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Guyton Award Lecture

Thomas Schmidt
2017 Arthur C. Guyton Physiology Educator of the Year Awardee

Thomas Schmidt

I certainly appreciate this opportunity to share with you some of my philosophy of teaching and briefly reflect on my own academic career as an educator. I firmly believe that teaching is a special privilege, since it has given me the opportunity to nurture, encourage, and motivate future generations of scientists, educators, and healthcare providers. However, first and most importantly, I want to convey to you how very honored I was to first be nominated for, and subsequently selected, as the recipient of the 2017 Arthur C. Guyton Educator of the Year Award. I know that most physiologists appreciate the fact that not only was Dr. Guyton recognized as a highly respected cardiovascular physiologist with expertise in hypertension, but he was also the author of one of the world's best-selling and most widely used textbooks of medical physiology. The fact that I have received an award that is named after this outstanding physiologist makes this recognition even more meaningful. During my career, I have been honored to receive a number of teaching awards, and those experiences have been very gratifying as well as humbling. However, for me personally, it is very important to never lose sight of the fact that I truly enjoy teaching and helping students. Over 150 years ago, President Abraham Lincoln said, "Don't worry when you are not recognized but strive to be worthy of recognition." Those words have inspired me throughout my academic career and have been posted above my desk for many years. They serve as a daily reminder of how fortunate I have been, both in terms of the opportunities that I have had to contribute to the education of so many diverse students, as well as to contribute to both curriculum development at my own institution and to the educational programs offered by several national and international organizations with clearly defined educational goals.

Second, I'd like to express my gratitude to the American Physiological Society (APS) for giving me numerous opportunities during my career to not only serve the Society in meaningful ways but to also promote the study of physiology at all educational levels. I hope that over the years I have made important contributions, not only by serving on the Education and Career Opportunities in Physiology Committees, but also as an invited faculty member for several APS Professional Skills Workshops and as faculty member/facilitator for the Institute on Teaching and Learning "Becoming an Effective Teacher" course. I certainly want to express my gratitude to the APS professional staff, not only for their encouragement and enthusiasm, but also for their confidence in my leadership abilities. I especially want to thank Marsha Matyas, Melinda Lowy, Brooke Bruthers, and Miranda Byse of the Education Office, and Marty Frank, APS

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Dinner with a Nobel Laureate

Two of the Trainee Advisory Committee members, Ryan Downey (Teaching Section) and Ijeoma Obi (Water and Electrolyte Homeostasis Section), as well as Jinae Roa (Porter Physiology Development Fellow, Eleanor Ison Franklin designee) had the pleasure of having dinner with Dr. Louis Ignarro, the 1998 co-recipient Nobel Prize winner in Physiology or Medicine for discovering the signaling role of nitric oxide in the cardiovascular system. This indeed was the highlight of the 2017 Experimental Biology conference.

The evening began with Dr. Ignarro giving his Nobel Prize award lecture followed by a long line of trainees and professors waiting to get an autograph and to have their picture taken with him. On our walk to dinner, I kept

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Mentoring Forum

Carpe Emeritus: A Physiologist Does Retirement

Gerald F. DiBona
Professor Emeritus
Departments of Internal Medicine and Molecular Physiology & Biophysics, University of Iowa College of Medicine, Iowa City, Iowa


Gerald DiBona

It may seem a bit strange to have an article on retirement in a forum devoted to all aspects of mentoring relevant to today's trainees at all stages of their careers (graduate, postdoctoral, early career). However, the importance of early planning for retirement is not limited to various financial aspects. An equally, if not more important, aspect is coming to grips with the free time (often 40-80 hours per week) you will have and what you plan to do with it.

Since there are multiple sources for information concerning financial planning for retirement, I will not comment on this aspect. Rather, I will comment on planning for the free time that will become available. This is certainly not meant to be a template or a how-to piece but rather a telling of my own personal experience, which emphasizes some of the steps that might be found useful. To keep things in perspective, I have always considered vacation time as a short-term look at what retirement could be like; I have preached to those who would listen that you don't get paid extra for not taking all your vacation time. The reader might also consider the fact that, when I told some of my closest colleagues about my retirement plans, some of them said, "How will we know the difference?"

Plan Ahead

"If one does not know which port one is sailing to, no wind is favorable."
– Lucius Annaeus Seneca

I had known too many colleagues whose work was their sole activity and who had not developed outside interests. They worked hard until close of business on their last day and awoke the next day facing the prospect of having nothing to do. They felt isolated, were bored, and became depressed in the absence of their usual professional activities and interactions. For some individuals, given the dropping of mandatory retirement ages in many universities, a satisfactory solution has been to continue to work under various contractual arrangements. However, at some point, these arrangements come to an end.

My major outside interest had always been sailing, and by retiring at an early age I could enjoy this while physical mobility was good as opposed to a later time when it might not be so good. My plan was that the retirement year would be divided between summers sailing in Maine and winters living somewhere else.

Clear message here: figure out what you are going to do with all the available time when you are no longer working . . . do it early! For many, the decision about what you want to do can be coupled to where you want to live. This adds another important dimension to the planning activity.

Recognize Opportunities

"If your ship doesn't come in, swim out to it."
– Jonathan Winters

Sailing summers along the Maine coast facilitated the identification of a harbor town in which we would like to live for part of the year. A chance opportunity during a favorable period in the local real estate market enabled the purchase of a summer vacation home. Lucky perhaps, but luck is a matter of "preparation meeting opportunity" (Lucius Annaeus Seneca).

Some years prior to retirement, a research sabbatical evolved into the opportunity to live and work in Sweden. Initially, this was Karolinska Institute, Stockholm, and currently, Gothenburg University, Gothenburg. This involved teaching renal physiology to medical students and clinical nephrology to nephrology trainees, as well as collaborative research with former trainees and long-term colleagues. Not long thereafter, the university's implementation of a phased retirement program allowed consideration of

retirement earlier than age 65, with minimum financial or fringe benefit loss. This permitted a stepwise decrease in effort over a period of 3 years prior to full retirement and allowed adjustment to the increased amount of free time as well as to living and working in Sweden. Currently, the year is divided into a winter period in Gothenburg, Sweden, a summer period in Maine, and shorter intervals between these periods in Iowa, our long-term home.

Pivotal Circumstances

"Circumstances are the rulers of the weak; they are but the instruments of the wise."
– Samuel Lover

The wishes, interests, and needs of spouses, partners, children, and other family members have a clear bearing on the planning activity and eventual choices. Retirement aspects of a spouse's or partner's current employment and both financial and nonfinancial aspects of their retirement planning require careful consideration. Having a partner who is a renal physiologist, a native of Gothenburg, Sweden (where she received her doctoral education), and a long-term sailor and lover of the sea is easily identified as a pivotal circumstance in the final definition of our retirement life.

Details

"Success is the sum of the details."
– Harvey S. Firestone

One needs to consider the basics of financial management and oversight as well as health status and care. Most of these issues can be managed electronically or during the short visits to home or by making suitable arrangements in the other living place. Similarly, developments in caretaking and property management provide peace of mind and security when we are living in different places.

Overall

"Life is like a sewer: what you get out of it depends on what you put into it."
– Tom Lehrer

While not knowing exactly how this would all work out, it has played out to be much better than anticipated. Initially, I thought I would be challenged by having to adjust to living in three different locations, one international, and all very different from each other. Aside from adjustment to time-zone change, this has not been a major issue. Would the teaching and collaborative research involvement in Sweden (part-time by the clock) be sufficiently fulfilling and stimulating? Far more than expected as these enjoyable activities replace the time that was previously occupied by some of the less-enjoyable activities of academic life. Learning Swedish and being in a country where the natives speak excellent English has made adjustment to a different society and culture relatively easy and pleasant. Sailing has always been a free time endeavor. Previously, some of my best experimental ideas came while at sea, whereas now I enjoy the luxury of endless reading time. The time in Iowa provides an opportunity to catch up with friends and colleagues as well as manage regular health maintenance and financial activities.

When I am asked what would I have done differently, I say I would have done it sooner. The initial plan was to fully retire at age 60, but an unexpected (but most gratifying) election to APS Presidency (a 3-year commitment) delayed this plan. One might put this event under the above category of *Pivotal Circumstances*.

Currently, career and family issues are likely the dominant ones for most of the readers of this article. View this article as a plea to consider various aspects of retirement planning along the way. This will serve to ensure overall flexibility at the time of retirement rather than being confronted with a situation constrained by many factors that could have (should have) been dealt with earlier. ●

Gerald DiBona Biography

Gerald DiBona received the AB from Harvard College and the MD cum laude from Tufts University School of Medicine. Following training in internal medicine at University of Pennsylvania and nephrology and renal physiology at Harvard Medical School/Peter Bent Brigham Hospital, he moved to University of Iowa College of Medicine in 1969. Rising through the ranks, he served as Professor and Vice Chairman of the Department of Internal Medicine and Chief, Medical Service, Iowa City Veterans Administration Medical Center from 1977 to 2001. From the APS, he received the Starling Lectureship Award, the Walter Cannon Lectureship Award, the Robert Berliner Award, and the Ray Daggs Award. He served as President of APS from 2000 to 2001. From the American Heart Association, he received the Dahl Award and the Novartis Award. From the Veterans Administration, he received the Middleton Award. Following retirement, he has served as Foreign Adjunct Professor at the Karolinska Institute, Stockholm, Sweden, and Guest Professor in Renal Physiology at Göteborg University, Göteborg, Sweden.

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Guyton Award Lecture

Executive Director. I'd also like to sincerely thank the APS Section on Teaching and the Guyton Award Committee for selecting me as the 2017 recipient, as well as Elsevier for their generous financial support of this award. Finally, I would not be a nominee for this prestigious award without the sound advice of my mentors at the Carver College of Medicine, including Edgar Folk, Professor Emeritus; Robert Fellows, Professor and Chair Emeritus; Peter Densen, former Associate Dean, Office of Student Affairs and Curriculum; and Kevin Campbell, Howard Hughes Investigator and current Chair of the Department of Molecular Physiology and Biophysics. Throughout my 33 years as a faculty member at The University of Iowa, these colleagues have supported my efforts and have encouraged me to pursue unique opportunities that have enabled me to further develop my potential as a teacher as well as a mentor.

In contemplating what I would like to share with you concerning my basic philosophy of teaching, I was impressed by the fact that this award is for the "Educator," not "Teacher," of the Year. My impression is that these two terms are used interchangeably as if they were synonyms. However, I, like others, would argue that there really is a difference in what is implied by these terms. The word *teacher* is often used in the sense of a trainer or preceptor, and the word *educator* is frequently used in the sense of a mentor. One might actually argue that not all good teachers can be called educators, whereas, on the other hand, educators are most likely natural teachers. Perhaps another way of expressing this idea would be that a teacher would not be considered a true educator unless he/she has somehow left a lasting impression or inspired his/her students. Another possible way of differentiating between these two terms is that teaching is one component of a faculty member's responsibilities along with scholarship and service, whereas being an educator is more of a calling and is characterized by passion and commitment. In my opinion, there is overlap between these terms, since good teachers often exhibit a passion for their work in the classroom. Regardless of how you might want to distinguish between a teacher and an educator, I sincerely hope that, during the course of my academic career, I have demonstrated that I am a dedicated and enthusiastic teacher as well as educator. Hopefully the numerous teaching awards that I have been honored to receive from the Carver College of Medicine and The University of Iowa, and from the International Association of Medical Science Educators, are indicative of my teaching effectiveness in a wide variety of courses and venues. I've had the privilege of teaching a wide spectrum of students, including undergraduate students, graduate students, medical students, physician's assistant students, dental students, pharmacy students, biomedical engineering students, and doctoral students enrolled in our certified registered nurse anesthetist program. My teaching experiences and interactions with each of these unique groups of students have not only been very rewarding but have also contributed to the development and continual improvement of my communication skills. Someone once said that to be a good teacher one needs to have good students. I've been very fortunate to have had many excellent students over the years, and they continue to inspire me to do my very best. Of course we all know that not all students are alike in terms of their backgrounds or abilities. I personally find that helping a struggling or confused student master difficult concepts is just as rewarding as watching a bright, highly motivated student do well in courses and reach his/her goals. In addition to working with many good students over the years, I've also had the good fortune to work with many outstanding colleagues from numerous basic science as well as clinical departments. Although excellent teaching obviously requires individual motivation and skills, there are many situations where coordinated teamwork is essential. Over the span of my career I've had the opportunity to serve as either a course director or a co-course director for several different medical as well as graduate level courses, and therefore I'm well aware of the challenges, as well as the gratification and rewards, associated with well-planned and effectively delivered interdisciplinary teaching and interdisciplinary collaborations.

During my career, I've hopefully demonstrated that I am a dedicated educator and motivating role model. I've had numerous opportunities to mentor students, both in terms of guiding them through the educational process and helping them plan their future careers. Examples of my most meaningful mentoring experiences have been in my roles as Director of Graduate Studies; Graduate Student Thesis Advisor; Assistant Dean in the Office of Student Affairs and Curriculum; and currently as the Faculty Mentor for several medical students who are pursuing the Teaching Distinction Track. Each of these positions or roles has presented unique challenges as well as special rewards for me personally, and professionally. In addition to serving as mentors, educators also contribute to their discipline with their scholarly works, including textbook chapters, peer-reviewed publications in educational journals, and presentations at national as well as international educational conferences. I believe that I have made specific contributions in all of these categories, and I hope to continue to do so in the future. Finally, I believe that educators should use their expertise and leadership skills to contribute in additional ways to the broader educational community. My most significant achievements in this regard have been my work on behalf of the National Board of Medical Examiners (USMLE Step 1 Test Material Development Committee – physiology and cell biology),

and my role over many years as a Faculty Facilitator for the Harvard Macy Institute – Leading Innovations in Healthcare and Education.

The French author Joseph Joubert (1754-1824) is quoted as having said, "to teach is to learn twice." More than two centuries later, I find this brief, but profound, statement to be very applicable to my own academic career. As a student, I obviously wanted to learn physiology and often relied on Dr. Guyton's textbook and study groups with my classmates and friends. When, as a faculty member, I actually started teaching some of these same topics, I had to "re-teach" myself at a much deeper level of understanding. In those situations, I tried to put myself in my student's shoes and then decide how I should present that topic in a way that was engaging and relatively easy for students to follow and understand. To this day, I try to use simple analogies, mechanistic diagrams, patient slides, human interest stories, and a sense of humor to make my presentations more effective as well as enjoyable. What I learned very quickly as an assistant professor is that teaching, and hence learning, really is a two-way street. Hopefully over the years my students have learned physiology and cell biology from me, because I know without question how much I have learned from them. Their inquisitive and thoughtful questions have motivated me to expand my knowledge and deepen my understanding of numerous topics. It has been these informal discussions and interactions with students that have been, and continue to be, what excites me the most about teaching!

In addition to continuous learning, teaching also requires rigorous evaluation, self-reflection, and a willingness to explore new teaching techniques that will accommodate students who learn in different ways. In courses where I have served as a co-director, I've relied on peer evaluations, as well as extensive student evaluations and anonymous comments, for feedback. I've always viewed these forms of constructive criticism very seriously, and over the years they have led to many positive course improvements. I've also met frequently with the students serving on course liaison committees and have appreciated our discussions concerning specific strengths of a course as well as opportunities for improvement. As an educator, I believe it is essential to be open to a variety of pedagogies and teaching technologies to engage students and promote their learning. As part of our Medical Physiology Online course, students enrolled in our Certified Registered Nurse Anesthetist program are required to learn endocrinology and reproductive physiology from a series of my pre-recorded lectures. I then use the in-class time to discuss with these advanced students a series of rather complex clinical cases that reinforce the concepts covered in the lectures. This approach has been very well received by these students but does raise the related issue of whether student attendance at lectures is critical for their learning. A number of years ago, medical students at Harvard Medical School responded to a questionnaire regarding their lecture attendance. When using video-recorded lectures as opposed to attendance at live lectures, these students felt that they were more likely to increase their speed of knowledge acquisition, stay focused, and learn more (1). My philosophy is that any approach that enhances student understanding should be recognized as a valuable learning tool, even though it may not be applicable to all students.

As I've already mentioned, we all recognize that not all students learn in the same way, so utilizing multiple learning tools such as detailed lecture outlines, histological images (virtual slide box), pathological specimens (diseased hearts), photographs of patients with endocrine imbalances, practice examination questions, supplementary reviews, and clinical diagramming exercises is essential. In the final analysis, each student needs to experiment to determine which learning tool(s) promote his/her understanding. The advantages associated with using a variety of learning tools have been fairly obvious to me since my earliest teaching experiences over 30 years ago. However, I've gleaned useful information and insight from published articles that have focused on applying the actual science of learning to medical education. Richard Mayer (2) has defined the science of instruction as the scientific study of how students learn. I've certainly been gratified to see that, in his published review, he stresses that multimedia learning – learning from words and pictures – is particularly relevant to medical education. His discussions of a variety of topics – including cognitive theory of multimedia learning; sensory, working, and long-term memory; meaningful learning as evaluated by retention and transfer tests; and the use of a variety of techniques to reduce what he terms "extraneous processing" – have been very useful to me in terms of honing my own teaching skills. My responsibility as an educator is to share those concepts, as well as my own experiences, with my Teaching Distinction Track mentees and promote their development as student teachers. In 2010, only about half of the medical schools in this country offered formal teaching skills programs for their students (4), and over the years I have been both honored and pleased that many students have asked me to serve as their mentor for the well-established Teaching Distinction Track at the Carver College of Medicine (3). The motivated and talented students who are pursuing this track will become the educators of the future, and I want them to be well-prepared and excited about the opportunities that lie ahead, including formal teaching of students in academic settings, as well as informal teaching of their colleagues and patients in clinical settings.

In conclusion, I'd like to reiterate what an honor it has been for me, as a Fellow of the American Physiological Society (FAPS), to receive the Arthur C. Guyton Physiology Educator of the Year Award. I'd certainly like to express

my sincere appreciation to the many students and faculty colleagues who have enthusiastically supported my nomination in their kind letters. Finally, I want to again express my gratitude to the APS for giving me, over the course of my career, numerous opportunities to serve our society and promote physiology as a discipline. I strongly encourage physiologists in all professions – academia, industry, medicine, military – as well as physiology students at all educational levels – undergraduates, graduate students, postdoctoral fellows – to not only become members of the APS, but to also ask themselves how they can best contribute to the future of APS in worthwhile and rewarding ways. ●

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Dinner with a Nobel Laureate

asking myself what it would be like to sit face to face with one of the most intelligent men in the field. It didn't take long to see how humble he was. I couldn't wait to ask him what his journey to becoming a Nobel Laureate was like. For him, it started out with a love and passion for chemistry.

