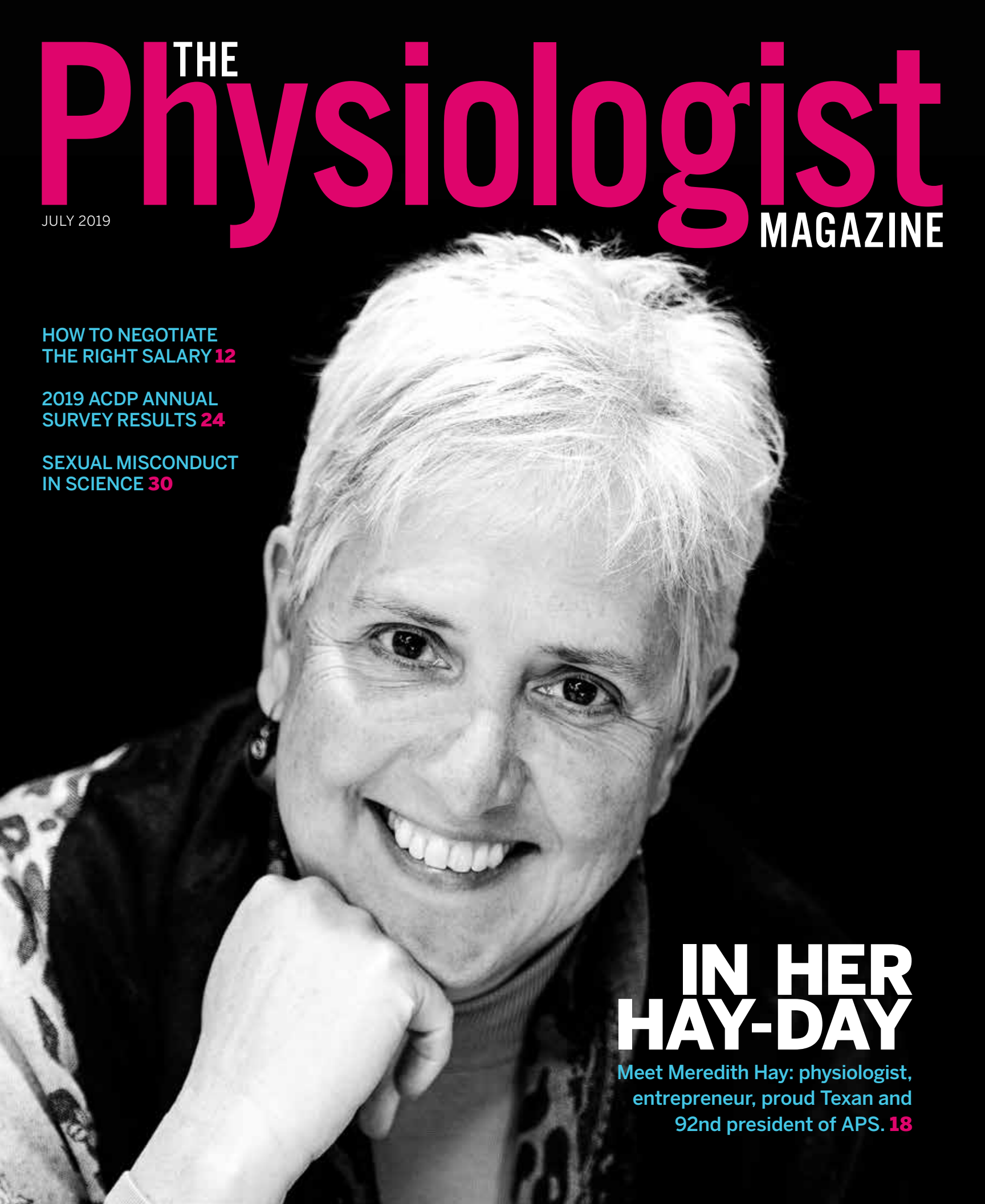
THE Physiologist MAGAZINE

JULY 2019



IN HER HAY-DAY

Meet Meredith Hay: physiologist, entrepreneur, proud Texan and 92nd president of APS. 18

american physiological society

SOCIETY AWARDS

APS provides more than $1 million in awards and fellowships each year as part of our mission to spotlight excellence in physiological research and education. These awards are a vital investment in researchers and educators of all career levels.

A. Clifford Barger Underrepresented Minority Mentorship Award
Application Deadline: September 15, 2019
$1,000 honorarium and travel reimbursement for EB up to $1,500
Honors a member who has demonstrated leadership, guidance and mentorship of underrepresented minority students in the physiological sciences.

Bodil M. Schmidt-Nielsen Distinguished Mentor and Scientist Award
Application Deadline: September 15, 2019
$1,000 honorarium and travel reimbursement for EB up to $1,500
Honors a member who is judged to have made outstanding contributions to physiological research and demonstrated dedication and commitment to excellence in the training of young physiologists.

ADInstruments Macknight Innovative Educator Award
Application Deadline: December 1, 2019
$1,500 honorarium, an institutional grant from ADI and travel reimbursement for EB up to $2,000
Made possible by our strategic partner ADInstruments, honors an early to mid-career member who demonstrates the greatest potential for incorporating innovative teaching techniques and effectively utilizing technology resources in engaging students in physiology education.

For further information, please visit **the-aps.org/educatorawards**.

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DEPARTMENTS

american physiological society

why submit?

We believe the voices shaping the future of physiology should be those of working scientists.

The American Physiological Society (APS) publishes 15 highly respected scientific journals covering research in physiology and related fields. As practicing scientists who are among the leading experts in their respective fields, our editors are positioned to provide a fair and expedient review process and make decisions about what topics truly serve the needs of their fields.

Articles in our journals are primed for maximum impact and reach. In addition to hosting articles on a highly-discoverable journal publishing platform, the Society supports article promotion with social media, press releases, content alerts, special collections and more.

Discover APS journals and submit your best work at physiology.org/submit.

average time to first decision

articles widely promoted

free color figures

customizable content alerts

mobile-friendly interface

indexed in all major abstracting and indexing services

average time to publication

editors are working scientists

Embracing Change while Nurturing Our Core

BY SCOTT STEEN, CAE, FASAE

"The future of APS, we believe, lies in the balance between excellence and inclusivity; hard-nosed science and a warm and welcoming community."

You may have noticed that there is a lot of change taking place at the American Physiological Society these days. There are the obvious changes like our new website, branding and this magazine. But there is also exploratory work underway for bigger changes to come in the next year or two, on things like our new journal, *Function*, as well as the APS annual meeting and a host of new member benefits.

Change is absolutely necessary for an organization like ours. In 2016, as part of research for our strategic planning process, members and nonmembers alike were asked to select adjectives that best described APS. While respondents said many positive things about the Society, the words people thought least described our organization included innovative, dynamic and empowering. Clearly, this needs to change. To not evolve—avoiding change and taking risks—is a clear path to irrelevance. If we are unable to appeal to a new generation of scientists or to address the new realities facing the discipline, we will slowly (or not so slowly) fade away.

Steen poses with APS members My Helms and Clintoria Williams following his speech on the future of APS at Experimental Biology.

Of course, change can be difficult. As we adapt and grow, some members will love the new directions we take and others may not. Risk, by its very nature, carries with it the possibility of failure. To navigate these tricky waters, I believe we need to make sure that we protect and nurture those key cultural attributes, traditions and values at the core of who we are—the things that make APS, well, APS. We also need to communicate—a lot.

For me, APS' core—our heart and soul—consists of three things:

- an unshakable commitment to advancing the science of physiology, regardless of what it is called;
- a passionate, connected and caring community of scientists and educators; and
- an engaged membership with a real voice in setting the direction of the organization.

While the specific mechanisms for achieving these may evolve, our commitment to preserving them must not.

In many ways, our agenda for change aligns directly with these core commitments. In surveys and meetings with members, leaders and staff, we are asking questions designed to enhance our ability to deliver on these defining attributes. These questions include: How do we spotlight the best science? How do we promote research that will have the greatest impact on humanity? How do we better serve trainees and early-career professionals? How can APS better champion the discipline within the scientific and funding communities? How do we make it easier to belong to APS and connect with our community? How do we give members more influence on the overall direction of the Society, while not burdening them with the details that could more easily and effectively be done by staff?

At the same time, we are exploring ways to simultaneously promote both excellence and inclusiveness. We want APS' journal program to be able to attract the very best papers and our meetings to attract the leaders in the field to present their best work. APS should be a catalyst for the most important and impactful physiological research. We also want to create a home and compelling value for next-generation scientists, physiology educators, those who work in industry and scientists from around the globe. We want to ensure that our community is open, welcoming and actively supportive of diversity in all its forms. The future of APS, we believe, lies in the balance between excellence and inclusivity, hard-nosed science and a warm and welcoming community.

