 1 figures (or 1 table/1 figure), one in color
- Standard ethical/scientific considerations apply. Overall impact is not a criterion. Extensive revisions or additional experiments should not be requested.
- Articles included in standard journal issue and appear in a separate online TOC.
- Host EIC in agreement with organizers on criteria established for the conference articles.
- No author charges apply; publication costs supported by APS.
- Applies to APS conferences in 2015–2016 (up to 2 per year; first-come, first-served); assessment at 2017 Spring Publications meeting.

Uptake of the initiative

- 1) *AJP-Regu* worked with the organizers of the Cardiovascular, Renal and Metabolic Diseases: Physiology and Gender Conference, Annapolis MD, November 17–20, 2015.
- 2) *AJP-Regu* targeted Promoting the Resolution of Inflammation in Sickle Cell Disease Conference, held in Washington, DC, November 6–8, 2017 (<http://www.the-aps.org/SickleCell>).
- 3) *Advances in Physiology Education* commissioned eight articles from speakers from the Institute on Teaching and Learning (ITL) Workshop, Madison WI, June 20–24, 2016.
- 4) *AJP-Heart* issued an open Call for Papers to speakers from the Inflammation, Immunity and Cardiovascular Disease Conference, Westminster CO, August 24–27, 2016.

- 5) *AJP-Heart* engaged the organizers of the conference, Cardiovascular Aging: New Frontiers and Old Friends Conference, Westminster, Colorado, August 11–14, 2017.

### Frontiers for Young Minds

In May, the APS Publications Department began a partnership with Frontiers for Young Minds (FYM; <https://kids.frontiersin.org/>), a not-for-profit service that provides science articles written for young audiences. Authors of recently published articles that are interesting to multiple audiences will be invited to opt in and work with a member of the editorial board at FYM to reshape the article for a young audience. Authors may choose whether they participate, there is no cost associated with the activity, and the articles will be made freely available to all on the FYM website.

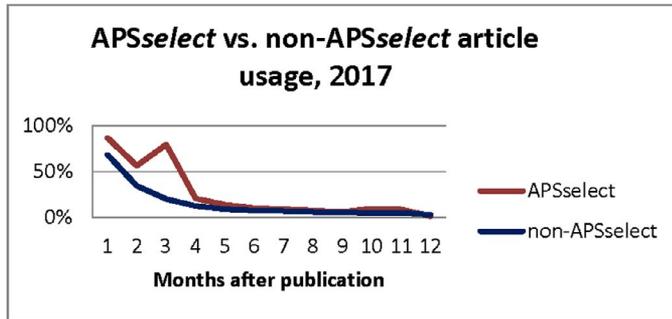
In 2017, the APS recommended 19 recently published articles. Ten articles were invited to be rewritten, and authors of eight of the articles accepted the invitation. In March 2018, one article entitled, “Do cigarettes have long-lasting effects on children’s sleep?” was published by authors of an *AJP-Regu* article (<https://kids.frontiersin.org/article/10.3389/frym.2018.00007>).

### APSselect

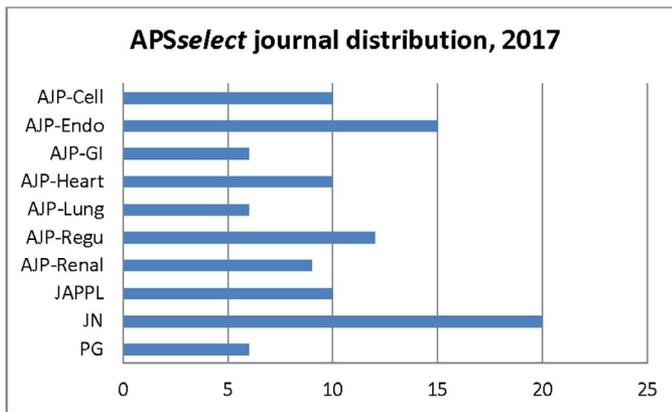
*APSselect* (<http://apsselect.physiology.org/>) launched January 2014, and highlights and promotes the top APS original research papers that are published each month across all 10 APS original research journals. As of 2018, *APSselect* is edited by Linda Samuelson (EIC) and Douglas Eaton (associate editor), who succeeded Founding EIC Joe Metzger and founding Associate Editor Linda Samuelson. The monthly selection process is:

- The EICs of each of the 10 journals nominate two recent articles.
- A Selection Board, representative of disciplines within physiology, chooses the final articles, using a 10-point rating system similar to that of NIH grant peer review.
- APS staff manages the nomination/selection and posts the winning list to the website.

**Usage data.** Data show that articles chosen for *APSselect* experience a spike in usage on publication vs. non-*APSselect* articles (see graph below).



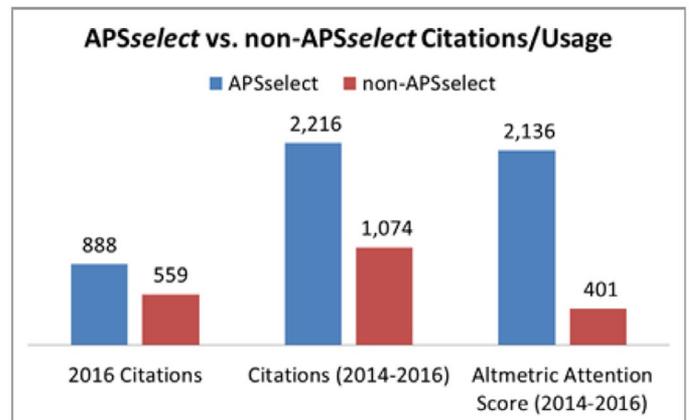
Average usage for selected vs. non-selected original research articles. The data have been normalized across all 10 research journals; values are given as a relative percentage of the maximum amount of usage that an average non-selected or selected article received during this 12-mo period.



APSselect articles in 2017, as represented across all APS original research journals. *Journal of Neurophysiology* had the highest representation of APSselect articles (20).

**Citation analysis.** APS conducted an analysis of APSselect article citations compared with non-APSselect articles. The control group is a random selection of original research articles from 2014–2015 that were published but not selected for APSselect ( $n = 192$  for both groups). We then compared the control groups' 2016 citations against the 2016 citations for the 2014–2015 APSselect articles. We also compared 2014–2016 (all APSselect years) citations, page views, and Altmetric Attention Scores for both groups. The results show that articles selected for APSselect outperform their equivalents on every metric we considered. APSselect articles had 159% of the 2016 citations for equivalent articles and 206% of the all-time citations. The calculated "Impact Factor" for APSselect articles was higher than that of the average of APSselect journals: 4.625 vs 3.4225.

The data shown above were presented to the Publications Committee at its August, 2017 teleconference by Joe



Metzger and Linda Samuelson, EIC and associate editor, respectively, of APSselect at that time. The Publication Committee determined that APSselect was doing what it set out to do—highlight the best research published by the APS.

## Recent Publications

### **Comprehensive Physiology**

*Comprehensive Physiology* ([www.comprehensivephysiology.com](http://www.comprehensivephysiology.com)), edited by David Pollock, is a digital update of the *Handbook of Physiology* published quarterly. The first issue, published in January 2011, included all content of the most recent edition of the printed *Handbook* digitized and presented as "Classic Content," plus 25 new articles. *Comprehensive Physiology* is published by Wiley on behalf of the APS. As of May 31, 2018, 939 articles have been invited, of which 501 have been accepted, 36 are in review or revision, and 476 have been published. The invited articles are from 12 of the 13 sections, covering 27 topics; "topics" correspond to a volume of the *Handbook*.

The Journal has been accepted in all of the major abstract and indexing services including Scopus, PubMed, SciSearch®; Journal Citation Reports/Science Edition; BIOSIS Previews; BIOSIS Reviews Reports and Meetings. The Journal was accepted into PubMed in 2012, and indexing began in July 2013. Its 2017 Impact Factor is 5.797.

To maximize use and appeal for teaching, *Comprehensive Physiology* added Teaching Materials to the Instructions to Authors for newly commissioned and updated articles. Since this requirement was implemented, 83% of accepted articles include Teaching Materials.

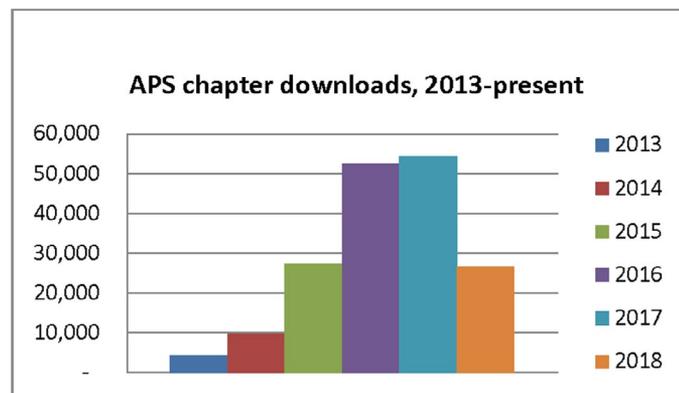
### Book Monograph Series

In June 2011, APS and Springer signed an agreement for Springer to publish books in the APS Monograph Series on behalf of the APS, which was renewed in January 2018. As part of the program, 33 APS backlist monograph titles were digitized.

- All new titles are published in electronic format as part of Springer's "Physiology eBook Collection" and are available in print.
- All eBooks published in the program—both new and backlist titles—are freely available to APS members via login at the APS website at [www.the-aps.org/mm/Publications/Books](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 hardcover print version of each new title published in the program is available to APS members at the special price of \$40.

**Book Committee.** The Book Monograph Series is managed by the Book Committee, which solicits and develops the book projects. Sources of topics and authors include EB and other symposia and articles in *Physiology* that may be appropriate for expansion. Current members of the Book Committee: Dee Silverthorn (chair); John West, UCSD; William H. Dantzler; Sue Barman, MSU; Robert L. Hester, UMC; Michael G. Levitsky, LSU; Gary C. Sieck, Mayo; Allen Cowley, MCW; and Kathy L. Ryan, US Army Institute.

Sixteen books have been published in the program to date for a cumulative life total of 174,527 full-text downloads. Cumulative downloads for the backlist titles total 28,419.



### Physiological Reports

*Physiological Reports* is a general physiology open access journal owned jointly by the APS and The Physiological Society and published on their behalf by Wiley. The contract with Wiley was renewed in as of January 2018 for a further 5 years. The Journal is tasked to achieve a quick time to publication while upholding a quality standard of sound research that constitutes a useful contribution to the field. The Journal uses a "cascading peer review model," whereby manuscripts considered unsuitable for publication in an APS/TPS journal, but yet are deemed to be of publishable value, are "referred" to *Physiological Reports*, with author agreement to "transfer" the manuscript and reviewer agreement to transfer the manuscript reviews. The Journal also accepts de novo submissions whose peer review process is comparable to that of APS journals.

**Article types.** The journal accepts original research articles, reviews, commissioned editorial focus articles, and case reports (see <https://physoc.onlinelibrary.wiley.com/hub/journal/2051817X/about/author-guidelines>).

**Joint Managing Board.** *Physiological Reports* is managed by a Joint Managing Board composed of representatives from both APS and The Physiological Society.

**Editors.** Thomas Kleymann (University of Pittsburgh, EIC) and Morten B. Thomsen (University of Copenhagen, Deputy EIC).

**Journal business model.** The Journal is funded by an author processing charge (APC) of \$1,600 paid by the author upon acceptance. There are waivers in place for submissions from authors based in countries that cannot afford the fees (as for all APS journals). The APC for case reports and reviews is \$1,000.

**Finances.** The societies receive a profit share, split 50:50 for articles published via de novo submissions and split by actual percentage of articles published via transfer from each society. The journal has been profitable since 2014, its first full year after launch.

**Editorial status.** *Physiological Reports* launched in March 2013. The first article appeared online in May 2013, and the first issue was compiled in June 2013. Articles are published

as they are ready, and issues are compiled monthly. From January to May 2018, 176 articles were published, with the cascading peer review model accounting for ~72% of the total submissions and ~90% of these articles accepted for publication.

**Impact Factor.** *Physiological Reports* is scheduled to be reviewed by Clarivate in July 2018 for inclusion in Journal Citation Reports. If the journal is accepted, it will receive a 2018 Impact Factor issued in June 2019

**Acta Physiologica.** In June 2015, the societies signed an agreement with The Scandinavian Physiological Society to include their journal, *Acta Physiologica*, as a supporter journal to *Physiological Reports*, from which suitable manuscripts are referred.

## Marketing and Communications

### Collaboration on Tactical Journals Marketing with Consultants

In September 2017, APS Publications retained DeltaThink consultants to work with the Marketing and Communications and the Publications Departments through September 2018 to develop a tactical plan to address the top priority of APS journals: that of increasing quality submissions. The approach targets messaging by specific segments of the potential author community (who respond differently), targeting early career/pre-tenure, mid-career/senior investigator, and non-engaged at any career stage. This builds on work done by DeltaThink in working with 10 societies, including the APS, on the Scientific Societies Publisher Alliance (SSPA) to promote the unique value and ideals of society publishers (see below). Highlights of our tactical marketing efforts for APS journals include:

- Focus on e-mail campaign messages by approaching author base/members/potential authors and members by career stage, career stage being a primary influence on submission habits
- Separate general and journal-specific messaging campaigns
- Develop prospective author list from culling authors from journals identified by the EICs as key competitors
- Submission benefits e-mails sent to this list in May 2018
- Develop new social media guidelines and actively encourage EICs to appoint a young investigator to the board as “social media curator”
- Interviews conducted by DeltaThink with each EIC to inform our plans

- Host reception at EB2018 for EICs as a group, highlighting the new APS journals website (e-mails promoting this event resulted in more than 200 “yes” RSVPs and a well-attended event)
- Promote SSPA to authors/prospective authors
- Monthly APSselect e-mails have consistent open and click rates
- Encourage content alert sign-ups on the Atypon platform (targeted e-mails to APS members, an author list pulled from eJournalPress, and a list of pre-Atypon migration subscribers went out in early May 2018. These initial e-mails were supplemented by follow-up e-mails, print collateral distributed at EB 2018, and social media posts. A significant surge in content alert sign-ups occurred in May 2018; see graph below. These efforts will continue in the second half of 2018, with updated messaging encouraging recipients to share this valuable resource with their networks using Informz Social Share functionality.)

### Scientific Society Publisher Alliance

For details on Scientific Society Publisher Alliance, see Rita Scheman’s article published in the January 2018 issue of *The Physiologist* (Scheman R. Scientific Society Publisher Alliance. *The Physiologist* 61: 6–8, 2018; <http://www.the-aps.org/mm/Publications/Journals/Physiologist/Archive/2018-Issues/January-2018-Vol-61No-1>).

### Sci-Hub and APS-Commissioned Report

For more details, see Rita Scheman’s article in the January 2017 issue of *The Physiologist* (Scheman R. The Physiologist 60: , 2017; <http://www.the-aps.org/mm/Publications/Journals/Physiologist/Archive/2017-Issues/January-2017-Vol-60No-1/Report/Sci-Hub-Downloads-of-APS-Papers>).

In 2011, a graduate student, Alexandra Elbakyan from Kazakhstan, made freely available what has now grown to [over] 50 million articles illegally downloaded from copyrighted materials, primarily from the scientific literature. The copyrighted materials are collected into a repository known as Sci-Hub. An injunction filed in the U.S. in October 2015 ordering Sci-Hub to desist drove the website domain name out of the reach of the U.S. legal system behind Russian firewalls, where the servers were already based. Sci-Hub continued to thrive. Legally, this action by Elbakyan constituted theft, or piracy, in the lingua franca of intellectual property. Elbakyan has been championed by some as a Robin Hood—taking from the rich what morally should be shared by all. How does she do it? Loopholes in some academic institutions’ library

access systems, stemming from lax authentication, as well as complicit institutional users, are understood to be the sources of the Sci-Hub repository. Content is updated through these methods when articles not yet included are requested. Currently, Sci-Hub reports nearly 60 million downloads by users.

To determine the extent of the unauthorized usage of APS journal content by Sci-Hub, the APS commissioned a report from Phil M. Davis, "Sci-Hub Downloads of APS Papers." The Report analyzes the sources and frequency of 26,703 downloads in Sci-Hub of APS published papers during the period September 2015 through February 2016 (see also from *Science*: <http://www.sciencemag.org/news/2016/04/whos-downloading-pirated-papers-everyone>).

### **Scholarly Collaborative Networks: STM Consultation on Article Sharing**

As described on the STM website: "To gain a better understanding of the current landscape of article sharing through scholarly collaboration networks (SCNs) and sites [such as ResearchGate, Academia.edu, et al.], STM conducted an open consultation across the scholarly community in 2015. The aim of this consultation was to facilitate discussion by all stakeholders in order to establish a core set of principles that clarify how, where and what content should be shared using these networks and sites, and to improve this experience for all."

In the initial phase, APS was part of a working group that supported and developed a draft set of "voluntary principles for article sharing on scholarly collaboration networks" and posted it for public comment and subsequently publicly endorsed the draft principles (<http://www.stm-assoc.org/stm-consultations/scn-consultation-2015>).

STM went on to develop the "How Can I Share It?" website to provide authors a quick way to determine how their article can be shared based on the copyright of the work. This website also includes a list of publisher sharing policies, including the APS copyright policy which states in part:

**"Websites. Authors may not post a PDF of the accepted or final version of their published article on any website including social and research networking platforms; instead, links may be posted to the article on the APS journal website (see exception to authors' own institution's repository, as noted below). (<http://www.physiology.org/author-info.permissions>)"**

The APS policy is intended to ensure that content under copyright is not illegally posted to public sites that can modify, commercialize, or illegally distribute the work of our authors. Instead, we encourage authors to post links back to the journal site. Such steps support readers obtaining the most up-to-date information from the bona fide source and provide a more accurate assessment of reader engagement with our content.

In addition, publishers, including the APS, have been in communication with article sharing sites, particularly Research Gate, to seek an arrangement that supports the authors' interests in sharing their work with colleagues and that protects the content from illegal activity. Publishers are committed to taking action against public sharing sites that illegally post journal content through the use of takedown notices.

*Council accepted the report of the Publications Committee. ●*

## Science Policy Committee



Laura McCabe, Chair

This report provides an overview of committee activities. There are no action items.

### Meetings

The Science Policy Committee (SPC) met June 26–27, 2017 in Bethesda and April 22, 2018 in San Diego. The committee will also meet September 16–17 in Rockville.

### Advocacy

Members of the SPC and the 2017 Early Career Advocacy Fellows went to Capitol Hill on June 27, 2017 to meet with their Senators and Representatives. They had 22 meetings with 10 Republican and 12 Democratic offices.

On September 14, 2017 the SPC encouraged all APS members to take part in a virtual advocacy campaign called the National Day of Action organized by the Rally for Medical Research.

I was one of 6 APS members who participated in FASEB's annual Capitol Hill Day on March 8, 2018.

### APS Early Career Advocacy Fellows

The 2018–2019 Early Career Advocacy Fellows (ECAAF) are Daria Ilatovskaya, (Medical University of South Carolina) and Anna Stanhewicz (Pennsylvania State University).

### Leadership Interactions with FASEB

The APS is represented on the FASEB Board of Directors by Kevin Kregel. I serve as the APS representative to the FASEB Science Policy Committee (SPC). Hannah Carey is completing her service as vice president-elect for Science Policy of FASEB. In July, she will become FASEB's president-elect.

### EB 2019 Public Affairs Symposium

The SPC will organize the EB 2019 Public Affairs Symposium on the topic of sexual harassment in the scientific community.

### Coalition Activities

To amplify our advocacy efforts, the APS participates in several advocacy coalitions.

### Future Plans

In addition to the topic of sexual harassment, the SPC identified increased advocacy on behalf of the NSF and peer review at NIH as further areas of focus for its activities in the coming year.

*Council accepted the report of the Science Policy Committee.* ●

## Section Advisory Committee



Sean D. Stocker, Chair

### SAC/Council Communication

Section Advisory Committee (SAC) and Council held two joint meetings: November Fall Council Meeting in Baltimore and Spring Council Meeting at EB in April. The Spring SAC/Council Meeting occurred during the joint SAC/Council Dinner.

The discussion at the Fall and Spring SAC/Council Meeting largely focused on the recommendations of the APS Task Forces. The majority of task forces had SAC representation. The task force reports and minutes from these discussions are summarized by the Council Meeting minutes.

Section chairs continue to emphasize the importance of these meetings to serve as two-way conversations and brainstorm sessions between Council and section chairs—the latter represent APS membership.

### Communication Via APS Connect

A major issue for sections and section chairs has been communication. APS Connect was implemented to serve as a platform. Section chairs had experienced numerous problems, formed a working group (Frank, Kuebler, McCole, Lazartigues, Jackson, Kohan, Browning), and identified solutions with APS IT (Kaneshige and Zhou).

Kevin Kaneshige and Christine Zhou provided two 45-min workshops (APS Fall Council and SAC Onboarding Session) regarding the improved functionality of APS Connect and Informz platforms. APS has requested additional information from section chairs regarding Informz templates that can be used to track responses from APS membership. These steps have been strongly welcomed by APS section chairs.

### Programming at EB

Over the past 2-3 years, SAC and JPC have worked together to identify solutions to increase the scientific visibility of the EB meeting. The SAC/JPC working group

was replaced by the Experimental Biology Task Force that included representation from the SAC/JPC working group.

Although we have no concrete data, several section chairs have received positive feedback regarding the changes in poster programming (10 AM to noon).

SAC is also tasked with developing metrics to assess session allocation for the EB meeting. The number of sessions allocated to sections/interest groups is usually assessed every 3 years and originally scheduled for 2015. However, the assessment of session allocations has been deliberately delayed due to proposed changes to EB. SAC will work together with JPC over the next 1-2 years to develop new metrics and to assess session allocation.

### Engaging Members in Section Operations

Sections interact with membership through newsletters and APS Connect. As noted above, section has various communication issues in previous years using APS Connect. This barrier appears to be resolved due to increased functionality.

All sections have established a trainee representation on the Steering Committee as well as a Trainee Committee within the section. A majority of sections support activities to increase interaction with trainees, distinguished scientists (i.e., Distinguished Lecturers), and opportunities for trainees to present research. These activities vary from section to section but are reflected by additional trainee award sessions, poster sessions, and dinners.

### Interactions with Other Sections and APS Journals

Section chairs have repeatedly asked for Council to promote interaction across sections. Part of the barrier to cross-sectional interaction was session allocations (abstract numbers). SAC has not formulated new metrics to address session allocation.

Sections continue to interact with various APS Journal editors-in-chief (EICs) and commonly have the respective EIC on the Steering Committee.

### Section Finances and APS Matching Funds

All sections reported a stable financial outlook. The amount of money within a section general funds account varies. A few sections (CNS, Endo) have endowments separate from Matching Funds or General Funds.

Sections are clearly interested in fundraising and coordinating efforts with the Development Office per new guidelines.

Fundraising efforts would largely support Matching Funds/Trainee Endowment Accounts, although not exclusively (some actions receive annual gifts or multiple year contracts to support awards). Below is a general summary to date of Matching Funds Accounts (as reported in annual section reports):

Section	Matching Funds
CV	\$30,000
CNS	\$65,000
CEP	?
CaMPS	\$21,000
EEP	n/a (plans to develop in 2018-19)
Endo	?
GI	?
NCAR	\$11,000
Renal	\$72,000
Respiration	\$84,000
Teaching	\$23,000
WEH	\$33,000

At least 3 sections are approaching the Matching Funds Account Limit (50K donations: 50K APS matched). In 2016, APS Council decided to expand the matching funds program from 25K:25K to 50K:50K. What advice do we provide to these sections regarding the matching funds program?

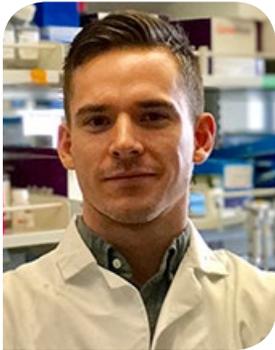
### How Can SAC and APS Better Serve Your Section?

Section chair responses:

- Monthly SAC conference call are extremely beneficial
- Nomination SOP should help tremendously
- Assistance in fund-raising and coordination with development office
- Increase communication/interaction between SAC and Council
- Use “brainstorm” or “work group” sessions at SAC/Council Meetings. These meetings have too many people in the room to be effective. However, these meetings are necessary to maintain communication between SAC and Council.

*Council accepted the report of the Section Advisory Committee.* ●

## Training Advisory Committee



Christopher Banek, Chair

### Training Advisory Committee Trainee Survey

A full analysis of the 2010 survey results, analyzed by educational level, was provided to Council in 2011, and a Training Advisory Committee (TAC) subcommittee is working on a manuscript to publish the 2010 survey results.

At the fall 2013 TAC meeting, the Committee approved moving from a survey every 3-5 years to align this process with the APS Strategic Planning process that is currently done every 5 years. The TAC began planning for the 2014 survey, including discussion of topics and objectives. However, with the change in timeline for APS Strategic Planning, TAC has put the finalization of the survey on hold to coordinate with Council planning activities. This survey has remained on hold since 2017.

### TAC Symposium

The TAC symposium for EB 2018 focused on increasing awareness for the need for rigorous research and was titled “Do It Again: How to Achieve Rigorously Reproducible Research.” Committee members Ryan Downey and Ijeoma Obi organized and chaired the session. The goal of this symposium was to help trainees and early career scientists to make data collection, analysis, and reporting more rigorous and reproducible, and to help young scientists meet the new reproducibility requirements for funding. The speakers addressed the following categories: 1) experimental design and analysis, 2) publishing and results, and 3) meeting new funding requirements for rigor and reproducibility. A new structure for the symposium was used for 2018. The symposium was held across 3 days, Sunday, Monday, and Tuesday, from 7 AM to 8 AM. Attendance was once again quite good (~150–170 total attendees) across all sessions.

### Career Webinar Series

The first webinar in this series (by Rudy Ortiz) was produced and is ready for coordinated dissemination. All stakeholders in the webinar series (COPC, TAC, and

Porter Committees) have chosen primary and secondary participants for the 2018 webinar/podcast recordings. We anticipate production of all webinars and podcasts for 2018 taking place over the summer months, and prepared for coordinated dissemination within 2018–2019. The podcast will be launched using FigShare.