Dr. Ignarro's parents were Italian immigrants without any college education. Growing up, he was a very curious boy who always wanted to know how and why things worked the way they did. His research career began in his parents' garage, where he'd set up a laboratory with the chemistry kit that his parents had bought him. Dr. Ignarro said that, as a child, he never feared anything. He said, if he failed, that's fine. He'll try something else. His curiosity led him to a career in research. While working on his PhD, one of his professors convinced him to apply to medical school. He did but disliked his medical school clinical rotation because he hated to deal with human blood. In line with following his true passion for research, he dropped out of medical school and continued pursuing his PhD. When asked if he regretted not completing his medical education, he did not hesitate to say, "No!" He said that those 2 years of medical school got him very interested in physiology, which ultimately led to him winning the Nobel Prize.

Left to right: Ijeoma Obi, 1998 Nobel Prize Awardee (Physiology or Medicine) Louis Ignarro, Ryan Downey, and Jinae Roa

We then asked Dr. Ignarro how he continues to remain humble despite all the media attention and accolades. He said that when he got back to the U.S. after hearing that he won the Nobel Prize, the first thing his mother said to him was, "You don't let this Nobel Prize change who you are!" Since then, he is continuing to live up to his mother's advice.

Dr. Ignarro is now retired. He spends his time traveling and is a frequent public speaker on the importance of nitric oxide and wellness. Apart from thinking about the next big science discovery, Dr. Ignarro enjoys watching football and basketball, biking with his wife, and taking spin classes. After a few hours of talking with him, we learned from his experiences that the requirement for success is passion for what you do, the ability to think outside the box, and not being afraid of failure because it opens the door to new opportunities. ●

Ijeoma Obi
Water and Electrolyte Homeostasis Trainee Advisory Committee Representative

Business Meeting Minutes

American Physiological Society 170th Business Meeting

Time: 5:45 PM, Tuesday, April 25, 2017
Place: Chicago, IL

I. Call to Order

The meeting was called to order at 5:45 PM by President Jane F. Reckelhoff, who welcomed members to the 170th Business Meeting of the American Physiological Society.

II. Election of Officers

President Reckelhoff announced the results of the election. The new president-elect is Jeff Sands (Emory University School of Medicine; April 26, 2017 to April 08, 2020). The three newly elected councillors are Charles Lang (Pennsylvania State University College of Medicine), Merry Lindsey (University of Mississippi Medical Center), and Ronald Lynch (University of Arizona Health Science Center). The newly elected councillors will serve a 3-year term (April 26, 2017 to April 08, 2020). All newly elected officers will assume office at the close of EB2017.

III. Membership

A. Summary of the Membership Status

President-Elect Dennis Brown reported on the status of the Society membership. As of March 1, 2017, the current membership of the Society is 10,711, of which 7,188 are regular members, 22 are honorary members, 1,140 are emeritus members, 125 are affiliate members, 1,812 are graduate student members, and 424 are undergraduate student members. He also indicated that women make up 29% of the membership, 27% of our members reside outside of the U.S., and 37% are under the age of 45.

B. Deaths Reported Since the Last Meeting

A list of the names of those members whose deaths had been reported since the 2016 Business Meeting was displayed (see Table 1 at end of article). Brown asked the membership to stand and to observe a moment of silence in tribute to their deceased colleagues.

IV. State of the Society

President Reckelhoff addressed the membership and spoke on the state of the Society.

Reckelhoff stated it was an honor and pleasure serving as the Society's 89th President.

The support provided by the Council, membership, and staff have made this a wonderful experience as we have worked together to advance the Society and our discipline of physiology.

As was written in an article in *The Physiologist*, physiology does not get the respect that we all think that it deserves. As a consequence, the Society contracted with a consulting group, Minding Your Business, to work with us to rebrand the Society and discipline, as well as to work with us on the development of a new Strategic Plan.

APS President Jane Reckelhoff and President-Elect Dennis Brown present the Ray G. Daggs Award to Kim E. Barrett

Joined by members of the Section Advisory Committee, Trainee Advisory Committee, and senior APS staff, the Council met with Minding Your Business in Houston earlier this year to develop a Strategic Plan. We are still working on the plan, so I'm not prepared to share it with you at this time, but it will be published by the end of the year in *The Physiologist*. However, I can share the five areas on which the plan is focused. Specifically:

- Refreshing the strategic focus of the Society
- Modernizing the membership model

- Prioritizing and evaluating Society offerings
- Extending the influence of the Society through journals and conferences
- Enhancing governance and operational performance

To help us finalize the Strategic Plan this summer, we will be incorporating the results of a post-EB meeting survey that each of you should receive later this week and I urge you to complete it since it will be important in informing the strategic plan.

The post EB meeting survey will also help to inform the Society on how best to restructure our annual meeting. As you may or may not know, this will be the last year that the American Society for Nutrition will be meeting as part of EB. The remaining five societies (APS, ASBMB, ASPET, ASIP, and AAA) will be holding a strategic planning meeting at the end of May to discuss how to restructure the meeting to best serve the members of each of our societies, and also to create a scientific program that draws upon the expertise of each of our disciplines. The integration of the programming will help strengthen the meeting and enable us to move forward. This planning meeting will also help us to identify venues for the joint meeting in the future.

Reckelhoff said the good news is that the Society is financially strong with an annual budget of $20 million, which will allow us to allocate the funds needed to implement a new strategic plan. The Society also has an endowment of over $15 million, which supports many of the APS awards and to which the Development Office is striving to raise additional funds from individuals and foundations. APS currently receives support from three foundations: the William Townsend Porter Foundation, the S&R Foundation, and the Novo Nordisk Foundation.

The APS membership is stable, but there is increasing interest in the Society's new Fellows Program that is designed to acknowledge noteworthy scientific and professional accomplishments, as well as APS leadership and service. At present, there are approximately 200 Fellows of APS (FAPS), and each of you are encouraged to consider applying for Fellow status or nominate someone you think would qualify for Fellowship status.

APS President Jane Reckelhoff, President-Elect Dennis Brown, and Lynell Golden present the Arthur C. Guyton Educator of the Year Award to Thomas Schmidt

APS President Jane Reckelhoff, President-Elect Dennis Brown, and Erica Dale (TAC Chair) present the Dale Benos Early Career Professional Service Award to Patricia Silveyra

The APS Publications program remains the strength of our operations, with 15 scientific journals and a book monograph book series published with Springer. Three of the journals will be receiving new editors before EB 2018: Sue Bodine becomes EIC for *Journal of Applied Physiology* as of July 1, 2017 (replacing Peter Wagner), Rory Morty becomes EIC for *AJP-Lung* (replacing Sadis Matalon), and Sadis Matalon becomes EIC for *Physiological Reviews* as of January 1, 2018 (replacing Dennis Brown). We would like to welcome the new editors and thank the outgoing editors for their service to APS journals.

Although it is always exciting to welcome new editors to our journals, this year we have more excitement. We will be moving our journals to a new online platform. After over 20 years with HighWire Press, the Society will be moving the journals to Atypon, with new journal websites and enhanced features. We hope you like the new platform, which will go live January 2018.

The Publications program has also taken on the issue of data reproducibility and the promotion of transparent reporting. Transparent reporting will focus on animal experimentation, antibody validation, adequate descriptions of experimental details in figures and legends, and the public deposit of software for articles based on original computer simulations. In addition, the journals will be publishing articles focused on the proper experimental design and statistical analyses needed for data sets.

APS President Jane Reckelhoff and President-Elect Dennis Brown present the Beverly Petterson Bishop Award to Paul Marvar

The Education Department continued its efforts this year to help our members become better educators and mentors. The Society has four awards designed to recognize excellence in mentoring, teaching, and service. In addition, there are awards and programs to support physiologists in training from professional skills training courses through fellowships. At this year's meeting, we recognize the Society's 50-year history of promoting the training of underrepresented minority students through the Porter Physiology Development Program. In addition, the Society has been building for the future through the undergraduate summer research fellowship program and through PhUn Week.

The APS Science Policy program focuses on research funding and the humane use of animals in research. We hope that each of you are on the mailing list for information from the Science Policy program since each of us needs to be an advocate for science. As you are aware, Saturday, April 22, was not only the start of our annual meeting but it was also the date for the March for Science, which was held in Washington, DC, here in Chicago, and over 400 other sites nationally and internationally. We have to make sure that the March is not just a one-time event but the start of advocacy on the part of the scientific community and APS membership. Please use the URL *www.experimentalbiology.org/speakup* to contact your elected representatives to urge them to pass the 2017 appropriations bill from which NIH will get an additional $2 billion, and to pass the 2018 appropriations bill, supporting an increase in funding for NIH, NSF, and the other science agencies.

Reckelhoff reported another challenge facing the Society relates to FASEB. As a founding member of FASEB, the APS is supportive of FASEB and its mission. Since its founding in 1912, FASEB has grown from 4 societies to 30 societies, representing over 125,000 scientists. As such, it provides us with a large and active voice in support of research and basic science, in particular, on Capitol Hill. However, as of late, FASEB has been undergoing some upheaval as a result of the departure of its Executive Director, Guy Fogelman, and the decision to sell its campus in Bethesda. As a result, the APS will be moving to a new location in mid-2018, hopefully with some of our sister societies. A final decision on the location of our new home should be announced shortly.

Reckelhoff reminded members of the upcoming APS meetings to be held in 2017. APS will be holding three conferences this year:

- **August 11-14:** *Cardiovascular Aging: New Frontiers and Old Friends* in Westminster, CO.
- **August 27-30:** *Mitochondria from Bench to Bedside* in San Diego, CA
- **November 6-8:** *Physiological and Pathophysiological Consequences of Sickle Cell Disease* in Washington, DC

The 38th World Congress of the International Union of Physiological Sciences will be held August 1-5, 2017 in Rio de Janeiro.

Reckelhoff said Mari Hopper, the Chair of the Chapter Advisory Committee, made a request to remind members of the Physiology Chapters Program. Nine chapters had scientific meetings in the past 6 months, with almost 1,000 attendees and almost 500 presentations, mainly by young physiologists. Mari says, "Some state chapters are still in their infancy and are actively looking for member support to help grow. If you, as APS members, are interested, please get involved. There are opportunities for everyone."

Reckelhoff reported that the annual meeting closes on Wednesday with the Nobel Prize Lecture by Dr. Louis Ignarro. The lecture was followed by the closing party and the "Battle of the Bands" starring GI Distress and the Third Reviewers.

Reckelhoff thanked Martin Frank for his support while she was President. She said that she has been friends with Marty for over 25 years. She noted that, although we do not always agree on everything, that was okay because not all scientists agree on everything. However, they have developed a close relationship and trust that was not apparent before her presidency. She noted that Frank manages an awesome staff, which has been instrumental in helping her accomplish the things that were important in advancing the Society. The APS staff is critical to the success of the Society.

With that, Reckelhoff expressed her thanks for the opportunity to serve as APS President before moving on to recognizing the recipients of the Society's various awards. APS annually makes about 400 awards for about $1.2 million. Most of the awards are listed in the Business Meeting Agenda Book.

IV. Awards and Presentations

A. Ray G. Daggs Award

Ray G. Daggs was the APS Executive Secretary-Treasurer between 1956 and 1972. In tribute to his devotion to the Society, the Ray G. Daggs Award was established and is given annually to a physiologist for distinguished service to the Society and to the discipline of physiology. The 2017 Daggs Awardee is Kim Barrett, APS Past-President, Distinguished Professor of Medicine of the University of California, San Diego.

Kim Barrett, a native of the United Kingdom, obtained her BS and PhD degrees from the Department of Chemistry at University College London. Following a postdoctoral fellowship at the National Institutes of Health, she joined the faculty of UCSD School of Medicine in 1985 and rose to her current rank of Professor of Medicine in 1996, and is now a Distinguished Professor of Medicine. In 2006, she was appointed as Dean of the Graduate Division at UCSD.

Her research interests center on the normal and abnormal biology of the intestinal epithelium and their relevance to a variety of digestive diseases, including inflammatory bowel diseases, infectious diarrheal diseases, and peptic ulcer disease. Barrett has been recognized for her contributions with a number of awards, including a Science and Engineering Research Council Research Scholarship, Fogarty Visiting Fellowship, Fulbright Traveling Scholarship, the Young Investigator Award of the American Gastroenterological Association and Gastroenterology Research Group, the APS Henry Pickering Bowditch Award, a Kaiser-Permanente Award for Excellence in Teaching, Doctor of Medical Science, honoris causa, from Queen's University Belfast, the APS Davenport Lectureship, election as a Foreign Member of the Swedish Royal Society of Sciences, the AGA

APS President Jane Reckelhoff and President-Elect Dennis Brown present the Giles F. Filley Memorial Award to Mehendra Damarla

Outstanding Women in Science Award, the APS Bodil Schmidt-Nielsen Distinguished Mentor and Scientist Award, the Distinguished Administrator Award from the Graduate Student Association at UC San Diego, and the Partner in International Education Award from the UC San Diego International Center.

Kim has been highly active in editorial activities as well as other aspects of peer review. She served as Editor-in-Chief of *American Journal of Physiology – Cell Physiology*, among other editorial roles, and is currently on the Editorial Board of *Physiological Reviews* as well as serving as Editor-in-Chief (for The Americas) of *The Journal of Physiology*. She has served as a permanent NIH study section member and on review panels for the National Center for Complementary and Alternative Medicine.

APS President Jane Reckelhoff and President-Elect Dennis Brown present the Arthur C. Guyton Award to Justin Grobe

APS President Jane Reckelhoff and President-Elect Dennis Brown present the Lazaro J. Mandel Young Investigator award to Prabhleen Singh

She is chair of the International Scientific Advisory Board for the School of Biosciences at the University of Cardiff, UK, and the Scientific Review Committee of the Center for Gastrointestinal Biology and Disease at the University of North Carolina, Chapel Hill.

Barrett has been actively involved with the APS essentially for the entirety of her professional career. She has served the Society in many capacities, including President of the Society in 2013-2014. Her important role in APS publications as Chair of the Publications Committee was mentioned above. She also served as councilor, a member of the Nominating Committee of the GI Section, as member and chair of the Women in Physiology Committee, on the Steering Committee of the Cell and Molecular Physiology Section (ex officio), as APS representative to the FASEB Excellence in Science Award Committee and on the *FASEB Journal* Editorial Board, on the Awards Committee, as Chair of the Committee on Committees, as vice-chair of the Publications Committee in charge of ethical issues, on the Nominating and Finance Committees (ex officio), on the Publications Taskforce, and as a faculty member at every Professional Skills Workshop on Writing and Reviewing for APS Journals since their inception in 2006.

B. Arthur C. Guyton Educator of the Year Award

The Arthur C. Guyton Physiology Educator of the Year Award is selected by the Teaching Section and is supported by Elsevier. This award recognizes a full-time faculty member who has demonstrated excellence in classroom teaching, commitment to the improvement of physiology teaching, and contributions to physiology education at the local community, national, or international levels. This year the recipient of the Guyton Educator of the Year Award is Thomas Schmidt of Roy J. and Lucille A. Carver College of Medicine, University of Iowa. Lynelle Gordon assisted President Reckelhoff in presenting the award.

C. Dale Benos Early Career Professional Service Award

The Early Career Professional Service Award honors an APS member who is judged to have made outstanding contributions to the physiology community and furthering its broader goals. This award was established

to recognize the late Dale Benos, the Society's 79th President, Chair of Physiology at the University of Alabama, Birmingham, and a distinguished physiologist. The award recognizes Dale's dedication and commitment to excellence in the training and mentoring of young physiologists and colleagues. APS is pleased to recognize Patricia Silveyra (Penn State College of Medicine) as the 2017 Awardee. Erica Dale, Chair of the Trainee Advisory Committee, assisted the president in presenting the award.

D. S&R Foundation Ryuji Ueno Award

The S&R Foundation Ryuji Ueno Award was established in 2007 by the American Physiology Society through the generous support of Ryuji Ueno and Sachiko Kuno and the S&R Foundation. Ryuji Ueno and Sachiko Kuno are founders of Sucampo Pharmaceuticals and the S&R Foundation, both in Bethesda, MD. This award recognizes an APS member who has demonstrated outstanding research promise. The award is given annually to an early career physiologist demonstrating outstanding promise in research in wound healing, tissue remodeling, and/or organ regeneration. The award of $30,000 is designated for the awardee's research program. APS is pleased to recognize this year's awardee, Young C. Jang (Georgia Technology).

APS President Jane Reckelhoff and President-Elect Dennis Brown present the The Shih-Chun Wang Young investigator award to Jin O-Uchi

APS President Jane Reckelhoff, President-Elect Dennis Brown, and Terrence Haas present the Dean Franklin Young Investigator Award to Aaron Polichnowski

E. Beverly Petterson Bishop Award for Excellence in Neuroscience

The Beverly Petterson Bishop Award recognizes excellence in neuroscience/neurophysiology research. The award is given to an investigator who holds an academic rank no higher than assistant professor. The award is presented annually to an individual demonstrating outstanding promise based on his/her program in neuroscience/neurophysiology research. Each recipient receives a $20,000 award designated for use in their research program. APS is pleased to recognize Paul J. Marvar (George Washington University).

F. Giles F. Filley Memorial Awards

As a result of a bequest from the family of Giles F. Filley, a memorial fund was established to recognize excellence in research in respiratory physiology and medicine. Two annual awards of $16,000 are made to junior faculty members (at an academic rank no higher than assistant professor). APS is pleased to recognize this year's awardees, Mehendra Damarla (John Hopkins University) and Tatum Simonson (University of California, San Diego). Tatum Simonson was unable to attend the meeting.

G. Arthur C. Guyton Award for Excellence in Integrative Physiology and Medicine

The Arthur C. Guyton Award Fund was established in 1993 to recognize the contributions of Arthur C. Guyton and his interests in feedback, modeling, and integrative physiology. The awards are made to an independent, junior investigator pursuing research that uses integrative approaches to the study of physiological function and explores the role of feedback regulation in physiological function. The award is for $30,000 and is

designated for use in the awardee's research program. This year's awardee is Justin Grobe (University of Iowa).

H. Lazaro J. Mandel Young Investigator Award

As a result of a bequest from the wife of Lazaro J. Mandel, a memorial fund was established to recognize excellence in epithelial or renal physiology. An award is made to a junior faculty member who has demonstrated outstanding research promise. The award is $9,500 and is designated for use in the awardee's research program. This year's awardee is Prabhleen Singh (University of California, San Diego).

I. Shih-Chun Wang Young Investigator Award

As a result of a bequest from the wife of Shih-Chun Wang, a memorial fund was established to recognize excellence in physiology. An annual award is made to a junior faculty member who has demonstrated outstanding research promise. The award of $10,500 is designated for the use in the awardee's research program. APS is pleased to recognize this year's awardee, Jin O-Uchi (Cardiovascular Research Center, Brown University).