We have a lot to do. Today, APS and physiology are facing tremendous opportunities along with some real challenges. We need to make some significant changes for us to be ready for the new world we face. There's a new chapter for us to write, but this new chapter must build on and celebrate what has come before.

Scott Steen, CAE, FASAE, is executive director of the American Physiological Society.

Photo courtesy APS

american physiological society

New look.
New website.
What's next for APS?

NEW LOOK

This year we revealed a new brand for the Society including new themes and messaging. The new brand presents a dynamic image that represents the process of scientific discovery itself, how idea leads to idea and discovery leads to discovery.

NEW WEBSITE

Our new state-of-the-art website reflects APS' commitment to provide our members and community with exceptional experiences.

FUNCTION

Function, a new, high-profile journal that will provide a home for physiology-focused papers that might otherwise have been published in other top-tier, high-impact journals, is in development and scheduled to launch in 2020.

MORE INITIATIVES

Look out for more on developing Society initiatives geared toward strengthening our membership, our community and the discipline.

"We will increasingly be putting the spotlight on you, our members, on your work, and on the ways in which you are changing the world. So stay tuned for more exciting changes."

Scott Steen, CAE, FASAE
Executive Director of the American Physiological Society

The Physiologist MAGAZINE

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american physiological society

> “APS meetings [...] are the best way to keep up with what is going on in my field.”
>
> —Eleanor Lederer, MD, APS Member
> University of Louisville

WITH MEMBERSHIP COMES

CONNECTIONS

American Physiological Society (APS) meetings bring together researchers, educators and students from around the world to share the most recent advances and breakthroughs in physiology and related disciplines. APS members enjoy discounted registration rates.
Take advantage of your benefits at the-aps.org/benefits.

the-aps.org

Making Connections

Physiology attendees made the most of their time between sessions at the APS Info and Social Hubs, at the APS exhibit booth and all around the Orange County Convention Center.

Photography, pp. 8–11, by Chuck Fazio

The APS Annual Meeting at EB is a time where APS members connect, collaborate, network and celebrate. Take a look at some of the highlights of the 2019 meeting.

Awardees

Awards presented at EB recognize the research excellence in the physiology community. Here, we present a snapshot of the dozens of APS members who were honored at EB 2019.

Leadership and Esteemed Speakers

1. Sixteen current and former APS presidents attended the APS President's reception. **2.** Outgoing Past President Dennis Brown, PhD, on the right, received his recognition statue from President Jeff Sands, MD, at the APS Business Meeting on Sunday. **3.** President Jeff Sands passed the gavel to incoming President Meredith Hay, PhD, at the APS Business Meeting. **4.** Brian Druker, MD, of the Oregon Health & Science University Knight Cancer Institute delivered the 2019 Tang Prize Award Lecture, "Imatinib as a Paradigm of Targeted Cancer Therapies." **5.** A packed house attended the 2019 Tang Prize Award Lecture. **6.** Peter Wagner, PhD, presented the 2019 Bodil Schmidt-Nielsen Award Lecture. **7.** Peter Aronson, MD, of Yale University presented the Walter B. Cannon Award Lecture, "From salt to stones in CKD: Anion transporters in health and disease." **8.** APS Henry Pickering Bowditch Award Lecturer Jennifer Pluznick, PhD, with, left to right, Executive Director Scott Steen, Past Presdient Dennis Brown and President Jeff Sands after her talk, "Functional Roles for Orphan GPCRs in the Kidney." **9.** Peter Agre, MD, of Johns Hopkins University presented the 2019 Nobel Prize Award Lecture, "Aquaporin water channels—from atomic structure to malaria."

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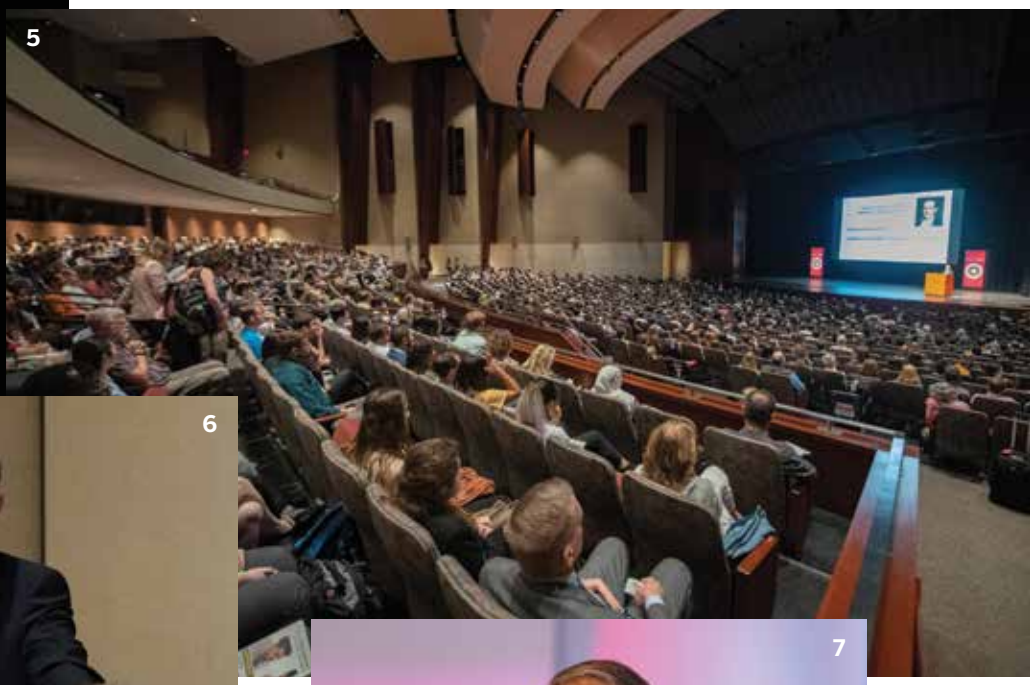
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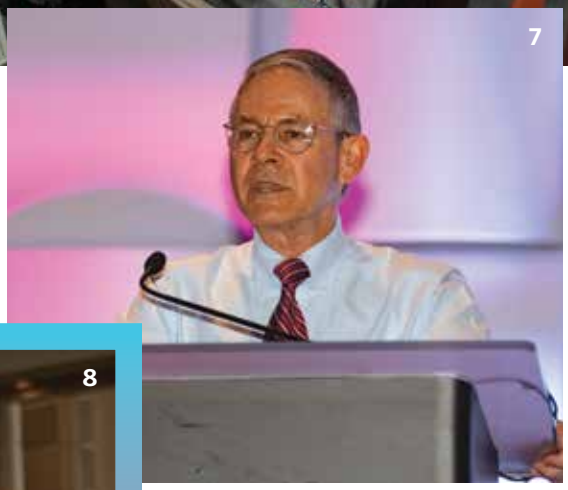
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LAB NOTES

RESEARCH FIZZ

Exercise Training Impacts Skeletal Muscle Gene Expression Related to the Kynurenine Pathway

Exercise-induced muscle changes through the kynurenine pathway could help boost mood in older adults.

American Journal of Physiology–Cell Physiology, March 2019

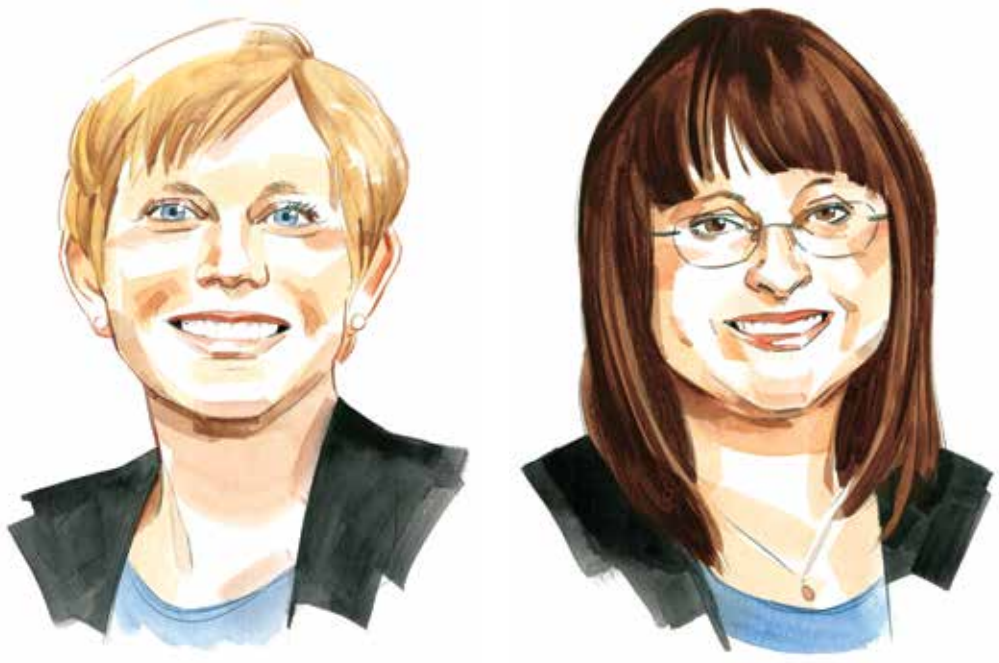
https://doi.org/10.1152/ajpcell.00448.2018