### Trainee E-Mail Newsletter and Social Media

Ryan Downey worked with APS staff on the newsletters this year, with special emphasis on the spring (EB) and fall (EB award applications) newsletters. The newsletter subcommittee has also been working closely with APS staff, and a monthly distribution of a formal newsletter has been replaced by use of Facebook ([www.facebook.com/apstrainees](http://www.facebook.com/apstrainees)) and Twitter (@apstrainees). As of June 2018, The APS Trainee Facebook page currently has 2,284 Facebook “Likes” (up from 404 in 2014, a 465% increase), and the Twitter account has 228 followers (up from 110 in 2014, a 107% increase). Postings come from staff, TAC members, TAC trainees, and APS Twitter feeds, providing regular communication (multiple postings per week, on average) to trainees from the APS and the TAC. At the annual 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 Trainee Advisory Committee completed its evaluation of the seven applications for the Dale J. Benos Early Career Professional Service Award. The Dale J. Benos Early Career Professional Service Award honors an early career stage member of APS judged to have made outstanding contributions to the physiology community and with demonstrated dedication and commitment to furthering the broader goals of the physiology community.

The Committee is extremely pleased to note that the applicant pool for this ninth year of the award was again highly competitive. Although all seven candidates were worthy of the award, the Committee agreed that Patricia Halpin (Assistant Professor at the University of New Hampshire) was the most outstanding candidate.

## APS Graduate Student Ambassador Program

The APS Graduate Student Ambassador (GSA) program was established to foster communication between APS graduate trainees and undergraduates in their geographic area. The primary goals of the program are to 1) build GSA leadership and outreach skills; 2) increase awareness of the numerous benefits of APS membership; and 3) encourage students to become APS members, particularly underrepresented minority students. The TAC received four applications for the second year of this award. The applications were reviewed by all Committee members. As in previous years, Committee members with a conflict of interest recused themselves from the review. Application review criteria included having passed qualifying exams, being an active APS student member in good standing, and being an outgoing, personable, creative, driven, and self-motivated individual. The Committee unanimously selected four candidates and recommended them to Council as the 2018 awardees. Council approved this request for these awardees. Upon approval, the applicants were contacted and notified of their acceptance into the program. The fellowship includes 1) reimbursement of

up to \$1,200 per year in registration and travel costs to EB for the 2-year term as a GSA; 2) web-based training to enhance knowledge of APS programs and membership benefits, leadership, and presentation skills; and 3) content materials for outreach presentations.

## Communication With Sections

Each TAC representative updated their section activity information in 2017–2018 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 trainees and junior faculty as symposia speakers and chairpersons, and e-media (primarily listserv) 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 accepted the report of the Trainee Advisory Committee.* ●

## Women in Physiology Committee



Sue Marsh, Chair

### Bodil M. Schmidt-Nielsen Distinguished Mentor and Scientist Award

Nine excellent nominations were received for the 2018 Bodil M. Schmidt-Nielsen Distinguished Mentor and Scientist Award. The Women in Physiology (WIP) Committee selected Merry Lindsey (Professor and Director, Mississippi Center for Heart Research,

Department of Physiology and Biophysics, University of Mississippi Medical Center) as the awardee. During the Experimental Biology meeting, Lindsey gave an outstanding talk, providing “The Flight Safety Briefing for Your Career,” an overview of her best tips on mentoring that she has developed over her prestigious career. The slide presentation from Lindsey’s presentation will be posted on the APS website. Approximately 125 individuals

were in attendance, including guests of Lindsey, APS presidents (current, past, incoming), past Schmidt-Nielsen Award recipients, WIP Committee members, APS trainee award winners, and APS staff. Lindsey has developed a Mentoring Forum column based on her lecture, to be published in *The Physiologist*.

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

The WIP Committee received 95 complete and eligible applications for the 2018 tum Suden Professional Opportunity Awards, which is exactly the same as the number of applications in 2017 (95) but less than those received in 2016 (117). The Committee was able to fund 50 tum Suden Awards, 2 Horvath Awards (awarded to the top two URM applicants), and 1 Strand Award (awarded to the top overall applicant) for an overall funding rate of 56% (53 awards in total).

## Mentoring Programs

### Mentoring Forum

Over the past 12 months, the WIP Committee has coordinated the development of six new Mentoring Forum columns published in *The Physiologist*. These columns cover a wide range of topics, from retirement and career change to “alternative” careers, recruiting students to a new lab, and tips for aspiring physician-scientists. Each article has related bulletin board discussion topics at the mentoring website and on LifeSciTRC.

### Online Mentoring Programs

The WIP Committee continues to provide information about MentorNet on the APS website, and the APS is also a Scientific & Professional Society partner with the National Research Mentoring Network (NRMN) (<https://nrmnet.net/>), which provides comprehensive mentoring services for APS members, including a “Virtual Mentoring Program,” similar to the MentorNet approach. A variety of mentoring resources are also available on the APS website under the “Career Development & Mentoring” link. During the 2017 Fall Meeting, the WIP Committee continued to explore a number of innovative options that would provide much needed mentoring experiences across career stages, without incurring the logistical and fiscal expenses of establishing and maintaining a formal mentoring program. The WIP Committee plans to establish an APS Connect Community for women in physiology and discussion about other initiatives are ongoing.

### WIP Committee Facebook Page

The WIP Committee has a very active Facebook page, with 712 “likes,” and many posts reaching more than 300 views. 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. Please visit and “Like” the WIPC Committee Facebook page at <https://www.facebook.com/APS.WIPC>.

### Experimental Biology Mentoring Workshop

The EB 2018 workshop was entitled, “Recognizing and Responding to Implicit Bias in Science.” The workshop was held during the new “Trainee Hour” over 3 days (Sunday to Tuesday) from 7:00 AM to 8:00 AM. Given that this was the first year of the change in format for the symposia, attendance was understandably lower than the previous years with 35,

40, and 25 participants on Sunday, Monday, and Tuesday, respectively, compared with the 125 participants at the 2017 Mentoring Workshop. Seventy-one attendees completed a survey, with several attendees having attended the sessions on multiple days. Based on these responses, the audience was primarily made up of trainees (undergraduate students, graduate students, postdoctoral fellows); however, there was a wide range of audience members, including junior and established investigators. The speaker presentations received very high ratings (average of 4.3 out of 5.0), and the subsequent 5- to 10-minute question-and-answer period resulted in an informative and lively dialogue between the speakers and audience members.

### 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. Of the members who include gender in their membership profile ( $n = 6,311$ ), women currently comprise 33% of the APS membership [29% of the regular membership ( $n = 5,158$ ), 47% of the graduate student membership ( $n = 932$ ), and 63% of the undergraduate student membership ( $n = 221$ )]. These numbers are consistent with those from last year.

In reviewing the membership of the APS Section Advisory Committee (SAC) and other Society committees, we found that the representation of women on the general Society committees continues to be good. The WIP Committee commends the Committee on Committees for its ongoing attention to diversity on APS-appointed committee positions. The Committee notes, however, that in 2018, the APS Council has 3 women out of 9 elected regular members (33%; down from 44% in 2017) in addition to 1 woman in the Past-President position. Thus, overall, 4 (33%) of the 12 elected members of Council are women. While this is lower than in 2017, the Committee feels that this reflects the overall distribution of women in the Society as a whole, but that it could be improved. In 2018, the SAC also has 4 women representatives out of 14 (29%), which is also lower than in 2017 (31%); we continue encouraging all Sections to involve women in their leadership positions, particularly as Section chairs.

In reviewing the Section Steering Committees, we found a higher proportion of women compared with last year (43% compared with 38% in 2017). In 2017, there were three Sections that had Steering Committees where <25% of the members are women, and this has improved in 2018 such that all but one Section (EEP) now has >30% of women members. We are also pleased to report that 3 of the 12 Sections now have Steering Committees where at least 50% of the members are women. In 2017, 20 of 22 APS Committees were comprised of at least 25% women members; however, this has dropped in 2018 such as only 18 of 22 Committees now meet this benchmark. Women are also Chairs of 10 of these APS Committees (45%), which is a noticeable increase over 32% from 2017. The WIP Committee encourages the Committee on Committees and the Section Steering Committees to continue their efforts to identify and select women members for APS Committees.

Historically, there have been very few women selected for the major APS awards. At EB 2017, only 2 of the 15 (13%) Distinguished Lectures were given by women. Although this is more than the single lecture in 2017, this is down from 3 lectures in 2016 and 6 lectures in 2015. The Committee continues to strongly encourage Sections to include women on their slate of candidates for their Distinguished Lectureships in the future.

### Concluding Remarks

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 are also working to specifically address the mentoring needs of LGBTQ scientists. 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 WIP Committee.* ●



### Set yourself apart.

APS' undergraduate summer fellowship programs allow students to participate in hands-on research in the laboratory of an established scientist.

Fellows complete 10 weeks of summer research and participate in interactive online professional development activities with APS Fellows.

Learn more and apply at [the-aps.org/summerresearch](http://the-aps.org/summerresearch).



“APS has provided me with an excellent platform to meet pioneers in my field to advance my scientific and skillful knowledge.”

— Parul Chaudhary  
University of North Texas  
Health Science Center

# Education

## 2018–2019 Porter Fellows Announced

The APS and Porter Physiology Development and Minority Affairs Committee congratulate the 2018–2019 Porter Physiology Development Fellowship recipients:

Name	Institution
Nathalie Fuentes	Penn State College of Medicine
Rosario Marroquin-Flores	Illinois State University
Naiomy Rios-Arce	Michigan State University
Crystal Taylor	University of Alabama at Birmingham
Keon Wimberly	University of Florida
Inevy Sequinot	Ponce Health Sciences University
Emily Larson	University of Oregon
Matthew Romero	Auburn University

Naiomy Rios-Arce was named the 2018–2019 Eleanor Ison Franklin Fellow in honor of Dr. Franklin, the past co-chair of the Porter Committee, indicating that she had the highest-ranked application among the renewal applicants.

Porter Fellowships are 1-year graduate fellowships that provide a stipend of \$28,300, with the opportunity to reapply for a second year of funding. The fellowships are open to underrepresented racial/ethnic minority applicants who have been accepted into or are currently enrolled in a graduate program pursuing an advanced degree in the physiological sciences; the applicant and their PI must both be members of APS. For more information, see the APS website ([www.the-aps.org/porter](http://www.the-aps.org/porter)) or contact APS at [education@the-aps.org](mailto:education@the-aps.org). ●

## Award Opportunities – Deadlines Through February 2019

To apply for any of these awards, go to [the-aps.org/awardapps](http://the-aps.org/awardapps).

### Translational Research Awards for Predoctoral Students and Postdoctoral Fellows

*Application deadline: November 14, 2018 (coincides with EB abstract deadline)*

[the-aps.org/mm/awards/Other-APS-Awards](http://the-aps.org/mm/awards/Other-APS-Awards)

This award recognizes a postdoctoral fellow (\$800 award) and a predoctoral student (\$500 award) whose area of experimental research is translatable to industry applications (treatment development or improvement, diagnosis, mechanism of action, health and wellness). Applicants will be evaluated on their first-author abstract submitted to the APS annual meeting at EB and a supplementary 1-page (maximum) description of 1) the translational nature of their project and its potential utility for future research, 2) their contribution to the work, and 3) their career goals. Applicants do not have to be APS members, and there are no restrictions on how the award is spent; however, their sponsor must be an APS member in good standing at the time of application.

### Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Awards

### Steven M. Horvath Professional Opportunity Awards

### Fleur L. Strand Professional Opportunity Award

*Application deadline: November 14, 2018 (coincides with EB abstract deadline)*

[the-aps.org/mm/awards/Other-APS-Awards](http://the-aps.org/mm/awards/Other-APS-Awards)

To be considered for these awards, the applicant must be either a graduate student or a postdoctoral fellow, the first author of an abstract submitted to APS, and a member of APS in good standing at the time of application (either Student or Regular). To receive the award, recipients must attend the APS annual meeting at EB, present a poster at the meeting, and attend the APS Business Meeting. The top applicant will be designated as the Strand Awardee and will receive \$1,000. The top two underrepresented racial/ethnic underrepresented minority recipients will be designated as Steven M. Horvath Awardees. The tum Suden/Hellebrandt and Strand awardees receive \$500 and complimentary EB registration. Awardees will be allowed to only receive a tum Suden, Strand, or Horvath Award once as a predoctoral student and once as a postdoctoral fellow.

## Graduate Student Ambassadors

**Application deadline: November 21, 2018**

[www.the-aps.org/gsa](http://www.the-aps.org/gsa)

The Graduate Student Ambassador (GSA) program seeks to foster communication between current APS graduate trainees and undergraduates in their geographic area. The 2-year GSA fellowship includes travel support to attend the APS annual meeting at EB, web-based training, and local outreach activities involving visits to primarily undergraduate institutions to promote careers in biomedical sciences and APS membership, programs, and awards. The APS Trainee Advisory Committee (TAC) is recruiting a passionate and dedicated group of graduate students to become part of the next class of Graduate Student Ambassadors.

## Martin Frank Diversity Travel Fellowship Awards

**Application deadline: November 21, 2018**

[the-aps.org/MFDT](http://the-aps.org/MFDT)

The Martin Frank Diversity Travel Fellowship Awards (formerly known as the Minority Travel Fellowship Awards) are open to underrepresented minority (URM) graduate students, postdoctoral fellows, and early career faculty (recently transitioned or within 5 years of receiving a PhD); and graduate students, postdoctoral fellows, and early career faculty (recently transitioned) with disabilities. This travel award is designed to increase active participation in, and networking at, APS's scientific meetings. See website for full eligibility details.

Awardees will receive up to \$1,800 in expense reimbursement for registration, housing, meals, air and ground transportation, and tips. These awards do not provide funds for international travel.

## ADIstruments Macknight Early Career Innovative Educator Award

**Application deadline: December 1, 2018**

[the-aps.org/adi](http://the-aps.org/adi)

The ADIstruments 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 honorarium plus up to \$2,000 in travel expense reimbursement and complimentary advanced registration to attend the APS annual meeting at EB and an Institutional Grant providing the awardee's institution with a PowerLab PTB4152 Physiology Teaching Bundle or equivalent. Applicants must be a member of the APS Teaching Section (1st, 2nd, or 3rd affiliation).

## Barbara A. Horwitz and John M. Horowitz Undergraduate Research Awards

**Abstract deadline: November 14, 2018**

**Application deadline: January 12, 2019**

[the-aps.org/eb-undergrad](http://the-aps.org/eb-undergrad)

The Barbara A. Horwitz and John M. Horowitz Undergraduate Research Awards are presented annually to undergraduate students who submit a first-author abstract to the APS annual meeting at EB and present their research at the meeting. There are two types of Horwitz/Horowitz Undergraduate Awards that students can apply for through a single application.

### Outstanding Undergraduate Abstract Awards

These awards provide \$100 and a 2-year complimentary APS membership. The student must be enrolled as an undergraduate at the time of the abstract submission, be the first author on an abstract submitted to the APS annual meeting at EB, 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.

### Excellence in Undergraduate Research Awards

To be considered for this award, students must be an Outstanding Undergraduate Abstract Awardee and must attend and present a poster at the APS annual meeting at EB. The recipients receive \$400 and a certificate. The highest-ranked awardee receives an additional \$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 Award Selection Committee.

## Porter Physiology Development Fellowships

*Application deadline: January 15, 2019*

[the-aps.org/porter](http://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 APS.

The Porter Fellowship provides a full-time graduate fellowship (\$28,300 during the academic year) to students in programs leading to the 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 U.S. or its territories and are student members of APS. The applicant's mentor/PI must also be an APS member.

## Dale J. Benos Early Career Professional Service Award

*Application deadline: January 24, 2019*

[the-aps.org/benos](http://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 by otherwise strengthening and promoting the physiology community. The awardee receives a \$1,000 honorarium plus complimentary advanced registration to attend the APS annual meeting at EB.

## Undergraduate Summer Research Fellowships

*Application deadline: February 1, 2019*

[the-aps.org/summerresearch](http://the-aps.org/summerresearch)

The APS undergraduate summer research fellowships offer undergraduate students the opportunity to participate in a summer immersed in research. Fellows spend an average of 10 weeks in the laboratory of an APS member-researcher. Each fellow receives a \$4,000 stipend plus additional funds for travel to present his or her research at the APS annual meeting at EB. Research hosts receive funds for student lab supplies. See the website for more details about eligibility requirements, application instructions, and program benefits. ●



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## APS/ASPET Presidential Symposium Series

APS President Jeff Sands has collaborated with ASPET President Edward Morgan to create an exciting series on the microbiome. This APS/ASPET Presidential Symposium Series features a Saturday workshop followed by three symposia held each day of the meeting. Come hear the latest research advances in understanding the gut microbiome featuring presenters working on the forefront of this emerging area.

### Schedule of Sessions

**Saturday, April 6, 2019, 1:00 PM–3:00 PM**

*Workshop on Microbiome Research: What You Need to Know*

**Chairs:** Andrew D. Patterson, *Penn State University*; Meredith Hullar, *University of Washington*

**Speakers:** Cathryn R. Nagler, *University of Chicago*; Meredith A. Hullar, *University of Washington*; J. Greg Caporaso, *Northern Arizona University*; Andrew D. Patterson, *Penn State University*

**Sunday, April 7, 2019, 8:30 AM–10:00 AM**

*Gut Microbiome and Metabolic Disorders*

**Chairs:** Jeff M. Sands, *Emory University*; Edward T. Morgan, *Emory University*

**Speakers:** Rachel Perry, *Yale University*; Martin Blaser, *NYU*; Eugene Chang, *University of Chicago*

**Monday, April 8, 2019, 8:30 AM–10:00 AM**

*Gut Microbiota: A Chemical Factory*

**Chairs:** Hyunyoung Jeong, *University of Illinois*; Jennifer Pluznick, *Johns Hopkins Medical School*

**Speakers:** Emma Allen-Vercoe, *University of Guelph*; Matthew Redinbo, *University of North Carolina*; Emily Balskus, *Harvard University*

**Tuesday, April 9, 2019, 8:30 AM–10:00 AM**

*Microbiota in Action: The Gut and Beyond*

**Chairs:** Laura McCabe, *Michigan State*; Julia Cui, *University of Washington*

**Speakers:** Andrew Neish, *Emory University*; Dominik Mueller, *MDC-Berlin*; Elaine Y. Hsiao, *UCLA* ●



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# Science Policy

## NIH Moves to Protect Research Integrity

On August 23, 2018, NIH Director Francis Collins issued a public statement on protecting the integrity of U.S. biomedical research (<https://www.nih.gov/about-nih/who-we-are/nih-director/statements/statement-protecting-integrity-us-biomedical-research>). After declaring that NIH research is “built on the bedrock principles of scientific excellence, unassailable integrity, and fair competition,” Collins went on to say that “the robustness of the biomedical research enterprise is under constant threat by risks to the security of intellectual property and the integrity of peer review.”

Collins outlined three areas of concern. The first is the failure of some NIH-funded researchers to “disclose substantial contributions of resources from other organizations, including foreign governments.” This failure “threatens to distort decisions about the appropriate use of NIH funds.” The second is the “diversion of intellectual property in grant applications or produced by NIH-supported biomedical research to other entities, including other countries.” The third concern involves instances where peer reviewers have shared confidential information with others, “including in some instances with foreign entities, or otherwise attempting to influence funding decisions.”

On August 23, Collins also discussed these issues in his opening statement before the Senate Committee on Health, Education, Labor, and Pensions (HELP). The hearing had been called to review progress on the goals of the 21st Century Cures act, but Collins used the occasion to note the existence and increasing magnitude of these threats. HELP

Committee Chair Sen. Lamar Alexander acknowledged the important contributions of foreign-born researchers but expressed concern that certain countries have taken advantage of U.S. investments in science and technology. Previously reported cases of data or intellectual property diversions seem to have involved engineering and the physical sciences, but in an August 31 *Science* article, Jocelyn Kaiser and David Malakoff reported that, due to widening concerns about the problem, the FBI has begun briefing university officials on information security issues. Collins told *Science* that NIH’s actions were not prompted by “some big explosive episode” but rather a “gathering sense that it’s time to take action.”

A few days earlier, on August 20, Collins took the extraordinary step of sending a letter to more than 10,000 research institutions, urging them to ensure that NIH grantees are reporting foreign funding for their work or if they have a second laboratory in another country. Collins has appointed a working group of the Director’s Advisory Committee that will “tap experts in academic research and security” to do the following:

- Improve accurate reporting of all sources of research support, financial interests, and relevant affiliations.
- Mitigate the risk to IP (Intellectual Property) security while continuing NIH’s long tradition of collaborations with foreign scientists and institutions.
- Explore additional steps to protect the integrity of peer review. ●

### Stay up to date on the latest occurrences in science policy.

- NIH, NSF, NASA and VA funding
- Federal research policy
- Animal research



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[twitter.com/SciPolAPS](https://twitter.com/SciPolAPS)

## Starting a Science Policy Group

In a recent article in *Scientific American*, graduate student Thaiesha Wright offers advice about how to start a science policy group. The article provides pointers on how graduate students can create and maintain a successful group at their university that focuses on science advocacy, scientific communication, and science-based policy making. The first step, according to Wright, is to identify core members, and both current and future officers. This is critical to ensure a smooth leadership transition as the current officers graduate.

Equally important is finding a faculty mentor who can provide guidance on science policy issues. Some professors may have attended science-policy workshops, March for Science events, and national or local lobbying days through their scientific society. In addition to providing mentorship,

a faculty mentor may be able to help the group become an official campus organization.

Starting a science policy group isn't always easy, but if attendance and audience participation are low for one event, try to find a topic of broader interest for the next one. Since it may be difficult to secure speakers without sufficient funding, one option is inviting campus faculty. Wright also suggests inviting local professionals in science-related fields. For example, campuses in rural areas may be able to host local agricultural experts. For more information, see "How to Create a Science Policy Group" on *Scientific American's* website (<https://blogs.scientificamerican.com/observations/how-to-create-a-science-policy-group/>). ●





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—Justin Grobe, PhD

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# Publications

## Current Calls for Papers

### Physiological Genomics

- Physiology of Cell State Transitions  
*Submission deadline:*  
June 30, 2019

### Journal of Neurophysiology

- Model Systems of Synaptic Transmission  
*Submission deadline:*  
December 31, 2018
- Society for the Neural Control of Movement  
*Submission deadline:*  
December 31, 2018
- Advances in Vestibular Research: A Tribute to Bernard Cohen, MD  
*Submission deadline:*  
December 31, 2018
- 50 Years of Modeling Neural Activity: Celebrating Jack Cowan's Career  
*Submission deadline:*  
June 30, 2019
- International Motoneuron Society  
*Submission deadline:*  
June 30, 2019
- Modularity and Compositionality in Motor Control: Acknowledging Emilio Bizzi  
*Submission deadline:*  
June 30, 2019

### Advances in Physiology Education

- K – 12 Outreach
- Curricular Integration of Physiology

### American Journal of Physiology – Cell Physiology

- Cell Physiology of Germ Cells  
*Submission deadline:*  
December 31, 2018
- Channels and Transporters in Cell Signaling  
*Submission deadline:*  
December 31, 2018
- Correlating Muscle Function with Muscle Health Markers  
*NEW deadline:*  
December 31, 2018
- Endoplasmic Reticulum Functions in Cell Physiology and Disease  
*NEW deadline:*  
December 31, 2018
- Mitophagy, Autophagy and Cell Death  
*NEW deadline:*  
December 31, 2018

### American Journal of Physiology – Endocrinology Physiology

- Role of Gut Microbiota, Gut-Brain and Gut Liver Axes in Physiological Regulation of Inflammation, Energy Balance, and Metabolism  
*Submission deadline:*  
December 31, 2018
- Browning and Beiging of Adipose Tissue: Its Role in the Regulation of Energy Homeostasis and as a Potential Target for Alleviating Metabolic Diseases  
*Submission deadline:*  
December 31, 2018

- Mitochondria Dysfunction in Aging and Metabolic Diseases  
*Submission deadline:*  
December 31, 2018
- Immunometabolic Cross-Talk and Regulation of Endocrine and Metabolic Functions  
*Submission deadline:*  
December 31, 2018

### American Journal of Physiology – Heart and Circulatory Physiology

- Adaptive Immunity in Cardiovascular Disease  
*Submission deadline:*  
January 31, 2019
- Many Avenues to Cardiac Cell Death  
*Submission deadline:*  
January 31, 2019
- Chromatin and Epigenetics in Cardiovascular Disease  
*Submission deadline:*  
February 15, 2019

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

- Electronic Cigarettes: Not All Good News?  
*Submission deadline:*  
December 31, 2018

## Current Calls for Papers (*continued*)

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

- Cardiovascular and Metabolic Consequences of Sleep and/or Circadian Disruption  
*Submission deadline:*  
*April 1, 2019*

### American Journal of Physiology – Renal Physiology

- Epigenetics and MicroRNAs in Kidney Physiology and Pathophysiology  
*Submission deadline:*  
*June 30, 2019*
- Circadian Rhythms or Time-of-Day Effects in Renal Physiology, the Urinary System, Blood Pressure or Volume and Electrolyte Regulation  
*Submission deadline:*  
*June 30, 2019*

- Sex and Gender in Renal Health and Function  
*Submission deadline:*  
*December 31, 2018*
- Inflammatory Mediators in Kidney/Bladder Diseases, and in Hypertension  
*NEW Submission deadline:*  
*December 31, 2018*
- Mechanism and Treatment of Renal Fibrosis  
*NEW Submission deadline:*  
*December 31, 2018*

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

## CALL FOR NOMINATIONS

for the Editorship of

*Advances in Physiology Education*<sup>®</sup>



Nominations are invited for the Editorship of *Advances in Physiology Education* to succeed Douglas C. Curran-Everett, who will complete his term as Editor on December 31, 2019. The APS Publications Committee plans to interview candidates in the spring of 2019.

**Applications should be received before January 15, 2019.**

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

**Curt D. Sigmund, PhD**  
**American Physiological Society**  
**6120 Executive Boulevard, Suite 600**  
**Rockville, MD 20852-4911**

You may also send your nominations to Curt Sigmund via email, care of the APS Publications Department Administrative Assistant, Charmon Kight ([ckight@the-aps.org](mailto:ckight@the-aps.org)).