J. Dean Franklin Young Investigator

The Dean Franklin Young Investigator Award was established by Data Sciences International (DSI) to recognize Franklin's role in developing instrumentation to monitor physiological function in conscious animals and humans. The award recognizes a postdoctoral scientist or junior faculty member who is pursuing in vivo physiological research and is in the process of establishing an independent laboratory. The award recipient receives a travel award of $1,500 to attend the annual Experimental Biology meeting to present his/her work, and a DSI instrumentation starter kit valued at approximately $20,000. Terrence Haas of DSI joined Reckelhoff to recognize this year's awardee, Aaron Polichnowski (East Tennessee State University).

K. ADInstruments Macknight Early Career Innovative Educator Award

The ADInstruments Macknight Early Career Innovative Educator Award is named in honor of Anthony Macknight, an APS member since 1978 and founder of ADInstruments. The award honors an APS member who incorporates innovative teaching techniques and technology resources to engage undergraduates in physiology education. The awardee receives a $1,500 honorarium, up to $2,000 in travel reimbursement and complimentary registration to attend the EB meeting, and an institutional grant providing the award recipient's institution with a PowerLab PTB4153 Human and Animal Physiology System or equivalent. This year, the Society is pleased to recognize Katherine Wilkinson (San Jose University) as the ADInstruments Macknight Early Career Innovative Educator Awardee. Tony Macknight of ADInstruments joined Reckelhoff to recognize this year's awardee.

APS President Jane Reckelhoff, President-Elect Dennis Brown, and Tony Macknight present the ADInstruments Macknight Early Career Innovative Educator Award to Katherine Wilkinson

President Jane Reckelhoff and President-Elect Dennis Brown present the Fleur B. Strand Professional Opportunity Award to Jamie Hijmans

L. Annual Reviews Award for Scientific Reviewing

The Annual Reviews Award for Scientific Reviewing 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 helped to provide an enhanced understanding of physiology through their review articles. The recipient receives an award of $2,000 and travel to attend the EB meeting. APS is pleased to recognize this year's awardee, David Harrison (Vanderbilt University).

M. Physiologists in Industry Committee Awards

The Novel Disease Model Awards were established in 1999 and are given to a graduate student and to a postdoctoral fellow submitting the best abstracts describing novel disease models. This award is sponsored by the Physiologists in Industry Committee.

APS President Jane Reckelhoff, President-Elect Dennis Brown, and Eugene Shek present the Physiologist in Industry Committee Novel Disease Model Awards to T. Dylan Olver and Kasi McPherson

APS President Jane Reckelhoff, President-Elect Dennis Brown, and Peter Horvath presented the Steven M. Horvath Professional Opportunity Awards to Gwendolyn Davis and Steven Romero

The recipient of this year's postdoctoral award is T. Dylan Olver (University of Missouri), and the recipient of this year's predoctoral award is Kasi McPherson (University of Mississippi Medical Center). Eugne Shek, member of the Physiologist in Industry Committee, assisted in presenting the awards.

N. International Early Career Physiologist Travel Awards

The International Early Career Physiologist Travel Award program was established in 2008 to assist with travel expenses for international early career physiologist who are attending the APS Annual Meeting at EB to present their work. This year's awardees are Florencia Dadam (INIMEC-CONICET-UNC), Leonard Forgan (Deakin University), Monique Francois (University of British Columbia, Okanangan), Crystal Ghantous (American University of Beirut), Sofien Laouafa (Quebec Heart and Lung Institute), Marcelle Paula-Ribeiro (Federal University of Sao Paulo), Helena Rocha (Fluminense Federal University), Miguel Sanchez-Hechavarria (University of Medical Science of Santiago de Cuba), Andre Teixeira (University of Brasalia), Lukas Wichmann (Justus-Liebig University), and Lysien Zambrano (Federal University of Sao Paulo).

O. Caroline tum Suden/Frances Hellebrandt Professional Opportunity Awards

The recipients of the Caroline tum Suden awards are selected by the Women in Physiology Committee chaired by Caroline Rickards. This year's 50 awards were made possible by the bequests of Caroline tum Suden and Frances Hellebrandt, who were long-time members of the Society. Awards are open to graduate students or postdoctoral fellows, who receive a $500 check and paid registration.

P. Fleur Strand Professional Opportunity Awards

The Fleur L. Strand Award was established to recognize the achievements of a graduate student or postdoctoral fellow, enabling the recipient to attend the EB meeting. The award is named in honor of the late Fleur Strand, formerly Professor Emerita, New York University. Strand was the first to show that stress-evoked hormones such as ACTH can have a direct effect on peripheral systems, independent of the adrenal gland.

The award is open to a physiologist working in any area of research. The awardee receives $1,000 and complimentary registration for the EB meeting. APS is pleased to recognize this year's awardee, Jaime Hijmans (University of Colorado Boulder).

Q. Steven M. Horvath Professional Opportunity Awards

The Steven M. Horvath Award is given to the top two applications from minority candidates. This award is a reflection of Horvath's long-term commitment to the training of minority physiologists. These awards are made possible by a bequest of the family of Steven M. Horvath. APS is pleased to recognize this year's awardees, Gwendolyn Davis (University of Mississippi Medical Center) and Steven Romero (University of Texas Southwestern Medical Center).

T. Recognition of Outgoing Councillors

Councillors Barbara Alexander (University of Mississippi), Rudy Ortiz (University of California-Merced), and Bill Yates (University of Pittsburgh) completed their terms at the close of the EB17 meeting.

APS President Jane Reckelhoff and President-Elect Dennis Brown present the Presidential Recognition Plaque to Patricia E. Molina, APS Past-President

APS President Jane Reckelhoff passes the gavel to President-Elect Dennis Brown

R. Recognition of Outgoing Section Chairs

Joseph T. Brozinick (Chair of Endocrinology Section), Donald E. Kohan (Chair of the Renal Section), Larissa A. Shimoda (Chair of the Respiration Section), and Jonathan D. Kibble (Chair of the Teaching of Physiology Section) completed their terms at the close of the EB17 meeting. Reckelhoff thanked them for their service to their sections and to APS, and presented them with certificates of service.

S. Recognition of Outgoing Committee Chairs

Ida Llewellyn-Smith (Chair of the Awards Committee), Michael Sturek (Chair of the Chapter Advisory Committee), Michael Brands (Chair of the Conference Committee), Douglas Eaton (Chair of the Daggs Award Committee), Michael Hill (Chair of the International Committee), Eugene Shek (Chair of the Physiologist in Industry Committee), Margarita Curras-Collazo (Chair of the Porter Physiology Development and Minority Affairs Committee), and Kevin Kregel (Chair of the Science Policy Committee) completed their terms on December 31, 2016. Reckelhoff thanked them for their service to their respective committees and to APS.

U. Recognition of Past-President Patricia Molina

Reckelhoff asked the membership to join her in offering a special thank you to our outgoing past-president, Patricia Molina, for her hard work and dedication to APS over the past 3 years. She stated she did not know Molina that well, but over the past 2 years Patricia has become her collaborator and her mentor both in the Executive Cabinet at APS as well as in her new role at the University of Mississippi Medical Center. She indicated that Patricia is her cheerleader and has become her dear friend. Although Patricia will be leaving her position on the Executive Cabinet and

Council, Reckelhof said that she knows her role in the Society will not end. She asked the membership to join her again in thanking Molina for her strong support and dedication to APS in the past few years as well as in the future.

V. Conclusion

Reckelhoff stated it is her distinct pleasure to introduce Dennis Brown as the incoming President of APS. Reckelhoff reported that Brown currently wears many hats; he is a Professor of Medicine at Harvard Medical School, an APS journal editor *(Physiological Reviews)*, a Scientific Program Leader at the Massachusetts General Hospital, and a Director of the MGH Program in Membrane Biology, Division of Nephrology, and Director of the Career Development Office. Reckelhoff asked the membership to join her in welcoming the 90th President of APS, Dennis Brown.

VI. Passing of the Gavel

Reckelhoff then passed the gavel to Dennis Brown (Harvard Medical School, Massachusetts General Hospital), with her sincere commitment to support Brown in his work to achieve the goals as incoming President of the APS.

Brown stated that it is a pleasure to be elected as the President of the APS. The Society has been his professional home since he came to the U.S. He noted that he has huge shoes to fill. He expressed his appreciation for the work of Reckelhoff and Molina and for their service to the Society. He looks forward to serving the Society in these turbulent times. He reported that there is a lot to do for the Society with the implementation of the new strategic plan. He requested that everyone submit their best publications to our journals.

VII. New Business

No new business.

There being no new business, the meeting was adjourned at 6:44 PM, April 25, 2017. ●

Dennis Brown
President-Elect

Table 1. Deceased members as of April 4, 2017

Member Name	City	State
Shaila Basavappa	Chicago	IL
Paolo Caldini	Weston	MA
Vivien A. Casagrande	Nashville	TN
Robert J. Dellenback	Jackson	WY
Joseph Engelberg	Lexington	KY
Abram B. Fajer	Gaithersburg	MD
Allahverdi Farmanfarmaian	Princeton	NJ
Gunnar F. A. Flemström	Uppsala	Sweden
John C. S. Fray	Worcester	MA
Walter J. Freeman	Berkeley	CA
Haim Garty	Rehovot	Israel
Francis J. Haddy	Rochester	MN
William Hansel	Baton Rouge	LA
Robert E. Hyatt	Rochester	MN
Robert L. Isaacson	Binghamton	NY
Eliezer Kamon	State College	PA
Mearl A. Kilmore	Urbandale	IA
Milton Landowne	Auburndale	MA
Charles M. Mansbach II	Memphis	TN
Etienne Olivier	Brussels	Belgium
Charles R. Park	Nashville	TN
Tauba Pasik	New York	NY
Lawrence Rabinowitz	Davis	CA
John P. Reeves	Newark	NJ
Michael J. Rennie	Nottingham	United Kingdom
Bengt N. S. Rippe	Lund	Sweden
Arthur Rosen	Winnetka	IL
Paul C Royce	Boston	MA
James A. Schafer	Birmingham	AL
Ronald L. Seaman	Fort Sam Houston	TX
Donald H. Singer	Evanston	IL
Robert R. Smeby	Rock Creek	OH
Roger Tsien	San Diego	CA
John Urquhart	Palo Alto	CA
Bernard Wortman	Bethesda	MD

Annual Surveys

Association of Chairs of Departments of Physiology 2016 Survey Results

Elsa I. Mangiarua (Secretary-Treasurer, Marshall University), Melinda E. Lowy (Executive Assistant, ACDP), and Charles E. Wood (President, University of Florida College of Medicine)

The Association of Chairs of Departments of Physiology annual survey was sent electronically to 204 physiology or physiology-related departments throughout the U.S., Canada, Mexico, and Puerto Rico. A total of 52 partial or complete surveys were returned, for a response rate of 25%. This rate is slightly lower than last year but more than in previous years. Of the 52 surveys received, there were 12 private and 40 public medical schools. We continue to encourage more of our colleagues to respond so that we can have more robust data that will benefit all.

The data provide the reader with general trends of faculty demographics and distribution, overall departmental budgets, and space available for research. As a reminder, beginning in 2004, ACDP decided not to include faculty salary information in this report. AAMC salary data is more generally used, so the ACDP Council decided to no longer collect or report this data.

Data were collected on level, years in position, tenure status, gender, and ethnicity of faculty members (Table 1). Table 1 also includes information on the average number of student contact hours for faculty in the lab, classroom, and small discussion groups, and the type of teaching interactions for the department (MD/DO, DVM, allied health, etc.). Also included is information on the type of medical physiology course being taught (note that departments teach multiple class types, accounting for the fact that the numbers do not add up to the total respondents).

Table 1a.

Faculty Summary (*n* = 910)						
	Male		Female			
	No.	Average No. Years in Position	No.	Average No. Years in Position	Total Number	Total Average No. Years in Position
Chair	35	14	9	6.2	44	12.4
Professor	289	14.7	81	10.5	370	13.8
Associate professor	176	8.4	64	8.6	240	8.5
Assistant professor	124	5.1	65	4.1	189	4.8
Instructor	21	3.8	32	5.3	53	5.3
Rank not given	9	6.2	5	5.5	14	6
48 responses	654		256		910	

Table 2 focuses on student/trainee information. Information on the gender and number of U.S. citizen/resident alien vs. foreign pre- and postdoctoral students, gender and ethnicity of the U.S. citizen/resident alien predoctoral and postdoctoral fellows, and gender and country of origin of the foreign predoctoral and postdoctoral fellows is included. Also shown are the number of predoctoral trainee completions by gender, the number of U.S. citizen/resident alien postdoctoral completions by gender and ethnicity, and the number of foreign postdoctoral completions by gender and region of origin. The type of support that is used for foreign pre- and postdoctoral students is included, as are the average stipends paid to all pre- and postdoctoral students by the departments. For faculty reported (n = 46), an average of 55% (SD = 21%) of the faculty had either graduate students or postdoctoral fellows in their laboratories.

Institutional information is provided in Table 3 in terms of the type of institution (public or private) and the average square footage of space occupied by the departments for research, teaching, administration, and other purposes.

Departmental budget information (Table 4) shows average dollar amounts for type of support (institutional hard money, research grants, training grants, endowments, indirect cost recovery). Numbers for all institutions are reported, and the data are broken out by public medical, private medical, and non-medical. Financial information is also given, including fringe benefit rate, federally negotiated indirect cost rates for both on and off campus, allocated salary dollars from grants directly returned to the departments, percentage of indirect costs returned to the departments, percentage of total faculty salaries derived from research grants, and percentage of faculty having extramural research funding greater than $100,000/yr.

Table 5 ranks responding Institutions according to their total dollars (institutional hard money, research grants, etc.), research grant dollars (direct or direct plus indirect, as appropriate), research dollars per faculty member, departmental research space, and research dollars per research space. Total number of faculty in each department is also shown.

For an update of AAMC salary data, please see the accompanying article (begins on p. 204). ●

Table 1b.

Medical Physiology Course Type			
	Yes	No	Total Responded
Integrated disciplines	22	28	50
Traditional	38	12	50
Within traditional	38	12	50

Table 1c.

Tenure Status in each department by degree									
	Tenured		Not Tenured		Not Eligible		Not identified		Total
	No.	Years in position	No.	Years in position	No.	Years in position	No.	Years in position	
MD	12	10	9	4.9	10	11.2			31
PhD	528	12.5	151	3.6	130	5.3	5	3.2	814
2 Doctorates	37	9.3	5	4	17	6.9			59
Other	0		0		6	10.3			6
Total	**577**		**165**		**163**		**5**		**910**

Table 1d.

For your faculty, what is the average number of hours of student contact (per year) for:			
	Student Type	**Average (hours)**	**Number (inst.)**
Lab Hours	Graduate	546	29
	Medical	102	25
	Other	339	11
Lectures	Graduate	106	42
	Medical	53	42
	Other	159	24
Small Group	Graduate	69	27
	Medical	33	36
	Other	70	12

Table 1e.

Teaching Interactions (*n* = 52 departments)		
	No. of Depts.	**%**
MD/DO	47	90%
DDS	14	27%
DVM	7	13%
Allied health	23	44%
Pharmacy	10	19%
Other biomedical	37	71%
Life science	26	50%
Bioengineering	22	42%
Other*	16	31%

*Other includes pre-professional and graduate students (both MS and PhD)

Table 2a.

Student/Trainee Summary				
	Predoctoral		**Postdoctoral**	
	Male	**Female**	**Male**	**Female**
US Citizen/ resident alien	283	274	121	108
Foreign	82	97	131	102
Total	365	371	252	210

Table 2b.

Race/Ethnicity of US Citizen/Resident alien Pre- and Postdoctoral Students/Trainees				
	Predoctoral		**Postdoctoral**	
	Male	**Female**	**Male**	**Female**
Native American	1	1	1	1
Asian/Pacific Islander	24	30	25	29
Black (not Hispanic)	11	21	6	9
Hispanic	12	21	10	8
White (not Hispanic)	235	201	79	61
Total	283	274	121	108

Table 2c.

US Citizen/Resident Alien Predoctoral Trainee Completions		
	Male	**Female**
Native American	0	0
Asian/Pacific Islander	6	11
Black (not Hispanic)	4	2
Hispanic	4	5
White (not Hispanic)	54	31
Total	68	49

Table 2d.

Number of Foreign Pre- and Postdoctoral Students/ Trainees				
	Predoctoral		**Postdoctoral**	
	Male	**Female**	**Male**	**Female**
African	4	3	1	0
Asian/Pacific Islander	47	53	83	47
Central/South American	7	9	15	15
European/Canadian, etc.	10	11	25	30
Middle Eastern	14	21	4	5
Other	0	0	3	5
Total	82	97	131	102

Table 2e.

Foreign National Predoctoral Trainee Completions		
	Male	**Female**
African	0	0
Asian/Pacific Islander	13	17
Central/South American	2	2
European/Canadian, etc.	1	0
Middle Eastern	0	6
Other	0	0
Total	**16**	**25**

Table 2f.

Total Predoctoral Trainee Completions During the Year Ending June 30, 2016	
	Total
Female	74
Male	84
Total	**158**

Table 2g.

Number of Foreign Pre- and Postdoctoral Trainees Whose Primary Source of Support is:		
	Predoctoral	Postdoctoral
Institutional	67	15
Research grants	84	199
Private foundations	5	16
Home (foreign) government	10	7
Other	1	5
Total	**167**	**242**

Table 2h.

Average Annual Stipend (U.S. $)		
	Average	No. of Institutions
Postdoctoral	$44,265	43
Predoctoral	$26,042	44

Table 3a.

Type of Institution	
Private	12
Public	40
Total	**52**

Table 3b.

Space Controlled by Department		
	Average sq. ft.	No. of Depts
Research space	20,434	48
Administrative space	3,578	47
Teaching space	2,630	27
Other space*:	2,740	26
Total space	**26,900**	**48**
*Other includes common space, prep room, storage, core facilities, offices		

Table 4a.

	All Institutions	No. of Depts	Mean No. of Faculty	Private Medical	No. of Depts	Mean No. of Faculty	Public Medical	No. of Depts	Mean No. of Faculty
Institutional (Hard money, e.g, operating costs, state allocations)	2,377,484	48	19	2,061,967	11	17	2,471,286	37	20
Outside Research Grants and Contracts (direct costs only)	4,119,550	46	20	5,309,319	9	19	3,830,146	37	20
Training Grants (direct costs only)	345,735	18	21	407,765	4	21	328,013	14	21
Endowments	472,219	33	20	456,952	8	17	477,105	26	21
Indirect Cost Recovery (amount returned to your department)	360,398	37	20	1,639,823	4	22	205,316	33	20
Other Budget Support	497,016	30	20	494,528	4	17	497,399	26	20
Average Departmental Budget	7,368,129	48		7,662,689	11		7,280,633	37	
SD	5,204,006			8,185,156			4,088,055		
Total faculty			910			184			726
No non-medical departments reported									

Table 4b.