STATS & FACTS

34%

Average Percentage of Faculty Salary **Derived from Research Grants** (not including fringe benefits)

Source: ACDP 2018 Survey Results, Table 5b



MENTORING Q&A | SALARY NEGOTIATION

Net Worth

How to negotiate the right salary

Each issue, we'll ask a trainee member to pose their career questions to an established investigator and mentor. Here, Sarah E. Baker, PhD, assistant professor of physiology at the Mayo Clinic in Rochester, Minn., asks about salary negotiation. APS Past President Kim E. Barrett, PhD, FAPS, professor of medicine at the University of California, San Diego School of Medicine, offers her tips on how much to ask for, when to ask and what to do when the offer is not where you want it to be.

Q: How do I figure out what the right salary looks like, and how do I know whether it is competitive within the institution/state/field?

A: Knowledge is power! APS publishes an annual survey that is a great place to start. The American Association of Medical Colleges also publishes

Above: Illustration by Kagan McLeod; top left: iStockphoto

"You should not begin to negotiate until you have an offer in hand and have had time to review it."

salary information for medical schools. (Read about their latest findings on page 24.)

Q: How would I determine if a wage gap exists between myself and male colleagues?
A: For gender equity, check if the institution has conducted a salary equity study and what it did about any inequities found. For public universities, faculty salaries can often be found in public databases.

Q: Once I have established what the right salary should look like, what is an appropriate way to ask for what I want? When is the best time in the interview process to bring up salary?
A: Negotiations typically begin around the time of a second visit, but you should not begin to negotiate until you have an offer in hand and have had time to review it.

Q: Do all employers negotiate salary? Oftentimes, when asking directly whether a salary is negotiable the immediate answer is no. Is there a more effective way to go about initiating these conversations?
A: In a few cases institutions may have rigid policies, but generally just about everything is negotiable. But you should think in terms of the package as a whole, not just the salary. If the salary amount is particularly important, you should counter with actual data that shows you understand the salary offered is lower than for similar positions. If it isn't, you don't have much room to negotiate.

Q: How should I respond when the offer—whether that is salary, benefits or other perks—is not what I was expecting or need?
A: You ask, politely, whether there is any flexibility in the offer because the conditions are not what you expected and will "inhibit your success because _____."

Q: How do you choose the best offer when receiving job offers from more than one employer?
A: To choose the best offer, be sure to consider all elements, including your gut feelings about the place. The highest salary is often not the best offer.

Q: What are the options if I receive an offer from one employer, but really want to wait and see if I get an offer from a top-choice employer?
A: You can hold off for a while, but don't play games for too long. It is reasonable to contact your top choice to see if they can speed up their decision-making when you have another offer in hand.

Q: For those applying to academic positions, what considerations should we make regarding space, start-up, teaching, etc.?
A: You need enough space to get your research up and running, with renovations if the space does not match the type of work you do. Ideally, you'll be close to neighbors with common interests or with complementary expertise and equipment they might share. Your start-up needs to carry you through until you can generate outside support, but ideally you get to retain the funds for at least a while if your grants come sooner than expected. And you should try, if possible, to delay major teaching assignments for at least a year or two if you are joining a research-intensive institution.

Got a career question you'd like to submit? Email it to education@the-aps.org and we'll consider it for an upcoming Mentoring Q&A.

"To choose the best offer, be sure to consider all elements, including your gut feelings about the place. The highest salary is often not the best offer."

STATS & FACTS

Median Salary for PhD Faculty (public and private institutions)

Chair:
$285,000

Chief:
$240,000

Professor:
$170,000

Associate Professor:
$123,000

Assistant Professor:
$95,000

Instructor:
$60,000

Source: AAMC 2018 Salary Survey, Table 2

RESEARCH FIZZ

Heat Waves, the New Normal: Summertime Temperature Extremes Will Impact Animals, Ecosystems and Human Communities

This review explains how increasing global temperatures will contribute to heat stress in humans as well as animals on land, in the sea and in the air.

Physiology, March 2019

https://doi.org/10.1152/physiol.00040.2018

Bottom right: iStockphoto

RESEARCH FIZZ

Soft Drink Consumption during and Following Exercise in the Heat Elevates Biomarkers of Acute Kidney Injury

Research suggests that drinking sugary, caffeinated soft drinks during exercise in hot weather may increase the risk of kidney disease.

American Journal of Physiology—Regulatory, Integrative and Comparative Physiology, March 2019

https://doi.org/10.1152/ajpregu.00351.2018

STATS & FACTS

Average **Annual Stipend** for Pre- and Postdoctoral Researchers

Predoctoral:

$26,977

Postdoctoral:

$47,018

Source: ACDP 2018 Survey Results, Table 3h

POLICY IQ | NSF FUNDING

APS Triples Down

APS members lobby for more NSF research dollars on three Capitol Hill visits.

APS is working with its advocacy partners on initiatives to help Congress appreciate the pressing need for real, sustained growth in the NSF budget.

The National Science Foundation (NSF) supports nearly 25 percent of all federally funded basic research in science and engineering fields, including the education and training of the future STEM workforce. Despite these critical roles, the NSF budget has remained flat in real terms for the past 15 years. APS is working with its advocacy partners on initiatives to help Congress appreciate the pressing need for real, sustained growth in the NSF budget.

Hannah Carey, PhD, FAPS, APS member and past president and president of the Federation of American Societies for Experimental Biology (FASEB), went to Capitol Hill on April 30 for the Coalition for National Science Funding's 25th annual research exhibition. Carey was among several scientists from a broad spectrum of disciplines who described their NSF-funded work. Carey shared her work on the gut microbiome of hibernating squirrels. The exhibition was attended by members of Congress, congressional staff and other research advocates.

In May, a group of NSF-funded APS members convened in Washington, D.C., to meet with their members of Congress. Armed with FASEB materials illustrating how much NSF funding goes to each state, the researchers shared stories about the implications of their work. They asked their elected

Above: Allyson Hindle meets with Rep. Susie Lee to discuss the importance of robust funding for the NSF. Right: Jonathan Stecyk, Edna Chiang, Hannah Carey and Scott Steen at the office of Rep. Mark Pocan.

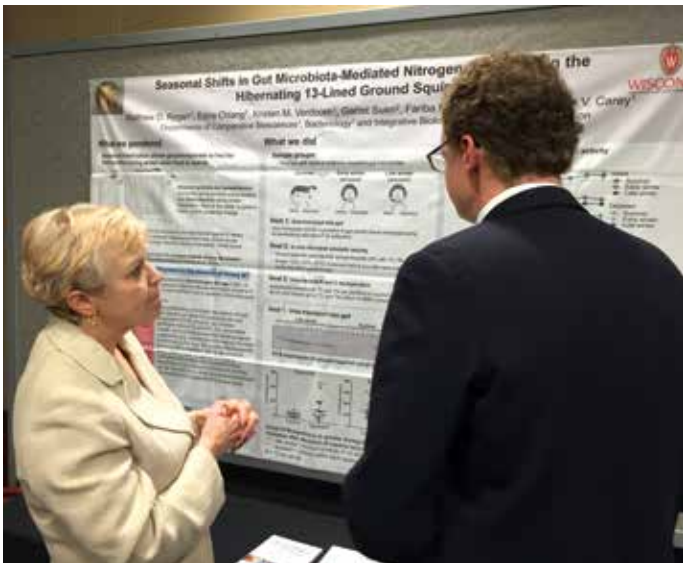
Far left, top: iStockphoto

Keith Choe, Keon Wimberly and Allyson Hindle at the U.S. Capitol.

representatives to provide NSF with $9 billion in fiscal year 2020, an amount that would allow the agency to support approximately 1,000 more research grants next year.