[advan.org](http://advan.org)

# Membership

## New Regular Members

\*transferred from student membership

### Ted Abel

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### Raheleh Ahangari

Univ. Central Florida, Orlando, FL

### Ernesto Alejandro Aiello

Facultad De Ciencias Médicas UNLP-  
CONICET, La Plata, Argentina

### Rakhad Alrawi

Mesa Community Coll., Peoria, AZ

### Christopher D. Askew

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Downs, QLD, Australia

### Michael Barnett-Cowan

Univ. Waterloo, Waterloo, ON, Canada

### Tara Georgina Bautista

Univ. of Melbourne, Melbourne,  
VIC, Australia

### Carmen Bergom

Med. Coll. Wisconsin, Milwaukee, WI

### Joseph Bidwell

Indiana Univ. Sch. Med.,  
Indianapolis, IN

### Jessica Lynne Bradshaw

Univ. Mississippi Med. Ctr.,  
Jackson, MS

### Maile L. (Ceridon) Richert

U.S. Navy, Niantic, CT

### Robert H. Coker

Univ. Alaska Fairbanks, Fairbanks, AK

### Hiroaki Eshima

Diabetes and Metabolism Res. Ctr.,  
Salt Lake City, UT

### Tyler Farney

Texas A&M Univ.-Kingsville,  
Kingsville, TX

### Roman Fomin

UFC, Las Vegas, NV

### Nandu Goswami

Med. Univ. Graz, Graz, Austria

### Navin K. Kapur

Tufts Med. Ctr., Boston, MA

### Denise Kay

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### Andrei V. Krassioukov

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Vancouver Genera, Vancouver, BC,  
Canada

### Leszek Kubin

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### Satoshi Matsuoka

Univ. Fukui Faculty of Med. Sci.,  
Fukui, Japan

### Micah Meltzer

Contra Costa Community Coll., San  
Francisco, CA

### Bindu Menon

Univ. Toledo, Toledo, OH

### Masashi Mukoyama

Kumamoto Univ. Grad. Sch. of Med.  
Sci., Kumamoto, Japan

### Naro Ohashi

Hamamatsu Univ. Sch. Med.,  
Hamamatsu, Japan

### Caitlin O'Meara

Med. Coll. Wisconsin, Milwaukee, WI

### Aaron A. Phillips

Univ. of Calgary, Vancouver, BC,  
Canada

### Farhad Rikhtegar Nezami

Massachusetts Inst. Tech.,  
Cambridge, MA

### Lisa Suzanne Robison

Albany Med. Coll., Albany, NY

### Robbert J. Rottier

Erasmus MC, Rotterdam, The  
Netherlands

### Emily Cornelius Ruhs

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Madison, WI

### Ibrahim M. Salman

Case Western Reserve Univ.,  
Cleveland, OH

### Luiz C. Sampaio

Texas Heart Inst., Houston, TX

### Zachary M. Sellers

Stanford Univ., Palo Alto, CA

### Deena J. J. Small

Univ. New England, Biddeford, ME

### David Souto

Univ. Leicester, Leicester,  
United Kingdom

### Michelle Diane Tallquist

Univ. Hawaii, Honolulu, HI

**Binu Tharakan**

Texas A&M Univ. Hlth. Sci. Ctr.,  
Temple, TX

**Aiko Thompson**

MUSC, Awendaw, SC

**Kristy Townsend**

Univ. Maine, Orono, ME

**Sophie Toya**

McLaren Hosp., Flint, MI

**Michael D. Treat**

Univ. Nevada-Las Vegas,  
Las Vegas, NV

**Evan Usler**

Boston Univ., Warwick, RI

**Kasey C. Vickers**

Vanderbilt Univ. Med. Ctr.,  
Nashville, TN

**Rommy Von Bernhardt**

Pontificia Univ. Catolica De Chile,  
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**Patricia Widder**

Washington Univ.-St. Louis, Saint  
Louis, MO

**Kristen Zuluago**

Albany Med. Coll., Albany, NY

**New Graduate Student Members****Katie Annette Adler**

Louisiana State Univ. Hlth. Sci. Ctr.-  
New Orleans, New Orleans, LA

**Kaitlin Allen**

Univ. of California-Berkeley,  
Berkeley, CA

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Queen's Univ., Kingston, ON, Canada

**Christian Arias Reyes**

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**Remon Sobhy Azer**

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**Nile Banks**

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**Ozge Beyazcicek**

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**Jessica D. Rippamonti**

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**Oswaldo Rivera Gonzalez**

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**Anna Rix**

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**Paul Anthony Roberson**

Auburn Univ., Auburn, AL

**Andrea Rummel**

Brown Univ., Providence, RI

**Emily Smith**

Univ. of Oklahoma Hlth. Sci. Ctr.,  
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**Sarrya Narayan Talukdar**

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ND

**Isadora Davila Tassinari**

Federal Univ. of Rio Grande do Sul,  
Porto Alegre, Brazil

**Taylor Templeton**

LSUHSC-NO, New Orleans, LA

**Karem Nathalie Vazquez**

Roman Univ. of North Texas,  
Denton, TX

**Undergraduate Student Members****Shane Geary Carr**

Univ. of Arizona, Tucson, AZ

**Brendan Ho**

Univ. of Cincinnati, Cincinnati, OH

**Jarred Ryan Howard**

Texas A&M Univ., Bryan, TX

**Kathy Nguyen**

Univ. of Colorado-Boulder,  
Thornton, CO

**Affiliate Members****Ulf Smith**

Univ. of Gothenburg, Gothenburg,  
Sweden

# Experimental Biology

## Experimental Biology 2019 Distinguished Lectures



**Physiology in Perspective: The Walter B. Cannon Memorial Award Lecture**

**Peter Aronson**

Yale University School of Medicine  
*From Salt to Stones to CKD: Anion Transporters in Health and Disease*

Sunday, April 7, 2019, 5:30 PM



**Henry Pickering Bowditch Award Lecture**

**Jennifer Pluznick**

Johns Hopkins University  
*Functional Roles for Orphan GPCRs in the Kidney*

Monday, April 8, 2019, 5:30 PM



**Robert M. Berne Distinguished Lectureship of the APS Cardiovascular Section**

**Rong Tian**

University of Washington  
*Cardiac Metabolism: An Odyssey of Energy and Beyond*

Monday, April 8, 2019, 8:30 AM



**Hugh Davson Distinguished Lectureship of the APS Cell and Molecular Physiology Section**

**David Dawson**

Oregon Health Sciences University  
*Membranes, Music and Economics: What I Learned from CFTR, Bob Dylan and Adam Smith*

Sunday, April 7, 2019, 3:30 PM



**Joseph Erlanger Distinguished Lectureship of the APS Central Nervous System Section**

**Tracy Bale**

University of Maryland School of Medicine  
*Parental Stress and Germ Cell Epigenetic Contributions to Offspring Development*

Monday, April 8, 2019, 3:30 PM



**August Krogh Distinguished Lectureship of the APS Comparative and Evolutionary Physiology Section**

**Terrie Williams**

University of California, Santa Cruz  
*On the Cardio-Neural Trail of Stranded Whales and Wounded Warriors: An August Krogh Investigation*

Monday, April 8, 2019, 3:30 PM  
*Supported by Novo Nordisk Fonden*



**Solomon Berson Distinguished Lectureship of the APS Endocrinology and Metabolism Section**

**Juleen R. Zierath**

Karolinska Institutet  
*Epigenetic Control and the Circadian Clock: Turning Back Time on Diabetes Pathogenesis*

Monday, April 8, 2019, 3:30 PM



**Edward F. Adolph Distinguished Lectureship of the APS Environmental and Exercise Physiology Section**

**Sue Bodine**

University of Iowa  
*Skeletal Muscle Atrophy: Multiple Pathways Can Achieve the Same Outcome*

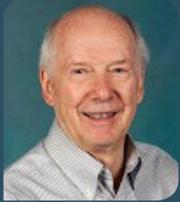
Monday, April 8, 2019, 1:30 PM



**Horace W. Davenport Distinguished Lectureship of the APS Gastrointestinal and Liver Physiology Section**

**Nicholas LaRusso**

Mayo Clinic  
Monday, April 8, 2019, 3:30 PM



### History of Physiology Lecture

#### James Bassingthwaite

University of Washington

*Ancel Keys Lambasted at the Faraday  
Society Meeting of 1937!*

Tuesday, April 9, 2019, 1:00 PM



### Carl Ludwig Distinguished Lectureship of the APS Neural Control and Autonomic Regulation Section

#### Susan Barman

Michigan State University

*What Can We Learn about Neural  
Control of the Circulation by Studying  
Rhythms in Sympathetic Nerve Activity?*

Monday, April 8, 2019, 1:30 PM



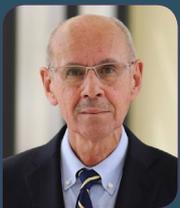
### Carl W. Gottschalk Distinguished Lectureship of the APS Renal Section

#### R. Ariel Gomez

University of Virginia School  
of Medicine

*Regulation of Renin Cell Fate in  
Homeostasis and Disease*

Monday, April 8, 2019, 3:30 PM



### Julius H. Comroe, Jr. Distinguished Lectureship of the APS Respiration Section

#### Sadis Matalon

University of Alabama, Birmingham

*Heme as a Central Mediator of  
Acute and Chronic Lung Injury*

Tuesday, April 9, 2019, 1:30 PM



### Claude Bernard Distin- guished Lectureship of the APS Teaching of Physiology Section

#### Mary Pat Wenderoth

University of Washington

*Evidence Based Teaching: So That  
All Students May Learn*

Monday, April 8, 2019, 8:30 AM

*Supported by APS Strategic Partner  
ADIstruments*



### Ernest H. Starling Distinguished Lectureship of the Water and Electro- lyte Homeostasis Section

#### Jennifer S. Pollock

University of Alabama at Birmingham

*There's NO Place Like Home(ostasis)*

Sunday, April 7, 2019, 3:30 PM



### APS Nobel Prize Award Lecture

#### Peter Agre

Johns Hopkins School of Public Health

Tuesday, April 9, 2019, 5:30 PM

# Experimental Biology 2019

April 6–9, 2019, Orlando, FL

[www.apsebmeeting.org](http://www.apsebmeeting.org)

We are excited to present the tentative educational program for the APS annual meeting held in conjunction with Experimental Biology (EB) 2019 in Orlando.

**NEW this year:** The 2019 annual meeting features a compressed, 4-day meeting schedule from Saturday, April 6 to Tuesday, April 9. The daily schedule for APS will be:

7:00 AM to 8:00 AM	Professional development sessions
8:30 AM to 10:00 AM	Oral scientific sessions
10:15 AM to 12:15 PM	Poster presentations
12:15 PM to 1:30 PM	Free time for lunch and visiting exhibits
1:30 PM to 3:00 PM	Oral scientific sessions
3:30 PM to 5:00 PM	Oral scientific sessions
5:30 PM to 6:30 PM	Plenary named lectures

We hope you find the new meeting format valuable and that you take advantage of the many collaborative, cross-society offerings, such as the plenary Tang Award Prize lecture, the EB-wide Opening Reception, and the joint APS/ASPET President's Symposium Series held daily throughout the meeting. Submit an abstract, register, reserve your housing, and more on the EB 2019 website ([www.experimentalbiology.org](http://www.experimentalbiology.org)). We can't wait to see you in Orlando!

**JOIN US**  
APRIL  
6–9,  
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## PHYSIOLOGY PLATFORM SESSIONS

Saturday, April 6, 2019

Morning	Afternoon	Afternoon/Evening
8:00 AM–12:00 PM <i>Education Committee Refresher Course</i> Beyond the Weight Room: The Importance of Skeletal Muscle in Health and Disease (Supported by APS Strategic Partner ADInstruments) <b>Merritt/Durocher</b>	12:00–1:00 PM <i>MCS Mentoring Lunch</i>	2:00–5:00 PM <i>WEH Section</i> Trainee Award Finalists and Data Diuresis
9:00 AM–5:00 PM <i>ETG Pre-EB Meeting Conference</i> <b>TBD</b>	1:00–2:30 PM <i>AFMR Symp</i> Alzheimer's Disease: Many Failed Trials so Where Do We Go from Here? <b>Reiss/Stecker</b>	3:00–4:30 PM <i>AFMR Symp</i> New Method and Models to Study Human Metabolism with Stable Isotope Tracers <b>Cree-Green/Parks</b>
9:30 AM–11:30 AM <i>MCS President's Symp</i> Clinical Perspectives on the Microcirculation <b>Pierce-Cottler/Mendelson</b>	1:00–3:00 PM <i>Science Policy Committee Symp</i> A Role for Professional Societies in Addressing and Preventing Sexual Harassment in the Sciences <b>Goulopoulou/Wilson</b>	3:00–5:00 PM <i>NCAR Section Awards Session</i> Data NCARnation
	1:00–3:00 PM <i>APS-ASPET Presidential Symp Series on Microbiome</i> Workshop on Microbiome Research: What You Need to Know <b>Patterson/Hullar</b>	3:15–5:15 PM <i>Techniques Workshop</i> Writing Good Multiple Choice Questions: A Hands-on Workshop <b>Silverthorn</b>
	1:00–5:00 PM <i>Physiological Omics Group 6th Annual PG Conference</i>	3:30 PM–5:30 PM <i>MCS Symp</i>
	1:00–3:00 PM <i>MCS Symp</i>	6:00–7:00 PM <i>Tang Prize Award Lecture</i> <b>Druker</b>
		6:00–8:00 PM <i>MCS Poster Discussion and Reception</i> <b>Pierce-Cottler</b>

## Sunday, April 7, 2019

7:00–8:00 AM Professional Development Hour	8:30–10:00 AM	1:30–3:00 PM	3:30–5:00 PM
<i>Trainee Advisory Committee Symp</i> Marketing Yourself for a Successful Career I <b>Obi/Zarate</b>	<i>CV Section FT</i> Kaley Award FT: The Microcirculation and Its Many Cells that Contribute to Tissue Repair <b>Kubes</b>	<i>Physiological -Omics Group Symp</i> Metagenomic and Metabolomic Studies of Host-Microbial Contributions to Health and Disease <b>Joe/Abais-Battad</b>	<i>MCS Landis Award Lecture and Business Meeting</i>
<i>Women in Physiology Committee Symp</i> Career Planning: No Scientist Left Behind <b>Nichols/Maura Porta</b>	<i>Resp Section Symp</i> Central Control of Breathing: Gliocentric Mechanisms <b>Funk/Mulkey</b>	<i>Hypoxia Group Symp</i> The Lahari Cherniak Lecture Symp <b>Wilson</b>	<i>EB Symp Series</i> Carotid Body Sensing—More than Just an O <sub>2</sub> Sensor <b>MacFarlane</b>
<i>Career Opportunities in Physiology Committee Symp</i> The Hidden Job: Aspects of a Physiology Career You May not be Aware of <b>Becker/Trimby</b>	<i>Pubs Committee Workshop</i> Publications 101 Workshop <b>Sigmund/Scherman</b>	<i>CNS Section Symp</i> Interaction of Cardiovascular Disease and Neuro-cognitive Impairment. <b>Wallace</b>	<i>GIL Section Symp</i> Innovative Imaging Approaches in Gastrointestinal Epithelial Biology <b>Edelblum</b>
	<i>Renal Section FT</i> Young Investigator Award: At the Nexus of Circadian Biology and Renal Physiology <b>Gumz</b>	<i>Cell Section FT</i> pH Homeostasis and Acid-Base Transport <b>Parker/Romero</b>	<i>EM Section Symp</i> Hormonal Influences on Tissue Remodeling <b>Lindsey/Gohar</b>
	<i>NCAR Section FT</i> Young Investigator Awards <b>TBD</b>	<i>PIC Symp</i> SGLT2 Inhibitors: From Basic Physiology to Clinical Success <b>Gonzalez Villalobos/Pati</b>	<i>NCAR Section Symp</i> Autonomic Control of Metabolism <b>Aubert</b>
	<i>EEP Section Symp</i> Exercise and Heat Therapy: Shared Molecular Targets and Cardiometabolic Benefits <b>Minson</b>	<i>ETG Ussing Lecture FT</i> <b>Keely</b>	<i>Nutrition Group Symp</i> Nutrition as a Biological Variable: Considerations for the Future of Physiology Research <b>Anthony/Baum</b>
	<i>WEH Section Symp</i> Translational Models of Renal and Cardiovascular Disease: Informing Human Health or Not? <b>Harrison-Bernard/Osborn</b>	<i>NCAR Section FT</i> Autonomic Anti-inflammatory Mechanisms: Which Branch Trumps? <b>Harwani/Pham</b>	<i>Renal Section Symp</i> Mechanism of Hypertension-induced Kidney Damage <b>Li/Prieto</b>
	<i>CV Section FT</i> Cardiac ECM Niche in Health and Disease <b>Dixon/Griffiths</b>	<i>TPIG FT</i> Translational Physiology Highlights <b>Young</b>	3:30–4:30 PM <i>Cell Section Davson Lecture</i> <b>Dawson</b>
	<i>CV Section Symp</i> Neurodegeneration and Heart Failure: An Intimate Connection <b>del Monte/Wold</b>	<i>CV Section Symp</i> Survived a Complicated Pregnancy? Maternal, Postpartum, and Fetal Cerebrovascular Risks <b>Warrington/Cipolla</b>	<i>Respiration Section FT</i> Sex and Gender in Respiratory Physiology <b>Silveyra/Prakash</b>

## Sunday, April 7, 2019, continued

	<i>CEP Section FT</i> Trainee session <b>Crossley</b>	<i>EM Section FT</i> Sex Specific Differences in Obesity Induced Hypertension <b>Barnes/Primeaux</b>	<i>Sex/Gender Symp</i> Sex and Metabolic Health: Emerging Challenges and Discoveries <b>Alexander/Rice</b>
	<i>Teach Section FT</i> Innovative Techniques for Teaching Health Sciences to Increase Retention and Mastery Learning <b>Jones/EISayed</b>	<i>CV Section FT</i> Aging, Exercise, and Heart Failure: Common Connections and New Targets <b>Emter/Wrann</b>	<i>PanAm Symp</i> Common Pathways of Angiotensin on Cardiovascular and Respiratory Responses Induced by High-Fat- Diet, Hypoxia, and Renal <b>Hypertension</b> <b>Colombari/Del Rio</b>
	<i>EB Symp Series</i> Aquaporins – More than Water under the Bridge <b>Mamenko/Ilatovskaya</b>	<i>Teaching Section Symp</i> Using Writing to Teach and Assess Undergraduate Physiology Students <b>Anderson</b>	<i>EEP Section Symp</i> Nrf2 as a Promising Target for Increasing Healthspan and Diminishing Aging-Related Chronic Diseases <b>Hamilton</b>
	<i>APS/ASPET President's Symp Series on Microbiome</i> Gut Microbiome and Metabolic Disorders <b>Sands/Morgan</b>	<i>EEP Section Symp</i> The Role of Skeletal Muscle Damage in Adaptive Remodeling <b>McCarthy/Murach</b>	3:30–4:30 PM <i>WEH Section Starling Lecture</i> <b>Pollock</b>
			4:30–5:30 PM <i>WEH Section Lecture</i> New Investigator Award
			5:30–6:30 PM Physiology in Perspective: The Walter B. Cannon Award Lecture <b>Aronson</b>

## Monday, April 8, 2019

7:00–8:00 AM Professional Development Hour	8:30–10:00 AM	1:30–3:00 PM	3:30–5:00 PM
<i>Trainee Advisory Committee Symp</i> Marketing Yourself for a Successful Career II <b>Obi/Zarate</b>	8:30–9:30 AM <i>CV Section Berne Lecture</i> <b>Tian</b>	1:30–2:30 PM <i>NCAR Section Ludwig Lecture</i> <b>Barman</b>	3:30–4:30 PM <i>EM Section Berson Lecture</i> <b>Zierath</b>
<i>Women in Physiology Committee Symp</i> Career Planning: No Scientist Left Behind (Monday) <b>Nichols/Maura Porta</b>	<i>EEP Section FT</i> EEP Impact Award FT: Modulation of Systemic and Tissue Metabolism via Differences in Activity and Fitness <b>Morris/Rector</b>	1:30–2:30 PM <i>EEP Section Adolph Lecture</i> <b>Bodine</b>	3:30–4:30 PM <i>CEP Section Krogh Lecture</i> Supported by Novo Nordisk Fonden <b>Williams</b>

## Monday, April 8, 2019, continued

<p><i>Careers in Physiology Committee Symp</i> The Hidden Job: Aspects of a Physiology Career You May not be Aware of <b>Becker/Trimby</b></p>	<p>8:30–9:30 AM <i>Teaching Section Bernard Lecture</i> Supported by APS Strategic Partner ADInstruments <b>Wenderoth</b></p>	<p><i>GIL Section FT</i> Gastrointestinal and Liver Physiology and Disease <b>Zachos</b></p>	<p>3:30–4:30 PM <i>GIL Section Davenport Lecture</i> <b>LaRusso</b></p>
	<p><i>Cell Section FT</i> Molecular Mechanisms of Cellular Signaling and Transduction <b>Blazer-Yost/Teal</b></p>	<p><i>CAC Symp</i> APS Chapters: Why, How, What of Starting New Chapters <b>Hopper</b></p>	<p><i>Cell Section Symp</i> New Frontier in Direct Effects of Lipids and Lipid Metabolic Defects on Membrane Proteins <b>Jiang/Greenberg</b></p>
	<p><i>WEH and ETG FT</i> Hot Topics in Water and Electrolyte Homeostasis and Epithelial Transport <b>TBD</b></p>	<p><i>History Symp</i> Updating the History of Insulin: Novel Insights into Regulation of Release, Delivery, and Functions <b>Molina/Souza-Smith</b></p>	<p><i>WEH Section FT</i> Environmental and Epigenetic Contributions to Disease Origin <b>TBD</b></p>
	<p><i>TPIG Symp</i> Type 2 Diabetes: A Metabolic Karma <b>Sepulveda/Chen</b></p>	<p><i>EM Section Symp</i> Crosstalk between Metabolic Disorders and Mitochondrial Oxidative Stress <b>Dikalov/Sack</b></p>	<p><i>CV Section FT</i> Wiggers Award Featured Topic <b>Chien</b></p>
	<p><i>CNS Section FT</i> Effects of Diet on Emotion and Motivated Behavior <b>Silberman</b></p>	<p><i>Renal Section FT</i> Advances in Renal Physiology I <b>Ellison</b></p>	<p><i>Respiration Section Symp</i> ENaC and Fluid Transport across Airway Epithelia <b>Althaus/Butterworth</b></p>
	<p><i>EB Symp Series</i> Oxidative Stress and Post-translational Modification of Protein Thiols in Cell Signaling <b>Helms</b></p>	<p><i>EB Symp Series</i> Brown Adipose Tissue – The Fat that Makes you Thin <b>Symonds</b></p>	<p>3:30–4:30 PM <i>Renal Section Gottschalk Lecture</i> <b>Gomez</b></p>
	<p><i>NCAR Section Symp</i> Neural Circulatory Mechanisms Linking Sleep Loss to Hypertension <b>Limberg/Somers</b></p>	<p><i>CV Section FT</i> CV Section Young Investigator Competition <b>Faulkner/Dorrance</b></p>	<p>3:30–4:30 PM <i>CNS Section Erlanger Lecture</i> <b>Bale</b></p>
	<p><i>Respiration Section FT</i> Mapping The Lung: Leveraging Emerging Technologies To Better Understand Pulmonary Disease <b>Beers/Bastarache</b></p>	<p><i>WEH Section FT</i> Therapeutic and Adverse Effects of Pharmacological Agents on Integrative Physiology and Pathophysiology <b>TBD</b></p>	<p><i>EEP Section FT</i> Mechanisms underlying the Greater Propensity for Cardiovascular Disease in Populations with Elevated Risk <b>Keller/Brothers</b></p>
	<p><i>Muscle Biology Group FT</i> Hot Topics in Muscle Biology <b>Wang/Mitch</b></p>	<p><i>CV Section Symp</i> Thoracic and Abdominal Aortic Aneurysm: From Models and Mechanism to Clinical Trials and Therapy Updates <b>Kassiri/Liu</b></p>	<p><i>CV Section FT</i> Cardiac and Peripheral Vasculopathies: Emerging Biomarkers, Imaging and Treatments <b>LeBlanc/Kaufman</b></p>

## Monday, April 8, 2019, continued

	<i>Respiration Section FT</i> Perinatal reprogramming of respiratory control <b>Huxtable/Baker</b>	<i>CEPS Symp</i> From The Brainstem to the Heart: Cardio-Respiratory Control in Ectothermic Vertebrates <b>Janes/Conner</b>	<i>Respiration Section FT</i> Emerging Therapeutics for Respiratory Dysfunction <b>Turner/Falk</b>
	<i>APS/ASPET President's Symp</i> Series on Microbiome Gut Microbiota: A Chemical Factory <b>Jeong/Pluznick</b>		5:30–6:30 PM Henry Pickering Bowditch Award Lecture <b>Pluznick</b>