Financial Information		
	Average %	No. of Depts.
Current fringe benefit rate most frequently used for primary faculty	30	47
Federally negotiated indirect cost rate for FY 13-14 off campus	28	42
Federally negotiated indirect cost rate for FY 13-14 on campus	52	46
Percentage of allocated salary dollars from grants directly returned to your department	67	30
Percentage of indirect costs returned to your department	19	34
Percentage of total faculty salaries derived from research grants (does not include fringe benefits costs)	33	43
Percentage of faculty having extramural research funding greater than $100,000/year	55	46

Table 5. Student/Trainee Summary

Complete Ranking According to Total Dollars										
Rank Total Dollars	Total Dollars	Rank Research Grant Dollars	Research Grant Dollars	Rank Research Dollars/ Faculty	Research Dollars/ Faculty	Rank Research Space	Research Space	Rank Research Dollars/ sq. ft.	Research Dollars/ sq. ft.	No. of Faculty
1	30,019,623	1	16,515,455	1	718,063	2	45,845	5	360	23
2	16,457,392	6	8,952,572	2	497,365	5	36,042	11	248	18
3	16,376,642	2	10,282,568	13	277,907	7	34,591	9	297	37
4	15,213,838	4	9,117,270	10	294,106	12	26,020	6	351	31
5	14,392,142	3	9,805,733	7	316,314	3	40,945	14	239	31
6	14,259,215	9	6,200,191	16	248,008	20	19,877	7	312	25
7	12,385,791	5	9,032,008	4	392,696	4	36,048	10	251	23
8	11,612,920	7	7,500,000	23	178,571	42	10,414	1	720	42
9	11,519,081	10	5,887,582	5	346,328	6	35,313	27	167	17
10	10,797,896	11	5,887,369	6	346,316	11	29,133	21	202	17
11	10,669,041	15	4,621,336	37	107,473	8	33,170	30	139	43
12	9,548,877	12	5,721,514	17	238,396	37	12,048	3	475	24
13	9,068,241	14	4,655,756	19	232,788	21	19,053	13	244	20
14	8,384,623	13	5,039,282	8	314,955	15	23,377	19	216	16
15	7,955,357	24	3,240,050	34	124,617	19	20,220	28	160	26
16	7,643,743	8	6,790,464	12	282,936	10	31,313	18	217	24
17	7,028,858	19	3,724,738	24	177,368	17	21,450	25	174	21
18	6,947,493	23	3,290,561	25	173,187	9	31,563	37	104	19
19	6,836,723	28	2,643,535	21	203,349	16	22,095	32	120	13
20	6,821,365	27	2,863,585	38	95,453	1	49,427	45	58	30
21	6,765,658	18	3,963,808	3	396,381	26	16,729	15	237	10
22	6,757,660	20	3,594,347	14	276,488	25	17,000	20	211	13
23	6,715,000	17	4,200,000	9	300,000	40	11,427	4	368	14
24	6,163,209	16	4,545,096	15	267,359	28	15,065	8	302	17
25	6,006,594	26	3,197,136	33	127,885	30	14,492	17	221	25
26	5,741,857	37	1,636,910	44	58,461	14	24,166	43	68	28
27	5,547,586	21	3,559,440	18	237,296	46	5,640	2	631	15
28	5,513,075	29	2,326,344	29	145,397	34	12,484	22	186	16
29	5,505,313	35	1,905,143	27	158,762	23	18,355	38	104	12
30	5,214,146	25	3,218,022	28	146,274	13	25,000	31	129	22
31	4,968,429	22	3,457,868	11	288,156	31	14,000	12	247	12
32	4,683,737	31	2,291,652	30	143,228	18	21,368	34	107	16
33	4,605,535	46	385,535	46	18,359	22	18,500	46	21	21
34	4,551,072	32	2,286,877	26	163,348	35	12,455	23	184	14
35	4,170,608	39	1,257,984	40	83,866	24	18,216	42	69	15
36	3,865,988	34	2,023,450	35	119,026	36	12,048	26	168	17
37	3,859,541	42	1,129,388	42	75,293	32	12,914	40	87	15
38	3,797,659	41	1,146,133	45	45,845	41	10,555	33	109	25
39	3,784,049	33	2,279,513	22	189,959	33	12,507	24	182	12
40	3,642,599	43	1,072,124	41	76,580	29	14,774	41	73	14
41	3,587,264	38	1,625,640	36	108,376	39	11,623	29	140	15
42	3,350,595	30	2,305,003	20	230,500	43	10,334	16	223	10
43	3,004,849	40	1,237,397	31	137,489	38	11,671	35	106	9
44	2,926,552	36	1,648,214	32	137,351	27	15,766	36	105	12
45	2,015,427	44	834,695	39	92,744	45	8,289	39	101	9
46	1,220,000					48	2,975			7
47	959,600	45	600,000	43	66,667	44	10,100	44	59	9
48	807,721			40	51,928	47	3,088			6

AAMC Medical School Faculty Compensation Survey

Each year the American Association of Medical Colleges (AAMC) surveys all the U.S. medical schools as to faculty compensation. Because of this, the ACDP (see associated article on p. 199) decided to no longer collect the same data from its members.

As a supplement to the ACDP survey, the AAMC has agreed to allow the APS to publish selected results from their survey.

Table 1 shows the regional distribution of medical schools responding to the AAMC survey in terms of public medical and private medical. Also shown is the number of physiology departments in those regions that responded (with either PhD or MD Chairs). The number of departments responding to the AAMC survey is not the same as the ACDP survey, since AAMC usually receives over 99% response rate from institutions.

Summary statistics on faculty compensation in physiology departments for PhD and MD faculty are given in Table 2. Shown are 25th percentile, median, 75th percentile, and mean salaries for the given number of faculty. For any group that has less than five faculty, data are not reported.

Table 3 shows the changes in salary that have occurred over the past 3 years for both PhD and MD faculty, with the percent change over the past 2 years.

Summary salary statistics for separate regions of the country for both PhD and MD faculty are given in Table 4. Given again are 25th percentile, median, 75th percentile, and mean salaries for the given number of faculty.

Table 5 shows the salary comparison between PhD and MD faculty in all basic science departments vs. those specifically in physiology departments. ●

Table 1. Distribution of medical schools responding to AAMC medical school faculty compensation survey

		Northeast	Midwest	South	West	TOTAL
All	Private Medical	26	12	14	4	56
	Public Medical	13	22	38	15	88
Physiology	All Medical Schools	15	19	30	9	73

Table 2. Summary statistics on physiology department PhD and MD faculty compensation

PhD Faculty						
		25th	Median	75th	Mean	No. of Faculty
Chair	All schools	224,000	275,000	328,000	281,000	61
	Medical Public	225,000	271,000	319,000	268,800	42
	Medical Private	221,000	284,000	370,000	308,100	19
Professor	All schools	142,000	168,000	200,000	175,200	505
	Medical Public	143,000	167,000	195,000	175,600	329
	Medical Private	142,000	172,000	206,000	174,600	176
Assoc. prof.	All schools	105,000	119,000	132,000	121,400	305
	Medical Public	104,000	117,000	130,000	117,900	221
	Medical Private	108,000	121,000	152,000	130,700	84
Asst. prof.	All schools	71,000	90,000	104,000	89,400	325
	Medical Public	69,000	88,000	100,000	87,000	219
	Medical Private	72,000	95,000	111,000	94,300	106
Instructor	All schools	51,000	55,000	62,000	56,500	81
	Medical Public	50,000	55,000	60,000	54,900	52
	Medical Private	55,000	59,000	67,000	59,500	29

Table 2. Summary statistics on physiology department PhD and MD faculty compensation

MD Faculty						
		25th	Median	75th	Mean	No. of Faculty
Chair	All schools	284,000	379,000	431,000	369,000	12
	Medical Public	257,000	296,000	404,000	318,000	7
	Medical Private	350,000	452,000	525,000	440,400	5
Professor	All schools	161,000	191,000	231,000	197,300	76
	Medical Public	164,000	191,000	231,000	199,900	44
	Medical Private	154,000	186,000	230,000	193,700	32
Assoc. prof.	All schools	104,000	115,000	133,000	121,800	35
	Medical Public	102,000	111,000	131,000	119,300	20
	Medical Private	108,000	125,000	134,000	125,100	15
Asst. prof.	All schools	71,000	92,000	107,000	88,700	32
	Medical Public	66,000	81,000	101,000	84,700	20
	Medical Private	76,000	100,000	114,000	95,400	12
Instructor	All schools					4
	Medical Public					3
	Medical Private					1

For less than 5 faculty, data are not reported

Table 3. Change in total compensation for physiology department PhD and MD faculty

PhD Faculty							
2015 - 2016		2014 - 2015		2013 - 2014		% Change 2014 - 2015 to 2015 - 2016	
Mean	Median	Mean	Median	Mean	Median	Mean	Median
136,200	125,000	131,600	122,000	129,100	119,000	3.5	2.5

Mean and median values were combined for Assistant, Associate, and Professor

MD Faculty							
2015 - 2016		2014 - 2015		2013 - 2014		% Change 2014 - 2015 to 2015 - 2016	
Mean	Median	Mean	Median	Mean	Median	Mean	Median
154,500	147,000	149,500	143,000	149,900	134,000	3.3	2.8

Mean and median values were combined for Assistant, Associate, and Professor

Table 4. Summary statistics on physiology department PhD and MD faculty compensation by region

PhD Faculty					
		Northeast	Midwest	South	West
Chair	25th	237,000	222,000	211,000	271,000
	Median	282,000	271,000	261,000	299,000
	75th	321,000	341,000	325,000	346,000
	Mean	289,800	295,000	263,200	300,100
	Total faculty	13	14	26	8
Professor	25th	151,000	150,000	135,000	152,000
	Median	170,000	172,000	164,000	180,000
	75th	198,000	218,000	192,000	208,000
	Mean	170,200	180,600	166,000	194,400
	Total faculty	94	133	196	82
Assoc. Prof.	25th	114,000	102,000	101,000	111,000
	Median	125,000	117,000	114,000	120,000
	75th	141,000	128,000	131,000	142,000
	Mean	132,400	119,400	115,900	127,500
	Total faculty	59	90	123	33
Asst. Prof.	25th	75,000	69,000	69,000	75,000
	Median	100,000	90,000	87,000	96,000
	75th	116,000	102,000	100,000	111,000
	Mean	95,500	88,000	86,400	98,100
	Total faculty	56	97	145	27
Instructor	25th	50,000	44,000	51,000	52,000
	Median	56,000	55,000	55,000	60,000
	75th	67,000	62,000	60,000	62,000
	Mean	59,000	53,800	55,700	58,200
	Total faculty	14	11	39	17

MD Faculty					
		Northeast	Midwest	South	West
Chair	25th		240,000		
	Median		378,000		
	75th		442,000		
	Mean		348,200		
	Total faculty	2	5	4	1
Professor	25th	161,000	147,000	158,000	165,000
	Median	194,000	184,000	189,000	181,000
	75th	251,000	215,000	225,000	227,000
	Mean	201,300	181,200	196,700	206,100
	Total faculty	29	13	22	12
Assoc. Prof.	25th		105,000	97,000	
	Median		131,000	105,000	
	75th		165,000	124,000	
	Mean		136,500	107,800	
	Total faculty	3	15	14	3

Table 4. Summary statistics on physiology department PhD and MD faculty compensation by region (continued)

		Northeast	Midwest	South	West
Asst. Prof.	25th		86,000	58,000	
	Median		97,000	71,000	
	75th		111,000	83,000	
	Mean		98,700	73,700	
	Total faculty	3	13	15	1
Instructor	25th				
	Median				
	75th				
	Mean				
	Total faculty	0	2	0	2

For less than 5 faculty, data are not reported

Table 5. Salary comparison between all basic science departments and physiology departments for both PhD and MD faculty

		All Basic Science Depts-PhDs	Physiology PhDs	All Basic Science Dept. MDs	Physiology MDs
Chair	25th	234,000	224,000	293,000	284,000
	Median	288,000	275,000	379,000	379,000
	75th	342,000	328,000	468,000	431,000
	Mean	292,600	281,000	393,300	369,000
	Total faculty	519	61	114	12
Professor	25th	148,000	142,000	165,000	161,000
	Median	177,000	168,000	208,000	191,000
	75th	215,000	200,000	263,000	231,000
	Mean	188,300	175,200	225,900	197,300
	Total faculty	4,278	505	647	76
Assoc. prof.	25th	105,000	105,000	113,000	104,000
	Median	122,000	119,000	133,000	115,000
	75th	141,000	132,000	173,000	133,000
	Mean	125,700	121,400	150,900	121,800
	Total faculty	3,358	305	347	35
Asst. prof.	25th	80,000	71,000	80,000	71,000
	Median	96,000	90,000	102,000	92,000
	75th	112,000	104,000	138,000	107,000
	Mean	97,400	89,400	120,100	88,700
	Total faculty	3,973	325	403	32
Instructor	25th	54,000	51,000	57,000	
	Median	60,000	55,000	64,000	
	75th	72,000	62,000	79,000	
	Mean	66,700	56,500	73,900	
	Total faculty	641	81	61	4

Experimental Biology

Emmanuelle Charpentier Delivers Tang Prize for Biopharmaceutical Science Award Lecture at EB 2017

Emmanuelle Charpentier of the Max Planck Institute was a joint winner of the international 2016 Tang Prize for Biopharmaceutical Science. She won the award – along with Jennifer A. Doudna and Feng Zhang – for "the development of CRISPR/Cas9 as a breakthrough genome editing platform that promises to revolutionize biomedical research and disease treatment." Winners of the prestigious honor receive a $1.3 million cash prize and $330,000 in grants toward their research project. Since 2015, Tang Prize Biopharmaceutical Science laureates have presented their award lectures at Experimental Biology (EB).

Charpentier delivered her award lecture, "The Bacterial CRISPR-Cas9 System: A Game Changer in Genome Engineering," to a standing-room-only crowd of more than 1,200 attendees on Sunday, April 23, at EB 2017 in Chicago. Doudna is scheduled to present the next Tang Prize award lecture at EB 2018 (April 21-25 in San Diego).

According to a press release recapping the event on the Tang Prize website: "This 'game changer' in gene editing gives labs everywhere a no-nonsense tool that works with precision and ease; for the history books, it will likely mark a new paradigm for life on Earth. Since essentially anything with DNA can be altered to suit specific needs, the system's applications are wide-reaching: agriculture, drug development, and disease prevention being just a handful." Read the full release at *http://www.tang-prize.org/en/media_detail.php?cat=23&id=727*. ●

Left to *right:* Tang Prize Foundation CEO Jenn-Chuan Chern, APS member Shu Chien, 2016 Tang Prize Winner Emmanuelle Charpentier, and APS Executive Director Martin Frank

Education

Having a Lot of PhUn – Physiology Understanding Week

A record breaking number of PhUn Week posters at EB 2017 kept the over 125 members viewing them busy for 2 hours. The continental breakfast session was co-sponsored by the APS and ADInstruments, Inc.

In 2005, the American Physiological Society (APS) established a member-driven outreach program, Physiology Understanding Week (PhUn Week) with five objectives:

1) Increase student interest in and understanding of physiology in their lives
2) Introduce students to physiology as a possible career
3) Increase teacher recognition of physiology in the curriculum
4) Involve more physiologists in outreach to students and teachers in their communities
5) Reach a broad base of students (grades, gender, race/ethnicity)

From 2005 to 2016, APS members have engaged more than 100,000 students in grades pre-K to 12 during PhUn Week, which occurs the first week of November. APS members work with local schools and teachers to plan and implement meaningful interactions between physiologists, trainees, and students with their own activities or APS-provided resources (hands-on lessons, career presentations, and follow-up materials). Students have direct contact with science role models.

PhUn Week events are held across the U.S. and Puerto Rico, and take place in classrooms, in museums, at university campuses, and at outdoor venues. These models provide flexibility in planning events and engaging both physiologists and students in different community types and countries.

Phreezy Bear made her debut this year as a companion to Phizzy Bear. Phreezy is a polar bear wearing a Physiology Week t-shirt, snowflake scarf, and snowflake charm bracelet. Phreezy Bear has her own activity book, "Fun with Physiology," geared toward 2nd- to 4th-grade levels. Life-size Phreezy and Phizzy Bears were on hand for pictures. The APS booth sold out of Phreezy bear during her inaugural debut EB in Chicago.

During EB 2017, an event record 47 poster presenters described strategies for outreach and hands-on physiology-related activities across primary, elementary, middle, and high school levels at the PhUn Week Training Session. The poster session format fosters a community of sharing best practices and grassroots outreach efforts by APS members who participate in the PhUn Week outreach program (*www.PhUnWeek.org*). In addition to classroom activities, topics included working with a teacher, recruiting and training of a volunteer team, and organizing special community events.

Jeff Osborn, chair of the Education Committee, was busy presenting PhUn Week participation awards to four APS members for 10 years of participation and five APS members for 5 years of participation. Our members make PhUn Week a successful event. ●

The following is a list of the members recognized during the award ceremony for being the lead APS member for 10 years and 5 years of PhUn Week events:

10 Year Awardees	Institution
Barb Goodman	Sanford School of Medicine of the University of South Dakota
Andrea Gwosdow	Gwosdow Associates Science Consultants
Lisa Harrison-Bernard	Louisiana State University Health Sciences Center
Diane Munzenmaier	Medical College of Wisconsin

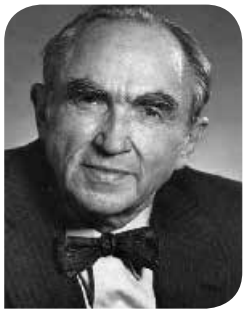
5 Year Awardees	
Erika Boesen	Nebraska Medical Center
Carmen De Miguel	University of Alabama at Birmingham
Patrick Mueller	Wayne State University
Alvaro Navarro	Indiana State University
Clintoria Williams	Emory University

The following is the 2017 EB Training Session presenter and poster title list.