On June 4, FASEB, in conjunction with APS and other FASEB member societies, sponsored a Capitol Hill briefing that featured NSF-funded basic research into the emergence of antimicrobial-resistant pathogens. Hosted by Sen. Tammy Baldwin (D-WI) and Rep. Mark Pocan (D-WI 2nd district) and moderated by Carey, the event gave congressional staff the opportunity to hear directly from scientists about cutting-edge NSF research to address antimicrobial-resistant pathogens, a global health challenge.

These efforts are part of APS' larger program of research funding advocacy that also includes advocacy for the budgets of the National Institutes of Health, medical and prosthetic research at the Department of Veterans Affairs and life sciences research at NASA.



Left: Hannah Carey discusses her NSF-funded work with a guest at the Coalition for National Science Funding Exhibition.

Far right, center: iStockphoto

RESEARCH FIZZ

Development of Solitary Chemosensory Cells in the Distal Lung after Severe Influenza Injury

Research finds taste bud-like cells in mouse lungs after flu exposure may be linked to chronic inflammation.

American Journal of Physiology—Lung Cellular and Molecular Physiology, March 2019

https://doi.org/10.1152/ajplung.00032.2019

RESEARCH FIZZ

Modest Changes to Glycemic Regulation Are Sufficient to Maintain Glucose Fluxes in Healthy Young Men Following Overfeeding with a Habitual Macronutrient Composition

This study suggests that the body adapts glucose and insulin processing during short-term bouts of overeating.

American Journal of Physiology—Endocrinology and Metabolism, April 2019

https://doi.org/10.1152/ajpendo.00500.2018

UNDER THE MICROSCOPE

Rapid Fire Q&A

Michael Ryan, PhD, talks 'MacGyver,' lab equipment, interesting family facts and more.

Each issue, we get to know an APS member up close and personal. Read on to learn more about Michael Ryan, PhD, his favorite "MacGyver" moment in the lab, the piece of lab equipment he can't live without, a surprising fact about his three kids and other fun tidbits.

Ryan and his son Gavin in front of the ruins at Stonehenge in Wiltshire, England

Q: What inspired you to become a scientist?
A: My dad loved any science or history and passed that love on to me.

Q: Favorite time of the day/week to work in the lab and why?
A: Early morning and late in the afternoon because most meetings are over and there are fewer distractions.

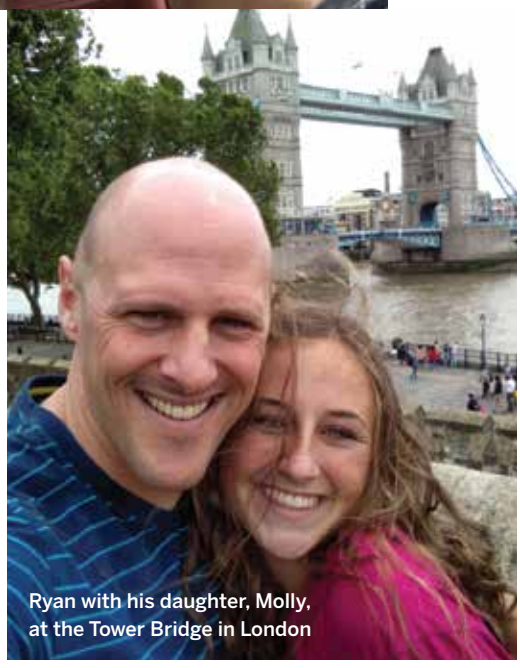
Q: "Old school" technique you're most proud of mastering?
A: Isolating RNA (the old-fashioned way without a commercial kit) and running a northern blot.

Ryan with his son Jacob at the Changedeokgung Palace in Seoul, South Korea

Q: Items on your lab bench that you are/were most possessive of?
A: Surgical instruments (especially microdissecting scissors and forceps).

Q: Favorite lab mishap story that you can share without incriminating the innocent?
A: The open end of some tubing connected to an oxygen tank was exposed to an open flame. As the oxygen in the tube caught fire and slowly moved up the tube toward the tank, a lab member cut the tubing ahead of the flame. Crisis averted!

Q: Best "MacGyver" moment in the lab?
A: I had to spin a 96 well plate to get the volume to the bottom of the wells but did not have a plate adapter for the centrifuge. I purchased a cheap (less than $5) salad spinner from Walmart, put a blue absorbent pad inside to prop up the plate and used the spinner as a makeshift centrifuge.



Ryan with his daughter, Molly, at the Tower Bridge in London

Q: If you could do a sabbatical with any scientist (living or dead) who would it be and why?
A: Leonardo da Vinci. I would love to be witness to his thought process and creativity.

Q: If you were a model organism, which model organism would you be?
A: I guess it would only be fair for me to be a mouse.

Q: Favorite book about science (fiction or non-fiction)?
A: "Brilliant Blunders" by Mario Livio.

Q: No. 1 guilty pleasure?
A large tub of movie theater popcorn (no butter).

Q: Most influential scientist on your career?
A: Dr. David Pendergast from the University at Buffalo. I completed only a lab rotation with him in my first year as a PhD student, but his early advice and mentoring put me on the path that led to where I am today.

Q: Favorite science-related TV show (fictional or factual)?
A: "Bill Nye the Science Guy."

Q: Biggest misconception about physiology/physiologists is ... in five words?
A: Physiology isn't a dynamic discipline.

Photos courtesy Michael J. Ryan, PhD

Q: Favorite way to spend a free hour?
A: Table tennis with my kids.

Q: Most valuable quality in a colleague?
A: Trustworthiness.

Q: Tell us a surprising fact about you.
A: My three kids were born in February, nine days apart, and the numbers in their birthdates each add up to 7 (7, 16, 25).

Q: Favorite part of your job?
Working with students and fellows.

Q: Least favorite part of your job?
Meetings that don't have agendas or action items.

Q: If you were a model organism, which model organism would you be? A: I guess it would only be fair for me to be a mouse.

Q: Notable scientists you follow on Twitter?
I follow a lot of my APS colleagues!

Q: Title you'd use on your autobiography?
A: "Jack of Many Trades, Master of None." (I feel that I've always been capable of doing a lot of things, but I am not really an expert at any of them.)

Q: One thing every researcher/scientist should try at least once in their life?
A: To visit other institutions, or go to another institution different from where you trained, in order to learn new ways of doing things and make new colleagues.

Q: Next book on your reading list?
A: "The Catalogue of Shipwrecked Books," by Edward Wilson Lee.

Q: Go-to tech device?
A: My iPhone.

Q: Favorite TV show, movie series or podcast to binge-watch/listen?
A: "The Office."

Q: Go-to snacks that get you through long days in the lab or classroom?
A: Just about anything with chocolate.

Q: Crunchy or creamy?
A: Crunchy!

Michael J. Ryan, PhD, is professor of physiology and biophysics, director of graduate studies in physiology and biophysics, and associate dean for student affairs in the School of Graduate Studies in Health Sciences at the University of Mississippi Medical Center. He is the recipient of the 2019 APS A. Clifford Barger Underrepresented Minority Mentorship Award. Ryan has been a member of APS since 1998.

PUBLISH WITH POLISH | CITATION FORMATTING

Did an abstract grab your attention at EB this year? Here's how to cite it:

Campos HO, Drummond LR, Rodrigues QT, Horta NA, Primola-Gomes TN, Coimbra CC. Physical performance in different stages of hypertension in spontaneously hypertensive rats (Abstract). *FASEB J* 33, *Suppl* 1: 534.2, 2019.

CITATION FORMATTING EXPLAINED:

1. List last name, then first—and middle, if applicable—initial(s) with no periods.

2. Article titles are first-word capped, not title-capped. For abstracts, like the given example, the title is followed by "(Abstract)."

3. Journal names are abbreviated per PubMed standards.

4. List volume information in this format: **Vol. No: First Page–Last Page, Year.** (Note: There's usually only a first page for abstracts.)

APS' experienced publishing staff share their tips and know-how to help you improve the polish of your scientific manuscripts. Got a scientific publishing or style question that you want us to weigh in on? Email it to tphysmag@the-aps.org.

STATS & FACTS

Average **Grad Student Contact Hours** for Faculty

Lab:	Lectures:	Small Group Discussion:
248	**61**	**46**

Source: ACDP 2018 Survey Results, Table 2b

IN HER HAY-DAY

Meet Meredith Hay: physiologist, entrepreneur, proud Texan and 92nd president of APS.

BY MEEGHAN DE CAGNA, MSc, CAE

In April 2019, Meredith Hay, PhD, FAPS, became the 92nd president of the American Physiological Society. Hailing from Houston, Hay currently calls Tucson, Ariz., home. She is a professor of physiology at the Evelyn F. McKnight Brain Institute at the University of Arizona Health Sciences, where she oversees her named lab—the Hay Laboratory of Cardiovascular Neurobiology and Biophysics.