## Tuesday, April 9, 2019

7:00–8:00 AM Professional Development Hour	8:30–10:00 AM	1:30–3:00 PM	3:30–5:00 PM
<i>Trainee Advisory Committee Symp</i> Marketing Yourself for a Successful Career III <b>Obi/Zarate</b>	<i>Muscle Biology Group Symp</i> Muscle-Derived Extracellular Vesicles in the Regulation of Metabolic Health and Disease <b>Lark</b>	1:00–2:00 PM <i>History Lecture</i>	<i>EM Section</i> Awardees Session <b>Romero/Sidossis</b>
<i>Women in Physiology Committee Symp</i> Career Planning: No Scientist Left Behind <b>Nichols/and Maura Porta</b>	<i>Physoc/APS Joint Symp</i> Physiology of Obesity: From Mechanisms to Medicine <b>Aldiss/Lewis</b>	1:30–2:30 PM <i>Respiration Section Comroe Lecture</i> <b>Matalon</b>	<i>Physoc Symp</i> The Clinical and Metabolic Benefits of Exercise for People with Type 1 Diabetes <b>Wagenmakers</b>
<i>Careers in Physiology Committee Symp</i> The Hidden Job: Aspects of a Physiology Career You May not be Aware of <b>Becker/Trimby</b>	<i>CV Section Symp</i> Protein Degradation Mechanisms: A Compartmentalized Affair in Cardiac Muscle and Disease? <b>Sheik/Liang</b>	<i>GIL Section FT</i> <i>Control of cellular organelle function, metabolism, and injury in liver and intestinal diseases</i> <b>Li</b>	<i>ETG Hebert Lecture</i> <b>McDonough</b>
	<i>Cell Section FT</i> Ion Channels, Solute and Molecular Transporters In Health and Disease <b>Baines/Althaus</b>	<i>Cell Section Symp</i> <i>Emerging Roles of the Cytoskeleton in Striated Muscle</i> <b>Hawke/Perry</b>	<i>NCAR and CNS FT</i> Hot Topics in Neuroscience <b>TBD</b>
	<i>NCAR Section FT</i> Autonomic Function in Normal and Preeclamptic Pregnancies <b>Stachenfeld</b>	<i>WEH Section FT</i> Hormones and Receptors in Homeostatic Control of Physiology and during Allostasis in Pathophysiology <b>TBD</b>	<i>Nutrition Group FT</i> Hot Topics in Nutrition <b>Thalacker-Mercer/Borsheim</b>
	<i>CV Section FT</i> Cardiovascular Metabolism in Diabetes <b>Hill/Harmancey</b>	<i>CNS Section FT</i> New Advances in CNS Physiology <b>Wainford</b>	<i>WEH Section FT</i> Effect of Diet on Metabolism, Cardiovascular and Renal Physiology and Pathophysiology <b>TBD</b>

## Tuesday, April 9, 2019, continued

	<i>EEP Section FT</i> Examining Physiological Mechanisms Using Environmental Stressors <b>Johnson/Schlader</b>	<i>NCAR Section FT</i> Regulation of Muscle Sympathetic Outflow during Exercise <b>Floras/Millar</b>	<i>CV Section FT</i> Inflammation and Leukocyte Biology in Cardiovascular Disease <b>Halade/de Castro Brás</b>
	<i>Renal Section FT</i> Advances in Renal Physiology II <b>Layton</b>	<i>EB Symp Series</i> Metabolism, Organ Crosstalk, Microbiome and Mechanisms <b>Sun</b>	5:30–6:30 PM Nobel Prize Award Lecture <b>Agre</b>
	<i>Respiration Section Symp</i> Musculoskeletal Afferents and the Control of Breathing <b>Streeter/Fuller</b>	<i>Renal Section Symp</i> Mighty Concepts in Mitochondrial Biology in the Kidney <b>Mallipattu/Li</b>	
	<i>GIL Section FT</i> John Forte Plenary Session <b>Frey</b>	<i>CV Section Symp</i> AJP-Heart Editors Symposium <b>Zucker/DeLeon Pennell</b>	
	<i>EB Symp Series</i> Crosstalk among Myofibers, Microvessels and Motor Nerves during Skeletal Muscle Regeneration <b>Segal</b>	<i>EM Section FT</i> Noncoding RNAs: Emerging Functions in Metabolism and Diseases <b>Huang/Zhang</b>	
	<i>Resp Section FT</i> Inflammasome Activation in Diseases of the Lung <b>Waters/Yeligar</b>	<i>Hypoxia Group FT</i> Hot Topics in Hypoxia <b>TBD</b>	
	<i>APS/ASPET President's Symp Series on Microbiome</i> Microbiota in Action: The Gut and Beyond <b>McCabe/Cui</b>	<i>CEP Section Symp</i> Causes and Consequences of Inter-individual Physiological Variation <b>Rees</b>	

# People and Places

## Robert Carroll Named 2018 Alpha Omega Alpha Robert J. Glaser Distinguished Teacher



Robert Carroll

APS member Robert Carroll has been named the 2018 Alpha Omega Alpha Robert J. Glaser Distinguished Teacher by Alpha Omega Alpha, a medical honors society, and the Association of American Medical Colleges (AAMC). Carroll is associate dean for medical student education and

professor of physiology at the Brody School of Medicine at East Carolina University, and a founder of the International Association of Medical Science Educators. The Robert J. Glaser Distinguished Teacher Award recognizes four faculty members each year who have made outstanding contributions to the education of medical students. Read more in the AAMC press release at <https://www.aamc.org/initiatives/awards/2018-aamc-awards-recipients/490578/2018-alpha-omega-glaserd-distinguished-teacher-award.html>. ●

## Curt Sigmund Named Chair of Physiology

Denise O'Grady Gaffney, Jamie Sands, and Elizabeth Dorr

We are pleased to announce the completion of our search for the Chair of the Department of Physiology at the Medical College of Wisconsin (MCW). From a strong pool of candidates, Curt D. Sigmund has been named to this important position. He will assume his post in January of 2019.

Sigmund currently serves as Chair and Department Executive Officer, Department of Pharmacology; Professor and Roy J. Carver Chair in Hypertension Research; and Director, UIHC Center for Hypertension Research at the Roy J. and Lucille A. Carver College of Medicine, University of Iowa in Iowa City. He also holds appointments at the Carver College of Medicine as Professor of Internal Medicine and Professor of Molecular Physiology and Biophysics. A member of the Iowa faculty since 1991, Sigmund has been significantly involved in undergraduate, medical student, graduate, and postdoctoral education in the areas of molecular genetics, molecular biology, human physiology, physiology for physicians assistants, pharmacogenetics, pharmacology for pharmacy students, pharmacology for nurse anesthetists, cardiovascular research, and more. He also continues to serve as a mentor to junior faculty members at the University of Iowa and at the UIHC Center for Hypertension Research.

Sigmund has published more than 200 peer-reviewed research articles and more than 75 books, reviews, and invited commentaries. He has presented at more than 170 local, regional, national, and international lectures and

workshops. He has been recognized with research awards from the American Federation for Medical Research and American Society of Hypertension. From the American Physiological Society, he received the Henry Pickering Bowditch Award Lecture in 2000, the Ernest H. Starling Distinguished Lecturer in 2011, the Distinguished Lecturer in Physiological Genomics in 2016, and, in 2018, the Carl J. Wiggers Award from the Cardiovascular Section. Sigmund was the recipient of the Inaugural Vancouver 2010 Lectureship from Hypertension Canada in 2015, and from the Council on Hypertension of the American Heart Association, he received the Arthur C. Corcoran Memorial Lecture Award in 2007 and the Excellence Award in Hypertension Research (commonly known as the Novartis Award) in 2009.

Sigmund earned his Bachelor of Arts and Master's degrees in biology in 1982 and 1984, respectively, from the State University of New York (SUNY) at Buffalo. He received a PhD in cell and molecular biology from SUNY-Buffalo in 1987. From 1987 to 1991, he was a postdoctoral fellow in the Department of Molecular and Cellular Biology, Roswell Park Cancer Institute in Buffalo, NY, and performed molecular and physiological studies examining some of the first transgenic mice with genetic alterations in the renin-angiotensin system.

On behalf of MCW and Isaacson, Miller, we extend our appreciation and best wishes. Please let us know if we can be of help to you in the future. ●

# News from Distinguished Physiologists

## Letter to Ulla Kopp

**Ronald Kramp writes:** "I feel highly honored and thankful to have been asked on my 80th birthday by Professor Ulla Kopp to write this letter as a senior physiologist. Such a request brings many memories concerning professional and career choices. In this regard, I have been privileged during my lifetime to have encountered wonderful teachers and mentors. They have greatly influenced my career. Although I initially combined clinical activities and basic medical research, physiology became my predominant interest.

"Born and raised in Antwerp (Belgium), I started the 7-years medical curriculum at the University of Louvain in 1957. During my medical studies, two teachers initiated my curiosity for research. First was Professor Christian de Duve, future Nobel laureate, who was a fascinating lecturer and enthusiastic communicator about fundamental research. Second, Professor René Lambert attracted me to his laboratory (my first experiments with rats) in the department of gastroenterology at the Edouard Herriot Hospital in Lyon, where I practiced patient history taking and clinical examinations during the summer months (from 1961 to 1963).

"After the 7 years of medical education, I was fortunate to become resident in the department of internal medicine at the University Hospital in Louvain (1964–1966). During my second year of residency, I joined the newly created Nephrology Unit headed by Dr Charles Van Ypersele, my first mentor. He had just returned from Boston (Dr. W. Schwartz). He stimulated my curiosity for nephrology research and suggested that I should go abroad, first to Paris and, thereafter, to the USA.

"In Paris, I was a foreign resident in the department of nephrology headed by Professor G. Richet at the Hôpital Tenon and worked in the immuno-histology laboratory directed by Dr. L. Morel-Maroger (1966–1967). Until his recent death, Professor Richet and I remained regularly in touch. He was a friendly and close advisor over all these years.

"In the USA, my objective was to acquire the technics of micropuncture. I was fortunate to join the micropuncture laboratory of Dr. CW Gottschalk at UNC Chapel Hill as

an international research Fellow of the NIH (1967–1969) and as a Career Investigator Fellow of the American Heart Association (1969–1970). This was my first introduction to renal physiology and the discovery of a new way to approach research! Indeed, in French-speaking Europe, physiology was still greatly influenced by Claude Bernard and mainly based on experimental observation, whereas in the USA emphasis was put on elucidating mechanisms underlying function. My main research assignment concerned the determination of urate fluxes and transport mechanisms along the rat tubule using the tracer microinjection technic. I also studied the function and structure of chronically altered nephrons using micropuncture and microdissection technics in collaboration with Dr. J. Oliver to further investigate the adaptive nephron concept.

"These were 3 marvelous years spent in an exciting research environment. Thereafter, I frequently returned to Chapel Hill for brief visits with Carl Gottschalk, an outstanding mentor who became a longtime friend.

"Upon returning to Belgium to fulfil military duties, I set up a micropuncture unit in Dr. Van Ypersele's nephrology laboratory in Louvain and undertook further investigations on urate transport mechanisms focusing at the urate secretory pathway in the rat kidney. These studies were the basis of a PhD thesis (1976), a necessary step to pursue an academic career in Belgium. The urate project was completed by a micropuncture study on allantoin excretion in the rat kidney undertaken in collaboration with F. Roch-Ramel of Lausanne.

"These studies were carried out as a research fellow of the Fonds National de la Recherche Scientifique.

"During these years in a clinical environment and a short stay at Merck & Co Belgium, my orientation toward research and teaching in physiology grew steadily. The main focus of my professional career began with the opportunity in 1977 to join the newly created medical school at the State University of Mons. In 1979, I was appointed Professor of Physiology and Pathophysiology. The main objective of the new school of medicine was quality teaching. I was fortunate to be assisted by

dedicated collaborators to achieve this goal. My research orientation became the study of renal hemodynamics in the rat using electromagnetic probes investigating implications of endothelial and paracrine factors such as NO and endothelin on autoregulation. Among administrative commitments, I fulfilled a 4-year term as Dean of the Faculty and subsequently as Vice-Chancellor of the University. I was also President of the Belgian Society of Nephrology and of the Belgian Society of Physiology and Pharmacology. In 2000, I was elected member of the Royal Academy of Medicine.

"At the time of mandatory retirement (2003), the University of Mons kindly provided an office that was outside of the department of physiology. During the following 5 years, I participated as a delegate of the University of Mons to audits of Belgian university cooperations with developing countries as well as of INSERM research units in France.

"Stimulated by physicians in Mons, my curiosity led me to a new field: the *Ordre des Médecins* or Council of Physicians for regulatory affairs, deontological rules, medical laws, ethical matters, and disciplinary jurisdiction. I was elected to the Provincial Council of Hainaut (Mons) (2003–2009 and 2012–2018), where I served as President during the last term, and to the National Council (2006–2012 and

2012–2018). The two memberships recently came to an end. It was a most interesting and challenging experience where rigor of judgment had to be applied likewise to methodological rigor in physiological research.

"I'm now member on the disciplinary Appeal Court of the National Council of Physicians (2018–2024).

"Looking back on my career, I feel the most important thing is to be passionate about your chosen field. At times, frustrations may occur, but research also provides moments of great joy when an unexpected finding leads to a better understanding of the problem. Teaching physiology has been an important part of my academic career. It was most enjoyable to be able to transmit to young medical students that physiology is an indispensable link toward comprehension of pathophysiology and disease processes.

"During all these professional years, many ties of sincere friendship were made on different continents. Nevertheless, my best and most faithful supporter was, and still is, my dear spouse Cécile. Our three cherished children gave us seven grandchildren, with whom we will now spend some more time to discover together new countries and new cultures." ●

## Letter to Peter K. Lauf

**Loy William Frazier, Jr. writes:** "Thank you so much for what you are doing for the APS as chair of the Distinguished Physiologist Committee.

"I have enclosed a short narrative of my professional activities since retiring from Baylor University College of Dentistry, in Dallas, Texas, in 1999 (now part of the Texas A & M. System). I did continue to teach part time at Texas Wesleyan University and the University of Texas at Tyler until 2004. I will say more about this in the following note of my activity since that time.

"I retired from Baylor in 1999. After retirement, I continued to teach part-time at Texas Wesleyan University, Fort Worth, Texas and also at the University of Texas at Tyler, Texas until 2004. In 2004, myself, a nurse, and a nurse practitioner launched a medical clinic, Grace Community Health Care of Mineola Texas. Our current medical staff is

composed of an MD (clinical director), a PhD (laboratory director), six registered nurses, and many support volunteers. We have only one paid employee, and that is a business manager. The clinic takes no government funding and operates on donations from private foundations and individuals. We currently have clinic 4 days a week, accommodating an average 80–100 patients each week. The clinic accepts only patients between the ages of 16 and 65 years of age, who are uninsured or under-insured. Clinic and laboratory fees to patients are only 15–20% of these same fees paid in the private sector.

"In my extra time, I enjoy a couple of rounds of golf each week. The remainder of our time is spent traveling around East Texas and spending some time with our 7 kids, 10 grand kids, and 1 great grandson. Retirement has been great for my wife and I, and we are enjoying a great life here in East Texas." ●

## Letter to Luis G. Navar

**Yoshinobu Ohira writes:** “Thank you for the nice letter. I retired from Osaka University, when I reached to the retirement age 5 years ago. But I am still working at Doshisha University as a full-time distinguished visiting professor. I have been conducting research in the area of space medicine. Doshisha University kindly founded Research Center for Space and Medical Sciences in 2007, and I currently am acting as the director of the Research Center.

“The third Monday in September is the national holiday ‘Respect for the Aged Day’ in Japan. However, it looks like young fellows do not understand what that holiday means. They asked me to work as one of the dissectors of mice in our current experiment. What a huge generation gap!!! But I enjoyed the party after that.” ●



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# Reports

## 2018 APS Workshop: The APS Institute on Teaching and Learning

Madison, Wisconsin, June 18–22, 2018

In early summer 2018, APS held its third Institute on Teaching and Learning in Madison, Wisconsin. The workshop allowed attendees to learn new skills and techniques so they can teach physiology in their own classrooms.

The workshop was organized by Thomas Pressley (Chair; Texas Tech. University Health Science Center), Barbara Goodman (Co-chair; University of South Dakota), along with an Organizing Committee that is equally dedicated to the art of teaching. The committee members included Nancy Aguilar-Roca (University of California, Irvine); Beth Beason-Abmayer (Rice University); Gregory Brower (Texas Tech. University Health Science Center); Robert Carroll (East Carolina University); Jane Chapman (Heartland Community College); Ryan Downey (Georgetown University); Jonathon Kibble (University of Central Florida College of Medicine); Joan Lafuze (Indiana University); Andy Petzold (University of Minnesota at Rochester); Jennifer Rogers (University of Iowa); Kathleen Seiler (Champlain College); Jennifer Stokes (Centenary College); Steve Swoap (Williams College); Christopher Trimby (University of Delaware). 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 workshop was attended by 116 total registrants, of whom 61 identified as APS members; 13 registered as nonmembers; 7 identified as postdoctoral fellows; 9 were considered student attendees; and the remaining 26 were invited speakers. Table 1 shows the breakdown of the different registration types. This workshop mainly attracted individuals from the U.S.; however, of the 116 registrants, 9 were from outside of the U.S. Table 2 depicts the breakdown of attendees by country.

The workshop program consisted of 2 keynote lectures, 7 plenary lectures, and 18 unique workshops on a wide variety of topics related to the teaching of physiology and classroom teaching techniques. The audience was encouraged to share



Workshop Organizers Barb Goodman and Thomas Pressley with the Minority Travel Fellowship Awardees

their ideas and thoughts with the speakers at the end of their talks. The workshop also had several social activities including a welcome dinner, 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 also three afternoon poster sessions where scientists presented their work and discussed their teaching styles and techniques with other attendees. Moreover, the workshop had daily group meals that facilitated further discussions between the attendees.

A total of 60 abstracts were submitted for the workshop. Thirty-two of these abstracts were programmed as poster presentations. The remaining 28 abstracts were submitted by invited speakers. Of the abstracts submitted for the workshop, 35 (58%) were submitted by a female first author; 8 (13%) were submitted from institutions outside of the U.S., including abstracts from Canada, China, Nepal, New Zealand, Nigeria, Russia Federation, and the United Kingdom.

At the workshop the following attendees were awarded the Minority Travel Fellowship Award: Elinette Albino (University of Puerto Rico); Angelina Hernandez-Carretero (University of California, San Diego); and Rebeca Nuñez (University of Puerto Rico). The award is provided to encourage participation of under-represented minority individuals in the physiological sciences. The fellowship provides reimbursement of all expenses associated with travel and participation in the workshop.



Attendees of the 2018 APS Institute on Teaching and Learning Workshop

Also at the workshop, there were 19 undergraduate educators who received Physiology Education Community of Practice (PECOP) Fellowships, which were funded through the National Science Foundation (NSF). The PECOP project is designed to build a growing and dynamic community of undergraduate physiology educators who interact, share resources, and collaborate on an ongoing basis; learn and apply effective scientific teaching methods in their classrooms, such as student-centered learning emphasized in Vision and Change; and use scholarship of teaching and learning (SOTL) methodologies to improve their teaching. The PECOP Fellows are Scott Amiss (Cal State Northridge); Katie Kowalski (University of Oregon); Carol Britson (University of Mississippi); Monica McCullough (Western Michigan University); April Carpenter (Ursinus College); Patricio Mujica Urzua (CUNY-Lehman College); Joann Chang (Arizona Western College); Amber Schlater (The College of St. Scholastica); Gregory Crowther (Everett Community College); Jennifer Stokes (Centenary College); John Henry Dasinger (Medical College of Wisconsin); Heidi Walsh (Wabash College); Ryan Downey (Georgetown University); Laura Weise Cross (University of New Mexico); Jessica Fry (Curry College); Christopher Wingard (Bellarmine University); Patricia Halpin (University of New Hampshire); Matthew Zahner (East Tennessee State University); Yass Kobayashi (Fort Hays State University).

In addition, Tara Slominski of the Univ. of North Dakota received the William Galey Professional Skills Training Scholarship Award.

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

**Table 1.** Registration Statistics

Registration Type	No. of Attendees	% of Attendees
APS Member	61	54%
Nonmember	13	11%
Postdoctoral Fellows	7	6%
Students	9	7%
Invited Chairs/ Speakers	26	22%
<b>TOTAL</b>	<b>116</b>	<b>100%</b>

**Table 2.** Registration Geographic Region Statistics

Registration Type	No. of Attendees	% of Attendees
U.S.	107	91%
Canada	2	2%
Cayman Islands	1	1%
New Zealand	1	1%
St. Kitts & Nevis	2	2%
Saudi Arabia	1	1%
United Kingdom	2	2%
<b>TOTAL</b>	<b>116</b>	<b>100%</b>

# Positions Available

**Assistant Professor:** The Department of Human Physiology at the University of Oregon invites applications for two tenure track faculty positions (one open rank and one at the Assistant Professor level), to begin fall 2019. We are seeking individuals with research interests in motor control, biomechanics, and/or neurophysiology that complement existing areas of excellence within the department. Competitive candidates will be broadly trained and have experience with the mechanical and/or neural principles underlying movement, neurorehabilitation, motor control, or other aspects of neuromuscular physiology. Applicants with a research program focused on orthopaedic or movement disorders are strongly encouraged to apply. Competitive salary support and start-up funds will be provided. *Application deadline:* November 16, 2018; position open until filled. *Required application materials:* Apply at <https://academicjobsonline.org/ajojobs/11693>. Applicants should submit a cover letter, curriculum vitae, three letters of recommendation, three representative publications, and three statements: 1) research accomplishments and future plans, 2) teaching philosophy, and 3) personal contributions to foster an environment of equity and inclusion for faculty, staff, and students from diverse backgrounds. Questions about the application process should be addressed to Andy Karduna ([karduna@uoregon.edu](mailto:karduna@uoregon.edu)). To ensure consideration, please submit application materials by November 16, 2018. The positions will remain open until filled. Applications are encouraged from minorities, women, or members of other underrepresented groups. The Department of Human Physiology is dedicated to the goal of building a diverse community that is committed to teaching and working in a multicultural environment. Applicants are requested to include a statement about how they will further this goal. In particular, candidates should describe any experience with mentoring minorities, women, or members of other underrepresented groups, including examples of supporting or leading activities that promoted interest and retention in the science by individuals from under-represented groups. Additionally, candidates are encouraged to provide information of how their research agenda addresses or incorporates issues that involve or affect diverse groups. *Department or program summary:* The UO Department of Human Physiology is home to undergraduate and graduate students who desire strong training in human physiology and anatomy that will prepare them for careers in medicine, allied health professions, and

biomedical research. At the undergraduate level, future researchers, educators, physicians, physical therapists and other health care providers receive comprehensive, multidisciplinary training in the physical, biological, and chemical sciences that prepares them well for entrance into most professional health care-related programs. Human Physiology students also examine the health sciences from a perspective that explores the functional and structural mechanisms underlying human movement across health and disease, using a variety of physiological methods, ranging from biochemical and systems techniques through whole body analysis. The graduate program develops researchers and health professionals who are creative thinkers and innovators capable of generating new knowledge in the physiological sciences. To this end, the department has a number of outstanding, funded laboratories that use physiological and engineering methods to evaluate human subjects under a broad spectrum of experimental conditions. The Department's faculty members recognize that cutting-edge translational research, from basic physiological mechanisms through integrative systems physiology related to health, human movement, and physical activity, has a major influence on disease treatment and prevention. Consequently, in the performance of their research, they routinely work closely with physicians and other clinical personnel. *Minimum requirements:* PhD in Physiology, Kinesiology, Neuroscience, Biomedical Engineering or related field; postdoctoral research experience (2 years). *Preferred qualifications:* Demonstrated commitment and contribution to institutional diversity, equity, and inclusion; previous experience with university-level teaching and service; assistant professor level, promising publication record and experience with grant writing; associate professor level, established record of publications and grant funding (eg, NIH, NSF or DoD); full professor level, exceptional record of publications and grant funding, demonstrated leader in their field. *About the university:* The University of Oregon is one of only two Pacific Northwest members of the Association of American Universities and holds the distinction of a "very high research activity" ranking in the Carnegie Classification of Institutions of Higher Education. The UO enrolls more than 20,000 undergraduate and 3,600 graduate students representing all 50 states and nearly 100 countries. The UO's 295-acre campus features state-of-the-art facilities in an arboretum-like setting within the traditional homelands of the Kalapuya people. The UO is located in Eugene, a vibrant city of 157,000 within

easy driving distance of the Pacific Coast, the Cascade Mountains, and Portland. The University of Oregon is proud to offer a robust benefits package to eligible employees, including health insurance, retirement plans, and paid time off. For more information about benefits, visit <http://hr.uoregon.edu/careers/about-benefits>. The University of Oregon is an equal opportunity, affirmative action institution committed to cultural diversity and compliance with the ADA. The University encourages all qualified individuals to apply and does not discriminate on the basis of any protected status, including veteran and disability status. The University is committed to providing reasonable accommodations to applicants and employees with disabilities. To request an accommodation in connection with the application process, please contact us at [uocareers@uoregon.edu](mailto:uocareers@uoregon.edu) or 541-346-5112. UO prohibits discrimination on the basis of race, color, sex, national or ethnic origin, age, religion, marital status, disability, veteran status, sexual orientation, gender identity, and gender expression in all programs, activities, and employment practices as required by Title IX, other applicable laws, and policies. Retaliation is prohibited by UO policy. Questions may be referred to the Title IX Coordinator, Office of Civil Rights Compliance, or to the Office for Civil Rights. Contact information, related policies, and complaint procedures are listed on the statement of non-discrimination. In compliance with federal law, the University of Oregon prepares an annual report on campus security and fire safety programs and services. The Annual Campus Security and Fire Safety Report is available online at <http://police.uoregon.edu/annual-report>.