Title of Poster	Presenter
K-12 Introduction to Heart Physiology and the Bionic Hand	William Booth II Wake Forest University School of Medicine, Winston-Salem, NC
K-12 Introduction to Heart Physiology and the Bionic Hand	Steve Elmer Michigan Technological University, Houghton, MI
Developing a Diverse PhUn Week Team	Sierra Nance Wake Forest University School of Medicine, Winston-Salem, NC
Science Fiesta - Community Engagement in San Antonio	Jessica Ibarra University of the Incarnate Word, San Antonio, TX
Celebrating PhUn Week with Physiology Stations for First Graders	Keisa Mathis University of North Texas Health Science Center, Fort Worth, TX
Safe PhUn in the Sun! Teaching Sun Safety to Elementary School Students	Carmen De Miguel University of Alabama at Birmingham, Birmingham, AL
Teaching Glomerular Damage in Elementary Schools Can be PhUn!	Carmen De Miguel University of Alabama at Birmingham, Birmingham, AL
Spread the PhUn, Not the Germs! Teaching Hand Hygiene to 1st Graders	Carmen De Miguel University of Alabama at Birmingham, Birmingham, AL
Hands-on Learning Activities based on Cardiovascular Adaptions to Exercise during an Urban Milwaukee Classroom Visit for Physiology Understanding (PhUn) Week	Diane Munzenmaier Medical College of Wisconsin, Milwaukee, WI
Exercise Physiology is PhUn!	Kim Henige California State University Northridge, Canyon County, CA
PhUn at the Mississippi Children's Museum	Michael Ryan University of Mississippi Medical Center, Jackson, MS
Grasping the Idea: Using Hand Dynamometry to Teach The Scientific Method to Elementary Students	Ed Merritt Appalachian State University, Boone, NC
Exposing Elementary Students to the "PhUn" World of Physiology	Michaela Drake Butler University, Indianapolis, IN
Physiology Understanding Week (PhUn Week), First Time in Kingsville, Texas: The Immune System	Rachel Johnson Texas A&M University-Kingsville, Kingsville, TX
Learning the Cardiovascular System Can be PhUn	Amanda Gonzalez Texas A&M University-Kingsville, Kingsville, TX
Initiating an Exercise Physiology-Themed PhUn Week Presentation for 4th graders	Naveen Sharma Central Michigan University, Mount Pleasant, MI
Annual PhUN Week Service Learning Events improve student content mastery and civic engagement	Erin Rhinehart Susquehanna University, Selinsgrove, PA
Utilizing Pre- and Post-Exercise Changes in Heart Rate as a Method of Teaching the Scientific Method to Second Grade Students	Jessica Taylor Mississippi Osteopathic Medical Association Hattiesburg, MS
Teaching Middle School Students About Lung Function in the Context of Their Science and Math Curriculum	Andrew Roberts University of Louisville, Louisville, KY
Exposing Baltimore City Youth to STEM	Stanley Andrisse Johns Hopkins University School of Medicine, Baltimore, MD
8th Graders Teach Cardiovascular Science & Health to 1st Graders: Creativity & Innovations	Jeff Falcone University of Louisville, Louisville, KY
Understanding How We Understand: Promoting Research Literacy During PhUn Week	Anne Crecelius University of Dayton, Dayton, OH
Interactive Activities to Learn How Our Muscles Work for 4th and 5th Graders	Kim Huey Drake University, Des Moines, IA
Learning Phundamental Physiology With PhUn Augusta Scientists	Debra Irsik University of Augusta, Augusta, GA

Title of Poster	Presenter
Exercise Science in the World of Witchcraft and Wizardry	Jessica Kutz Shenandoah University, Winchester, VA
Cardiovascular System Explained on the Bases of Sports, Taught by Undergraduate Students Majoring in Biomedical Sciences or Biology	Hector Lopez Indiana State University, Terre Haute, IN
Building Community by Serving the Community	Valerie Van Ryn Michigan State University, East Lansing, MI
Modeling Organ Systems with Play-Doh	Lillian Zerihun Wake Forest University School of Medicine, Winston-Salem, NC
Gut and Brain PhUn in Ponce, Puerto Rico	Gladys Chompre University of Puerto Rico, Ponce, PR
A Cellular Physiology Experiment for Students of All Ages	A'ja Duncan Wake Forest University School of Medicine, Winston-Salem, NC
Introducing Cardiac and Pulmonary Physiology to Middle School Students in Rural Georgia	Ellen Gillis Augusta University, Augusta, GA
Students at Moanalua Middle School Have PhUn with Exercise Physiology	Dao Ho Tripler Army Medical Center, Honolulu, HI
Phun Overview of the Cardiovascular System	Ronald Williams Texas A&M University-Kingsville, Kingsville, TX
Demonstrating Heart Rate Recovery to High School Students Using Biopac Science Lab	Caleb Harrison Indiana State University, Clinton, IN
A Summer PhUn Week for English Language Learners	Patricia Halpin University of New Hampshire at Manchester, Manchester, NH
Collaboration between UAB-CORD (Community OutReach Development) and GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs)	Robert Akseyn University of Alabama at Birmingham, Birmingham, AL
PhUn Week Histology Blinded Study: Ozone or No Ozone?	Patricia Silveyra Penn State University College of Medicine, Hershey, PA
2016 PhUn Week Celebration at the University of Arkansas for Medical Sciences	Parimal Chowdhury University of Arkansas for Medical Sciences, Little Rock, AR
What Are You Blubbering About? A Study of Comparative Cold Physiology	Megan Clarke Pennsylvania State University, State College, PA
Understanding How We Understand: Promoting Research Literacy During PhUn Week	Anne Crecelius University of Dayton, Dayton, OH
Physiological Differences between Sexes of High School Students	Brycen Ratcliffe Indiana State University, Terre Clinton, IN
Stress Management as a Correlation to Sympathetic Activity in High School Students	Robert Pawlak Indiana State University, Terre Haute, IN
An Active Learning Exercise to Demonstrate the Function and Integration of Physiological Systems	Dexter Lee Howard University College of Medicine, Washington, DC
Introducing High School Students to Basic Human Physiology	Vinai Kumar Southern Illinois University-Edwardsville, Edwardsville, IL
Clinical Research 101: A Way to Showcase Healthcare Professions in High-School Students Using PhUn Week	Alvaro Gurovich Indiana State University, Terre Haute, IN
Engaging Interest in Physiology for 6th and 7th Graders Through Hands On in Classroom Workshops	Jorge Serrador VA NJ Health Care System, Newark, NJ
Slouching While Sitting Limits Vital Capacity Compared to Sitting Straight	Joshua Sheak University of New Mexico, Albuquerque, NM

A. Clifford Barger Underrepresented Minorities Mentorship Award



A. Clifford Barger

Caroline Appleyard, 2017 Barger Awardee

www.the-aps.org/barger
Award: **$1,000 + travel expenses for EB 2018 meeting**
Deadline: **September 15, 2017**

The Porter Physiology Development and Minority Affairs Committee invites you to nominate an APS member who has an outstanding dedication and commitment to excellence in training and education of underrepresented minority (URM) physiologists for the 2018 Barger Award. Visit the website above for details on the nomination packet requirements and for the online application link. ●

Bodil M. Schmidt-Nielsen Distinguished Mentor and Scientist Award

Bodil Schmidt-Nielsen

Kurt Albertine, 2017 Schmidt-Nielsen Awardee

www.the-aps.org/schmidtnielsen
Award: **$1,000 + travel expenses for EB 2018 meeting**
Deadline: **September 15, 2017**

The Women in Physiology Committee invites you to nominate an APS member (male or female) who is judged to be both a superb mentor and an outstanding scientist for the 2018 Schmidt-Nielsen Award. Visit the website above for details on the nomination packet requirements and for the online application link. ●

Minority Travel Fellowship Awards for 2017 APS Conference

Physiological and Pathophysiological Consequences of Sickle Cell Disease

Application deadline: **July 7, 2017**

APS will be offering Minority Travel Fellowship Awards, which provide up to $1,800 in travel expense reimbursement for the 2017 APS Conference: *Physiological and Pathophysiological Consequences of Sickle Cell Disease*. The conference will take place in Washington, DC, November 6-8, 2017.

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

APS Minority Travel Fellows at the 2016 Inflammation Conference in Westminster, CO

Congratulations 2017 Undergraduate Summer Research Fellows!

APS is pleased to announce the recipients of the 2017 Undergraduate Summer Research Fellowships. These fellowship programs provide hands-on summer research for students interested in exploring physiological research careers. Some fellowships are geared toward providing research experiences to students from a wide range of backgrounds—including those from underrepresented racial and ethnic groups, from disadvantaged backgrounds, and students with disabilities—to work with APS members in a specific area of physiological research.

2017 Integrative Organismal Systems Physiology (IOSP) Fellows and Research Hosts (*www.the-aps.org/IOSP*)

Student/Institution	Host/Institution
Laura Anchondo University of California, Riverside	**Margarita Curras-Collazo, PhD** University of California, Riverside
William Clark Arizona State University	**Karen Sweazea, PhD** Arizona State University
Megan Dougherty Fort Hays State University	**Yasuhiro Kobayashi, PhD** Fort Hays State University
Lauren Eisenman Scripps College	**Melissa Coleman, PhD** Claremont McKenna College
Alyssa Knudson Coe College	**Cassy Cozine, PhD** Coe College
Lindsey Sniffen Emory University	**Malu Tansey, PhD** Emory University School of Medicine
Blair Thompson Claremont Colleges	**Jenna Monroy, PhD** Claremont Colleges
Karina Vega California State University, San Bernardino	**Thomas Roberts, PhD** Brown University
Julie Wilson Baldwin Wallace University	**John Gensel, PhD** University of Kentucky

2017 Short-Term Research Education Program to Increase Diversity in Health-Related Research (STRIDE) Fellows and Research Hosts (*www.the-aps.org/STRIDE*)

Student/Institution	Host/Institution
Carolee Collier Auburn University	**Ganesh V. Halade, PhD** University of Alabama at Birmingham
Roberto Guzman University of Puerto Rico, Rio Piedras Campus	**Sabzali Javadov, PhD** University of Puerto Rico School of Medicine
Maloree Khan University of Missouri-Columbia	**Shawn Bender, PhD** University of Missouri-Columbia
Vanessa Lopez Occidental College	**Sean Wilson, PhD** Loma Linda University School of Medicine
Rumbidzai Majee University of Iowa	**Gary Pierce, PhD** University of Iowa
Shawn Melendy University of Oregon	**Carrie McCurdy, PhD** University of Oregon
Alyssa Pennington Jackson State University	**Jan Michael Williams, PhD** University of Mississippi Medical Center
Juliet Santiago University of Florida	**Gordon Mitchell, PhD** University of Florida
Edward Truong University of California, Riverside	**Margarita Curras-Collazo, PhD** University of California, Riverside

2017 Undergraduate Research Excellence Fellows (UGREF) and their Research Hosts (*www.the-aps.org/UGREF*)

Student/Institution	Host/Institution
Tessa Adler Yale College	**Nina Stachenfeld, PhD** Yale School of Medicine
Maleeha Ahmad Michigan State University	**Stephanie Watts, PhD** Michigan State University
Alexandra Carl University of Wisconsin-Madison	**Jill Barnes, PhD** University of Wisconsin-Madison
Janine DeBlasi University of South Florida	**Dominic P. D'Agostino, PhD** University of South Florida College of Medicine
Ashley Holland University of Florida	**Gordon Mitchell, PhD** University of Florida
Karine Liu Brown University	**Carlos Aizenman, PhD** Brown University

2017 Undergraduate Summer Research Fellows (UGSRF) and their Research Hosts (*www.the-aps.org/UGSRF*)

Student/Institution	Host/Institution
Alecia Alto University of Minnesota Rochester	**Arthur Beyder, PhD** Mayo Clinic
John Bonamer University of Cincinnati	**Bryan Mackenzie, PhD** University of Cincinnati College of Medicine
Thomas Bye Michigan Technological University	**Steven Elmer, PhD** Michigan Technological University
Autumn Conger University of Kentucky	**Kenneth Campbell, PhD** University of Kentucky
Lauren DeSantis University of Michigan	**Christin Carter-Su, PhD** University of Michigan
Melanie Judice The George Washington University	**Colin Young, PhD** The George Washington University
Jeffrey Kepple Gonzaga University	**Christopher Mendias, PhD** University of Michigan
Iuliia Kulchytska Los Angeles City College	**Eric R. Gross, MD** Stanford University
Pierce Lancor University of New England	**Markus Frederich, PhD** University of New England
Amanda Ludwig Purdue University	**Joshua Selsby, PhD** Iowa State University
Rachel Maile Virginia Polytechnic Institute and State University	**Sean D. Stocker, PhD** University of Pittsburgh School of Medicine
Madeline Matthys Duke University	**Thomas Weimbs, PhD** University of California, Santa Barbara
Joseph Mijares University of Florida	**Karyn Esser, PhD** University of Florida
Amber Miller University of Florida	**Michelle Gumz, PhD** University of Florida
Dante Pezzutti University of Dayton	**Carissa M. Krane, PhD** University of Dayton
Lindsay Piwinski Pitzer College	**Jenna Monroy, PhD** Claremont Colleges
Tania Rodezno Augustana University	**Mark Larson, PhD** Augustana University
Zachary Trottier Carleton College	**Michael J. Joyner, MD** Mayo Clinic
Justin Trueman Mount Allison University	**Suzie Currie, PhD** Mount Allison University
Chayla Vazquez Emory University	**Malu G. Tansey, PhD** Emory University School of Medicine
Robert Wendroth University of Kentucky	**Julie Pendergast, PhD** University of Kentucky
Andi Zhang University of Nebraska Medical Center	**Irving H. Zucker, PhD** University of Nebraska Medical Center
Shao Yang Zhang University of Iowa	**Justin Grobe, PhD** University of Iowa
Julia Zimmerman Swarthmore College	**R. Alberto Travagli, PhD** Penn State College of Medicine

APS Undergraduate Summer Research Fellows complete not only 10 weeks of a summer research experience and professional development activities but also online, interactive activities with students nationwide, exploring career options, responsible conduct of research, structuring research studies, developing abstracts, and presenting research posters. Fellows will also present at the Experimental Biology meeting where they are active participants in a professional community and become active proponents for physiological research via APS's social media outlets (blog, Facebook). These programs take students beyond a summer experience to become involved members of the APS community.

The IOSP program is supported by a grant from the National Science Foundation (NSF) Integrative Organismal Systems (IOS) Award No. IOS-1238831.

The STRIDE program is supported by the APS and a grant from the National Heart, Lung and Blood Institute (NHLBI; 1 R25 HL-115473-01).

The UGREF and UGSRF programs are supported fully by APS.

For more information, visit the program websites (listed above) or contact the APS Education Office (*education@the-aps.org*). ●

Teachers Complete New Fellowship Structure-2016 Frontiers in Physiology

Frontiers in Physiology Research and Community Leaders (RCLs) fellows were the pioneers for this new second year of the fellowship. After completing the Online Teacher (OT) program, six middle and high school teachers from across the nation served as the pilot class of this second year of their Frontiers fellowship in April 2016. The teachers experience biomedical research first-hand by working during the summer in a research lab with an APS member in their geographic area.

RCLs develop leadership skills, serving as leaders in the OT online discussions and learning how to share their knowledge with other teachers, students, researchers, and policymakers in both live and online settings. The teachers presented their research findings in a poster session.

As they progressed through the year, they completed online professional development lessons that developed leadership skills not only relating to their research but also in how to share what they learned with online communities, with policy holders, and during workshops. Teachers completed their fellowship year in April, with their attendance and presentation at the Physiology Workshop for Teachers and Students for Chicago-area high school teachers and students at EB 2017. The Frontiers in Physiology Program was made available by generous support from APS and an NIH Science Partnership Award (SEPA). Lead Mentor Instructor Becky Evans was assisted in leading the online forum of leadership training modules by Mentor Instructor Monica Erwin. ●

The teachers participating in the program include:

Research Teacher	Teacher School	Research Host	Host Institution
Kyle Duhon	Jennings County High School Jennings, LA	Liz Simon, PhD	Louisiana Health Sciences University, New Orleans
Georgia Everett	Western High School Russiaville, IN	Steven Miller, PhD	Indiana University School of Medicine
Tisha Grudzien	Gallistel Language Academy Chicago, IL	Pietr de Tombe, PhD	Loyola University Chicago
Landra Knodel	Irene-Wakonda High School Irene, SD	Yifan Li, PhD	University of South Dakota
Melanie Loulousis	New Berlin High School New Berlin, IL	Julio Copello, PhD	Southern Illinois University School of Medicine
Shannon Seidl	Salpointe Catholic High School Tucson, AZ	Thomas Pannabecker, PhD	University of Arizona

Science Policy

NIH Budget to Increase by $2 Billion in FY 2017

On May 5, 2017, President Trump signed H.R. 244, an omnibus package of legislation to fund the federal government in fiscal year (FY) 2017. Included in the legislation is a $2 billion increase for the National Institutes of Health (NIH), an additional $9 million for the National Science Foundation (NSF), and a $368 million increase for NASA. Overall, the bill increases spending on research and development by 5% (*https://www.aaas.org/news/congress-rejects-white-house-approach-pursues-targeted-science-technology-boosts*).

National Institutes of Health

For the second year in a row, the NIH budget will increase by $2 billion (+6.2%), bringing the total budget to $34.1 billion. This includes $352 million for targeted research projects, as designated by the 21st Century Cures Act. The legislation also specifies an increase for research on Alzheimer's disease (+$400 million), the Brain Research through Advancing Innovative Neurotechnologies (BRAIN; +$110 million), and research into antibiotic resistance (+$50 million). The budget of each institute and center will also increase over FY 2016 levels.

National Science Foundation

With a modest $9 million increase (+0.13%), the NSF budget is essentially held flat at the FY 2016 funding level. The total funding level for the agency is $7.472 billion. The additional $9 million is directed to the large facilities account at NSF, with the research and education directorates held flat. The legislation also directs NSF to build three new research ships but falls short on providing the necessary funds to get construction underway.

NASA

The omnibus provides NASA with a budget increase of $368 million (+1.9%), for a total of $19.653 billion. This includes a 13% increase for the planetary science budget and additional funding for the Mars 2020 rover program.

Prospects for FY 2018

With work on FY 2017 budgets now complete, Congress is now turning its attention to FY 2018 funding bills. The Trump Administration's first budget proposal that was released on May 23, 2017 recommends cutting NIH funding by 20% and NSF funding by 11%. Prominent members of Congress from both parties have declared this proposal untenable, but researchers also need to remind their own Senators and Representatives why investing in biomedical research is important and how it helps people living in their own states and districts. To keep up with the latest news from Washington, with a focus on how you can be a research advocate, sign up for the monthly newsletter *Science Policy News* by sending an e-mail to *sciencepolicy@the-aps.org*. ●

APS Urges Congress to Reject Trump Plan to Cut Research Funding

On May 23, 2017, the Trump administration released its FY 2018 budget proposal calling for large cuts to research at the NIH, NSF, NASA, and VA. The APS calls on members of Congress to reject these huge and damaging cuts to research. Not only would this curtail scientific progress, it would also be devastating to our nation's scientific enterprise and biomedical workforce.