APS Chief Engagement and Partnerships Officer Meeghan De Cagna sat down with Hay to share her journey, goals she has as APS president, and a little about her big horse, Pakuna.

Photo, facing page, by Chuck Fazio

MD: How did you become interested in science?
MH: I've always loved nature and learning about how things worked. Some of my earliest childhood memories were of time spent with my dad. He passed away when I was 10, but when I was six, he taught me how to fix my bicycle, taking things apart, then using tools to solve the problem and put the bike back together. I liked doing that. That lesson was a memory that stayed with me forever.

MD: Why did you choose physiology as a career choice?
MH: I fell in love with learning about how the brain works. I remember being fascinated when I saw a picture of a neuronal action potential. It wasn't until I started my PhD program that I became enamored with how the brain was involved in regulating blood pressure and whole-body functions—physiology!

MD: What area of physiology are you working in today and why?
MH: My current interests are focused around understanding how systemic inflammatory diseases such as heart failure, hypertension or diabetes affect cognitive health. About 12 years ago, my mother suffered from undiagnosed heart failure following a breast cancer diagnosis and chemotherapy treatment. As her heart failure progressed, she developed significant cognitive impairment and ultimately vascular dementia. Her cardiologist told us there was nothing they could do to help her memory loss.

While my mom survived the cancer, the chemotherapy had damaged her heart, which ultimately led to dementia. I knew then that we had to find a way for the cardiovascular experts to connect with the neuroscientists to help patients.

To me, this is the soul of physiology and why I work in the discipline today. The essential question is how can we apply what we know about how the different organ systems work together to affect health and disease.

About five years ago, a colleague, Dr. Carol Barnes, was describing her work on understanding how our brain and memory change as a normal part of the aging process. I remember asking her how many of the older adults she studies also have some kind of cardiovascular disease and how much of that disease affects memory in older adults. As it turns out, approximately 65 percent of older adults have some kind of cardiovascular disease or hypertension. That's when we began to develop novel therapeutics to treat inflammation-related brain dysfunction and cognitive impairment.

MD: Can you tell me more about the work of your lab?
MH: Our lab is working to develop novel peptide therapies for traumatic brain injury, chronic pain and vascular dementia. We're also running clinical trials to test Ang-(1-7) on cognitive impairment in cardiac surgery patients.

Top: Hay, on the left, with her friend, Donna Hanson, fly-fishes near her cabin in the mountains of northern New Mexico. Bottom: One of Hay's five dogs, a rescued standard poodle named Remington. Facing page: Hay spends several mornings a week learning dressage with her horse, Pakuna, after spending most of her life riding Western.

All photos, other than page 18, courtesy Meredith Hay, PhD, FAPS

We're collaborating with scientists from across the University of Arizona system and across the U.S.—from chemists, psychologists and neuroscientists to biophysicists and

cardiologists—all on behalf of bringing new therapies to help patients achieve better health outcomes.

MD: In addition to your university roles, you are also an entrepreneur, having founded and now serving as chief science officer of ProNeurogen Inc. Can you describe what your entrepreneurial journey has been like?
MH: Starting our own company to develop novel therapeutics for inflammation-related memory loss and pain has been, without a doubt, the most rewarding and the hardest endeavor I have ever undertaken. And I have had my share of big jobs! I joined the University of Arizona in 2008 as the executive vice president and provost in the middle of a financial crisis. And while that job was certainly challenging, starting up and developing a biotech company has been thrilling. Taking an idea, testing it in animal models and then seeing it help patients has been an opportunity of a lifetime.

MD: ProNeurogen has a robust pipeline portfolio. Over the next few years what are you hoping to accomplish?
MH: Currently, we have three therapeutics in development. We are working to raise non-dilutive funding to advance the novel therapeutics into phase 2 clinical trials. Then we hope to find a pharmaceutical partner who can help advance the therapeutics to the marketplace to help patients just like my mom.

MD: What has being an entrepreneur taught you about yourself?
MH: I've learned never to give up. Persistence, persistence, persistence. I remind myself to just keep swimming!

MD: Do you see other physiology colleagues becoming more interested in entrepreneurship or product development? What advice would you give others just starting out?
MH: I hope so. Many bench scientists believe they cannot take their ideas forward to clinic. Not true. My advice is to believe anything is possible, find the right clinical partner and create a mutually shared vision.

> "To me, this is the soul of physiology and why I work in the discipline today. The essential question is how can we apply what we know about how the different organ systems work together to affect health and disease."

MD: You've been a member of APS since 1987. Why did you initially join, and what has being a member and volunteer leader meant to you?
MH: I was fortunate to have my mentor, former APS President Vernon Bishop, encourage me to join when I was a student. I took his advice, and APS has been my professional home ever since. Throughout my time as a member and Society leader, I've cultivated valuable relationships both personally and professionally with very dear friends and colleagues with whom I have worked over the years.

"Many bench scientists believe they cannot take their ideas forward to clinic. Not true. My advice is to believe anything is possible, find the right clinical partner and create a mutually shared vision."

MD: As president, what are some of your aspirations to advance and expand the APS community?
MH: This is an exciting time to be involved with APS. With our new executive director, Scott Steen, we are preparing for the next decade to come. Modernizing our value position to our members, advancing our journals and creating opportunities for physiologists to succeed is our focus. That means broadening our membership base, ensuring that our meetings offer the best and most relevant science on the planet, championing young scientists, supporting educators, serving members at all stages of their careers and leading national conversations around science policy and funding. This collective work is why I ran for the president role. Our efforts will position APS for the next decade, and I'm committed to working together with APS membership, the Executive Cabinet and APS Council to ensure success. Exciting times indeed!

MD: Speaking of early-career trainees, what can you, as president, and APS do to prepare young investigators for great success?
MH: I believe mentoring is important. We need to help early-career members understand that success in science is not only about success in the lab. Rather, it is also about successful networking and getting to know the leaders in the field. I want young scientists to get involved in APS. I encourage trainees to engage through our meetings, committee service or manuscript reviews to name a few. Their voice is vital to our future.

MD: What do you think are the most important issues facing the discipline today?
MH: APS must stay at the forefront of the creation of new ideas and new knowledge that advances humankind and all living things. We cannot be complacent. APS must continue the process we've already begun—evolving, changing, adapting—to be the global leader in the physiological sciences.

MD: APS is launching a new open access journal called *Function* that will feature translational research. Why do you think it's important for our members to be involved in translational work?
MH: I believe it's important for our members to be involved in translational work because when diseases need understanding, we turn to basic scientists for new ideas from the bench—ideas that will advance life on the planet. Translational medicine—which is a two-way street—is a key component of APS staying relevant and leading the life sciences across the world. APS, our journals and *Function* will feature this most important research.

MD: With a thriving career and so many diverse interests, what is something you are really curious about?
MH: I live in Tucson, Ariz., where we have some of the most incredible evening and night skies. I am always amazed at the true vastness of the universe, the depth and seemingly unlimited galaxies. I'm curious to know if humankind will someday travel the galaxies. I hope so.

MD: When life gets hectic, how do you step away and have a little fun?
MH: As a Texan, I've ridden horses, Western, all my life, but a few days a week I spend the morning with my big Holstein dressage horse named Pakuna. I deeply enjoy learning how to dance with my 17.4 hands tall big mare! I also love to fly-fish near our cabin in the mountains of Angel Fire, N.M. That and our five dogs keep us very busy.

MD: Do you have a bucket list? What's on it?
MH: I've been privileged to travel and have had the blessings of family and great friends, but I do have a few things on my bucket list. I want to visit the base of the seven summits and scuba dive in the seven seas. I'm working on both!

Above: Hay and her niece, Sally Vangness, golfing together. Right: Hay shows off her catch on a recent fishing trip.