**Assistant/Associate Professor:** The Department of Nutritional Sciences seeks applications for a tenure-track Assistant/Associate Professor position with a focus on nutrition and the microbiome. This position will complement the research of existing faculty, which includes research related to the prevention of cardiovascular disease; ingestive behavior and mechanisms underlying obesity; studies of diet, physical activity and cancer prevention; micronutrient metabolism in animal models or humans; epidemiology, and/or global health nutrition. The research area of the successful applicant could include questions exploring the maternal and infant microbiome, diet and the microbiome, and/or the microbiome and metabolic diseases. The successful applicant's research can be basic using cell and animal

models; translational using basic and clinical models; and/or clinical with a focus on nutrition, human health, and the microbiome. The successful applicant's research is expected to be synergistic with core areas of the strategic plans of the Department of Nutritional Sciences, the College of Health and Human Development, and the University of which Enhancing Health is one of five thematic priorities (<http://strategicplan.psu.edu/thematic-priorities/>). The position is a tenure-track position in the Department of Nutritional Sciences, one of eight departments in the College of Health and Human Development (<http://hhd.psu.edu/>). Penn State takes pride in faculty who integrate research, teaching, and service activities and seeks excellence in all three domains of academic activity. The National Research Council ranked Penn State's Graduate Program in Nutritional Sciences among the nation's best. More information is available at <http://nutrition.hhd.psu.edu/>. The Department has 26 full-time faculty and 17 research scientists. Current student enrollments are 212 undergraduate students and 35 PhD candidates. The Department provides a supportive environment for interdisciplinary translational research spanning applied and basic sciences. Collaborative opportunities abound in the Department of Nutritional Sciences; in other departments in the College of Health and Human Development; as well as in other Penn State Colleges (e.g. Agriculture, Engineering, Medicine, Science), Centers, and Institutes across campus, including but not limited to the newly formed Microbiome Center, the Huck Institutes for the Life Sciences, Penn State Clinical and Translational Institute (CTSI), and the Penn State Cancer Institute. Furthermore, depending on the research area of the candidate, this position may be part of a co-hire with the Huck Institutes for the Life Sciences (<https://www.huck.psu.edu/>). Applicants should have strong academic training in nutritional sciences, physiology, microbiology, or a closely related field. A doctoral degree (PhD, DrPH, MD, and/or equivalent) and 2 or more years of postdoctoral research experience is required. Candidates will be expected to establish an extramurally funded research program and to teach in the Department's undergraduate and graduate programs. Service expectations will be appropriate to Penn State's mission as a land grant university. Qualified candidates should provide evidence of original research published in peer-reviewed journals and are expected to have obtained or show strong potential to obtain external support for their independent research program. Applicants should

also have experience that demonstrates proficiency in both teaching and potential for mentoring students. Candidates should address their ability to work effectively with diverse populations and audiences. To apply, interested candidates should complete an online application (<https://psu.jobs/job/82918>) and upload: 1) a cover letter of application; 2) a personal statement addressing interests and vision (future goals and plans) in *a*) research and *b*) teaching; 3) a curriculum vitae along with 4) names, titles, and complete contact information. Review of applications will begin immediately and continue until the position is filled. Salary is competitive, commensurate with background and experience. An attractive benefits package is available. To review the Annual Security Report, which contains information about crime statistics and other safety and security matters and policies, please go to <https://police.psu.edu/annual-security-reports>, which will also explain how to request a paper copy of the Annual Security Report. Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability, or protected veteran status.

**Assistant/Associate Professor:** The Philadelphia College of Osteopathic Medicine (PCOM), Department of Biomedical Sciences, invites applications for a 12-month, tenure-track position at the rank of Assistant or Associate Professor. In this position, based at our Philadelphia, PA campus, you will be instrumental in establishing and conducting an independent extramurally funded research program, aid in course administration and contribute to institutional and departmental governance and service. Applicants at the Associate Professor level are expected to have funding and a recognized reputation of innovative research excellence and productivity. Rank will be commensurate with experience. *Requirements:* DO, MD, or PhD degree in the biological sciences and demonstrated excellence in graduate biomedical education; 3 years of experience in teaching any aspect of physiology or pathophysiology, bringing innovative approaches into the classroom, and the ability to work collaboratively with other faculty and staff in team taught courses. Candidates working at all levels of approaches (molecular, cellular, and organismal) will be considered. Investigators using state-of-the-art techniques, including animal models, with

research programs that leverage molecular and cellular insights to inform physiological and pathophysiological functions, are highly desired. Competitive lab space and start-up funds are available. Please apply online at: <https://cw.na1.hgnccloud.com/pcom/loadJobPostingDetails.do?jobPostingID=102600&source=jobList>. Applicants must be authorized to work in the U.S. PCOM adheres to a policy that prohibits discrimination on the basis of race, color, sex, sexual orientation, gender identity, religion, creed, national or ethnic origin, citizenship status, age, disability, veteran status, or any other legally protected class.

**Assistant/Associate/Full Professor:** The Mohammed Bin Rashid University of Medicine and Health Sciences (MBRU) is a newly launched University in Dubai Healthcare City (Dubai, United Arab Emirates). With Queen's University of Belfast as its academic partner, MBRU aims to train healthcare professionals in a culture that champions excellence in education, clinical service, and research. The College of Medicine offers an innovative 6-year MBBS program, open to all nationalities. The language of instruction is English. MBRU is soliciting applications for positions at all academic ranks in the following disciplines: Physiology for the College of Medicine. Faculty members will be working in an academic and healthcare environment located in the heart of Dubai, a major travel hub with direct flight connections to most major cities. Our strategic partnership with Al Jalila Foundation ([www.aljalilafoundation.ae](http://www.aljalilafoundation.ae)) will facilitate access to research grants and research facilities in a number of disciplines. MBRU offers competitive compensation packages, including tuition fee support for children's education and air travel tickets for faculty and eligible family members. Successful candidates must meet the following requirements: PhD, MD, or MD/PhD degree(s). For clinical disciplines, candidate must hold Board certification (U.S. and Canada), CCT (UK), or equivalent. Academic experience in a recognized university (at least 5 years for Associate Professor position and at least 10 years for Full Professor position). Significant research track record. Experience in teaching and assessment of medical students. Interested candidates should e-mail their CV and a cover letter indicating the candidates' teaching philosophy, research plans and motivation to move to MBRU to [faculty.recruitment@mbru.ac.ae](mailto:faculty.recruitment@mbru.ac.ae). Positions will remain open until filled. To learn more about (MBRU) please visit ([www.mbruniversity.ac.ae](http://www.mbruniversity.ac.ae)).

**Assistant/Associate/Full Professor:** American University of the Caribbean School of Medicine (AUC) is actively seeking a dynamic, experienced full-time faculty member to join the 2nd Semester Medical Sciences Unit at their St. Maarten Campus to teach cardiovascular physiology. Education is the primary focus of the AUC faculty. The academic year is divided into three semesters, with a new class of students admitted each semester. Lectures and other educational responsibilities continue throughout the year. AUC is particularly interested in individuals who have an interest in improving medical education and are effective team members. *Essential duties and responsibilities:* Preparation of course materials (lecture notes and slides, and USMLE style questions); effective delivery of lectures; supervise educational activities of students under actual or simulated situations; advise students in academic matters and exercise professional judgment in referring students to appropriate personnel; develop new instructional materials and teaching techniques with participation in on-going reviews and revision of curriculum planning; actively participate in relevant professional activities to improve teaching and subject matter competence; serve on faculty committees as appointed or elected, and confer with advisory groups to modify course content; prepare, administer, and evaluate examinations to assess the development of student accomplishments; participate in other activities in coordination with the Semester Lead or Executive Dean. *Qualifications:* PhD, MD, or DO from an accredited U.S. or Canadian medical school required; recent 5–7 years teaching experience in the U.S. or Canadian medical curriculum required; applicants must have proven teaching experience in Cardiovascular Physiology; flexibility and ability to work well on a team with excellent interpersonal and communication skills. Please submit your CV, cover letter, and list of physiology lectures taught and number of years teaching those lectures in a U.S. or Canadian medical school curriculum to Talent Acquisition Consultant, Barbara Roberge, at [Barbara.Roberge@adtalem.com](mailto:Barbara.Roberge@adtalem.com).

**Leadership Position:** West Virginia University, located in Morgantown, WV, is seeking a highly qualified leader to serve as the Chairperson for the Division of Exercise Physiology in the Department of Human Performance in the School of Medicine. The Division of Exercise Physiology is nationally recognized and encompasses education from the baccalaureate to doctoral level,

as well as basic and applied research and associated clinical services. Research areas of strength align with key initiatives of West Virginia University and include cardiopulmonary, neuromotor, and muscle physiology science. At this exciting time, West Virginia University, in conjunction with the WVU Medicine clinical enterprise, has established the Rockefeller Neuroscience Institute. Core innovation areas of the Institute include Human Performance Research, which aspires to maximize human performance through accelerated recovery, reduced injury, optimized readiness, and holistic wellness. This new initiative will afford exciting collaborative opportunities for the Division of Exercise Physiology, which already has a reputation for high-impact education, research, and clinical programs. The Division of Exercise Physiology is administratively housed within the School of Medicine's Professional Programs unit, which is home to over 1,000 students enrolled in degree programs including exercise physiology, occupational therapy, physical therapy, medical laboratory sciences, immunology, pathologists' assistant, physician assistant, and health information management. Many of the graduate and professional programs within the unit use the exercise physiology undergraduate program as the preferred baccalaureate degree for admission. Therefore, the exercise physiology program has a large undergraduate enrollment of approximately 650 students. In addition, the program offers a master's degree with thesis and clinical track options and a doctoral (PhD) program. The exercise physiology chairperson will report directly to the Vice Dean for Professional Programs. The chairperson will also represent exercise physiology as part of a team of leaders working closely with the Senior Associate Vice President for Research and Graduate Education. The Chairperson will serve as leader of the academic program and will be responsible for administration of the education program at all levels, including budget, oversight of recruitment, retention and new education initiatives, quality of student experience, and program assessment. The chairperson is also expected to maintain an active research program and serve as a mentor to tenure-track research faculty, including oversight of all funded research projects within the division and plans for strategic growth of the research mission. The School of Medicine is committed to investment in exercise physiology to maximize the interdisciplinary collaborative research and education opportunities. The Chairperson must meet the following criteria for consideration: doctoral degree in

Exercise Science or related field; minimum of 10 years of experience in higher education, with experience at both undergraduate and graduate levels; scholarship record consistent with appointment at the Associate or full Professor rank; 2–3 years of advanced level administrative/leadership experience. In addition to the required qualifications listed above, candidates with the following qualifications are strongly encouraged to apply: research record with a consistently funded program that documents competitiveness at the national level. West Virginia University is a land grant Carnegie-designated Doctoral Research/Extensive institution, with approximately 32,500 students, including 27,000 undergraduate and 5,500 graduate/professional students. The WVU Health Sciences Center includes the Schools of Pharmacy, Medicine, Dentistry, Public Health, and Nursing. Patient care facilities include a 645-bed teaching hospital, a Level I trauma center, and a 70-bed psychiatric hospital. Morgantown is within easy traveling distance of Washington, DC to the east, Pittsburgh, PA to the north, and Cleveland and Columbus, Ohio to the northwest. Morgantown has 55,000 residents and is rated as one of the best small towns in the U.S., with affordable housing, excellent schools, a picturesque countryside, and many outdoor activities. Review of applications will begin immediately and continue until the position is filled. The appointment date is negotiable, but the goal is to have the position filled no later than January 1, 2019. To inquire about the position, please contact the chairperson of the search committee, Dr. Linda Vona-Davis, PhD, Director, Biomedical Master of Science in Health Sciences, [lvdavis@hsc.wvu.edu](mailto:lvdavis@hsc.wvu.edu). Applicants should apply at <https://wvu.taleo.net/careersection/faculty/jobdetail.ftl?job=09324> with a cover letter of interest, current CV, and contact information, including e-mail addresses for three professional references. If you have any questions regarding this position/process, please feel free to contact Carol Smith, Executive Recruiter at [cbsmith@hsc.wvu.edu](mailto:cbsmith@hsc.wvu.edu) or 304-293-4512. WVU is an EEO/Affirmative Action Employer and the recipient of an NSF ADVANCE award for gender equity. The university values diversity among its faculty, staff, and students, and invites applications from all qualified individuals, including minorities, females, individuals with disabilities, and veterans.

**Leadership Position:** Applications are invited from high energy, results-oriented individuals to fill the position of Vice-Chair for Research in the Department

of Anesthesiology for the University of Nebraska Medical Center. The Vice-Chair for Research represents a major leadership opportunity within the Department. This individual will lead and facilitate collaborations within the department and across campus. This is a tremendous opportunity for a seasoned scientific leader to expand and further develop research in a supportive clinical environment. In addition, s/he will guide the department's research programs and provide strong research mentorship to both basic science and clinical faculty and fellows. S/he will have an opportunity to make an impact on translational science that covers multiple disciplines. The Department of Anesthesiology is the exclusive provider of anesthesia services for Nebraska Medicine, including all academic and private clinical practices. Nebraska Medicine's integrated academic health science center has almost 700 licensed beds, 40 specialty and primary care clinics, and handles over 30,000 inpatient admissions and more than half a million outpatient visits per year. Under the leadership of its Chairman, Steven J. Lisco, MD, FCCM, FCCP, the department has grown tremendously and is currently ranked 45th in NIH research awards among anesthesiology departments in the U.S. The Department has a highly dedicated faculty, including junior, mid-career, and senior members, with a diverse mix of clinical, research, and educational interests. It is well positioned to expand research on an already solid base. The successful Vice-Chair candidate will be an MD, MD/PhD, or PhD. S/he will have a vibrant, well-funded research program and prior administrative experience. S/he will have a history of extramural research funding. As Vice-Chair for Research in UNMC/Nebraska Medicine, s/he will have a vision for building an interactive basic/clinical/translational program bridging multiple departments and groups. UNMC is a premier academic medical center located in Omaha, NE with newly built research and clinical space. Total campus research space is approximately 1 million square feet. Active training programs exist in basic and clinical sciences. In addition, busy pain management, critical care, ECMO, echocardiography, and cardiovascular surgery programs exist at UNMC, providing outstanding resources for clinical and translational research. For consideration, please submit CV and letter of interest in confidence to: Eileen Blake Alexander, Wollman & Stark [eblake@AlexanderWollmanStark.com](mailto:eblake@AlexanderWollmanStark.com), 610-399-5284. Individuals from diverse backgrounds are encouraged to apply.

**Leadership Position:** The University of Arkansas for Medical Science (UAMS) seeks a dynamic and innovative academic leader with a nationally recognized research portfolio and strong interpersonal skills to serve as the next Chair of the Department of Physiology and Biophysics. The Chair is responsible for ensuring the highest-quality academic, research, and administrative leadership for the department, including strategic planning, faculty recruitment/retention and diversity, resource development and allocation, continuous quality improvement, and representation to external entities. *The opportunity:* The next Chair will have an opportunity to build on the Department's strong foundation and craft a vision that will continue to foster discovery and excellence in physiological sciences. Areas of current research focus by departmental faculty broadly include gene transcription, protein targeting, posttranslational protein processing, subcellular signaling, extracellular matrix, control of differentiation and growth, and tumorigenesis. Reporting to the Dean of the College of Medicine, the Chair will provide broad leadership to strengthen and grow the Department's research initiatives, resources, and educational contributions to UAMS's College of Medicine and Graduate School. The potential exists for teaching within UAMS's other four health professions colleges. *Responsibilities:* Engage the Department's faculty and staff in defining its vision for the future in alignment with the University's mission and strategic plan; recruit and develop a diverse cohort of professors who will join the current faculty to execute the Department's mission and provide a strong succession plan for research, teaching, and mentorship activities; work collaboratively with the Department's faculty and the Dean to manage the Department's budget; demonstrate innovation in advancing the Department's national prominence in its various research areas and exhibit a central role in building academic collaborations and partnerships across the University; foster the Department's continued innovation and leadership in the use of learning technologies; serve as a model of integrity, demonstrating the highest ethical standards of conduct in all aspects of the Department's work and in fostering collegiality. *Qualifications:* The successful candidate will hold a PhD and/or MD with a scholarly history that warrants appointment as a professor, a robust research portfolio, and evidence of leadership and administrative experience in an academic health sciences or equivalent

setting. Important qualifications also include service on national grant review study sections, service to national scientific professional organizations, and proven skills in mentoring young researchers. Interested individuals are asked to submit their CV, NIH-biosketch, and a letter addressing their experiences that fulfill the criteria for this position to Julian Tunno, Manager of Executive and Faculty Recruitment at [jtunno@uams.edu](mailto:jtunno@uams.edu). Contact Julian Tunno by phone at 501-686-2590. For further information please visit <https://physiology.uams.edu/chair-search/>. Written nominations, inquiries, and applications (including e-mails) may be subject to disclosure under the Arkansas Freedom of Information Act. UAMS is an inclusive Affirmative Action and Equal Opportunity Employer of individuals with disabilities and protected veterans and is committed to excellence.

**Postdoctoral Fellow:** An NIH-funded postdoctoral fellow position is available in the laboratory of Dr. Kevin Cummings, Associate Professor in the Dept. of Biomedical Sciences at the University of Missouri-Columbia. Using a multidisciplinary approach, our research program focuses on the neurohumoral control of breathing and cardiovascular function in neonatal and adult animals during sleep and wakefulness. We are particularly interested in the parallel functions of serotonin and orexin in cardiorespiratory function, sleep, and thermoregulation across vigilance states. This work is relevant to the Sudden Infant Death Syndrome, which occurs during periods of sleep and is associated with defects in brainstem serotonin and orexin systems. Studies will involve the recording of breathing and cardiovascular variables during wakefulness and sleep, the microinjection of drugs into the CNS, and the utilization of DREADD technologies to silence or activate specific groups of neurons in the CNS. We are looking for highly motivated people who can work independently and who also thrive in a group setting. Candidates should hold a PhD degree in an area of cardiorespiratory physiology or neuroscience, and have excellent oral and written communication skills. Our laboratory is located in Columbia, Missouri, a small city with a low cost of living that is only a 2-hr drive from both St. Louis and Kansas City. Columbia has vibrant art and music scenes, each year hosting the world-renowned True/False Film Festival and the Roots and Blues BBW Music Festival. There are many excellent restaurants and bars in the downtown "District" that will satisfy your food, drink,

and coffee cravings. We are only a couple of hours drive from the beautiful Ozark mountains and spring-fed lakes and rivers. Interested candidates are encouraged to send a cover letter, CV with publications, and names and e-mail addresses of three referees to Dr. Kevin Cummings by e-mail at [cummingske@missouri.edu](mailto:cummingske@missouri.edu).

**Postdoctoral Fellow:** The Department of Physiology & Biophysics at Case Western Reserve University School of Medicine seeks a highly motivated postdoctoral scholar to conduct research in the laboratory of Dr. Walter F. Boron (<https://physiology.case.edu/people/faculty/walter-f-boron/>). The Boron lab focuses on two major and closely related research areas: acid-base homeostasis and the transport of gases across biological membranes. Because virtually every biological process is pH sensitive, understanding acid-base physiology is of vital importance. The Boron lab uses a combination of cell biological, biophysical, and electrophysiological approaches to study 1) how cells regulate intracellular pH; 2) how proximal tubule cells sense extracellular carbon dioxide and bicarbonate; and 3) how gases move through membrane proteins, such as the aquaporins and the Rh complex. Also, the Boron lab uses mathematical modeling to complement wet-lab experiments with the goal of helping in data interpretation and in guiding the experiments. The successful applicant will participate in an NIH-funded project focused on developing multi-scale computational models of acid-base physiology to study the mechanisms by which gases move through gas channels. The ideal candidate will have 1) demonstrated experience in developing reaction-diffusion mathematical models of biological systems; 2) strong background in numerical analysis, in particular in Finite Difference and Finite Element Methods; 3) advanced proficiency with MATLAB; 4) strong interest in learning acid-base and transport physiology; 5) excellent oral and written communication skills and interpersonal skills; 6) ability to effectively and professionally communicate and work in a multidisciplinary environment; 7) excellent organization skills and willingness to collaborate. Experience on mesoscopic modeling and knowledge of Python will be a plus. Key responsibilities will include 1) conduct independent research-including generating hypotheses, designing and executing research plans, data analysis-under the supervision of the PI and/or senior members of the lab; 2) interact/collaborate with technicians, students, postdoctoral fellows, and instructors in the laboratory; 3) interact with collaborators

within and outside the university; 4) present results in lab meetings and other scientific meetings; 5) write manuscripts; and 6) assist in grant writing. The applicant must have a PhD in Applied Mathematics, Biomedical Engineering, or related disciplines. Interested individuals should send a cover letter, CV, and the names/phone numbers of three people who could provide letters of reference by e-mail to [mxs86@case.edu](mailto:mxs86@case.edu). Review of applications will begin immediately and continue until the position is filled. In employment, as in education, Case Western Reserve University is committed to Equal Opportunity and Diversity. Women, veterans, members of underrepresented minority groups, and individuals with disabilities are encouraged to apply. Case Western Reserve University provides reasonable accommodations to applicants with disabilities. Applicants requiring a reasonable accommodation for any part of the application and hiring process should contact the Office of Inclusion, Diversity and Equal Opportunity at 216-368-8877 to request a reasonable accommodation. Determinations as to granting reasonable accommodations for any applicant will be made on a case-by-case basis.

**Postdoctoral Fellow:** The laboratory of Dr. Jalees Rehman at the University of Illinois at Chicago is seeking to fill a Postdoctoral Research Fellow position in cardiovascular regeneration and stem cell biology. One of the main goals of the Rehman laboratory's research program (<http://mcp.hiuc.edu/rehman/>) is studying mechanisms of cardiovascular regeneration and using induced pluripotent stem cells (iPSCs) to model cardiovascular disease. All candidates must have a PhD or equivalent doctoral degree in the biological or biomedical sciences, as well as experience working in two or more of the following areas: 1) stem cell biology, 2) epigenetic or transcriptional regulation, 3) animal models of cardiovascular disease, 4) RNA-Seq or ChIP-Seq analysis, 5) lineage tracing of cardiovascular regeneration in vivo, and 6) cellular metabolism. All candidates must have published at least one first-author original research article accepted for publication in a leading peer-reviewed journal. The successful applicant will develop a research project studying induced pluripotent stem cell differentiation into cardiomyocyte and vascular lineages as well as assess their function and fate in vivo. The position is ideally suited for an enthusiastic postdoctoral scientist who wants to pursue a career in academic research and develop expertise in multidisciplinary research. Our institution offers a dynamic, multidisciplinary environment with close

interaction with other basic and clinical scientists. The laboratory of Dr. Rehman is part of the Department of Pharmacology, the Department of Medicine, the Department of Bioengineering and the UIC Stem Cell and Regenerative Medicine Center. All laboratory members have access to state-of-the-art research equipment, including super-resolution microscopy and single-cell RNA-Seq, which enable our researchers to conduct high-impact work and significantly advance the field. *Minimum degree and field of knowledge:* PhD or equivalent doctoral degree in molecular biology, physiology, pharmacology, stem cell biology, or a related field. An ideal candidate would have extensive experience in cardiovascular differentiation of stem cells, animal models of cardiac disease, as well as expertise in the use of confocal microscopy, flow cytometry, and molecular biology (qPCR, cloning, immunoprecipitation, Western blotting). Expertise in epigenetics and high-throughput sequencing (ChIP-seq, ATAC-seq, DNA methylation, RNA-seq) would be very valuable. Salary will be commensurate with relevant experience and is competitive for postdoctoral research fellows. Interested candidates should submit a CV with the names of at least two references to Dr. Jalees Rehman ([jalees@uic.edu](mailto:jalees@uic.edu)), by August 31, 2018. The University of Illinois may conduct background checks on all job candidates upon acceptance of a contingent offer. Background checks will be performed in compliance with the Fair Credit Reporting Act. The University of Illinois at Chicago is an Equal Opportunity, Affirmative Action employer. Minorities, women, veterans, and individuals with disabilities are encouraged to apply.

**Postdoctoral Fellow:** *Description:* Assistant Professor (grant-supported, term track) and Postdoctoral Associate (grant-supported) positions are available for talented scientists to be part of ongoing exciting arrhythmia and heart failure projects directed by Faculty within the Pauley Heart Center and the Department of Physiology & Biophysics, Virginia Commonwealth University School of Medicine, in Richmond, VA. The selected individuals will work with a multidisciplinary team including clinical cardiologists, electrophysiologists, and cellular and molecular cardiologists. Term Assistant Professors who develop appropriate independence and a track-record of funding and publications can be considered for transfer to the tenure track. Our laboratory's translational studies integrate molecular, cellular and whole organ system

function to understanding chronic effects of ventricular ectopy and how premature ventricular contraction (PVC) induce cardiomyopathy. By characterizing underlying mechanism(s), we hope to identify strategies to prevent and reverse PVC-induced cardiomyopathy. We plan to expand studies involving RNA sequencing. *Applicant:* We seek strong candidates with training in molecular cardiology research on disease models with expertise utilizing DNA, RNA, proteins, tissue/cell culture, immunostaining/histology, and a strong publication record. Candidates must have a PhD and experience in cardiovascular physiology, biochemistry, biophysics, or other relevant fields. Knowledge in proteomics and microRNA biology, bioinformatics, and electron microscopy are also desired. We require excellent communication, presentation, and writing skills to present findings at internal, national, and international meetings, and submit original publications. The successful candidates' duties will include but are not limited to organizing and implementing research plans, the development of new methods, testing, data collection, analysis, interpretation of data, and preparing manuscripts for publication. The successful faculty candidate will have the opportunity for mentoring graduate and undergraduate students and applying for career development and other research awards. Interested Assistant Professor candidates should apply at <https://www.vcujobs.com/postings/77868>. Interested Postdoctoral Associate candidates should apply at <https://www.vcujobs.com/postings/81824>. Submit a cover letter, curriculum vitae, and three reference letters. *Potential Start Date:* Summer/Fall 2018. Demonstrated experience working in and fostering a diverse faculty, staff, and student environment or commitment to do so as a faculty member at VCU is required. Virginia Commonwealth University is an equal opportunity, affirmative action employer. Women, minorities, veterans, and persons with disabilities are encouraged to apply.

**Postdoctoral Fellow:** A Postdoctoral Fellow position is available in the George Washington University Institute for Neuroscience and Department of Pharmacology and Physiology. *Description:* A Postdoctoral Fellow position is available for a highly motivated individual in The George Washington University Institute for Neuroscience and Department of Pharmacology and Physiology. The position is within an integrative physiology and behavioral neurosciences laboratory that is focused

on understanding how stress and anxiety related disorders (i.e., posttraumatic stress disorder) contribute to increased cardiovascular disease risk. Using multidisciplinary approaches, we investigate integrative (i.e., neuroimmune) mechanisms related to the brain neurocircuitry involved in cardiovascular autonomic and fear/stress regulation. We have a particular interest in the renin angiotensin system and its role in the development of cardiovascular and anxiety related diseases. The laboratory utilizes a variety of novel transgenic mouse models and state-of-the-art cardiovascular, behavioral, and immunological interdisciplinary approaches. *Applicant:* We seek an individual with PhD biomedical sciences with strong background and expertise in the related field of cardiovascular physiology/immunology/behavioral neurosciences. Expertise in whole animal physiology, immunology, including flow cytometry, animal behavior, and surgery are highly desirable. Expertise with basic techniques utilizing DNA, RNA, protein, tissue/cell culture, and immunostaining/histology are also desired. The successful applicant's duties will include but are not limited to organizing and implementing research plans, the development of new methods, testing, data collection, analysis, interpretation of data, writing grant proposals, and preparing manuscripts for publication. The successful candidate will also have the opportunity for mentoring graduate and undergraduate students and for applying for career development awards. The candidate will be expected to possess excellent communication skills and to present their research findings on a regular basis to both peers within the department and at national and international meetings. Please provide a cover letter with a brief description of your current research, CV, and contact information for 3 references to [pmarvar@gwu.edu](mailto:pmarvar@gwu.edu). More info at <http://smhs.gwu.edu/neuroscience/positions>. *Potential Start Date:* Fall 2018–2019. *Contact:* Paul J. Marvar, Ph.D. Assistant Professor, Department of Pharmacology &

Physiology, Department of Psychiatry and Behavioral Sciences, GW Institute for Neuroscience, The George Washington University, 2300 Eye St., NW, Washington, DC 20037, Ross Hall 457; [pmarvar@gwu.edu](mailto:pmarvar@gwu.edu); (202) 994-5584.