Funding for biomedical research is a non-partisan issue. Champions in Congress from both parties have worked together for decades to foster research in the U.S. and the proposed cuts would reverse recent increases provided by leaders in Congress. We call on these champions to continue their commitment to the sciences by rejecting the administration's proposal.

President Trump's budget plan would:

- Cut NIH by 21% (-$7.16 billion) [*https://www.hhs.gov/sites/default/files/fy2018-budget-in-brief.pdf* (p. 36)] by eliminating the Fogarty International Center, making NIH absorb the cost and function of the Agency for Healthcare Research and Quality (AHRQ), and capping the indirect cost reimbursements at 10% of total research costs [*https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/budget/fy2018/msar.pdf* (p. 43)].
- Cut NSF by 10.7% (–$800 million) by reducing every major budget category including Research and Related Activities and Education and Human Resources (*https://www.nsf.gov/about/budget/fy2018/pdf/03_fy2018.pdf*).
- Reduce NASA's overall budget by 3%, from $19.65 billion to $19.1 billion (*https://www.nasa.gov/sites/default/files/atoms/files/fy_2018_budget_estimates.pdf*).
- Cut VA medical and prosthetic research by 5%, from $673 million to $640 million [*https://www.va.gov/budget/docs/summary/fy2018VAbudgetVolumeIImedicalProgramsAndInformationTechnology.pdf* (beginning on p. 419)].

These ill-advised cuts would threaten both the health of all Americans and the U.S. economy as a whole. Our nation depends on an educated workforce to drive innovation in both the public and the private sectors. Dollars invested in scientific research fuel our economy by employing skilled workers, purchasing supplies, and creating intellectual property. At a time when other nations are increasing their investments in research, the U.S. needs to maintain and grow research capacity or risk losing out in a competitive global marketplace. ●

NIH Announces Initiative to Fund Early and Mid-Career Researchers

On June 8, 2017, the NIH leadership announced an initiative aimed at increasing grant support for early stage (ESI) and vulnerable mid-career investigators. The Next Generation Researchers Initiative (NGRI) replaces an earlier plan to limit the number of grants per investigator and was first presented at a meeting of the NIH Advisory Committee to the Director.

The earlier plan was introduced on May 2 and sparked controversy because it would have limited the number of NIH grants an individual could hold. Although there is broad agreement that both early stage investigators (ESIs) and mid-career researchers with only one grant are in a precarious position, there were objections to NIH's plan to rectify the problem. The earlier plan would have made it difficult for individuals to hold more than the equivalent of three single-PI R-01 grants. Grant-equivalents were to be determined using a new Grant Support Index (GSI) that measured PI's effort rather than actual funding. The three-grant limit was based on data suggesting that marginal scientific productivity leveled off for individuals who held more than three awards. NIH estimated that, by capping grant support, it would have enough money to fund an additional 1,600 awards. However, concerns were raised about how this measure might impact team science, complex trials, research networks, and support for infrastructure and training, and NIH decided to withdraw that proposal and replace it with the NGRI.

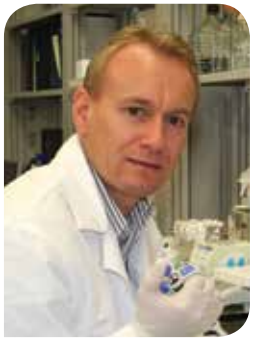
The NGRI aims to fund most ESI applications to the 25th percentile and extend the payline for mid-career investigators at risk of losing all NIH funding as well as those who just missed the payline for their second RPG. The policy is to be implemented immediately, so some applicants whose grants scored in the fundable range but did not receive funding may be funded after all.

The total cost of these measures is estimated at $210 million in the first year and may increase to $1.1 billion in 5 years, depending on the trajectory of the NIH budget as a whole. The NIH leadership did not identify a source for these funds. Rather, ICs will be expected to readjust their priorities to ensure that these investigators are funded. NIH also plans to track the outcome of funding decisions for early and mid-stage investigators with fundable scores to monitor implementation of the policy.

For more details, see the message posted by NIH Director Francis Collins (*https://www.nih.gov/about-nih/who-we-are/nih-director/statements/launching-next-generation-researchers-initiative-strengthen-biomedical-research-enterprise*) on June 8 and the NGRI webpage (*https://grants.nih.gov/ngri.htm*). ●

People and Places

Meet the New Committee Chairs



Eric D. Lazartigues, International Physiology Committee Chair

Eric D. Lazartigues

Louisiana State University Health Sciences Center-New Orleans School of Medicine

Eric D. Lazartigues received his Bachelor of Sciences in 1993 from the University Paul Sabatier of Sciences in Toulouse, France. His Master of Cardiovascular Sciences was awarded in 1994 from the University of Pharmacy Claude Bernard of Lyon, France. He received his PhD in Pharmacology from the University Paul Sabatier of Sciences in Toulouse in 1999. He completed his postdoctoral work at the University of Iowa School of Medicine in the Department of Anatomy & Cell Biology under the mentorship of Robin L. Davisson. During that time, he worked on the role of the renin-angiotensin system in the central regulation of blood pressure. He then focused on a new component of the renin angiotensin, ACE2 (angiotensin-converting enzyme type 2), in the brain and later in the pancreas. He joined the Department of Pharmacology at LSU Health Sciences Center in August 2005 and was promoted to associate professor with tenure in July 2011. In May 2014, Lazartigues was joint-appointed to the Neurosciences Center of Excellence. He was promoted to professor with tenure in July 2015. His group published several studies highlighting the compensatory role of ACE2 in hypertension and also in Type 2 diabetes. More recently, Lazartigues' group identified several transcription factors involved in ACE2 expression and posttranslational mechanisms contributing to ACE2 downregulation in disease states. Lazartigues has been a member of the APS since 2000 and served on the Awards Committee, the Porter Physiology Committee, and the International Committee. He is also the current chair of the Neural Control and Autonomic Regulation section of the APS. ●

Laura R. McCabe, Science Policy Committee Chair

Laura R. McCabe

Michigan State University

Laura R. McCabe, Professor in the Department of Physiology and Director of the Michigan State University (MSU) Beckman Scholar Program, received her BA and PhD from University of Chicago. After her PhD training in intestinal physiology, she focused her postdoctoral research on molecular mechanisms regulating bone formation at University of Massachusetts Medical Center. Her current research focuses on identifying osteoporosis therapeutics that target the gut. McCabe has published more than 80 manuscripts and has had continuous federal funding for 20 years. Since arriving at MSU, she has been active in teaching and training undergraduate, graduate, professional, and postdoctoral students, and participates in several training programs on campus, including Beckman Scholar, McNair/SROP, BEST, Dual-Degree, and Cell and Molecular Biology programs, and serves as an advisor to the MSU Council of Graduate Students. She also serves on numerous external and MSU interdisciplinary advisory groups, and in the leadership of MSU academic governance. McCabe has contributed to science policy initiatives through local and national advocacy efforts since 2004, including serving as the faculty institutional representative to the Federal Demonstration Partnership (2012-present) and as a member of the APS Science Policy Committee (2014-2017) and Science Policy Committee Chair (2017-present). ●

David M. Pollock, Conference Committee Chair

David M. Pollock

University of Alabama at Birmingham

David Pollock is the James A. Schafer NRTC Endowed Professor of Medicine in the Division of Nephrology at the University of Alabama at Birmingham. He serves as Director of the Section of Cardio-Renal Physiology and Medicine. Pollock earned his PhD in physiology from the University of Cincinnati and a postdoctoral fellowship at the University of North Carolina at Chapel Hill. He then spent 2 years as a senior scientist at the Institute for Circadian Physiology at Harvard University. In 1989, he took a position in the Drug Discovery Division of Abbott Laboratories in Chicago. In 1995, Pollock accepted a faculty position at the Medical College of Georgia (now known as Augusta University), where he served as a faculty member in the Vascular Biology Center and eventually led the establishment of the Experimental Medicine Section in the Department of Medicine. Pollock moved to his current position at the University of Alabama at Birmingham in January 2014.

Pollock's research, largely focusing on mechanisms of endothelin control of renal hemodynamics and excretory function, has been continuously supported by a series of National Institutes of Health and American Heart Association grants. Pollock has received a number of honors and awards for his research contributions, including the Louis K. Dahl Award for hypertension research from the AHA in 2013 and the Ernest Starling Lecture from the APS Water and Electrolyte Section in 2016.

Pollock has been very active in service to APS, including service on the Career Opportunities Committee, the Liaison with Industry Committee, Committee on Committees, APS Council, as well as several posts within the APS Renal Section. He served a 6-year term as associate editor for *AJP – Regulatory, Integrative and Comparative Physiology* and is currently editor-in-chief of *Comprehensive Physiology*. He recently served as the 87th President of APS. Pollock has also been very active in organizing numerous scientific conferences. He is a founding member of the International Advisory Board for the Endothelin Conferences and previously served on the APS Conference Committee, as well as on the FASEB Summer Conference review committee. ●

Irving H. Zucker, Ray G. Daggs Committee Chair

Irving H. Zucker

University of Nebraska Medical Center in Omaha

Irving H. Zucker is the Theodore F. Hubbard Professor of Cardiovascular Research and chairman of the Department of Cellular and Integrative Physiology and Cardiology at the University of Nebraska Medical Center in Omaha, Nebraska. He has been chairman since 1989. Zucker received his PhD from New York Medical College in 1972. He continued his postdoctoral training at the University of Nebraska Medical Center, where he became a faculty member in 1973. Zucker has been involved in studies related to the neural regulation of cardiovascular function over the past 45 years. His studies have revolved around cardiovascular reflex control of sympathetic nerve activity in animal models of chronic heart failure. These investigations focus on the role of central mediators of sympathetic nerve activity such as angiotensin II, nitric oxide, and oxidative stress. Zucker has published over 200 papers in this field, and this work has been continuously funded by the National Institutes of Health, the American Heart Association, and industry. He is the PI of a Program Project Grant currently in its 17th year of funding. He has been the recipient of a MERIT Award from the NHLBI, an Established Investigator Award from the American Heart Association, the Wiggers Award from the Cardiovascular Section of the American Physiological Society, and the Carl Ludwig Award from the Neural Control and Autonomic Regulation Section of the American Physiological Society. In 2015, he received the Lifetime Achievement Award from the International Academy of Cardiovascular Sciences. In 1993, he received the Outstanding Research and Creative Activity Award from the University of Nebraska. He serves on the editorial boards of nine journals. In addition to his research, Zucker has been and is currently active in administrative activities for the American Physiological Society and the

American Heart Association. He was a member of the National Research Committee of the American Heart Association. He is currently editor-in-chief of the *AJP – Heart and Circulatory Physiology*. He is a Past-President of the Association of Chairs of Departments of Physiology and a Past-President of the American Physiological Society. ●

Alan Hargens Receives NASA Distinguished Public Service Medal

Alan Hargens

APS member Alan Hargens was awarded the NASA Distinguished Public Service Medal last month. The medal is NASA's highest form of recognition for a non-government employee or an individual not employed by the government when his or her distinguished service was performed. Hargens is a professor of orthopedics at the University of California, San Diego, and has studied spaceflight-induced adaptations of the cardiovascular and musculoskeletal systems for more than 30 years. Working with scientists worldwide, Hargens has served as principal investigator and co-investigator for numerous NASA-funded experiments, including how spaceflight-induced fluid shifts might contribute to vision impairment and the year-long TWINS study. ●

Bishr Omary Named University of Michigan's Chief Scientific Officer

Bishr Omary

APS member Bishr Omary has been named chief scientific officer at the University of Michigan. Omary is also the H. Marvin Pollard Professor of Gastroenterology in the Department of Internal Medicine and previously served as chair of the Department of Molecular and Integrative Physiology, a position he held since 2008. "In his new role as CSO at U-M, Omary will work closely with key stakeholders to develop and implement a robust strategy to foster excellence in biomedical research and clinical translation to improve disease prevention and treatment, in addition to promoting fundamental basic science research." Read more on the University of Michigan Medicine Headlines website (*https://umhsheadlines.org/2017/04/omary-named-chief-scientific-officer/?utm_campaign=Newsletter&utm_source=Newsletter_20170421&utm_medium=email*). ●

New Medical College of Georgia Endowed Chair Honors Virendra Mahesh

Virendra Mahesh

In April, the Board of Regents of the University System of Georgia approved the establishment of the Virendra B. Mahesh Distinguished Chair in Neuroscience. The chair honors Mahesh, Regents Professor and Chairman Emeritus at the Medical College of Georgia (MCG) at Augusta University. He served as chairman of the Department of Endocrinology from 1972 to 1986 and of the Department of Physiology and Endocrinology from 1986 to 1999. "The chair will support a faculty member who conducts state-of-the-art basic science research in the MCG Department of Neuroscience and Regenerative Medicine," according to a press release on the MCG website. "Appointment to an endowed position is intended to be MCG's most prestigious recognition of continuing scholarly achievement and distinction." Read more at *https://jagwire.augusta.edu/archives/44107*. ●

Martin Frank Recognized by University of Illinois

Martin Frank

APS Executive Director Martin Frank was profiled in a recent issue of the University of Illinois at Urbana-Champaign School of Molecular and Cellular Biology (MCB) Magazine. Frank received all of his degrees – through his doctorate – from the university. In the article, titled "Illinois Alumni Makes Lasting Mark in Physiology," he discusses his journey into research and how, despite dreams of becoming "a professor in a Midwest town, riding a bicycle to campus with a brown bag lunch in his hand," he came to the helm at APS. Frank also talks about some of the APS programs of which he's most proud. Read the full interview on p. 19 of the MCB Magazine (*https://mcb.illinois.edu/magazine/MCB10.pdf*). ●

Yale Goldman Elected to NAS

Yale Goldman

APS Member Yale Goldman (University of Pennsylvania) has been elected to the National Academy of Sciences, one of the highest honors accorded a U.S. scientist or engineer. Selected for his "distinguished and continuing achievements in original research," Goldman is a member of the 2017 Academy class of 84 members and 21 foreign associates.

The National Academy of Sciences is a private, nonprofit institution that was established under a congressional charter signed by President Abraham Lincoln in 1863. It recognizes achievement in science by election to membership, and – with the National Academy of Engineering and the National Academy of Medicine – provides science, engineering, and health policy advice to the federal government and other organizations.

Goldman is a professor of physiology, former director of the Pennsylvania Muscle Institute, and associate director of the Nano/Bio Interface Center. His laboratory is widely known for its studies of molecular motors and protein synthesis. For these studies, he has developed and built several new biophysical devices to track single fluorescent molecules using laser tweezers and total internal fluorescence microscopes. He has received many honors in his career: the Upjohn Achievement Award and a Lindback Foundation Award for Distinguished Teaching from Penn; a Muscular Dystrophy Association Research Fellowship; a National Research Service Award and Research Career Development Award from the National Institutes of Health (NIH); Bowditch Lecturer of the American Physiological Society; Lamport Lecturer of the University of Washington, School of Medicine; and Distinguished Speaker for Graduate Student Research Forum, University of Cincinnati. Goldman was also a former president of the Biophysical Society. ●

Susan Margulies

Susan Margulies Named Chair and Eminent Scholar

Susan Margulies has been named the Wallace H. Coulter Chair of the Coulter Department of Biomedical Engineering (BME) at Georgia Tech and Emory University and a Georgia Research Alliance Eminent Scholar in Injury Biomechanics. Margulies is currently professor of bioengineering at the University of Pennsylvania. Her appointments are effective August 1. Read more at *https://coe.gatech.edu/news/new-chair-named-coulter-department-biomedical-engineering-georgia-tech-and-emory-university*. ●

Membership

New Regular Members

***transferred from student membership**

Egor Akimov
CXC Skiing, Verona, WI

Oleg Alekseev
Campbell Univ., Lillington, NC

Dianne Baker
Univ. of Mary Washington, Fredericksburg, VA

Yerko Berrocal
Univ. of Illinois, Coll. of Med., Peoria, IL

Om Lata Bhagat
All India Inst. of Med. Sci.-Jodhpur, Jodhpur, India

Dawn M. Blitz
Miami Univ., Oxford, OH

Robert S. Bowen
Truett McConnell Univ., Cleveland, GA

Lemuel Brown
Univ. of Michigan, Ypsilanti, MI

Rochelle Buffenstein
Calico Life Sci., South San Francisco, CA

Matteo Cerri
Univ. of Bologna Bologna Italy

Simon Gabriel Comerma-Steffensen
Aarhus Univ./Central Univ. of Venezuela, Aarhus, Denmark

Emily Dunford
McMaster Univ., Hamilton, ON, Canada

Selcuk Onur Onur Duygu
Ozel Kent Hastanesi, Izmir, Turkey

Kristin Shirey Edwards
Univ. of Mississippi Med. Ctr., Jackson, MS

Stacey D. Finley
Univ. of Southern California, Los Angeles, CA

Victoria Fischer
CUNY Hunter Coll., Sound Beach, NY

Kyle Flannigan
Univ. of Calgary, Calgary, AB, Canada

Gina L. J. Galli
Univ. of Manchester, Manchester, United Kingdom

Joseph Gigliotti
Liberty Univ., Lynchburg, VA

Evanna L. Gleason
Louisiana St. Univ., Baton Rouge, LA

Alexis Antonio Gonzalez
Pontifica Univ. Catholica De Valparaiso, Valparaiso, Chile

Troy Herter
Univ. of South Carolina, Columbia, SC

Robert L. Hesslink
Pioneer Pacific Coll., Damascus, OR

Richard L. Hyson
Florida State Univ., Tallahassee, FL

David H. Jang
Univ. of Pennsylvania, Philadelphia, PA

Younggeon Jin
NC State Univ. Coll. of Veterinary Med., Raleigh, NC

Michiko Jo
Univ. of Toyama, Toyama, Japan

Simon Keely
Univ. of Newcastle, Callaghan, Australia

Cassandra M. Kelleher
Massachusetts Gen. Hosp., Boston, MA

Jinu Kim
Jeju National Univ. Sch. of Med., Jeju, Republic of Korea

Supaporn Kulthinee
Tulane Univ., New Orleans, LA

Scott Leiser
Univ. of Michigan, Ann Arbor, MI

He Liu
Gannon Univ., Erie, PA

Jeffrey Charles Louie
Canadian Sport Inst.-Ontario, Toronto, ON, Canada

Alice E. McGovern
The Univ. of Melbourne, Parkville, Australia

Zesergio Melo
CONACyT-Centro de Investigacion Biomedica de Occidente, Mexico City, Mexico

Mihail I. Mitov
Univ. Kentucky, Lexington, KY

David Justin Moore
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Corrigendum

Table 1d in last year's "Association of Chairs of Departments of Physiology 2015 Survey Results" (*The Physiologist* 59: 165, 180-184, 2016; *http://www.the-aps.org/mm/Publications/Journals/Physiologist/Archive/2016-Issues/July-2016-Vol-59No-4/Association-of-Chairs-of-Departments-of-Physiology-2015-Survey-Results*) had incorrect numbers. The corrected table is shown below.