FASTFACTS

LEGACY OF APS SERVICE & LEADERSHIP

Membership Committee (1997–2001)
Education Committee (2001–2005)
Finance Committee (2006–2009)
Chair, Finance Committee (2015–2018)
APS Fellow (2017–present)
Editorial Board, *AJP–Heart* (1999–2005)
President-elect (2018)
President (2019)

EDUCATION

PhD, Cardiovascular Pharmacology, 1990, University of Texas Health Science Center, San Antonio

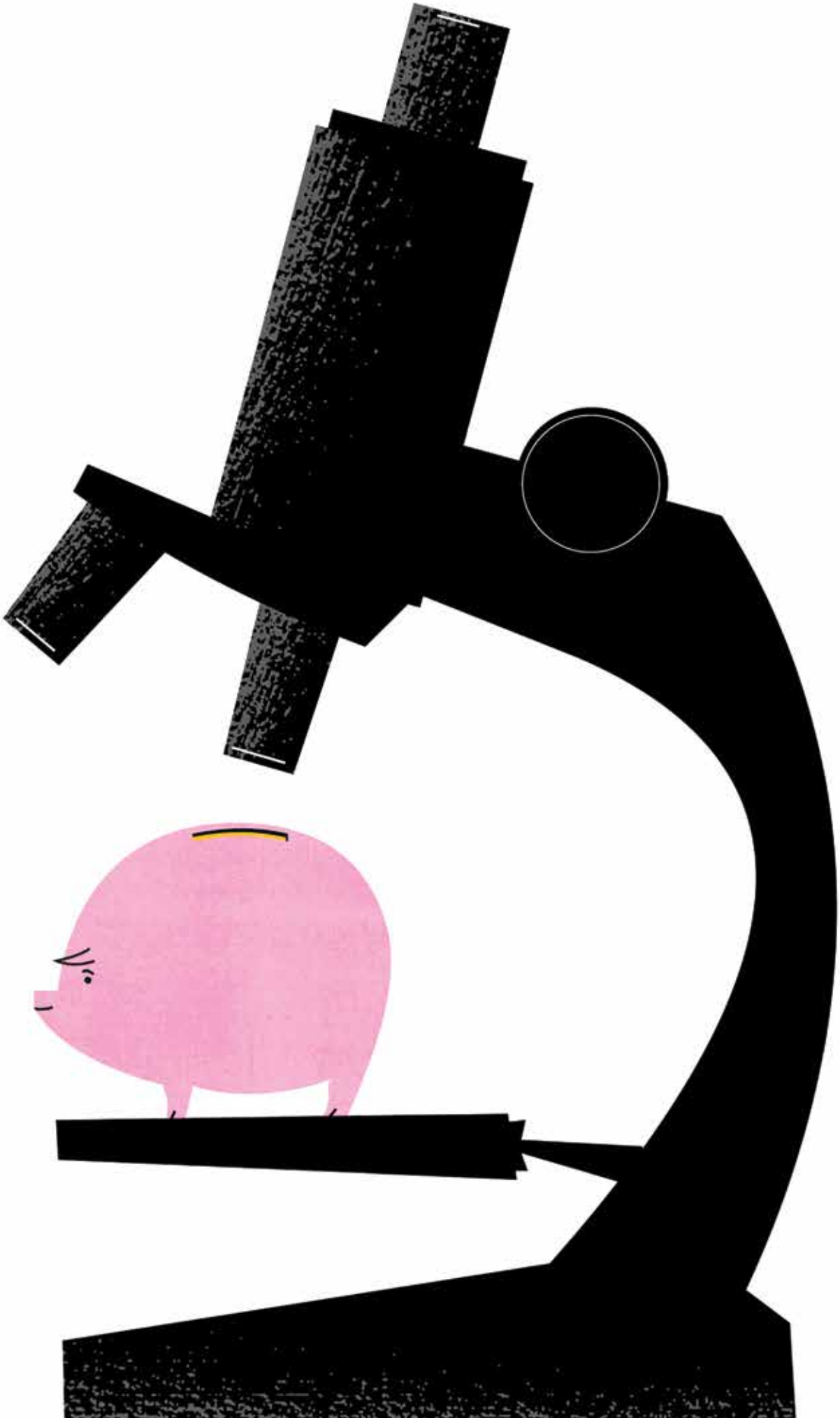
MS, Neurobiology, 1987, University of Texas Health Science Center, San Antonio

BA, Psychology, 1983, University of Colorado, Denver

SEVEN SEAS:

(✳ indicates seas where she's scuba dived)

North Atlantic Ocean
South Atlantic Ocean ✳
Indian Ocean ✳
North Pacific Ocean ✳
South Pacific Ocean ✳
Arctic Ocean
Antarctic Ocean



MONEY TALKS

The new ACDP report shows the changing reality for physiology in academia.

BY REBECCA A. CLAY

Good decisions start with good data. That's the idea behind the Association of Chairs of Departments of Physiology's (ACDP's) annual survey, which has gone out to North American physiology and physiology-related departments for more than two decades. The data allow chairs to make persuasive arguments for more resources and for departments to see how they measure up in areas such as the proportion of women and underrepresented minority trainees or department space designated for research. You can use the ACDP data, along with an accompanying salary survey, as a tool to advocate for yourself or your department.

The ACDP data offer a snapshot of faculty and student demographics, departmental budgets, research space, time spent teaching and other points of interest. This year's response rate was 27 percent, with 54 partial or complete surveys returned from 39 public medical schools, 13 private medical schools and two private non-medical schools.

The average annual departmental budget among respondents was $9,007,876, with departments in private medical schools reporting average budgets of $11,176,976 and those in public medical schools averaging $8,603,269. (Outside research grants and contracts accounted for an average of $5,054,693 of departmental budgets.) On average, departments reported that they controlled 29,596 square feet of space, with 23,153 square feet of that space devoted to research activities. Average annual stipends were $47,018 for postdoctoral trainees and $26,977 for predoctoral trainees.

The survey results over the past few decades—with data since 1996—are available online at www.acdponline.org/home/surveys/past-surveys—offer

Illustration by Michael Austin

a look at how physiology as a field has been changing. "This is a wonderful archive," says Elsa I. Mangiarua, PhD, a professor of biomedical sciences at Marshall University's Joan C. Edwards School of Medicine in Huntington, W.V., who has worked on the survey for the past five years. "It's a great service to the community; it keeps historical data that we don't have in any other place I know of."

Take diversity among the next generation of physiologists. "There has been a concerted effort to enhance recruitment of women into science, technology, engineering and mathematics careers," says ACDP President and APS Past President Patricia E. Molina, MD, PhD, FAPS, who heads the department of physiology at Louisiana State University Health Sciences Center in New Orleans. The statistics show those efforts are slowly paying off, with women accounting for 37 percent of graduate students and postdoctoral trainees in 1998 compared with 48 percent in 2018. Similarly, the percentage of racial and ethnic minorities among predoctoral graduate students and postdoctoral trainees who are U.S. citizens and resident aliens has edged up from 24 percent in 1998 to 28 percent in 2018.

The number of foreign predoctoral graduate students and postdoctoral trainees has fluctuated over the past two decades, jumping from 29 percent in 1998 to 43 percent in 2008, then declining to 36 percent in 2018. Recent immigration policies may be having an impact, particularly among students "from countries that have greater barriers for visas," Molina says.

When it comes to salary information, ACDP now relies on data collected by the Association of American Medical Colleges (AAMC). "We were getting smaller percentages of faculty responding, and AAMC can get 99 percent of all physiology departments to respond," says Melinda Lowy, executive assistant for ACDP, who administers ACDP's survey. "That's much more valuable."

The results from AAMC's 2018 survey reveal that total compensation is "creeping up," at least when it comes to physiology department faculty with PhDs, Lowy says. Median compensation for PhD faculty increased 4 percent between fiscal year 2016 and 2017 and fiscal year 2017 and 2018, with median salaries increasing from $125,000 to $130,000. For faculty with MDs, median compensation was down 2.8 percent over the same period, with median salaries decreasing from $141,000 to $137,000. (The data combine mean and median values for assistant, associate and full professors.)

Administrators often argue that a single "mega-department" combining all the basic sciences needs less funding and fewer resources than multiple individual departments, Lowy says. As a result, "departments have issues with being merged right now,"

Student Contact Hours for Faculty per Year

	STUDENT TYPE	AVERAGE (HOURS)	NO. OF DEPTS.
Lab	Graduate	284	29
	Medical	47	24
	Other	284	29
Lectures	Graduate	61	45
	Medical	41	42
	Other	131	28
Small Group Discussions	Graduate	46	30
	Medical	23	36
	Other	61	16

Faculty Summary based on Race and Ethnicity

(n=53 depts.) "–" indicates no value

	MALE	FEMALE	NOT SPECIFIED	TOTAL
Asian/Pacific Islander	126	50	1	177
Black (not Hispanic)	7	1	–	8
Hispanic	31	20	–	51
Native American	0	1	–	1
White (not Hispanic)	494	210	1	705
Foreign National	40	15	–	55
Not identified race/ethnicity	–	–	–	–
Not identified gender	–	–	1	1
TOTAL	698	297	3	998

Race/Ethnicity of US Citizen/Resident Alien Pre- and Postdoctoral Students/Trainees

(n=48 depts.) "–" indicates no value

	PREDOCTORAL		POSTDOCTORAL	
	MALE	FEMALE	MALE	FEMALE
Native American	–	2	–	1
Asian/Pacific Islander	34	27	26	14
Black (not Hispanic)	18	30	6	7
Hispanic	27	31	5	10
White (not Hispanic)	230	232	85	69
Other	–	–	–	–
TOTAL	309	322	122	101

she says, adding that she hopes the ACDP and AAMC data will be both informative and useful for discussions with administrators. For example, chairs and program directors can use the ACDP data to make the case for more resources.