**Postdoctoral Fellow:** A postdoctoral position is available in the laboratory of Dr. Soroush Tahmasebi at Department of Pharmacology, University of Illinois at Chicago. The focus of the lab is to study the role of mRNA translation control in embryonic stem cell (ESC) and human diseases. The trainees will have opportunities to work with genetically modified animals and solve scientific problems utilizing a combination of molecular, high-throughput, cellular and animal model approaches. The candidate must have a PhD degree. Candidates with research backgrounds in molecular biology, signal transduction, and mouse models of lung diseases (e.g., pulmonary hypertension) are encouraged to apply. Preference will be given to recent PhD graduates. Selected candidates will perform highly interdisciplinary and collaborative scientific research in one or more of the following projects, working with human cell lines, mouse models, and clinical samples: 1) exploring the function of signaling-regulated mRNA translation in ESCs employing state-of-the-art high throughput (e.g., ribosome profiling) and synthetic biology (e.g., iPSC and CRISPR) approaches; 2) deciphering the role of mRNA translation control in mouse model of human diseases. To apply, please send a letter of intent, CV with a list of publications, names and e-mails of three referees to [sorousht@uic.edu](mailto:sorousht@uic.edu). The University of Illinois at Chicago is an Affirmative Action/Equal Opportunity Employer. Minorities, women, veterans, and individuals with disabilities are encouraged to apply. The University of Illinois conducts background checks on all job candidates upon acceptance of contingent offer of employment. Background checks will be performed in compliance with the Fair Credit Reporting Act. ●

# Meetings & Congresses

## 2018

November 8–9

**11th Edition of the International Conference: ICT for Language Learning**, Florence, Italy. Information: Internet: <https://conference.pixel-online.net/ICT4LL/index.php>

December 14–15

**Frontiers in the Clinical Management of Thyroid Diseases**, Paris, France. Information: Internet: <http://icmfs2019.com/>

## 2019

March 20–23

**23rd Annual Regenerative Medicine Workshop**, Charleston, SC. Information: Internet: <https://regenerativemedicineworkshop.com/>

March 25–26

**8th Edition International Conference on Internal Medicine, 2019**, Rome, Italy. Information: Internet: <https://internalmedicine.euroscicon.com/>

April 5–6

**European Meeting on Adult Congenital Heart Disease (EuroGUCH)**, Zagreb, Croatia. Information: Internet: <http://wp1.euroguch.com/>

April 6–9

**Experimental Biology**, Orlando, FL.

May 27–June 3

**PanAm 2019**, Havana, Cuba. Information: Internet: <http://panam2019.com/>

June 10–13

**14th FELASA Congress**, Prague, Czech Republic. Information: Internet: <http://www.felasa2019.eu/>

June 23–29

**2019 Control of Renal Function in Health and Disease**, Charlottesville, VA.

September 11–14

**The Interface of Mathematical Models and Experimental Physiology: Organ Function from the Microvascular Perspective**, Scottsdale, AZ

October 2–5

**9th Annual International Conference of Aldosterone and ENaC in Health and Disease: The Kidney and Beyond**, Estes Park, CO

October 29–November 1

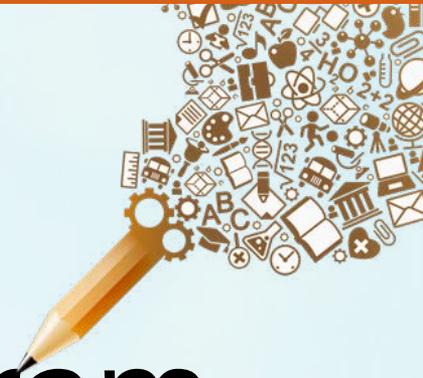
**31st World Congress of the International College for Maxillo-Facial-Surgery**, Tel Aviv, Israel. Information: <http://icmfs2019.com/>



# Workshop: Institute on Teaching and Learning

Madison, Wisconsin  
June 18–22, 2018

## Workshop Program and Abstracts



[the-aps.org/ITL](http://the-aps.org/ITL)

 #ITLPhysiology

# ABSTRACTS OF VOLUNTEERED AND INVITED ABSTRACTS

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## 1: Keynote Lecture I

### 1.1

#### Student-Instructor Interactions in a Large-group Environment

Prem Kumar<sup>1</sup>

<sup>1</sup> Univ. of Birmingham, Col. of Med. and Dent. Sci.

The gradient of the knowledge-doubling curve in our digital age demonstrates the futility of delivering an increasingly out of date curriculum using didactic methods. Such methods drive an instrumental approach to learning and reduce the meaning, feeling and relevance of the taught material. In contrast, effective active learning returns control to the student and personalizes the experience by relinquishing content delivery for understanding. This interactive lecture will describe the challenges and enjoyment of implementing flipped teaching to large physiology classes.

## 3: Plenary I

### 3.1

#### Teaching Best Practices

Jae-Eun Russell<sup>1</sup>

<sup>1</sup> Univ. of Iowa, Office of Teaching, Learning & Technology

What specific knowledge, skills, and competencies do we want our students to gain when they complete the course? Although lecture has been a traditional mainstay of any university campus, abundant research indicates that effective learning is supported when students are actively engaged in the learning process. Dr. Russell will briefly sketch teaching best practices and will provide the participants with useful rules of thumb to effectively implement them in the classroom.

## 4: Concurrent Workshop I: Assessment

### 4.1

#### Nuts and Bolts of Exam Analysis

Anne Schoening<sup>1</sup>

<sup>1</sup> Creighton Univ., Col. of Nursing

This session answers the question, "What do those exam stats mean anyway?" Participants will review the definitions of common statistical terms used in exam analysis and individual item analysis and will analyze statistical data for selected response items. Discussion will focus on using exam item analysis data as a means for quality improvement and making meaningful decisions about student learning.

## 5: Concurrent Workshop I: Professional Development

### 5.1

#### Compiling an Educator Portfolio for Promotion and Tenure

L. Britt Wilson<sup>1</sup>

<sup>1</sup> Univ. of South Carolina

Educator tracks in medical schools are becoming more common. In this presentation we will discuss ways to create an educator portfolio for promotion and tenure. The look of this portfolio should accentuate the guidelines of your institution. Thus, if you are at an institution that has an educator track, please consider bringing the guidelines to facilitate our discussion.

## 6: Concurrent Workshop I: Tricks of the Trade

### 6.1

#### Introduction to the CREATE Strategy - Deep Analysis of Primary Literature Benefits Both Students and Faculty

Christopher Trimby<sup>1</sup>

<sup>1</sup> Univ. of Delaware

CREATE courses use close analysis of linked sets of journal articles as a portal into the research laboratory. Faculty bring their deep research understanding to class, decreasing prep time and building students' independence and transferable skills. Workshop: (1) Brief CREATE overview; (2) Major focus: participants act as "CREATE students" in hands-on literature-based activities that introduce the CREATE strategy and toolkit; (3) Consider ways to apply CREATE approaches in physiology courses.

## 7: Plenary II

### 7.1

#### Why Collaborative Learning Works and How to Make it Happen

Robin Paige<sup>1</sup>

<sup>1</sup> Rice Univ., Ctr. for Teaching Excellence

Is group work an effective means to teach disciplinary content and skills or does it simply teach cooperation and teamwork? In this talk I will present research on how carefully organized student interaction through collaborative learning techniques enable students to engage in knowledge production, develop complex and critical thinking, and build fluency with the course material. I will discuss strategies for planning, managing, and assessing collaborative learning.

## 8: Concurrent Workshop II: Assessment

### 8.1

#### Objective Assessment of Instruction: How do you know your students are learning?

Jae-Eun Russell<sup>1</sup>

<sup>1</sup> Univ. of Iowa, Office of Teaching, Learning & Technology

Assessments should reveal how well students have learned what you want them to learn while instruction provides paths for them to learn it. How do you know your students are learning? Formative assessment is critical to support your student learning and to improve your instruction. This workshop will focus on developing and sequencing a formative and summative assessment plan to provide rich learning experiences that will support your student learning and performance.

## 9: Concurrent Workshop II: Professional Development

### 9.1

#### Embracing Diversity and Combatting Bias

Sydella Blatch<sup>1</sup>

<sup>1</sup> American Society of Cell Biology

Inclusive environments are key for all to succeed. But everyone (yes everyone!) has biases, so how can you as the leader, foster an inclusive environment when everyone is operating with bias? Biases go beyond race/gender, which are not the sole focus here. In this workshop you will use methods to identify various types of bias in an environment, practice using tools to decrease it, and learn strategies to help you bridge the needs of students coming to you with a host of personal experiences.

## 10: Concurrent Workshop II: Tricks of the Trade

### 10.1

#### Collaborative Learning

Beth Beason-Abmayr<sup>1</sup>

<sup>1</sup> Rice Univ.

Collaborative group work can be an effective method to facilitate inquiry-based learning. By scaffolding assignments throughout the semester, students work in teams to progress from structured to open-ended and independent levels of inquiry. In this workshop you will work with one example of a team-based project to help students learn animal physiology and brainstorm strategies to incorporate similar projects into your own courses.

## 11: Poster Session I and Group Discussions: Best Practices in Professional School Physiology

### 11.1

#### Case-Based Review Sessions Incorporating the Student Response Polling Feature of an Active Learning Platform Give Faculty and Students Real-Time Formative Feedback in Pre-Clerkship Medical School Courses

Rebecca Sullivan<sup>1</sup>, Thomas Fanrak<sup>2</sup>

<sup>1</sup>Physiology, Lewis Katz School of Medicine at Temple University, <sup>2</sup>Information Technology, Lewis Katz School of Medicine at Temple University

The Lewis Katz School of Medicine at Temple University annually welcomes a diverse class of 210 students to the MD program. Our goal is to create an interactive and collaborative experience to promote deeper levels of learning for large groups of students, while offering the attention, guidance and expertise of our faculty.

Course directors are tasked with increasing the active learning component while decreasing the passive lecture component of the pre-clerkship courses. The availability of course recordings of lectures, coupled with the attendance policy that attendance at lectures is not required, has shifted the classroom culture such that lecture attendance is low.

A challenge faculty face with large class sizes is obtaining valuable feedback as to which concepts the students struggle to learn, or adopt misconceptions which come from either prior knowledge or the misunderstanding of course material (2). Formative practice questions are provided to students as a study tool, but are neither required nor collected, and therefore cannot be used as feedback by the faculty. Often, faculty receive most feedback from the summative assessment.

Attendance in optional pre-exam review sessions has also been in decline. Facilitators of these sessions seek methods to provide meaningful review of a multitude of topics while gaining and keeping the attention of the students. Past methods include lecture-style reviews, Q&A style reviews, and case-based reviews during which students are called on individually.

To address these issues, we piloted a new review session format in a second year, pre-clerkship medical course. This format incorporates case-based learning with real-time formative assessment using student response polling software available in the Echo360 Active Learning Platform. The goals were to increase student engagement in the large class setting and to offer a method by which both students and faculty gained real-time insight into whether students understood key concepts. Faculty designed the sessions to build on cases previously introduced in lecture and/or workshops to integrate the structure/function relationships of

disease. This allows faculty to address big picture and high-yield concepts while modeling how to differentiate disease states. It also allows for spaced retrieval of information, which has been shown to improve learning (1). Another benefit of this method includes providing a method by which faculty can model how to approach board-style questions, which is of particular interest to the students as they prepare for their first Step exam at the conclusion of this academic year.

Faculty appreciate the students' enthusiasm and that they can instantly discover which topics students find challenging and clear up confusion and misconceptions. Students comment that they appreciate how a large amount of material can be covered in a meaningful way in a short period of time, that they can practice questions and cases with immediate faculty feedback, and that due to the timing of these sessions, they can refine their study plan and improve their time management.

Based on the success of this pilot program, we plan to expand these methods to other courses as well as other lecture and small group-based activities.

References:

1. Karpicke JD, Bauernschmidt A. Spaced Retrieval: Absolute Spacing Enhances Learning Regardless of Relative Spacing. *J Exp Psychol Learn Mem Cogn.* 2011 Sep;37(5):1250-7. doi: 10.1037/a0023436. PMID: 21574747
2. Michael JA. Students' misconceptions about perceived physiological responses. *Am J Physiol.* 1998 Jun;274(6 Pt 2):S90-8. PMID: 9841571

**11.2**

**Classroom attendance patterns and examination performance in pre-clinical medical students.**

**Christine Kauffman<sup>1</sup>, Jonathan Kibble<sup>1</sup>, Megan Derazin<sup>1</sup>, Abdo Asmar<sup>2</sup>**

**<sup>1</sup>Medical Education, University of Central Florida College of Medicine, <sup>2</sup>Internal Medicine, University of Central Florida College of Medicine**

Studies completed with undergraduate populations have shown that attendance positively correlates with academic performance. These were primarily done before the current era of the internet with online streaming of in-class sessions and multiple sources for content. In recent years, a marked decline in classroom attendance within medical school has been noticed with the advent of this online material. The goals of this study included a description of classroom attendance patterns, a determination of learner traits associated with voluntary attendance (using self-regulated learning theory as a theoretical framework), and the associated

performance on summative assessments in this modern era.

The study was performed during the second-year Gastrointestinal and Renal systems module of the 2017/18 academic year. Curriculum was divided into mandatory and voluntary sessions. The mandatory sessions included team-based learning and small group case-based learning sessions. In contrast, the voluntary sessions consisted of lectures and small group application exercises of material previously covered in the curriculum. All lectures were recorded and all other materials (e.g. PowerPoint files, small group case materials and answers) were available to students online whether or not they attended in person. Attendance was recorded for all sessions using a Bluetooth enabled smart-phone application (Tealpass). Performance was determined based on the 118 multiple-choice question final examination at the end of the 6-week module covering all material presented. Students voluntarily completed the Motivated Strategies for Learning Questionnaire (MSLQ). Spearman's rho correlation coefficients were calculated to assess the relationships between percentage of classes attended and each of the 15 subscales for motivation and learning strategies measured by the MSLQ. This study was IRB-approved and students gave informed consent.

The study group consisted of 78 students (68% of 114 total) of which 48 completed the MLSQ. The percentage of attendance in the study group was not different than that of the whole class. Attenders made up 67% of the group with 33% attending none of the non-mandatory sessions. High levels of self-efficacy and the ability to self-regulate effort were predictive of low attendance. Attendance was positively predicted by an orientation towards peer-learning and help-seeking. The non-attenders performed better on the final exam than the attenders group. However, there was no correlation between the percent of classes attended and performance on the final exam.

We conclude that different facets of self-regulated learning predict attendance, with highly confident students being the least likely to attend and that attendance at in-class sessions is no longer a good marker for those who will do well in a course. Further work is needed to characterize the nature of student engagement and effective approaches to study.

### 11.3

#### Flipping the Course: Independent Study of Online Videos and Interactive Sessions in a Medical Pathophysiology Course

Thomas Pressley<sup>1</sup>, Gilbert Berdine<sup>2</sup>

<sup>1</sup>Medical Education, Texas Tech University Health Sciences Center, <sup>2</sup>Internal Medicine, Texas Tech University Health Sciences Center

The intensity and depth of learning required in medical school poses challenges for both students and faculty. Students must constantly adjust priorities as they juggle scheduled content delivery such as lectures with the need for independent study. Like many medical schools, we record live lectures for digital distribution to the students. As each class progresses in its training, however, we have found that an increasing number of students rely exclusively on the recordings rather than attend the live presentations. As a result, they spend less and less time interacting with faculty members and each other. At the same time, increasing demands in the laboratory and clinics have made it more and more difficult for our faculty to invest the time needed for live lecture. Rather than fighting these trends, we adopted a model for our second-year pathophysiology course in which the bulk of subject material was delivered as prerecorded videos that were made available online. Although some videos were custom-made, most were adapted from recordings made in previous years. A suggested schedule of study was posted for the students, and each afternoon, we scheduled interactive sessions in which students could apply their learning. These included case studies, patient interviews, class discussion of vignette-style questions, and various hands-on clinical simulations. Some sessions were mandatory, but most were optional. With this flipped strategy, we hoped to enhance active engagement by students while reducing the time commitments for faculty. A field-test was conducted in 2015 with the respiratory section of the course, and performance and student feedback were encouraging. By the current year (2018), the entire course is conducted using the online material and interactive sessions. Student performance, as measured by in-house exams and high-stakes standardized exams, has not declined, and in many respects is improving. Moreover, evaluations of the course suggest that most students appreciate the flexibility and independence available with this approach. We believe that the flipped strategy for a course in the pre-clinical years facilitates student learning while optimizing faculty engagement.

### 11.4

#### Utilization of an Interprofessional Simulation Experience to Change Student Perception of Interprofessional Education

Chris Wingard<sup>1</sup>, Beth Quinn<sup>1</sup>

<sup>1</sup>Doctor of Physical Therapy, Bellarmine University

**Rationale:** Collaborative practice in healthcare results in improved patient safety, quality healthcare delivery and overall optimal health services (Interprofessional Education Collaborative Expert Panel 2011). To produce a healthcare workforce that is “collaborative practice-ready”, interprofessional education must be introduced and intentionally incorporated into the appropriate curriculums to allow students to learn about, from and with other healthcare professionals. Similarly, simulation-based education has demonstrated effective results in improving patient care services and better patient outcomes in a learning environment that is safe, structured and reproducible (Schmidt et al 2013; Thomas et al 2017). The purpose of this study is to determine if an interprofessional simulation experience changes Doctorate of Physical Therapy (DPT) and Bachelor of Respiratory Therapy (RT) students’ perception of interprofessional education and effectively meets learning objectives established to promote interprofessional communication, collaborative implementation of skilled therapy and effective team assessment of the patient’s intervention response.

**Participants:** 70 students enrolled in Cardiopulmonary Physical Therapy in the DPT and 15 students enrolled in Respiratory Therapy Science III in the RT program, both at Bellarmine University.

**Methodology:** All students were invited to participate in an anonymous survey prior to the scheduled simulation experience. The survey included: identification of program enrollment, any prior interprofessional education training, and the Student Perceptions of Physician-Pharmacist Interprofessional Clinical Education-Revised (SPICE-R) Instrument.

An interprofessional simulation lab experience was designed to include both DPT and RT students in the early mobilization of a ventilated high-fidelity simulation mannequin with complex cardiopulmonary clinical presentation. Immediately following the lab, students were invited again to complete a second anonymous survey that included the SPICE-R Instrument and Simulation Effectiveness Tool- Modified.

**Summary of Results:** 80 students participated in the Pre-experience survey and 60 participated in the Post-experience survey. In general, there was a positive shift in student perception as noted between SPICE-R surveys. The simulation experience appears to have had the greatest impact on student’s feeling that their education

is enhanced when working with students from another health profession. 23.8% responded Strongly Agree pre-experience and 70.0% responded Strongly Agree post-experience. Students also perceived that patient satisfaction is improved when a patient is treated by a team that consists of individuals from two or more health professions. 31.3% responded Strongly Agree pre-experience and 70% responded Strongly Agree post-experience.

**Conclusion:** Survey results demonstrated a positive shift in student perception of interprofessional education. IPE embedded into health professional curriculums can have a positive impact on student perception on the value of IPE as well as the positive patient outcomes that result from interprofessional collaboration.

#### Reference List:

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#### 11.5

##### **Benefits of Early Clinical Exposure Using Simulated Patient Encounters for First-Year Medical Students**

**James Bunch<sup>1</sup>, Dan Webster<sup>2</sup>, Gregory Brower<sup>2</sup>**

**<sup>1</sup>School of Medicine, Texas Tech University Health Sciences Center, <sup>2</sup>Medical Education, Texas Tech University Health Sciences Center**

Early clinical exposure has the potential to improve retention of important physiological concepts in undergraduate medical education. Experiential learning has been linked to improved skill development, with one benefit being facilitating the transition between pre-clinical and clinical education. First-year medical students at Texas Tech University Health Sciences Center School of Medicine partake in Emergency Department Simulations during the Major Organ Systems (Systems Physiology) block, and again in the second year as part of the Systems Disorders block. With the goal of improving retention of clinical pathophysiology and quality of clinical reasoning, we embarked on a three-fold quality improvement project in conformance with Institutional

guidelines. We produced and distributed an electronic module introducing students to the layout and clinical features of our model Emergency Department Simulation room. Additionally, we developed new simulation activities based on cardiac, endocrine, gastrointestinal and renal physiology and the recognition of several common clinical conditions (e.g., pre-renal azotemia). Finally, we developed an Advanced Clinical Skills elective to provide School of Medicine Teaching Assistants the relevant clinical expertise needed to effectively explain the clinical reasoning relevant to diagnosis and treatment of the pathophysiology encountered in these new simulations. Student performance was assessed by a pre- and post-test focused on clinical management of emergent disease and evaluation of clinical write-ups (i.e., SOAP notes) documenting the simulated patient encounters. Early analysis of the data indicates that this intervention has produced improved clinical reasoning skills in first-year undergraduate medical students at our institution. While there is accumulating qualitative data surrounding the benefit of early clinical education in the literature, these findings provide quantitative evidence that early clinical exposure is beneficial to integration and retention of clinical information, as well as the development of improved clinical reasoning skills, in first-year undergraduate medical students.

#### 11.6

##### **Students in a graduate-level physiology class believe participation in group assessments improves their understanding of course concepts but knowledge retention is reduced in low-performing students.**

**Renee McFee<sup>1</sup>, Katie Bidne<sup>2</sup>**

**<sup>1</sup>School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln, <sup>2</sup>Animal Science Department, University of Nebraska-Lincoln**

Group assessments have been shown to benefit both low and high-performing students and several studies have reported positive student perceptions of collaborative testing, including improved learning. Unfortunately, there is conflicting evidence regarding the impact on knowledge retention. Group quizzes have previously been utilized in our systemic physiology course for graduate and professional students; students complete quizzes individually and are then organized into groups of 3 to retake the same quiz. However, questions on formative weekly quizzes typically assess lower-level learning while questions on summative unit exams assess a higher-level of learning. Therefore, use of both group quizzes and exams was evaluated for the 2016-17 academic year. Group quizzes and individual exams were administered during the fall semester and individual quizzes and group exams were administered during the spring semester. The group testing format was the same

between quizzes and exams with the exception that quiz groups were assigned randomly and exam groups were randomly sorted until there was no significant difference in mean course grade between groups. Students indicated that participation in group assessments improved their understanding of physiologic concepts (quizzes = 83%, exams = 83%) and were a valuable use of class time (quizzes = 92%, exams = 93%). Students appreciated the opportunity to discuss ideas with fellow students and believed the group format was similar to interactions they will have with future colleagues. However, high-performing students did not appreciate being regularly grouped with low-performing students and certain students admitted to reducing their study efforts if knowingly paired with high-performing students. In addition, the difference in individual and group assessment scores was significantly greater ( $P < 0.003$ ) for low-performing students (scoring in the bottom 1/3 of the class; 25.8%) than high-performing students (scoring in the top 1/3 of the class; 3.0%). Knowledge retention was assessed by taking select questions from quizzes and exams and administering them again at the end of the semester as part of an unannounced, ungraded posttest. Student performance was significantly lower ( $P < 0.02$ ) on the posttest compared to individual assessments for all testing formats: group quizzes (55.6% vs. 82.1%), individual quizzes (68.2% vs. 81.0%), group exams (60.9% vs. 80.5%), and individual exams (69.0% vs. 80.8%). When only low-performing students were evaluated, scores were significantly lower ( $P < 0.008$ ) on the posttest compared to individual assessment scores for group quizzes (41.7% vs. 70.8%) and exams (42.9% vs. 63.2%) but not individual quizzes (59.0% vs. 65.8%) and exams (62.5% vs. 68.8%). This suggests that participation in group assessments reduced knowledge retention in low-performing students. This study is being repeated for the 2017-18 academic year with 3 modifications to address some of the identified shortcomings to determine if student perceptions and knowledge retention can be improved: 1) All student groups will be assigned in a strictly random manner. 2) Students will not be aware of their fellow group members until just before the group assessment. 3) Individual and group assessments will no longer be weighted equally, rather, students will have the opportunity to earn a limited number of bonus points towards their individual assessment score by earning a higher score on the group assessment.

## 11.7

### **Individualised student learning and feedback in large medical student cohorts: flipping respiratory physiology** **Clare Ray<sup>1</sup>, Prem Kumar<sup>1</sup>**

<sup>1</sup>Institute of Clinical Sciences, University of Birmingham

Successful transition to University requires students to adapt to new styles of teaching and learning. Traditionally, the teaching of physiology to medical students is by a series of didactic lectures accompanied by tutorials. This approach fulfils the requirements of efficient content delivery, but with increased cohort size, does not provide students with many opportunities to assess their understanding at an individual level. The challenge therefore is to design modules which engage all students in a large cohort with the subject material and yet give them the chance to obtain personalised feedback to test their own understanding. We therefore sought to redesign the delivery of our respiratory physiology module to address these concerns.