For your faculty, what is the average number of hours of student contact (per year) for:

	Student Type	Average (hours)	Number (inst.)
Lab Hours	Graduate	436	32
	Medical	70	27
	Other	303	11
Lectures	Graduate	101	45
	Medical	45	43
	Other	133	26
Small Group Discussions	Graduate	46	31
	Medical	25	40
	Other	50	14

Publications

Current Calls for Papers

Physiological Genomics

- Omic Approaches to Understanding Muscle Biology
  Submission deadline: November 30, 2017
- Genetics of Metabolic Syndrome

Journal of Neurophysiology

- Working Memory: Neural Mechanisms
  Submission deadline: December 31, 2017
- 50 Years of Microneurography: Insights into Neural Mechanisms in Humans
  Submissions deadline: December 31, 2017
- Control of Coordinated Movements
  Submission deadline: December 31, 2017

Advances in Physiology Education

- Historical Perspectives and Living Histories

American Journal of Physiology – Endocrinology and Metabolism

- Role of Gut Microbiota and Gut-Brain and Gut-Liver Axes in Physiological Regulation of Inflammation, Energy Balance, and Metabolism
  Submission deadline: September 30, 2017
- Role of Fetal Programming and Epigenetic Regulation on the Development of Endocrine and Metabolic Alterations
  Submission deadline: September 30, 2017
- 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: September 30, 2017
- Mechanisms of Effects on Sleep Disruption on Adipocyte/Obesity Metabolism and Their Relation to Other Metabolic Disease
  Submission deadline: September 30, 2017
- Metabolism and Signaling Functions of Amino Acids in the Regulation of Cell/Tissue Function in Health and Disease
  Submission deadline: September 30, 2017
- Role of Adipose Tissue Nutrient/Vitamin Metabolism in Physiological and Altered Metabolic Settings
  Submission deadline: September 30, 2017
- Endocannabinoids and Cannabinoid Receptors as Regulators of Endocrine Functions and Tissue Metabolism
  Submission deadline: September 30, 2017
- Role of Myokines and Adipokines and Other Cross-Talk Mechanisms of Regulation of Endocrine and Metabolic Functions
  Submission deadline: September 30, 2017
- Mitochondria Dysfunction in Aging and Metabolic Diseases
  Submission deadline: September 30, 2017

American Journal of Physiology – Gastrointestinal and Liver Physiology

- Mechanisms of Host and Microbiome Interactions
  Submission deadline: December 1, 2017
- Appetite, Satiation, and Obesity
  Submission deadline: December 1, 2017
- Gastrointestinal Motor, Secretory, and Sensory Functions
  Submission deadline: December 1, 2017
- Gastrointestinal Aging
  Submission deadline: December 1, 2017
- Enteric Nervous System Interactions
  Submission deadline: December 1, 2017
- Gastrointestinal and Liver Development and Organogenesis
  Submission deadline: December 1, 2017
- Immune Mechanisms of Gastrointestinal Cancer
  Submission deadline: December 1, 2017

American Journal of Physiology – Heart and Circulatory Physiology

- Advances in Cardiovascular Geroscience
  Submission deadline: September 30, 2017
- miRNA Regulation of the Mitochondrion in Cardiovascular Disease
  Submission deadline: August 31, 2017

American Journal of Physiology – Lung Cellular and Molecular Physiology

- Electronic Cigarettes: Not All Good News?
  Submission deadline: October 1, 2017
- Ion Channels and Transporters in Lung Function and Disease
- Age-Related Dysfunction in Lung Barrier Function in Health and Disease

American Journal of Physiology – Regulatory, Integrative and Comparative Physiology

- G Protein-Coupled Receptor Signaling in Metabolic Disease
  Submission deadline: December 31, 2017
- Oxygen Signaling
  Submission deadline: December 31, 2017

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

News From Distinguished Physiologists

Letter to Claude Bouchard

Henry Jay Forman writes: "Thank you for the invitation to share a bit with the society as I approach my 70th birthday. I have had the privilege of a successful career in science and the good fortune to be able to continue as an NIH-funded investigator, which I plan to do for a few more years.

"I began my career in chemistry and biochemistry with an emphasis on redox biology, and still consider those as my primary fields. My over 200 peer-reviewed publications and other contributions led to me receiving two major awards last year from the Society for Free Radical Research-Europe and the Society for Redox Biology and Medicine. I also had the honor of serving as president of the latter society. I've written a personal view of the history of redox biology that was published last year (Forman HJ. Redox signaling: an evolution from free radicals to aging. *Free Radic Biol Med* 97: 398-407, 2016).

"But I have been an APS member for quite some time and served for a couple of years on the Scientific Policy Committee. How I became a physiologist and how that helped my career is what I will relate here. My early career was very successful in terms of publishing some of the early work on superoxide dismutase and the co-discovery of superoxide production by mitochondria. But career opportunities during the Vietnam War and family problems caused me to look for a new position. I was fortunate to be offered a research-track position in the Department of Physiology at the University of Pennsylvania by Aron Fisher, who also continues to be very active and will be 81 on the same day I turn 70. Coincidentally, April 20th was also the birthday of my graduate advisor and several other people important in my life.

"Back to physiology. Aron was interested in my work because he was investigating pulmonary oxygen toxicity. Together, we published many studies that contributed to understanding the mechanisms of injury and antioxidant defenses. I learned a great deal from Aron, including how to set up an isolated perfused lung and isolate type II alveolar epithelial cells. But the excellent environment in the department also exposed me to the concept of thinking more about function, and I began to look at how oxidants altered cell function rather than how oxidants killed organisms, which had been the primary approach in the field.

"This focus on alteration in cell function by oxidants became one of the central topics as I moved from Penn to the University of Southern California, then onto UAB as Chair of Environmental Health Sciences. Our early studies revealed that altered calcium signaling played a central role in altered cell function. Nonetheless, determination of the lowest concentrations of hydroperoxides that inhibited the ability of alveolar macrophages to be stimulated to produce the respiratory burst led to the discovery that, at low concentration, hydroperoxides increased rather than inhibited this cell function. But realizing that the cells we were studying also produced hydrogen peroxide led to what is probably the first study reporting the activation of NF-κB by endogenously produced hydrogen peroxide. Previous studies and many continuing today add hydrogen peroxide to cells, which may or may not mimic physiologically relevant events.

"My research has continued to be influenced by the focus on cell function. It has moved further into mechanisms of redox signaling and regulation of antioxidant defenses. Recently, my colleagues and I have been thinking more about redox homeostasis, basing our ideas on those of Claude Bernard. Thus physiology continues to influence our work.

"My first exposure to physiology teaching was sitting in on the lectures to medical students at Penn. The next 2 years, I participated in small group sections with the medical students. I thought that would be the end of my teaching physiology, and I returned to teaching biochemistry. But when I moved to the School of Pharmacy at USC, I was asked to organize a combination physiology, histology, and anatomy course, which I did for several years. Then, for about a decade, I taught biochemistry again. As a founding faculty member of the University of California at Merced, there was need for another person to teach organic chemistry, which I did for 7 years. During that time, there was one week I taught both muscle physiology (due to absence of the instructor) and mechanisms of the Diels-Alder reactions, a truly unique experience.

"Now, having retired from teaching, I am busy with research on the mechanisms underlying the increased susceptibility in aging to inflammation caused by air pollution. I also am editing a journal. But I've also found some time to write two murder mysteries. Physiology helps with that too in multiple ways. My wife Alexia, a librarian, and I like to travel. We also enjoy having our daughter, Victoria, living close by.

"I will finish by stating that learning and incorporating physiology into other areas of biological research is of great value, and I encourage all biochemists and molecular biologist to do so." ●

Positions Available

Assistant Professor: The Georgetown University Medical Center Department of Pharmacology & Physiology is seeking qualified candidates for a position at the level of assistant professor on the medical educator track (non-tenure track). The position would start June 1 or July 1, 2017. Applicants should hold a PhD, MD, or DO degree and be seeking an academic teaching and administrative position working with outstanding graduate programs. The applicants should demonstrate the ability to teach graduate-level physiology (with experience in teaching neurophysiology and other physiology disciplines). Recent graduates with appropriate experience will be considered. Candidates should have organizational or student-advising experience that will position them for a robust career in teaching, administration, and scholarship in graduate education. The department provides a highly supportive environment for mentorship and faculty development. Prospective candidates should submit the following by e-mail: letter of interest; personal statement including previous experience and teaching evaluations (student and peer, if available); curriculum vitae; names, e-mail addresses, and phone numbers of three professional references. Please e-mail all materials to Ms. Katie Helgeson (*kmh274@georgetown.edu*). For further information about our programs, please visit *http://pharmacology.georgetown.edu/ms_physiology.html#_ga=1.162595516.168188162.1389295773*. Georgetown University is committed to affirmative action and equal opportunity through excellence and diversity. Applications from women and minorities are particularly welcome.

Assistant/Associate Professor: The Department of Health and Exercise Science is seeking applications for TWO faculty positions: both at the assistant or associate professor level commensurate with experience. The 9-month tenured/tenure-track appointments will begin between January 1 and August 15, 2018. *Position responsibilities.* Applicants are sought who have expertise in integrative/applied physiology (including metabolic and cardio-pulmonary regulation, and/or skeletal muscle or adipose biology) that complement or broaden our existing research strengths in aging and chronic disease (e.g., diabetes, cardiovascular disease, cancer, multiple sclerosis). The successful candidates are expected to establish and/or maintain an existing nationally recognized, externally funded research program, and to integrate their research into current and new academic courses. The successful candidates will have outstanding departmental support, strong research infrastructure, excellent departmental colleagues, and potential for collaborative and translational opportunities within the department and with relevant units on and off campus. *Colorado State University.* Inspired by its land-grant heritage, Colorado State University is committed to excellence, setting the standard for public research universities in teaching, research, service, and extension. CSU is a Carnegie Research university (very high research activity) and has been designated a Carnegie Community Engagement university. According to a National Science Foundation report on research universities, CSU ranks second in the nation among public research universities without a medical school. *The Department of Health and Exercise Science.* Faculty in the Department of Health and Exercise Science conduct innovative research in state-of-the-art facilities, with an emphasis on basic, translational, and clinical applications in the area of chronic and age-related diseases. We are committed to our goal of producing nationally and internationally recognized research programs and graduates that focus on helping people protect and improve their health and quality of life throughout the lifespan. The department has ~1,300 undergraduate majors, ~30 MS and PhD students, and 22 tenure-track, tenured, and special appointment faculty. Research activities within the department are supported by NIH, DARPA, the American Heart Association, the American Diabetes Association, the National Dairy Council, National Multiple Sclerosis Society, and other federal, state, and industry sponsors. The Human Performance Clinical/Research Laboratory, designated as a CSU Program of Research and Scholarly Excellence since 2008, is a center for interdisciplinary research, training, and outreach. Department faculty collaborate with and/or have academic or affiliate appointments in several schools, departments, and centers, including the Center for Healthy Aging, Biomedical Sciences, Food Science and Human Nutrition, the Center for Cardiovascular Research, the Colorado School of Public Health, the Prevention Research Center, the School of Biomedical Engineering, and the Veterinary Teaching Hospital. Faculty also collaborate with the University of Colorado Health-North, University of Colorado Anschutz Medical Campus in Denver, and the Rocky Mountain Cancer Rehabilitation Institute at the University of Northern Colorado in Greeley. To

learn more about the Department, visit our website at *http://www.hes.chhs.colostate.edu/*. *Applicant qualifications. Required qualifications:* earned research doctorate or medical degree (e.g., MD or DO, with appropriate post-degree training) in Health and Exercise Science, Biomedical Sciences, Kinesiology, Integrative/Applied Physiology or related field. *Preferred qualifications:* minimum of 2 years postdoctoral training, previous tenure-track appointment, or comparable research faculty appointment (exceptional candidates without the foregoing preferred qualifications will be considered). Demonstrated ability/promise to attract external funding related to integrative/applied physiology that strengthens/broadens our current research areas. Strong record of dissemination of scholarly work. Commitment to participate in an innovative curriculum for undergraduate and graduate-level students. Reflecting departmental and institutional values, candidates are expected to have the ability to advance the Department's commitment to collegiality, collaboration, diversity and inclusion. *To be competitive at the Associate Professor Level. Additional preferred qualifications:* Active, sustainable, extramurally funded research program related to integrative physiology that strengthens/broadens our current research areas (i.e., current funding via an NIH R01 or equivalent multi-year, renewable mechanism). Record of successful graduate student research mentorship. Strong record of dissemination of scholarly work. University-level teaching experience or evidence of teaching effectiveness in related venues. Strong interest in mentoring junior faculty in similar research areas and providing leadership in a growing department. Service at the national level in appropriate professional organizations. *Colorado State University and Fort Collins Communities.* Colorado State University is located in Fort Collins, which is nestled against the foothills of the Rocky Mountains just 1 hour north of the Denver metropolitan area. With a population of approximately 160,000, Fort Collins has been cited by *Money Magazine* as one of the "Best Places to Live in the United States," is one of five cities with Platinum rating by the League of American Bicyclists, and is consistently rated as one of the healthiest, well-educated, and best places to retire in the U.S. Fort Collins has excellent public schools; numerous cultural offerings; an extensive network of parks, bike trails, and open space; and a reported annual average of over 300 days of sunshine. Visit *http://www.fcgov.com* for more details. *Application process.* To apply, submit the following application materials directly to the posting at *https://jobs.colostate.edu/postings/44592*: *1)* a letter of application addressing the required and preferred qualifications of the position, *2)* a curriculum vita, and *3)* names and contact information for three professional references. References will be contacted automatically via e-mail and will be requested to submit a letter on your behalf. Questions about the application process should be directed to Bret Ellis at *bret.ellis@colostate.edu*. Questions regarding the nature of the position(s) should be directed to the Search Chair, Dr. Frank Dinenno at *frank.dinenno@colostate.edu* or by phone at (970) 491-3203. Colorado State University (CSU) strives to provide a safe study, work, and living environment for its faculty, staff, volunteers, and students. To support this environment and comply with applicable laws and regulations, CSU conducts background checks. The type of background check conducted varies by position and can include, but is not limited to, criminal (felony and misdemeanor) history, sex offender registry, motor vehicle history, financial history, and/or education verification. Background checks will be conducted when required by law or contract and when, in the discretion of the university, it is reasonable and prudent to do so. Colorado State University is committed to providing an environment that is free from discrimination and harassment based on race, age, creed, color, religion, national origin or ancestry, sex, gender, disability, veteran status, genetic information, sexual orientation, gender identity or expression, or pregnancy and will not discharge or in any other manner discriminate against employees or applicants because they have inquired about, discussed, or disclosed their own pay or the pay of another employee or applicant. Colorado State University is an equal-opportunity/equal-access/affirmative-action employer fully committed to achieving a diverse workforce and complies with all Federal and Colorado State laws, regulations, and executive orders regarding non-discrimination and affirmative action. The Office of Equal Opportunity is located in 101 Student Services.

Postdoctoral Fellow: A postdoctoral research position is available at the University of Oregon in Eugene, OR in the Obesity & Metabolism Research Laboratory directed by Carrie McCurdy, PhD, to study nutrient and inflammatory regulation of adipose tissue metabolism and systemic insulin sensitivity. The research position

will focus on interrogation of signal transduction pathways and regulation of gene expression that facilitate activation of the inflammatory profile in response to nutrient excess. Research will be conducted in novel transgenic mouse models and adipocyte cell culture models. Specific techniques related to this project will include, but are not limited to, analysis of cellular signaling by flow cytometry, immunoblotting, qPCR, as well as more advanced molecular techniques to identify novel protein-protein interaction, microscopy, and gene transcriptional activation. *Required qualifications.* The ideal candidate is exceptionally motivated, creative, and committed to scientific discovery. The individual should have a strong academic training in biochemistry, and molecular and cell biology with a PhD degree or equivalent in a biological science. The position requires a PhD prior to employment. The successful applicants will have knowledge and experience with molecular and genetic methods to complement and advance the ongoing research in the Obesity & Metabolism Laboratory. Evidence of fluency in written and spoken English and the ability to work as part of a research team are essential. The successful candidates will be able to work independently and as a member of a research team. *Preferred qualifications.* Demonstrated ability to work independently. Requires strong skills in molecular biology, cell culture, and/or microscopy. Experience in metabolism- or obesity-related research. *How to apply.* Applications will be routed through the UO Human Physiology Postdoctoral Scholars applicant pool. Please submit application materials by e-mail to *hphyresearch@uoregon.edu* with "McCurdy Postdoc" in the subject line. Application material should include a cover letter detailing your specific interest in the position, your research accomplishments, and your skills/experience that directly relate to this position, a CV, and three (3) professional references, including the institution, phone number, and e-mail address for each reference. Please direct any question regarding the position to Carrie McCurdy at *cmccurd5@uoregon.edu*. The link to the pooled Post-Doc ad no. 150408 is on the UO Jobs Page at *http://jobs.uoregon.edu/unclassified.php?id=5124*. 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.

Postdoctoral Fellow: A postdoctoral research position is available at the University of Oregon in Eugene, OR in the Obesity & Metabolism Laboratory (directed by Carrie McCurdy, PhD) to investigate mechanisms of metabolic programming in skeletal muscle of offspring exposed to an obesogenic fetal and early life environment. This research will focus on mitochondrial function, substrate utilization, and insulin action. Research will be conducted in muscle tissues collected from Japanese macaques in collaboration with Oregon National Primate Research center in Beaverton, OR and primary muscle cell culture. Analytical techniques will include mitochondrial and metabolic phenotyping using high-resolution respirometry, enzyme kinetic assays, radioisotope assays for glucose uptake and substrate oxidation, analysis of signal transduction pathways by immunoblotting and qPCR, as well as more advanced analysis of metabolomics, RNAseq, and epigenetics. *Required qualifications.* The ideal candidate is exceptionally motivated, creative, and committed to scientific discovery. The individual should have a strong academic training in biochemistry, and molecular and cell biology, with a PhD degree in a biological science. The position requires a PhD prior to employment. The successful applicant will have knowledge and/or experience with molecular and metabolic methods to complement and advance the ongoing research in the Obesity & Metabolism Laboratory. Fluency in written and spoken English and the ability to work as part of research team are essential. The successful candidates will be able to work independently and as a member of a research team. *Preferred qualifications.* Experience in mitochondrial bioenergetics. Experience in primary cell culture. *How to apply.* Applications will be routed through the UO Human Physiology Postdoctoral Scholars applicant pool. Please submit application materials by e-mail to *hphyresearch@uoregon.edu* with "McCurdy Postdoc" in the subject line. Application material should include a cover letter detailing your specific interest in the position, your research accomplishments, and your skills/experience that directly relate to this position, a CV, and three (3) professional references, including the institution, phone number, and e-mail address for each reference. Please direct any question regarding the position to Carrie McCurdy at *cmccurd5@uoregon.edu*. The link to the pooled Post-Doc ad no. 150408 is on the UO Jobs Page at *http://jobs.uoregon.edu/unclassified.php?id=5124*. 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.