"This survey allows people to go to their deans, vice presidents for research or whomever and say, 'We have all these research dollars, yet compared to other departments we don't have as much space' or 'We're not getting back some of the money from indirect costs like other departments are,'" Lowy says. "Or they can say, 'Our faculty have way more hours of teaching compared to other faculty and compared to the grants we're bringing in.'"

Knowledge is power when it comes to salary negotiations—and the AAMC salary data can be especially useful for researchers planning their next career move. "If you're applying for a job as an associate professor, you can see what the average salary is," Lowy says. "If they're offering you way under that amount or way over … you have something you can go back in and negotiate with." Chairs and program directors can also use the salary data to make the case for higher salaries for their faculty.

For those who already have jobs, the data allow comparisons with peers in similar institutions in their regions or nationally. "The salary data is always an eye-opener," Mangiarua says.

View the full survey data at www.the-aps.org/tphysmag.

Budget by Institution

	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)	$ 2,558,936	49	21	$ 2,690,457	12	18	$ 2,493,982	35	22
Outside Research Grants and Contracts (direct costs only)	5,054,693	48	21	5,543,809	12	18	5,025,754	35	22
Training Grants (direct costs only)	334,002	22	22	370,358	6	20	320,369	16	23
Endowments	567,234	36	21	1,571,842	9	18	246,283	25	23
Indirect Cost Recovery (amount returned to department)	477,687	35	23	1,477,993	6	21	270,727	29	23
Other Budget Support	875,309	33	22	1,679,306	6	18	722,668	26	24
Avg. Departmental Budget	9,007,876	49	21	11,176,976	12	18	8,603,269	35	22
SD	6,526,012			9,382,670			5,249,988		
TOTAL FACULTY			1,015			212			776

Non-medical: only two departments responded so those numbers are not presented separately but are included in All Insititutions.

Complete Ranking According to Total Dollars

TOTAL DOLLARS		RESEARCH GRANT DOLLARS		RESEARCH DOLLARS PER FACULTY		RESEARCH SPACE		RESEARCH DOLLARS SQ. FT.		NO. OF FACULTY
RANK	$	RANK	$	RANK	$	RANK	$	RANK	SQ. FT.	
1	$ 35,516,990	3	$ 11,806,049	2	$ 491,919	2	$ 49,118	15	240	24
2	24,928,046	1	16,206,531	4	438,014	4	44,336	8	366	37
3	22,691,410	2	15,672,126	7	412,424	9	34,591	5	453	38
4	17,677,597	10	7,595,560	5	421,976	8	36,042	25	211	18
5	17,558,123	5	9,561,204	11	382,448	23	20,367	4	469	25
6	16,794,526	8	8,414,263	3	467,459	20	21,913	7	384	18
7	14,263,717	7	8,613,690	32	172,274	5	38,298	19	225	50
8	13,721,377	4	10,065,972	1	529,788	3	48,939	29	206	19
9	13,649,946	11	7,313,970	15	304,749	10	33,754	23	217	24
10	12,427,148	9	7,814,694	8	411,300	14	30,953	13	252	19
11	12,385,791	6	9,032,008	10	392,696	7	36,048	14	251	23
12	11,531,394	21	4,523,057	27	196,655	15	27,440	35	165	23
13	11,524,670	13	6,500,000	26	196,970	44	10,414	2	624	33
14	11,362,570	17	6,179,233	14	308,962	12	32,384	32	191	20
15	11,345,032	14	6,256,008	20	250,240	6	37,098	33	169	25
16	10,833,615	18	5,782,329	30	175,222	16	26,020	20	222	33
17	10,669,041	20	4,621,336	41	107,473	11	33,170	37	139	43
18	8,985,451	15	6,223,237	18	270,576	43	10,555	3	590	23
19	8,905,833	16	6,195,790	6	413,053	19	22,168	11	279	15
20	8,513,890	27	3,975,695	25	220,872	26	19,053	27	209	18
21	8,350,156	28	3,931,998	36	140,429	18	23,924	36	164	28
22	7,683,929	19	4,882,879	9	406,907	30	16,729	10	292	12
23	7,582,302	24	4,304,724	40	110,378	21	21,517	30	200	39
24	7,565,306	22	4,440,766	12	317,198	31	15,916	12	279	14
25	7,527,468	12	7,000,000	23	233,333	45	10,100	1	693	30
26	7,137,539	26	4,116,015	17	274,401	25	19,417	24	212	15
27	6,505,481	37	2,662,208	45	88,740	1	49,427	45	54	30
28	6,356,404	30	3,428,132	24	228,542	28	17,446	31	196	15
29	6,096,719	23	4,400,000	16	293,333	42	11,427	6	385	15
30	6,011,771	29	3,859,819	19	257,321	29	17,096	18	226	15
31	6,006,594	31	3,197,136	37	127,885	33	14,492	21	221	25
32	5,995,368	25	4,241,204	21	249,483	24	20,223	26	210	17
33	5,878,750	39	2,317,766	38	121,988	13	31,563	42	73	19
34	5,411,774	36	2,728,793	28	194,914	37	12,484	22	219	14
35	5,161,872	33	2,940,383	34	163,355	38	12,475	16	236	18
36	4,828,008	48	198,208	48	9,910	27	18,500	47	11	20
37	4,516,683	32	3,184,810	29	176,934	17	24,000	39	133	18
38	4,382,172	38	2,420,548	31	172,896	40	11,623	28	208	14
39	4,276,280	42	1,698,422	42	106,151	34	13,210	40	129	16
40	3,933,273	40	2,071,875	35	159,375	35	12,507	34	166	13
41	3,930,983	34	2,848,584	13	316,509	46	9,356	9	304	9
42	3,914,698	43	1,538,306	39	118,331	22	21,204	43	73	13
43	3,892,607	35	2,838,968	33	166,998	39	12,048	17	236	17
44	3,877,456	44	1,278,047	43	91,289	32	14,774	41	87	14
45	2,991,150	41	1,699,530	22	242,790	36	12,500	38	136	7
46	1,930,000	47	229,000	47	22,900	41	11,600	46	20	10
47	1,697,743	46	561,398	46	62,378	47	8,289	44	68	9
48	1,337,256	45	1,253,034	44	89,502					14
49	1,320,000					48	2,975			7

Jobs Board

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FACULTY,
RESEARCH SCIENTIST,
INSTRUCTOR,
LECTURER OR
LEADERSHIP

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the-aps.org/jobs

THE HARASSMENT TRAP

Sexual misconduct in the workplace ruins lives and careers. In science, it also pushes promising researchers away and delays or prevents important scientific breakthroughs. Physiology is not immune.

BY ANNE FORD

Illustration by Benedetto Cristofani

Donna Morgan* had two advisers during her doctoral work in cardiovascular physiology. One, Dr. Dixon*, frequently accompanied her into the basement facility where she worked. Morgan noticed that he seemed to stand much closer to her than was necessary. When she grew uncomfortable and moved away, he began asking her, "Why are you uncomfortable? Have you been hurt by a man?"

** APS member firsthand account. Name changed.*

All sources interviewed for this article are APS members. They chose to remain anonymous but wanted to share their stories to help educate others about sexual misconduct in the field of physiology.

Illustration by Brad Latham/iStockphoto

Dixon escalated to touching her. If he were teaching Morgan to do a surgical procedure, "maybe his right hand was helping to guide my right hand, but then his left hand would be on my shoulder or my thigh," she says. "I was 26, this was my doctoral adviser, and I just didn't know what to do with this at all."

Dixon asked her over and over why she didn't dress in a more feminine way. "It seemed as though if I didn't start making some of these adjustments, I would not move forward," she says. "The signals I was getting from him were that part of being a graduate student was going to meetings and making contacts and he would not take me with him to these meetings if he didn't think I'd be presentable." So she changed her appearance accordingly—and this, she says, "was when things completely fell apart for me."

Dixon did take her to a professional meeting. And on the drive back, in the middle of the night, he pulled off the interstate and sexually assaulted her.

For the next three years, he demanded that Morgan provide him sexual favors in exchange for him reading her work. "I spent those years thinking, 'Who do I tell? Is this my fault?'" she says. "Because that's the message I got from him: Now that I looked the part, he was unable to resist."