We now use a 'flipped classroom' approach<sup>1</sup> to engage approximately 350, year 1 medical students at the University of Birmingham with their learning, and to support their understanding of respiratory physiology. Lecture podcasts, recorded using lecture capture software (Panopto), are made available to the students via their VLE (Canvas, Infrastructure) to review in their own time before attending interactive sessions held in a lecture theatre. These sessions use mobile interactive response software (ResponseWare, Turning Technologies) and multiple-choice questions to give students the opportunity to apply their knowledge and get immediate and individualised feedback on their learning. Peer teaching and bespoke lecturer explanations, guided by the students' responses, help to consolidate understanding. Students are further supported by tutorials in which they can apply their knowledge to clinical scenarios.

73% of students agreed that the flipped approach had supported their learning. Whilst 20% of the cohort did not like having to review the podcasts prior to the interactive sessions, 86% of them said they spent no more than 1-2 hours in such preparation which is less than the allocated independent study time per delivered hour. Additionally, for many students the best part of the flipped approach was felt to be the opportunity to review podcasts at their own pace. To increase the efficacy for individual students, we have found it to be important to use questions with a range of difficulty to stretch the most able students without undermining the confidence of others. Our evaluation suggests that we have been able to achieve this as only 13% of students thought that the questions were too difficult and just 2% that they were too easy.

Following the success of this approach for respiratory physiology we are now using it successfully for the teaching of cardiovascular physiology to year 2 medical students. As the doubling time for medical knowledge is predicted to be just 73 days by 2020<sup>2</sup> wider use of the flipped approach may increase student confidence in their ability to learn and understand independently in a fast-changing environment. This will equip them with the skills that they require for a career of life-long learning and we should focus on the understanding of core principles in the initial years of medical education.

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### 11.8

**Teaching reform practice and reflections based on undergraduate Pathophysiology course in Tongji University in the past ten years**

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Entering to 21th century, teaching reform was carried out in full swing in China. Tongji University is one of the key universities of the Ministry of Education, and innovations in medical education are imperative as well as other subjects. As an important basic subject of undergraduate education in Chinese medical colleges and universities, Pathophysiology is deeply involved in the teaching reform action in Tongji University, covering a large amount of debates on curriculum development, teaching methodology, student assessment, curriculum evaluation, teacher's training, and so on. Here only review the construction practice of some teaching reform projects based on undergraduate theory and experiments course in the past ten years, including excellent course construction of experimental hemorrhagic shock (2008), curriculum integration based on organs and system (2009), shock - problem based learning course (since 2010), bilingual education (2012), excellent course construction of experimental hypoxia (2013), experimental teaching reform project experimental hepatic encephalopathy (2016). This article also addresses some thinking to the teaching reform practice on undergraduate: their knowledge, skills, good

attitudes and abilities to meet the challenge of the expanding body of medical knowledge and the social demands.

## 13: Plenary III

### 13.1

**Forgetting as a Friend of Learning**

Robert Bjork<sup>1</sup>

<sup>1</sup> Univ. of Calif., Los Angeles

It is natural to think that learning is building up skills or knowledge in one's memory and that forgetting is losing some of what was built up. The relationship between learning and forgetting is not, however, so simple and in some important respects is quite the opposite: Conditions that produce forgetting can enable additional learning, and learning or recalling some things can contribute to forgetting other things. In this talk I focus on why forgetting enables, rather than undoes, learning.

## 14: Concurrent Workshop III: Assessment

### 14.1

**Defining Competency in Physiology**

Jeff LaRochelle<sup>1</sup>

<sup>1</sup> Univ. of Central Florida

Effective peer leaders augment student learning and engagement. Faculty in a number of STEM fields incorporate peer leaders in the classroom, and this approach is growing in undergraduate anatomy and physiology courses. This workshop will examine practical approaches to designing a peer leader program while addressing logistical concerns. Considerations will include peer leader roles, session design, effective communication, and constructive assessment tailored to your course.

## 15: Concurrent Workshop III: Professional Development

### 15.1

**Crossing Over to the Dark Side: The Path to Academic Administration**

Joseph Benoit<sup>1</sup>

<sup>1</sup> Burrell Col. of Osteopathic Med.

Academic careers offer many opportunities for advancement that can extend beyond the traditional classroom. Each step provides exciting opportunities but often are accompanied by trade-offs that should become part of the decision to "Cross over to the dark-side." Join us for an exciting interactive session designed to help you develop an administrative portfolio and assess your of readiness for academic advancement.

**16: Concurrent Workshop III: Tricks of the Trade**

16.1

**Effective Use of Peer-Learning and -Teaching**

**Kathleen Hughes**<sup>1</sup>

<sup>1</sup> **Columbus State**

Effective peer leaders augment student learning and engagement. Faculty in a number of STEM fields incorporate peer leaders in the classroom, and this approach is growing in undergraduate anatomy and physiology courses. This workshop will examine practical approaches to designing a peer leader program while addressing logistical concerns. Considerations will include peer leader roles, session design, effective communication, and constructive assessment tailored to your course.

**17: Plenary IV**

17.1

**Transcending Content and Teaching Context: How to Foster Meaningful Scientific Literacy in the 21st Century**

**Cyndi Brandenburg**<sup>1</sup>

<sup>1</sup> **Champlain Col.**

The rate of scientific discovery makes content mastery a challenge even for experts. Meanwhile, while objectivity in science is highly valued in theory, in reality, the process is mediated by flawed humans in a complex and subjective world, thereby limiting its absolute potential. This presentation makes an argument for why contextualizing the role of science in society may be more important than teaching science content in and of itself, and provides one possible framework for doing so.

**18: Concurrent Workshop IV: Assessment**

18.1

**Team Teaching: Is it Worth the Hassle?**

**Aaron Kostko**<sup>1</sup>

<sup>1</sup> **Univ. MN at Rochester, Ctr. for Learning Innovation**

This session focuses on the pedagogical merits and challenges of team teaching. After a brief survey of various team teaching models, participants will be introduced to results from the author's research on the impact of team teaching on student attitudes and classroom performance. Participants will then consider how they could implement team teaching within their own courses and discuss the institutional and pedagogical barriers of doing so.

**19: Concurrent Workshop IV: Professional Development**

19.1

**Moving Beyond the Classroom (and Becoming a Media Star)**

**Mary Poffenroth**<sup>1</sup>

<sup>1</sup> **San Jose State**

Should you share your research with non-academics? With your already demanding schedule, it's so much easier to just talk to other professionals in your field. But sci-curious, non-academic audiences are out there and they want to hear about your research directly from You! Start creating engaging digital content for wider audiences using video, podcast, live events, and popular writing by joining Mary Poffenroth, University Biology Lecturer and Science Communicator, for this hands on workshop.

**20: Concurrent Workshop IV: Tricks of the Trade**

20.1

**Implementing Universal Design of Learning in Science**

**Stacie Rose**<sup>1</sup>

<sup>1</sup> **Heartland Comm. Col.**

Reaching every student is a daunting task. Universal Design in Learning is a comprehensive framework based on three areas we know influence learning: engagement, content, and assessment. This workshop will introduce you to the concept of UDL, provide concrete examples, and aide instructors in the implementation of UDL in their own classrooms.

**21: Poster Session II and Group Discussions: Best Practices in Undergraduate Physiology**

21.1

**Engaging Middle Schoolers and Undergraduates with Zehr's *Becoming Batman***

**Heidi Walsh**<sup>1</sup>

<sup>1</sup> **Biology Department, Wabash College**

Wabash College is an independent liberal arts college for men, whose mission is to educate students "to think critically, act responsibly, lead effectively, and live humanely." Approximately 20% of incoming freshmen indicate an interest in health professions, which has shifted the population of student who take our physiology course (BIO315) from those needing an elective for the Biology major to those fulfilling a requirement for admission to professional school. Traditionally, BIO315 was taught with an emphasis on organismal physiology, but the large degree of pre-health student enrollment drove me to reconsider the course's focus. Because health professionals must be proficient in communicating complex physiological concepts to a diverse population of patients, I adapted

the laboratory section of BIO315 to include a community-engaged learning project where Wabash students developed their own “superhero physiology” lessons for local middle school science classes, inspired by the book *Becoming Batman: The Possibility of Superhero* by Paul Zehr. This project had three aims: 1) Enhance working knowledge of physiological concepts by creating lessons to educate others. 2) Gain expertise in communicating science to general audiences. 3) Engage with the local community to promote science and health. During the first third of BIO315 in Fall 2016, Wabash students learned physiology concepts through traditional classroom instruction, human physiology laboratory exercises using iWorx, and reading Zehr’s book. After multiple brainstorming sessions, three groups of students developed interactive lessons based on Thor (muscle physiology), Spiderman (nervous system & reflexes), and Superman (respiratory physiology). Students ran these lessons during November 2016 in 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grade science classes at Crawfordsville Middle School in Crawfordsville, IN. While the Wabash students had hoped to incorporate iWorx more fully into their lessons, the middle school class sizes and time constraints made simpler activities more feasible. One of the most successful activities, however, involved a replica of Thor’s hammer linked to the iWorx FT-220 hand dynamometer. A 5-gallon bucket was filled with quick-dry cement with a small shovel placed in the middle to form the handle of Thor’s hammer. Once dry, the bulb of the hand dynamometer was attached to the handle so that force applied while squeezing the handle to lift the hammer could be measured with iWorx. Both Wabash and middle school students responded positively to the lessons, as did the middle school science teachers. For Fall 2018, we will perform more systematic assessments of the Superhero Physiology project, and incorporate more exposure to pedagogy prior to lesson plan design. This work was funded by a Lilly Endowment Faculty & Staff Mini-Grant.

## 21.2

### Course Delivery Format, Content Knowledge, and Motivation Factors in Undergraduate Human Physiology

Jennifer Rogers<sup>1</sup>, Jae-Eun Russell<sup>2</sup>, Anna Smith<sup>2</sup>, Yeajin Ham<sup>3</sup>

<sup>1</sup>Health & Human Physiology, The University of Iowa,  
<sup>2</sup>Office of Teaching, Learning, & Technology, The University of Iowa, <sup>3</sup>College of Education, The University of Iowa

**Introduction:** The purpose of this study was to examine the effects of course delivery format (traditional lecture, online, and blended) upon end-of-semester content knowledge and motivation factors (self-efficacy, anxiety,

and intrinsic value) in an undergraduate human physiology course. **Methods:** Students enrolled in HHP:3500 Human Physiology during the Spring 2017, Summer 2017, and Fall 2017 semesters were recruited for participation in this study, which included: (1) collection of demographic information (major, class standing, gender, first generation status, underrepresented minority status), (2) survey completion (perceptions of course activities, motivation factors, instructor characteristics), and (3) assessment of physiology-specific content knowledge (baseline, formative, and summative assessments). This course was offered in three delivery formats: traditional lecture, online, and blended, and each section progressed through the same course content at the same pace. All students had access to the same pre-recorded lectures and completed weekly adaptive learning assignments. The traditional lecture presented the same content as in the pre-recorded lectures during two 75-min in-class sessions per week; review of the pre-recorded content was optional and supplemental. Online students reviewed the pre-recorded lectures and engaged in asynchronous online discussion activities approximately every two weeks. Students in the blended section met in a classroom once per week for 75 min to review concepts presented in the pre-recorded lectures, complete in-class formative learning activities, and engage in guided peer discussions. **Results:** A total of 414 students participated in this study: 255 out of the 350 students (73%) enrolled in the traditional lecture sections, 105 out of 147 (71%) from the online sections, and 54 out of 67 (81%) from the blended section. There were no significant differences in students’ prior knowledge across the three course delivery formats. No significant differences in cumulative exam scores were noted relative to course delivery format after controlling for students’ prior learning (72% (15.7 SD), 72% (14.7), and 74% (14.9) respectively for traditional lecture, online, and blended course formats;  $P = 0.60$ ). However, performance on a post-course knowledge assessment was significantly higher for the blended format versus the traditional lecture and online formats (73% (13.3), 65% (14.4), and 66% (15.2) respectively;  $P = 0.007$ ). Of motivational factors, self-efficacy and anxiety were significant predictors of both cumulative exam scores ( $P < 0.001$  self-efficacy,  $P = 0.001$  anxiety) and the post-course knowledge assessment ( $P = 0.004$  self-efficacy,  $P = 0.036$  anxiety). Furthermore, students in the blended section reported significantly lower anxiety at the end of the semester compared with students the online section (4.22 versus 4.98 on a 7-point scale,  $P = 0.027$ ). The blended course format was associated with lower D/F/W rates (4.5%) compared with traditional lecture (18.1%) and online (18.8%) course

formats ( $P = 0.02$ ). **Conclusions:** The D/F/W rate for the blended course delivery format was lower, and anxiety lower, compared with the traditional lecture and online sections of Human Physiology. Thus, the blended course structure may be an effective course delivery format to facilitate perseverance and mastery of human physiology content knowledge.

### 21.3

#### **Utilization of a critical thinking framework to teach students to think through concepts in a second year Exercise Science course**

Jeremy Dicus<sup>1</sup>, Brock Jensen<sup>1</sup>

<sup>1</sup>Exercise and Rehabilitative Sciences, Slippery Rock University

The typical Exercise Science program may see students pursue a multitude of directions upon program completion. Destinations commonly range from entering a fitness profession to a variety of health-related graduate programs (e.g. MD, DPT, etc.). All of these desired paths require substantial content-knowledge for success. However, it has been suggested that employers value critical thinking more than the acquisition of discipline-specific knowledge. Therefore, programs and instructors are tasked with preparing students with both content knowledge and the ability to think critically. In order to bridge this gap, we have designed this course around critical thinking theory and identified tactics that develop basic critical thinking skills while students process course concepts. The Paul-Elder model of critical thinking provides a rich conception of critical thinking. Substantial investigation into the Paul-Elder has provided the framework to design a sophomore-level course in which students develop an understanding of critical thinking theory while leaning course concepts. There were six significant components to the successful design and implementation of this course. The first step was to identify and design the course around the most significant concepts of the subject. Second, students were provided with an introduction to the theory and language of critical thinking. The third component required the creation of opportunities for students to prepare for class sessions by clarifying their understanding of a course concept. Fourth, Socratic questioning was used to cultivate discussions that intentionally utilized the language of critical thinking. Fifth, assignments were designed to deliberately address one or more Elements of Thought as students processed a course concept. The final component was to provide ample opportunity for meaningful feedback through the use of Intellectual Standards.

### 21.4

#### **Scaffolded approach to primary literature in a non-majors biology course: a pilot study**

Melissa Petreaca<sup>1</sup>

<sup>1</sup>Biology, DePauw University

Although undergraduate research experiences have a substantial impact on student retention and success in STEM fields, relatively few students have the opportunity to participate in individual research opportunities, and these research opportunities are frequently reserved for more advanced students. To increase the numbers of introductory-level students engaged in biology research, I incorporated student-designed group research projects in my introductory-level, non-majors Inflammation course. In these research projects, students developed project proposals that included a hypothesis based upon evidence from previously published studies and a series of experiments that tested the hypothesis. However, before the students could develop a hypothesis and rationale for their projects, they needed to learn how to read and understand the primary sources that could provide evidence for their hypotheses. To guide students through the process of reading and understanding these primary sources, I created and implemented a series of scaffolded student-centered activities, mini-lectures, and short writing activities. I used data from pre- and post-course CURE surveys as well as comments in student opinion surveys to assess student confidence gains in several key areas, and both CURE survey results and student opinion surveys suggest that students in this class made substantial gains in their abilities to read and understand scientific literature. Using this type of approach to scaffold the process of comprehending scientific literature may make students more confident in their understanding of the literature, which may make student-designed research projects more feasible for introductory-level courses.

### 21.5

#### **Context as a source of difficulty in human physiology**

Tara Slominski<sup>1</sup>, Jennifer Momsen<sup>1</sup>

<sup>1</sup>Biological Sciences, North Dakota State University

Students struggle to succeed in Human Anatomy and Physiology (HA&P) for several reasons [1, 2]. Many students enter science classrooms with naïve, informal knowledge constructs that complicate or conflict with the concepts they are learning in class. These ideas originate from observing natural phenomena in the real world [3,4,5] and often conflict with formal instruction. As a result, a student must undergo considerable conceptual conflict and reformation of that knowledge if they are to be a successful learner [6].

Findings from my earlier research [1,2] on student difficulties suggest students may rely on intuitive reasoning and experiential knowledge to frame their thinking about physiology. For example, when asked to reason about neurotransmitters, students may associate this concept with an everyday example of movement or flow (e.g. water moving through pipes or electricity moving along a wire). Superficially, building links to existing knowledge structures may help students reason about biological phenomenon; however, this type of framing may lead students to make incorrect assumptions and reason inappropriately. Using the neurotransmitter example, if a student attempts to learn synapse physiology by relying on previous experiences from the real world (i.e. signal flow requiring physical contact like electricity moves along a wire), they will likely struggle to understand the actual mechanisms of synaptic transmission.

Although my previous research provides some evidence that students use experiential or intuitive knowledge to shape their reasoning about neurophysiology, the results from this single study are limited. My current research expands on this work by directly investigating the role of students' intuitive ways of thinking in HA&P classrooms. Specifically, I am researching *if*, *when*, and *how* students employ intuitive reasoning strategies when presented with a physiology problem or scenario and how these reasoning strategies affect student understanding of HA&P content.

I used surveys and interviews to investigate the impact of context, specifically human physiology context, on student reasoning. Through collaborating with physicists, I developed a set of isomorphic tasks that ask identical questions but present the questions in different situational contexts. By comparing student responses in each context, I can identify the impact of context on student reasoning. In addition, this experimental design enables me to control for student ability and isolate the effect of physiology context. I collected data in multiple iterations of HA&P and physics courses at NDSU, resulting in over 700 data points. In addition, I conducted semi-structured, think-aloud interviews with 12 HA&P students. Each participant was given one set of the isomorphic task and asked to reason through the question set. During the interviews, students' explanations were probed to gather deeper insight into their reasoning patterns.

The data gathered from students in both the classroom setting and the interviews provide insight into how students reason about human physiology. More importantly, the results from this study provide instructors and researchers with new insight into the minds of HA&P students and bring to light the unique

challenges students experience when learning physiology.

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#### 21.6

#### Engaging A&P Students in Communities of Practice Inside and Outside of Class.

Jane Chapman<sup>1</sup>

<sup>1</sup>Biology, Heartland Community College

Objective: To engage A&P students in communities of practice both in and outside of class.

Methods: Several changes were made to the design of the course to both in-class, fact-to-face time and outside, information acquisition time, to engage students in social learning and develop a community of practice in and out of class. Changes inside of class included: 1) creating permanent and diverse student groups with whom the students would work on collaborative learning lab activities, case studies, concept questions and peer instruction; 2) converting all exams to a team-based learning format using the team-based assessment in Learning Catalytics that were focused more on application rather than recall of the material. These assessments include an individual round followed by a team round and allow for implicit confidence level scoring options. Assessment of group functionality was made by instructor observation as well as with peer evaluation surveys via the CATME.org website. Changes outside of class added an annotation component to the pre-class reading assignment which is to be completed prior to completion of the pre-quiz. The annotation uses the social learning e-platform, Perusall, and provides students with the opportunity to interact with each other outside of class. Automated Perusall scoring determines how well the students are annotating the material and interacting with classmates.

Results: Inside of class: Student groups: Within a fairly short period of time these groups transitioned into positive support networks all working toward a common goal – learning anatomy and physiology. Student behavior in the groups was informally observed by the instructor and formally evaluated by their peers in 3 peer evaluation surveys throughout the semester – two formatively and a third summatively, administered

through CATME.org. The peer evaluations helped guide the students through the 'forming, storming and norming' stages of group/team formation. Team-based Exams: Group discussions during team round were robust and in-depth which indicates there was a lot of learning happening; additionally, teams that discussed questions the most tended to do better on the exams. Outside of class: Students are actively reading, via annotating in Perusall, the pre-class reading assignments. Approximately 80% of the students completed 75% or more of the assigned readings before exams. Students are interacting with their classmates, outside of class, while annotating in Perusall, by answering questions posted by classmates, by 'liking' classmate's comments, and by posting questions that classmates answer.

Conclusions: With intentional design and supportive activities A&P students can engage in social learning within a community of practice inside and outside of class.

### **21.7 Assessing and Adjusting: Student-Directed learning in an Advanced Physiology Class.**

**Jessica Fry<sup>1</sup>**

<sup>1</sup>Math and Natural Sciences, Curry College

The college experience is ideally designed to develop students' creative, critical, and independent thinking skills. At Curry College, a small liberal arts college primarily serving a population of students who score low on standardized tests or are otherwise underprepared, we find that some of our students are more comfortable with memorization as a mechanism of learning and resist other modalities. In 2016, to support student-directed learning in this population of students, Advanced Physiology, a 3000-level course with the prerequisites of Cell Biology and Genetics, was designed to encourage curiosity and creative learning within a Human Physiology framework. The inaugural semester experimented with three different student directed learning methods: The first, to research, design and carry out a group physiology experiment. The second is a student-led book club, in which each student group is responsible for integrating a chapter of Robert Sapolsky's "Why Zebras Don't Get Ulcers" with the physiological concepts presented in class. The third is a midterm assignment where students ask and answer their own physiology questions, demonstrating knowledge covered in class. Initial assessment indicated that students recognized the value in this teaching strategy as well as benefited from this exercise based on their performance on a more traditional final exam. However, in subsequent semesters, the same level of engagement has not been achieved by the same assignments, resulting in a

reworking of the assignments to increase student motivation by using metacognitive strategies. The assessment of these alterations will be presented.

### **21.8 Students report enhanced learning when using TeamUp!, a digital assessment tool that provides immediate feedback in blended classrooms**

**Michelle French<sup>1</sup>, Riya George<sup>1</sup>, Franco Taverna<sup>2</sup>, Melody Neumann<sup>3</sup>**

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<sup>2</sup>Human Biology Program, University of Toronto,

<sup>3</sup>Department of Cell and Systems Biology, University of Toronto

We trialed two blended learning approaches in two classes of our introductory physiology course: Basic Human Physiology. The course covers all organ systems of the body, and is normally delivered via one two-hour lecture/week to a class of 160 students. In the trial, some of the typical lecture content was delivered via a 20-30 min online video to be viewed before the class. The class started with the rest of the lecture and the final 30-40 min of class time consisted of an active learning session. For the first active learning session, students worked in small groups to complete a worksheet that included both multiple choice and short answer questions. For the second active learning session, students used a digital assessment tool called TeamUp!, developed by one of us (Neumann). TeamUp! allows students to form groups, engage in peer teaching, submit group answers, and provides immediate feedback: all of which have been reported to improve student learning (1-3). Groups get full marks if they select the correct answer on the first try and partial marks with subsequent attempts.

To gauge the effectiveness of the blended formats, we conducted a student survey at the end of the trial. We also compared student performance on term test questions related to the active learning component to overall test scores. In the survey, the majority of students (n = 110) reported that the blended format helped them learn the material better and that they enjoyed the approach more (62% vs 38%). Of the students who preferred the blended format, the majority stated that they preferred TeamUp! to worksheets in terms of both learning (71%) and enjoyment (81%). The performance of the students on test questions related to the group work vs the test overall was not significantly different. The group work, however, addressed conceptually difficult content, and we have not yet assessed long-term knowledge retention by analyzing performance on the final exam. Also, test performance is only one way to assess the effectiveness of a teaching intervention. Indeed, the instructor reported that the students were more engaged during the blended learning classes and

that attendance increased. We conclude that incorporating active learning sessions into traditional lecture courses, especially with the use of TeamUp!, enhances student engagement, enjoyment and perceptions of learning.

1) Mazur E. 1997. Peer Instruction: A User's Manual. Toronto: Prentice-Hall.

2) Freeman S, Eddy SL, McDonough M, Smith MK, Okoroafor N, Jordt H and Wenderoth MP. 2014. Active learning increases student performance in science, engineering, and mathematics. PNAS 111:8410.

3) Epstein ML, Lazarus AD, Calvano TB, Matthews KA, Hendel RA, Epstein BB and Brosvic GM 2002. Immediate feedback assessment technique promotes learning and corrects inaccurate first responses. The Psychological Record 52:187.

### 21.9

#### **A Framework for Integrating the events of the cardiac cycle: Electrical, mechanical, pressure, valve, volume (EMP double V)**

**Lisa Carney Anderson<sup>1</sup>**

<sup>1</sup>**Integrative Biology & Physiology, University of Minnesota**

The cardiac cycle can be described and explained by the Wigger Diagram, a complex graph showing the changes in cardiac electrical activity, ventricular volume and cardiac pressures during the cardiac cycle. Students may be able to follow individual outcome variables over time, but it can be a daunting exercise for students to consider multiple variables simultaneously. Furthermore, while students may understand that two cardiac events are associated in time, they may not realize that one event is caused by a previous event. For example, depolarization of the ventricles causes the release of calcium ions that permit the ventricle to contract; students may know that an increase in ventricle pressure occurs after the QRS complex, but they may not fully understand that the increase in pressure is caused by cardiac contraction or that contraction of the ventricles is caused by depolarization of ventricles. The following framework (electrical, mechanical, pressure, valve, volume) was developed by the author after several years of trying to help students learn and integrate the events of the cardiac cycle. Using this framework, students identify an electrical event, either a deflection or an isoelectric event within the electrocardiogram. Then the student identifies the mechanical event (contraction or relaxation) that occurs because of the electrical event. The mechanical event causes a pressure change that allows a valve to open, stay open, close or stay closed. If a valve is open, then ventricular volume can change; if all four valves are closed then the ventricular volume stays the same. Students can engage in active

learning activities to work through the Wigger Diagram using this framework. Examples of active learning activities based on this framework will be presented with the poster presentation.

## **22: Keynote Lecture II**

### 22.1

#### **What Determines the Physiology That Students Learn** **Tony Macknight<sup>1</sup>**

<sup>1</sup>**ADInstruments**

The different ways that students are motivated to learn will be discussed. These will include some historical perspective, the role of examinations, different modes of presentation, and some newer tools that are now available to promote learning.

## **24: Plenary V**

### 24.1

#### **Integrating Research into the Undergraduate Experience**

**Paula Mazzer<sup>1</sup>**

<sup>1</sup>**Dakota Western Univ.**

Our STEM majors arrive on campus as rule followers—"Tell me what to do, and I'll do it" is their refrain. To break this mindset, we redesigned our suite of lab courses to scaffold research throughout the major. Every lab incorporates both discipline-specific and research-specific skills. Foundational courses introduce skills, leading to upper level student-driven research. This model should be extensible to any curriculum, and makes research an integral part of the undergraduate career.