Postdoctoral Fellow: The Penn State Hershey Heart and Vascular Institute has an open postdoctoral research position in the laboratory of Dr. Jianhua Li. The laboratory uses multidisciplinary approaches to study sympathetic and cardiovascular responses to muscle afferent inputs and neural mechanisms of the response. Studies include investigations into the metabolic and mechanical signals that evoke the exercise pressor reflex in both health and simulated peripheral artery disease. Collaboration and interaction will be encouraged with other investigators in the institute. In vivo rat models are used to perform integrative and electrophysiological studies. The ideal candidate will have a PhD or MD degree in physiology or a related field at the time of appointment. Background in cardiovascular physiology or neurophysiology and experience using patch-clamp methods to record in vitro ion currents in dissociated neuronal cell is preferred. The successful applicant will be expected to participate in all aspects of the research project, including experimental design, data collection, data analysis, preparation of graphs and figures, and preparation of manuscripts. Strong writing and oral communication skills are highly desired. Interested candidates should submit the following to *https://psu.jobs* (job posting no. 69954): a brief cover letter summarizing research interests and career goals; a current curriculum vitae; the names of at least 3 references.

Postdoctoral Fellow: Under the guidance of the Director of the Barbra Streisand Women's Heart Center (Dr. C. Noel Bairey Merz) at the Cedars-Sinai Heart Institute, the candidate will focus on a funded project to study the relationship between coronary microvascular dysfunction and left ventricular diastolic dysfunction in women with ischemic heart disease. Candidates should have the following attributes: *1)* a strong background in integrative (human) physiology, *2)* good communication skills (written/spoken English), *3)* an excellent academic track record, *4)* previous research experience working with human volunteers and/or patients, and *5)* a creative, self-motivated, and team player. A doctorate (PhD, MD) in an area broadly related to the areas of integrative physiology and cardiac research is required. Background in cardiac imaging preferred. Candidates should submit a letter of intent to *debra.krems@cshs.org* outlining their qualifications and career objectives, curriculum vitae, along with names of 3 referees who have agreed to be contacted. Applications will be accepted until the position is filled. Funding is secured for 3 years. Salary will be commensurate with Cedars-Sinai policies.

Postdoctoral Fellow: The Cell and Molecular Physiology Department at Loyola University Chicago has postdoctoral positions immediately available for creative and self-motivated postdoctoral fellows to investigate intracellular ion channels and calcium signaling in cardiac and renal diseases. The position will focus on the interrogation of signal transduction pathways and resultant calcium-contractile responses that underlie non-hypertensive cardiac disorders. Experience in two or more of the following areas is preferred: genetic manipulation, whole-animal physiology, protein-protein interactions, electrophysiology, live cell imaging. The ideal candidate will possess strong oral and written communication skills and the ability to work as part of research team. The duties for the position include working with in vitro and in vivo systems, training new personnel in the laboratory, attending and presenting at scientific meetings, and writing drafts of manuscripts. Successful candidates will be encouraged to design his/her own related experiments, develop new techniques, and develop new collaborations with other researchers. Interested and highly motivated candidates with a PhD/DPhil degree (or near completion of a PhD/DPhil or equivalent) in physiology, pharmacology, biochemistry, molecular biology or a related and relevant field of biomedical sciences should submit a letter of interest to *ikuo@luc.edu* with a detailed CV/biosketch, previous publications, a brief outline of current research, and three letters of recommendation. Salary will be commensurate with relevant experience and based on the prevailing wage for postdoctoral research trainees set by NIH. The position includes an excellent benefits package

Postdoctoral Fellow: An NIH-funded position is available for a postdoctoral fellow in Dr. Lee Quinton's laboratory at the Boston University School of Medicine. Dr. Quinton and his colleagues in the Pneumonia

Biology Group of the BU Pulmonary Center investigate molecular mechanisms controlling immune resistance and tissue resilience in response to respiratory infection. Approaches for doing so include but are not limited to genetic mouse models, ex vivo methodologies, bioinformatics, and more, with the ultimate goal of elucidating cells and signals both inside and outside of the lungs that control pneumonia biology. Dr. Quinton's research program is particularly focused on lung-liver communication during pneumonia, as well as molecular determinants of epithelial barrier integrity. *Dr. Quinton's bibliography: https://www.ncbi.nlm.nih.gov/sites/myncbi/lee.quinton.1/bibliography/40747026/public/?sort=date&direction=descending. BU Pneumonia biology: http://www.bumc.bu.edu/pneumonia/. Eligibility.* This position requires a PhD, MD, or equivalent doctoral degree. Experience in immunology and/or lung biology research is preferred but not essential. *About our institution.* The Pulmonary Center is a fully equipped, state-of-the-art research facility encompassing >20,000 ft.^{2} of research space on the Boston University Medical Campus. The center is comprised of a highly collaborative group of investigators, with diverse areas of expertise, including but not limited to infection and immunity, lung development and regenerative medicine, clinical research science, and genomics and bioinformatics. The center is internationally renowned for forging the successful careers of many lung researchers, which is enabled in large part by its long-standing 40+ year NIH (T32)-sponsored training program. Boston University is an equal-opportunity employer, and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability status, protected veteran status, or any other characteristic protected by law.

Postdoctoral Fellow: An NIH-funded postdoctoral research fellow position is available in the laboratory of Christian Lemon at the University of Oklahoma. The successful applicant will receive training in and contribute to experiments investigating the involvement of the oral trigeminal system in unisensory and multisensory processing relevant to flavor perception. Specific experiments involve mouse models and will focus on in vivo neurophysiological and molecular analyses of oral thermal coding and discrimination by brain trigeminal cells and also studies of trigemino-taste integration in CNS pathways. These projects will use, in part, a combination of systems electrophysiology, quantitative methods, and optogenetics to mechanistically study how trigeminal neurons encode oral sensory information relevant to flavor and interact with neural circuits for taste. For relevant publications, please see *https://www.ncbi.nlm.nih.gov/pubmed/?term=DC011579*. The applicant is expected to have earned, or is about to receive, a PhD or equivalent degree in a relevant field (e.g., neuroscience, psychology, neurobiology, etc.). Experience with electrophysiology and/or optogenetics is preferred but not required. Applicants must submit a cover letter and curriculum vitae that includes the names and contact information for three references. Applicants must apply online at *https://jobs.ou.edu*. The job requisition number is 171037. (*https://ou.taleo.net/careersection/2/jobdetail.ftl?job=171037*). Computers and personal assistance are available at the Office of Human Resources, 905 Asp, Rm. 205, Norman, OK 73069. Include job requisition number on all correspondence. Deadlines subject to change with or without notice. For further information on this or other University of Oklahoma job opportunities, please call (405) 325-1826 or access our website at *www.hr.ou.edu*. The University of Oklahoma is an equal-opportunity institution (*www.ou.edu/eoo*).

Postdoctoral Fellow: A postdoctoral scientist position is available in the University of South Florida Department of Molecular Pharmacology & Physiology to study ion channels in the physiology and pathophysiology of the heart rhythm. The appropriate candidate will have a PhD degree or its equivalent. Experience in the field of electrophysiology is required. Experience with one or more of the following techniques are preferred: animal surgery, conventional molecular and cellular biology, optical mapping, and patch clamp. Interested candidates should send their CV, a brief research statement, and a list of 3 references to Dr. Sami Noujaim at *snoujaim@health.usf.edu*.

Postdoctoral Fellow: An immediate opening for an NIH postdoctoral fellowship (R01 HL-130249) to study brain stem respiratory circuits is available in the Ray lab at Baylor College of Medicine in Houston, Texas. The current focus in the laboratory is mapping the organization of the central noradrenergic system in regulating cardiorespiratory function and its role in pathophysiologies ranging from Sudden Infant

Death Syndrome and Rett Syndrome to Sudden Unexpected Death in Epilepsy. Our laboratory takes a multidisciplinary approach, using a variety of genetic, molecular, and viral techniques to target highly specific brain stem cell types for functional, molecular, and anatomical study in mouse wild-type and disease models. We are seeking candidates with demonstrable expertise in adult and neonate mouse respiratory studies or similar work. Additionally, our laboratory is active in the development of new tools for improved access and study of neural circuits and thus offers several training opportunities in mouse genetic model generation (including CRISPR/Cas9 techniques), development of novel viral vectors, as well as protein engineering and purification for in vivo applications. Baylor College of Medicine offers an outstanding research environment at the Texas Medical Center with more than 50 nonprofit institutions, which offers one of the highest densities of clinical, translational, and basic science research facilities in the world. BCM and the Ray lab are equal-opportunity employers committed to building a culturally diverse intellectual community and encourage applications from women and minorities. Please respond with a cover letter, including a description of work experience, CV, and contact information for two references to: Russell Ray, PhD, Baylor College of Medicine, Dept. of Neuroscience, 1 Baylor Plaza, Houston, TX 77030; phone: 713 798-2624; e-mail: *russell.ray@bcm.edu*; Ray Lab website: *http://www.molecularneurobiology.org*; BCM website: *https://www.bcm.edu/departments/neuroscience*.

Research Scientist: The University of Houston is looking for a research scientist. Duties will include: provide expertise in support of research projects in engineering, biology, mathematics, statistics, computer science, physics, etc.; prepare and edit research papers, proposal, and reports; perform advanced testing procedures and analyses of data; may prepare samples for testing; perform advanced testing procedure and perform analyses of data; make use of a variety of specialized equipment typical within area of specialization; may contribute to grant proposal development; ensure experiments are performed according to specifications; may make recommendations to changes in procedure, processes, or experimental design; understand and apply broad theoretical concepts; develop understanding of specialized scientific or engineering field; develop leadership and management skills. Assignments are difficult and broad, requiring originality and ingenuity. May be assisted by lower level personnel. Researcher will receive minimal supervision conferring with higher levels only in usual situations. EEO/AA. *Qualifications.* Bachelors and 3 years experience. *Notes to applicant.* This position will provide scientific and technical support to the Cardiovascular and Vision Laboratory (CVL). The CVL is a component of the Biomedical Research and Environmental Sciences Division, which implements the science objectives of the life sciences research laboratories at the Johnson Space Center. The primary function of the incumbent will be to collect, analyze, and manage research and medical data in support of research activities conducted in the CVL. *Preferred.* Bachelor's degree with +5 years experience; Master's degree with 02 years experience in human physiology, or a closely allied field, or equivalent experience. The incumbent's abilities and areas of technical skills will include the following: knowledge and experience in physiology research, preferably cardiovascular, cerebrovascular, and/or ocular physiology; understanding of research design and methodology; prior experience collecting data from human test subjects; ability to provide summary and graphical representation of test results; and elementary understanding of statistical methods. Incumbent must be willing to work on projects collaboratively as a team member of the laboratory; have excellent interpersonal and organizational skills; and be capable of clear written and oral communication. Prior experience with database management is highly desired. Technical skills associated with image analysis, including ultrasound (cardiac and vascular), MRI (eye and brain), and/or ocular coherence tomography (eye), is a plus. *Salary.* Salary will commensurate with experience. *Required attachments by candidate.* Resume, cover letter/letter of application, employee status regular/benefits; *http://uhs.taleo.net/careersection/ex1_uhs/jobdetail.ftl1/2*. The University of Houston is an equal-opportunity/affirmative-action institution. Minorities, women, veterans, and persons with disabilities are encouraged to apply. Additionally, the university prohibits discrimination in employment on the basis of sexual orientation, gender identity, or gender expression.

Research Scientist: The University of Texas Arlington is looking for a research scientist. *Job summary.* Oversee management of research lab and be knowledgeable

of molecular and cellular laboratory techniques, particularly cell culture, and also have the ability to work with live laboratory animals, ability to manage a lab and other personnel. (e.g., students). Effective with time management and general organization. *Essential duties.* Oversee management of the lab, collect data for all aspects of experiments, assist other lab personnel in the collection of data, maintain records, conduct cell-culture studies, and train other lab personnel on cellular, molecular, and cell culture techniques. *Required qualifications.* Bachelor's degree in cell biology, biology, exercise science or other related field. Demonstrated competence in cell culture and cellular and molecular biology techniques. *Preferred qualifications.* Prior experience with lab management. Prior experience working with live laboratory animals. *Special instructions to applicants.* Applicants MUST apply online at *http://uta.peopleadmin.com/postings/2148*. *Documents needed to apply.* Resume or CV and cover/interest letter. Applicants must include in their online resume the following information: *1)* employment history: name of company, period employed (from month/year to month/year), job title, summary of job duties; and *2)* education: school name, degree type and major. *EEO statement.* UTA is an equal-opportunity/affirmative-action institution. Minorities, women, veterans, and persons with disabilities are encouraged to apply. Additionally, the university prohibits discrimination in employment on the basis of sexual orientation. A criminal background check will be conducted on finalists. The UTA is a tobacco-free campus.

Research Scientist: The Molecular Cardiology Research Institute (MCRI) is an internationally known institute that includes 10 principal investigators studying diverse topics of molecular medicine. The MCRI is a center of excellence within the Tufts Medical Center, the principle teaching hospital for the Tufts University School of Medicine. We are seeking a highly motivated researcher, with experience working with rodents, to coordinate and perform experimental studies of pharmacological treatments for heart failure. The successful applicant will work closely with the principal investigators on a variety of research projects using state-of-the-art mouse models of cardiac hypertrophy and failure, as well as biochemical, molecular, and cell-biological assays, and to address clinically relevant questions in cardiovascular biology. The research team's goal is to identify new therapeutic targets to prevent or treat cardiovascular diseases in humans. As needed, the individual will be required to develop protocols independently and establish new methodologies in the laboratory. Competitive applicants will ideally hold an advanced scientific degree (MS or above). *Principal duties and responsibilities.* Work as part of one or more project teams, and remain proficient in designing, managing, and performing experiments. Perform cardiac function studies, including echocardiography, in mice. Drug administration to mice by oral gavage and intraperitoneal injection. May perform model mouse surgery in collaboration with the MCRI animal surgeon. Collect and analyze data, and deliver experimental research reports when necessary, with guidance from the PIs for collaborative research projects. With guidance from the PIs, produce scientific manuscripts for publication in peer-reviewed journals, and present research data in house and in scientific conferences. Write as well as assist in the preparation of applications for external grants for research and fellowships. Assist in general lab organization and maintenance, supply ordering, and liaising with infrastructure departments. Learn new skills such as vascular function studies in mouse models using wire and pressure myography. *Knowledge, skills, and abilities.* Minimum of MS in biochemistry, cell biology, microbiology, or bioscience degree program. Experience in molecular biology techniques and animal research experience is desired. Excellent organizational and communication skills are essential. Desire and ability to learn new procedural skills in mouse, such as ex vivo vascular function studies and cardiac myocyte isolation. Ability to coordinate and organize in vivo protocols and studies with large numbers of mice. *Job details.* Master's degree is required. 1-2 years experience is required. *Contacts.* E-mail: *joreilly@tuftsmedicalcenter.org*. In addition to the above contact, please cc the PI (*rblanton@tuftsmedicalcenter.org*) and administrator (*dslater@tuftsmedicalcenter.org*) on inquiries. ●

Meetings & Congresses

2017

July 8-13

International Society on Thrombosis and Haemostasis (ISTH) 2017 Congress, Berlin, Germany. *Information:* Internet: *http://www.isth2017.org*

August 1-5

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

August 11-14

APS Conference: Cardiovascular Aging, New Frontiers and Old Friends, Westminster, CO. *Information:* Internet: *http://www.the-aps.org/mm/Conferences/APS-Conferences/2017-Conferences/CV-Aging*; #CVAging17

August 27-30

APS Conference: Physiological Bioenergetics: Mitochondria from Bench to Bedside, San Diego, CA. *Information:* Internet: *http://www.the-aps.org/mm/Conferences/APS-Conferences/2017-Conferences/Bioenergetics*; #Bioenergetics17

September 8-11

47th European Brain and Behaviour Society Meeting, Bilbao, Spain. *Information:* internet: *http://www.ebbs-meeting.com/*

September 15-17

ILCA 2017 - The International Liver Cancer Association's 11th Annual Conference, Seoul, South Korea. *Information:* internet: *http://www.ilca2017.org*

October 12-14

Cognitive Development Society (CDS2017), Portland, OR. *Information:* internet: *http://www.cogdevsoc.org/destination/*

November 6-8

APS Conference: Physiology and Pathophysiology Consequences of Sickle Cell Disease, Washington, DC. *Information:* Internet: *http://www.the-aps.org/mm/Conferences/APS-Conferences/2017-Conferences/Sickle-Cell*; #SickleCell17

2018

April 21-25

Experimental Biology, San Diego, CA.

September 5-8

8th International Congress of Pathophysiology, Bratislava, Slovakia. *Information:* internet: *http://www.icp2018.com*

October

The 17th International Biochemistry of Exercise Conference (IEBC), Beijing, China. *Information:* Organized by the Chinese Association of Exercise Physiology and Biochemistry

October 18-21

34th World Congress of Internal Medicine, Cape Town, South Africa. *Information:* internet: *http://www.wcim2018.com*

Meetings and Conferences

APS Conference: Cardiovascular Aging: New Frontiers and Old Friends

August 11–14, 2017 • Westminster, Colorado

APS Conference: Physiological Bioenergetics: Mitochondria from Bench to Bedside

August 27–30, 2017 • San Diego, California

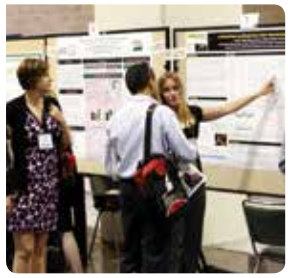
APS Conference: Physiological and Pathophysiological Consequences of Sickle Cell Disease

November 6–8, 2017 • Washington, DC

APS is also participating in the following meeting

IUPS 38th World Congress: Rhythms of Life

August 1–5, 2017 • Rio de Janeiro, Brazil



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

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

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