## **25: Concurrent Workshop V: Need Your Homework**

### 25.1

#### **Expanding the Classroom with Social Media**

**John Kanady<sup>1</sup>**

<sup>1</sup>**Univ. of Arizona**

In this workshop, I'll show you how you can use social media (primarily Facebook) to provide added value to your classes. We'll discuss some benefits/pitfalls of incorporating social media into your teaching and consider how you can analyze student participation. I'll share some of my tips for best practices, and you'll spend hands-on time creating a framework of content you can deploy for your very next course offering! Please make sure to bring a laptop and/or smartphone for this session.

**26: Concurrent Workshop V: The One-minute Paper and Other Interactive Tricks for a Large-group Class**

**26.1 The One-minute Paper and Other Interactive Tricks for a Large-group Class**

**Rebecca Teed<sup>1</sup>**

<sup>1</sup> **Wright State**

The best techniques to allow instructors to meaningfully engage with large groups of students often involve asking what they understand. I'm going to review ways to make even a lecture class more interactive using informal assessment, structured student discussion, and problem-solving exercises. We'll discuss challenges posed by class size, how to get student buy-in, and how to use technology (including index cards and whiteboards) to engage and assess almost all the students in the classroom.

**27: Concurrent Workshop V: Developing Multimedia**

**27.1 Developing Multimedia**

**Renee Link<sup>1</sup>**

<sup>1</sup> **Univ. of California, Irvine**

Tools allowing instructors to develop custom media are widely accessible, but making a video can be daunting. Have you wanted to make videos for your class but aren't sure where to start? Are you unsure of what software to use? We will review best practices for making videos and make one. Bring a computer and materials to use for a short video. We will use Camtasia in the workshop. Please download the free trial version in advance. The facilitator will be available before the workshop for help.

**28: Plenary VI**

**28.1 Engaging in the Scholarship of Teaching and Learning**  
**Jennifer Friberg<sup>1</sup>**

<sup>1</sup> **Illinois State**

Problems, opportunities, and wonderments: these are the hallmark of college-level teaching for many. Course instructors encounter problems due to their classroom environment, instructional context, or other variables they cannot control. Opportunities exist to change that, from study abroad to simulation encounters to out-of-class learning experiences (to name a few). As teachers, we have wonderments, too -- ideas we consider as possible pedagogies in our classrooms -- though we are unsure of their impact or efficacy.

The scholarship of teaching and learning (SoTL) is a form of research that focuses on just that, teaching and

learning. SoTL is comprised of three consistent components, according to most definitions: systematic study, focus on teaching and learning, work that is made public. This plenary will introduce attendees to the concept of SoTL and discuss the need to build a disciplinary evidence base to inform decisions about course design, implementation, and assessment of student learning. Friberg will explain how SoTL research can inform what we do to solve problems in our courses and how we measure the impacts of any opportunities we implement or wonderments we explore. Friberg will provide examples of SoTL work from clinical disciplines to frame this plenary. A follow-up workshop offered immediately after the plenary will help those interested in SoTL to convert their teaching into SoTL.

**29: Concurrent Workshop VI: Practicing Scholarship Sessions - Converting Your Teaching into SOTL**

**29.1 Practicing Scholarship Sessions – Converting Your Teaching into SOTL**

**Jennifer Friberg<sup>1</sup>**

<sup>1</sup> **Illinois State**

Picking up where Dr. Friberg's "Engaging in the Scholarship of Teaching and Learning" plenary address left off, this workshop will focus on making SoTL operational in your own institutional context. In this 90-minute session, participants will identify a potential SoTL research question and plan how that question could be converted into an interesting and informative research project. Advantages and disadvantages of various research methods and data sources for studying teaching and learning will be discussed. Ideas for disseminating SoTL work will be provided. Universal and readily accessible supports for SoTL will be identified. It is intended that this workshop will be interactive and that each participant will leave the workshop with an outline of a SoTL project that could be completed after this conference.

**30: Concurrent Workshop VI: Effective Management of Team Teaching**

**30.1 Effective Management of Team Teaching**

**Thomas Schmidt<sup>1</sup>**

<sup>1</sup> **Univ. of Iowa**

Faculty directors for team taught courses should exhibit excellent communication, organizational, networking and mentoring skills, and be recognized as enthusiastic and dedicated educators. Directors must know how to effectively recruit new team members and how to make all faculty expectations explicit. Students should be given multiple opportunities to anonymously evaluate course

content and organization, the effectiveness of course directors, and the teaching skills of individual faculty.

**31: Concurrent Workshop VI: Designing Curricula for Professional Schools**

**31.1**

**Mapping the Future of Health Sciences Education – Incorporating Online Resources Into Your Educational Program**

Simon Williams<sup>1</sup>

<sup>1</sup>Texas Tech Univ. HSC

Integrated curricula and the burgeoning on-line resources available can create tensions between the use of traditional resources such as texts and primary literature and the digested and self-directed learning platforms increasingly available. This workshop will review curriculum design practices that enable the seamless incorporation of educational resources in ways that maximize educational benefits and student outcomes in ways that fit into institutional budgets.

**32: Poster Session III and Group Discussions: Assessment, Programs, Resources**

**32.1**

**Roll For Essay: a mechanism for increasing self-accountability within summative assessment**

Andrew Petzold<sup>1</sup>

<sup>1</sup>Center for Learning Innovation, University of Minnesota Rochester

Preparing appropriate summative assessments that accurately test a student's breadth of knowledge and critical thinking can be a difficult task. Often times, to do this in a simple response format can be difficult generally leading to the creation of overly complex questions. To combat this, professors often rely upon a long-answer essay question to gauge the student's depth of knowledge and critical thinking skills. Unfortunately, students often have negative associations with essay only exams, either due to writing phobia, discomfort answering open-ended questions or being unsure of expectations or concepts being covered. To address these issues, I have employed an extemporaneous essay approach that uses random chance to provide students with a number of prompts in a written summative assessment that I call "Exam Roulette." Specifically, students are given twelve potential essay prompts a week prior to sitting for the examination with the instructions that they are able to ask clarifying questions, but are unable to seek affirmation of content. On the day of the exam, a 12-sided die is rolled once for each unique question being asked, with students answering the question that appears on the die. Students report a greater motivation in studying, better retention of

knowledge prior to and following the exam and reduction in associated stress.

**32.2**

**A New Course Makes Study Abroad More Accessible to Commuter Students**

Patricia Halpin<sup>1</sup>

<sup>1</sup>Department of Life Sciences, University of New Hampshire at Manchester

Our college is a commuter campus and most students work part-time to help defray the cost of attendance. For many, a study abroad experience is out of reach due to the high cost. In order to increase access to study abroad opportunities, a new semester-long course was designed with a study abroad trip to Belize occurring during spring break. The cost of the study abroad portion was made a course fee so it could potentially be covered under a financial aid package that provides funds for tuition and fees. An information session was held in the fall with the instructor, department chair, study abroad director and financial aid director. Ten students enrolled in the spring semester course, four of them obtaining their first passports prior to travel. Financial aid covered the additional cost of the trip for four students, and three students received partial coverage. The students were placed into four groups and performed background research on the specific ecosystem selected: coral reef, mangroves, and rain forests of Belmopan or Punta Gorda. Guest speakers came into class prior to spring break to provide information on the flora, fauna, and marine ecosystems of Central America. In Belize they performed research, learned about Mayan culture and travelled to many different locations. Many reported that, in addition to learning about Belize, they learned more about themselves and felt more comfortable getting out of their comfort zone. All of the students (100%) stated this course increased the likelihood that they would travel abroad again and that they would recommend the course to a friend. Each group displayed their research findings in poster format at the Undergraduate Research Conference (URC) and presented their travelogue videos at the URC Cinema Arts Day. Individual student's reflective writing was published as a blog on the university's Center for International Engagement and Global Education website. This course fulfills an upper level biological science elective for both Biology and Biotechnology majors and an elective for the Global Studies minor. Due to the successful first offering, the course will be offered again in spring 2019.

### 32.3

#### **Becoming a physiologist or not: Perspectives on student barriers and success at a small liberal-arts college**

Josef Brandauer<sup>1</sup>, Jennifer Cole<sup>2</sup>

<sup>1</sup>Health Sciences, Gettysburg College, <sup>2</sup>Academic Advising, Gettysburg College

If the aim of higher education science programs is to train the next generation of physiology researchers and educators, it is critical to understand how some students benefit from advantages while others may face barriers to success. In the context of today's diversifying student body, we studied the academic progress of early-career physiology students by analyzing records of courses that are required to complete basic core competencies in human anatomy and physiology at our institution. These courses consist of a required 2-semester course sequence in introductory biology (Bio 1, Bio 2) followed by a 2-semester human anatomy and physiology course sequence (A&P 1, A&P 2). In addition, we also assessed the relationship between several social, educational, and other characteristics on grade-point average (GPA) in these four courses.

We examined 18993 course records from 2226 individual students at a residential small liberal-arts college. We analyzed grades in these courses along with information on gender, social activities (Greek life, Varsity athletics), formalized educational support (individual educational accommodation plan; IEAP), ethnicity, and the number of college-level courses a student had completed.

Average course GPAs for students completing the four-semester course sequence were within 0.13 of one another. That is, students who complete a four-semester course sequence of Bio 1, Bio 2, A&P 1, and A&P 2 can be characterized as a group which attains consistency throughout these courses.

We also sought to determine whether academic performance in introductory science courses predicts later success in A&P 1 and 2. Student grades in Bio 1 were 0.11 GPA points, ( $p = n.s.$ ) lower in students who only completed 3 (Bio 1, Bio 2, A&P 1) rather than all four courses (Bio 1, Bio 2, A&P 1, and A&P 2) of the sequence. Conversely, average Bio 2 grades were significantly lower in students who only completed one rather than 2 semesters of A&P (0.29 GPA-point difference,  $p = 0.0001$ ). This suggests that a lack of success in first-year biology may prevent academic success in subsequent anatomy and physiology courses. In support of this, student grades among all courses were highly correlated. For examples, Bio 2 grades correlated well with A&P 2 grades ( $r = 0.644$ ,  $p < 0.005$ ).

Overall, women outperformed men in all courses. Involvement in extracurricular activities (Greek life, Athletics) was generally associated with numerically

lower course GPA in all four course levels. Students with a documented Individual Education Accommodation Plan (IEAP) underperformed students without an IEAP. Analysis of ethnic background showed that students who self-identified as Black or Hispanic/Latino underperformed in early-career sciences courses relative to Caucasian students. Importantly, students who reported completing at least one college-level course outside our institution (e.g., Advance Placement, International Baccalaureate, etc.) performed substantially and highly statistically significantly better over students who received no academic credit for such courses. Average GPA differences between students who reported at least one such course and those who did not ranged between 0.74 and 0.31 GPA points and were especially prominent in introductory Biology courses.

Our data provide important information on academic progression of early-career physiology students. Academic institutions may alter curricular or structural approaches in order to emphasize academic achievement among early-career science students based on such data. We intend to follow up on this project by further exploring our data and designing interventions intended to target students at risk as well as critical junctures during students' academic careers.

### 32.4

#### **Undergraduate Summer Research Programs Encourage Life-Long Research Pursuits**

Jessica C Taylor<sup>1</sup>, Allison Hood<sup>1</sup>, Marsha Lakes Matyas<sup>1</sup>

<sup>1</sup>Education, American Physiological Society

**Background:** The American Physiological Society (APS) Undergraduate Summer Research Fellowship (UGSRF) Program is designed to provide laboratory-based research opportunities for undergraduate students and encourage them to pursue a career as a basic scientist. The program aims to 1) teach students the scientific method, 2) encourage presentation of data and attendance at a national scientific conference, 3) demonstrate a commitment to research and 4) enroll in graduate or professional education which includes research. **Methods:** Data regarding this program is collected through pre- and post-program surveys, completion of online professional development activities and follow-up surveys about educational and career pursuits. **Results:** Since 2000, 348 students have participated in this program. Data collection (program aims 1-3) was divided into two segments, initial (2000-2003 program years) and current (2010-2017 program years). During the initial program, >92% of participants developed a hypothesis and conducted their own experiments. In the current program, 100% of participants developed a hypothesis and conducted experiments, as well as drafted a scientific

abstract. Greater than 95% of initial and current participants attended a national scientific meeting and 68% and 80%, respectively, published an abstract about their summer research. Of the UGSRFs in the initial segment, 85% were interested in a career in physiology research. Sixty-six percent of current participants planned to enter a research-involved career. Follow-up survey data (92 respondents, program aim 4) indicated that 38% of past UGSRFs were enrolled in a PhD or MD/PhD program (N=18) or employed in a research-based career (N=17). **Conclusions:** These data suggest that participation in a summer research program teaches students the scientific method and promotes use of their knowledge through presentation of their data. It also suggests that participation in summer research enhances or confirms a commitment to a research-based career through enrollment in a graduate or combined program and employment in a research-track field.

### 32.5

#### **Taking Advantage of the LifeSciTRC and What it Offers**

**Lynn M Diener<sup>1</sup>, Jessica C Taylor<sup>2</sup>, Marsha Lakes Matyas<sup>2</sup>**

<sup>1</sup>Sciences Department, Mount Mary University,

<sup>2</sup>Education, American Physiological Society

The Life Science Teaching Resource Community (LifeSciTRC) is an online community for life science educators at all levels formed through a partnership of ten professional scientific societies. The communities and educational resources found on the site are free and accessible worldwide. Access to high quality, peer reviewed resources is one of the benefits of the LifeSciTRC, but there are numerous additional ways to benefit from involvement in the community. LifeSciTRC members publish original educational resources, serve as reviewers, participate in communities of practice, write blogs and contribute to forums. During this session, participants will be able to join the community, learn to submit resources, sign up to author a blog post and submit a forum question and explore the myriad of communities available in the LifeSciTRC. Participants will also learn about earning badges, commenting on resources, and ways to have a voice through the monthly newsletter. A data presentation will also be included highlighting visits to and downloads from the LifeSciTRC, submissions per year, information about specific highly-sought after resources and more.

References: LifeSciTRC website:  
<https://www.lifescitrc.org>

### 32.6

#### **Online Professional Development Increases Teacher Knowledge, Confidence, and Use of Effective Pedagogy**

**Margaret Stieben<sup>1</sup>, Emma Hedman<sup>1</sup>, Marsha Matyas<sup>1</sup>**

<sup>1</sup>Education, American Physiological Society

**Background:** Despite the fact that there is little evidence that they are effective, short, one-time workshops continue to be the most common type of K-12 teacher professional development (PD) [1, 2]. Effective PD must be content-focused, incorporate active learning, support collaboration, use models of effective teaching practice, provide coaching and expert support, offer feedback and reflection, and be of a sustained duration [3]. Online PD can provide these key components as well as providing a sustaining community of practice for educators [3]. PD impacts must be assessed carefully, especially programs that are implemented broadly, rather than in specific schools or districts. For nationwide programs, data on student achievement is not readily available; therefore, changes in teachers' content and pedagogical knowledge, their confidence their preparation to use proposed pedagogies, and their actual use of targeted pedagogies is critical. **Methods:** In the current study, we sought to determine if a nationwide online PD program could positively impact participating teachers at three levels (knowledge, preparation, and actual use) in 9 areas: STEM Career Education, Up-To-Date Scientific Content, Animal Research, Basic and Clinical Research, Authentic Assessment, Equity and Diversity in the Classroom, Technology, Reflecting on Teaching and Learning, and Student-Centered Learning. Participants were 6 middle school and 20 high school science teachers from 13 states and 25 schools who successfully completed the APS Frontiers in Physiology-Six Star Science Online Professional Development Program. This 10-month interactive online PD program addresses the 9 areas listed above. The Online Teachers (OTs) completed pre- and post-program surveys with self-reports on knowledge, confidence/preparedness, and actual use in each area. Reliability for subscales ranged from .612 to .977. **Results:** OTs reported increased understanding and confidence/preparedness in many of the PD areas including 1) teaching about biomedical career options, the use of humans/animals in research, basic versus clinical research; and 2) using current science content, authentic assessment, technology in teaching, and student-centered pedagogy. They also reported increases in frequency of classroom use of current content, student-centered pedagogy, authentic assessment, information on biomedical research careers, use of humans/animals in research, and strategies to engage students from groups underrepresented in science (women, minorities, and persons with disabilities). In addition, OTs reported that

they reflected on their teaching and participated in online teacher communities of practice more often. **Conclusions:** The Six Star Science Online Teacher Professional Development Program is impacting teachers in areas of pedagogical and content knowledge and in preparedness and usage of student-centered teaching methods. **Funding:** Funding was provided by the APS and a grant from the National Institutes of Health (R25OD016492).

**References:**

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2. Rotermund, S., J. DeRoche, and R. Ottem, *Teacher Professional Development by Selected Teacher and School Characteristics: 2011-2012*. 2017, Washington, DC: U.S. Department of Education.
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**32.7**

**Student strategies when answering open-ended exam questions.**

**Matthew Nedjat-Haiem<sup>1</sup>, James Cooke<sup>2</sup>**

<sup>1</sup>Biology, UC San Diego, <sup>2</sup>Neurobiology, UC San Diego

While there is lots of information in the literature about student strategies in preparing for examinations (Biggs and Collis, 1982; Nolen, 1988; Dunlosky et al., 2013), there is very little information about the strategies that students employ *during* examinations, particularly for open-ended (or free-response) questions. Also, we have observed that students struggle to concisely answer open-ended questions on our examinations, often including a great deal of extraneous information in their answers. For this reason, we surveyed our students on the strategies that they employ while answering open-ended questions on midterm exams. Our class is an upper division physiology class on human reproduction, which is an elective class for biology students. The class is composed of seniors (85%) and juniors (15%). Our class has two midterms, both of which occurred during a 50-minute class time. After both midterms, we deployed an online survey to our students that remained open for 48 hours. One of the questions asked of the students was: "Did you have any specific strategies when answering the free-response questions? If so, please describe any strategies that you used." Of the 248 students enrolled in our class, 165 students (67%) provided an answer to this question after midterm 1, and 170 students (69%) provided an answer after midterm 2. In-between midterm 1 and 2 students were given an

exercise to reflect on their strategies used, and their inclusion of extraneous information in their answers. A rubric was developed and agreed upon by the authors based on student responses, and one of the authors coded the responses from the surveys after midterms 1 and 2. We will present our findings of the different strategies that students report using during open-ended exam questions. We will compare our data from midterm 1 to midterm 2, indicating if students alter their strategies between the two midterms. We believe that our data offer an insight into an area that has not - to our knowledge - been investigated before: student strategies on open-ended exam questions.

**32.8**

**Developing a rich conception of exercise physiology by placing critical thinking at the core of the course experience**

**Brock Jensen<sup>1</sup>, Jeremy Dicus<sup>1</sup>**

<sup>1</sup>Exercise and Rehabilitative Sciences, Slippery Rock University

The typical Exercise Science program may see students pursue a multitude of directions upon program completion. Destinations commonly range from entering a fitness profession to a variety of health-related graduate programs (e.g., MD, DPT, MPA, DOT, etc.). All of these desired paths require substantial content-knowledge for success. However, it has been suggested that employers value critical thinking more than the acquisition of discipline-specific knowledge. Therefore, programs and instructors are tasked with preparing students with both content knowledge and the ability to think critically. In order to bridge this gap, we have identified strategies which requires the process of critical thinking to foster a deep understanding of content in an Advanced Exercise Physiology course. Advanced Exercise Physiology is a follow-up course to a lower-level Exercise Physiology course and has equal-parts of lecture and laboratory. We designed the course around the most significant content-specific concepts that can be elaborated on with a required use of previously taught critical thinking skills. Also, students were provided with an introduction to an inquiry-based laboratory. Course opportunities for students included determining significant lecture and laboratory questions, gathering relevant information to form accurate inferences free of faulty assumptions, and determining the complexities of content-specific information with a senior-level point of view. Assignments were designed in alignment with the Paul-Elder critical thinking theory and required the deliberate use all of the Elements of Thought, and many of the standards, by students as they processed lecture and laboratory concepts.

**34: Plenary VII**

**34.1**

**Inclusive Practices for Diverse Student Populations**

**Kathryn Johnson**<sup>1</sup>

<sup>1</sup>Beloit Col.

Student populations are becoming more diverse, and it is critical for educators and institutions to implement practices that ensure the success of all students. Practical approaches, including small changes in the classroom and laboratory, can have a huge impact on student experience, success, and retention in the sciences. Diversification of successful scientists is essential for optimal scientific progress and innovation, as well as addressing important issues of equity and social justice.

**35: Large Group Discussion**

**35.1**

**Implementing and Managing Continued Change**

**Thomas Pressley**<sup>1</sup>

<sup>1</sup>Texas Tech Univ. HSC

Dr. Pressley will help participants begin planning for the next APS ITL in 2020.

**LB: Late Breaking Abstracts**

**LB.1**

**Online Modules Build Trainee Knowledge, Skills, and Confidence in Dealing with Publication Ethics Issues**

**Marsha Lakes Matyas, Christina N. Bennett**<sup>1</sup>

<sup>1</sup>American Physiological Society

Five online, on-demand modules were pilot-tested for their effectiveness in teaching trainees (graduate students and postdoctoral fellows) about publication ethics topics: authorship (AUT), conflicts of interest (COI), data fabrication & falsification (DFF), data management & integrity (DMI), and overlapping publications (OP). The modules included both didactic and student-centered activities that focused on increasing student knowledge of and skills in applying professional standards of practice related to ethics issues in these five topical areas.

Participants were recruited via APS member listservs and social media. Students were encouraged to share the promotion with colleagues. Overall, 69 students completed a total of 112 field tests of the five online modules. Participants received an Amazon gift card after completing the registration, entry and exit survey, entry and exit quiz, module activities (including providing written answers to all activities) and a reflection form. Many students completed more than one module.

**Results:** Students rated all of the modules as useful on a 7-point scale ("Very useful" = 7; "Not at all useful" = 1): OP (X=6.2) and AUT (X=6.0) were the highest rated modules, followed by DMI (X=5.9), DFF (X=5.8), and COI (X=5.3). Students' test scores significantly increased from

pretest to posttest for the AUT and OP modules. When asked to rate their skills in dealing with professional ethics topics in each area, students' self-ratings increased significantly on all five modules.

We also polled the field-test students on their preferences for the final versions of the online modules. They expressed clear preferences for: 1) On-demand, any time modules that they could access and re-access as needed; 2) Having feedback from experts recorded rather than individual, asynchronous interaction; 3) Requiring registration but no fee; 4) Having computer-graded multiple choice tests rather than getting instructor feedback; and 5) Receiving an automated email certificate to indicate that they completed the module and passed the posttest. Their feedback was more mixed about whether and how they wanted to interact with other participants. About 44% recommended no interaction among participants, as was done in the field test modules, but 32% said they would like the modules offered during a period of time (e.g., 8 weeks) and have live but asynchronous discussions among participants.

The final versions of the online, on-demand courses will be housed at the APS online training center at [www.schoolology.com](http://www.schoolology.com). Some courses will include asynchronous discussions and all will include recorded expert voices feedback. Each course will also link students to the classroom versions of the materials to encourage them to share the materials with their advisors and RCR instructors to promote classroom and lab group use. This work was supported by a grant from the National Science Foundation (SES-1238368).

**LB.2**

**Metacognitive training improves student metacognitive practices and attenuates decreases in self-efficacy in an upper division anatomy and physiology course.**

**Jennifer Schaefer**<sup>1</sup>

<sup>1</sup>Col. of Saint Benedict/Saint John's Univ.

Metacognitive ability and self-efficacy are correlated with increased academic performance. Metacognition has been defined in various ways, but nearly all definitions derive from "thinking about one's own thinking" (Flavell, 1979; Flavell et al., 2002; NRC, 2000; Tanner, 2012). Metacognitive ability has a direct relationship with academic success (Nickerson et al, 1985; Georghiades, 2000; Tanner, 2012). Self-efficacy—a student's confidence in his or her academic ability—also has a direct relationship with academic success (Bandura, 1977; Multon et al., 1991; Pajares, 1996; Zimmerman, 2000; Trujillo and Tanner, 2014).

Self-efficacy and metacognitive ability have been linked with each other, but the causative relationship

underlying this correlation is murky (Houtveen et al., 2004; Cera et al., 2013). It is likely that high self-efficacy increases metacognitive performance. Metacognitive performance improvement via high self-efficacy may be due to a positive effect of self-efficacy on intrinsic motivation, which enhances metacognitive performance (Zimmerman and Kitsantas, 1999). Alternately, self-efficacy improve use of effective learning strategies (Zimmerman and Martinez-Pons, 1990; Zimmerman and Bandura, 1994).

It is unclear whether the reverse—a positive effect of metacognitive performance on self-efficacy—exists. This study hypothesized that improved metacognitive performance increases self-efficacy. If so, metacognitive training could increase academic performance indirectly through increased self-efficacy in addition to its direct effect. Metacognitive training would thereby be of increased value due to the synergistic effect of metacognition and self-efficacy on academic performance. If self-efficacy could be increased through metacognitive training, the effect would be especially important in courses perceived as “challenging” (such as upper division biology courses) because self-efficacy is situation-specific such that general academic ability may not determine self-efficacy in the challenging course. This study found that metacognitive training preserved and increased student metacognitive practices, as measured by the Motivated Strategies for Learning Questionnaire (MSLQ) Metacognitive Self-Regulation scale (Pintrich et al., 1991). Student metacognitive practices, however, did not correlate with average or final exam score, exam score improvement, or final course grade. Student self-efficacy measured by the New General Self-Efficacy (NGSE) scale (Chen et al., 2001) correlated with exam scores and this correlation strengthened throughout the course. This correlation was stronger in control students than in students who received metacognitive training. Average self-efficacy measured by the MSLQ Self-Efficacy for Learning and Performance scale was lower at the end of the course than at the beginning but metacognitive training reduced this loss in self-efficacy. Overall, metacognitive training improved student metacognition and attenuated decreases in student self-efficacy. Neither of these effects increased academic performance measures such as exam scores and final course grades.

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