Morgan doubted she would be believed if she told anyone what was happening. And if she did, she would have to throw away all the work she'd done so far. Her other adviser noticed her depressed demeanor and told her that whenever he had to interact with her, it ruined his day. Could she please be more cheerful?

HARMING PEOPLE—AND SCIENCE

More than half—58 percent—of female academic faculty and staff have experienced sexual harassment, a workplace rate second only to that of the military at 69 percent, according to the National Academies of Sciences, Engineering and Medicine's 2018 report, "Sexual Harassment of Women: Climate, Culture and Consequences in Academic Sciences, Engineering and Medicine." Sexual harassment and gender discrimination are sometimes mischaracterized as mere annoyances—the equivalent of rude remarks at a dinner party. In truth, this dangerous behavior takes many forms, from comments that objectify or exclude members of one gender to unwanted sexual advances to sexual coercion and assault. For those who experience it, it can be life-altering, even career-ending. It can foster hostile work environments, push promising researchers out of the field and delay or prevent important advances in knowledge. Physiology is not immune.

The National Academies have named five factors that contribute to sexual harassment in academia:

1. A perceived tolerance for such harassment
2. Male-dominated work settings
3. A hierarchal power structure
4. Policies and procedures that focus on protecting the institution
5. An uninformed leadership

Like Morgan, postdoctoral fellow Tamara Green* experienced sexual harassment before she was out of graduate school. That's when a male student she was assigned to work with began asking her about her sexual preferences and experiences. "I had never had anyone ask me any of that before, and I didn't know what to do," she says.

Ignoring him did nothing, and Green didn't think she'd get anywhere by trying to talk to her male principal investigator (PI) about the situation. To make matters worse, she was on three publications with the student, and he had the power to remove her from her experiments. Would speaking up jeopardize her future career?

The harassment finally stopped when a female lab tech overheard him asking Green: "I noticed you shave your arms. Do you shave anything else?" The tech stepped in and said, "What did you just say to her?" That seemed to silence the harasser for good, "I think because he realized that other people were listening and that he could get in trouble," Green says.

More recently, during her postdoctoral fellowship, Green encountered a similarly uncomfortable situation with a visiting professor, who said things to her such as "You look nice in those clothes today" and "Would you ever date a married man?" When he escalated to touching her hair and face, she conferred with the lab's only other female postdoc, who had been a target of the same behavior. Together they told their male PI, who resolved the situation by having the professor work solely with a male postdoc.

While Green is relieved that the harassment stopped, she thinks her PI "appeased the situation, rather than approaching the situation. I don't know what he and this professor talked about; I don't know if there was a discussion about how his behavior was inappropriate."

The situation has negatively affected Green's own work, not just because of the distraction and distress involved, but because this professor—given his status as a visitor—has access to highly desirable experiments in which Green is now unable to join. But she and the other female postdoc feel loathe to rock the boat by raising the issue again.

Sexual harassment like this does more than harm a single individual and their career. Green says it hurts all of physiology. "I think it hinders progress because it makes people feel uncomfortable listening to each other, and you have to be extremely collaborative in order to move science forward," she says. "What's the point of diversity if we're not working together?"

DAMAGING CAREERS

University professor Gabriella Feliciano* has taught at the university level for several decades. She remembers during her younger days doing a poster session about her work in sexual behavior. She smiled stoically as male colleagues routinely asked, "Do you need a subject?" or "Is it true that Latin women are great lovers?"

"When you're young, and these are established people, you don't

Sexual harassment like this does more than harm a single individual and their career. It hurts all of physiology.

"It's getting better, with the #MeToo movement. Still, we haven't gotten to the point where males and females are equal. My goal is to see that we're all treated equally."

feel comfortable" speaking out in a situation like that, she says. "You don't know if it could impact your future career. All you can do is smile and try to change the subject."

The discrimination and harassment didn't end there. In her first job, she was promised her own laboratory, only to see it given to a male colleague instead. Then another male colleague—recruited at the same time she was—was given a class with 18 students, while she was assigned a class with more than 100. "So even the academic load was different because I was a female," she says.

When it came time for her to go on maternity leave, Feliciano planned to extend it by adding the two months of vacation time she had earned, but her male department chair said she couldn't because he needed her to teach a certain course during a particular term. As she puts it, "I have a lot of stories, but they're more or less the same."

Now that Feliciano has more seniority—and now that times have begun to change—she feels more comfortable objecting when she sees sexual harassment or gender discrimination taking place. "It's getting better, with the #MeToo movement," she says. "Still, we haven't gotten to the point where males and females are equal. My goal is to see that we're all treated equally."

PERVASIVE DISCRIMINATION

Nick McMillan* hasn't experienced gender discrimination. But as the husband and colleague of a fellow scientist, he has had a front-row seat to its effects.

Twenty-five years ago, McMillan and his wife, Irene*, worked at the same pharmaceutical company, where Irene was the only woman in her division. At one point, she took maternity leave, then returned to work. When it came time for performance evaluations, her boss downgraded her performance from previous years. "She said, 'I don't understand. I was just as productive as I ever was,'" McMillan remembers. "And he said, 'It's because you were gone. Think of it as being a factory worker. If you're off for three months, you can't make your quota of widgets.'"

Irene decided shortly afterward that she didn't need to keep working there. But even after Irene and her husband both left that company and moved into academia, it didn't take long for her to experience discrimination again.

This time, the couple held equal positions within a university department. Again, Irene went in for her annual evaluation, where the department chair told her, "We're really happy with your work. We're going to give you a 3 percent raise." But Irene knew that her husband had received a 5 percent raise. Upon pointing this out, she was told, "Well, when you look at what the two of you earn together, you're doing better than the other faculty in the department."

Irene stood her ground, consulting with a labor lawyer and eventually receiving a salary increase that put her on par with the men in the department.

These days, gender discrimination tends to show up in less measurable ways, McMillan says. For example, he notices that although both he and his wife have their own labs, people frequently assume they share a lab and that he's the head of it. Then, too, "a lot of times someone will ask me to speak or to write something, and it's clearly not in my primary expertise; it's in Irene's primary expertise."

Attention from APS

In late 2018, APS developed a sexual harassment task force to develop policies and procedures that ensure APS members and colleagues can collaborate in harassment-free spaces that keep the focus on the important work happening in the field of physiology. The Society is committed to creating an environment where individuals can exchange ideas and be safe, accepted and respected. Read more at www.the-aps.org/about/welcome/core-values.

While McMillan emphasizes that he can't speak on behalf of his wife or any other woman, he believes incidents like these are likely driving women out of science. "They see the kind of environment they have to deal with, and they're like, 'I'm going to go do something else.'"

As the National Academies report points out, laws against sexual harassment in academic settings have been on the books for three decades. Yet the prevalence of sexual harassment has not dropped. Rather than relying on the legal system to prevent or end harassment, the report concludes, the science community must look to organizational culture.

Does that mean holding ever more sexual harassment prevention trainings? Not necessarily. As the report states, "While sexual harassment training can be useful in improving knowledge of policies and of behaviors that constitute sexual harassment, it has not been demonstrated to prevent sexual harassment or change people's behaviors or beliefs, and some training shows a negative effect (or impact)."

Instead, the emphasis should be on implementing strong, effective leadership at all levels, as well as on creating organizational systems and structures that value and support diversity, inclusion and respect. The report also notes, "Reducing hierarchical power structures and diffusing power more broadly among faculty and trainees can reduce the risk of sexual harassment." Among its additional observations: Standards of behavior must be upheld not just on campus, but also at field sites and professional society meetings. As it concludes, "Professional societies have the potential to be powerful drivers of change."

A Road Map for Positive Change

Last year, the National Academies of Sciences, Engineering and Medicine released "Sexual Harassment of Women: Climate, Culture and Consequences in Academic Sciences, Engineering and Medicine." The detailed report provides an overview of sexual harassment research, explores how sexual harassment interfaces with academic environments, discusses job and health outcomes of sexual harassment, provides legal and policy mechanisms and offers thoughts on changing the culture and climate of higher education.

The report offers seven recommendations:

1. Create diverse, inclusive and respectful environments.
2. Address the most common form of sexual harassment: gender harassment. (Gender harassment consists of verbal and nonverbal behaviors that convey hostility, objectification, exclusion or second-class status about members of one gender.)
3. Move beyond legal compliance to address culture and climate.
4. Improve transparency and accountability.
5. Diffuse the hierarchical and dependent relationship between trainees and faculty.
6. Provide support for the target.
7. Strive for strong and diverse leadership.

The full report is available for free download at www.bit.ly/harassmentwomen.

WONDERING WHAT MIGHT HAVE BEEN

Morgan finally completed her doctorate and moved to another university for a postdoc. But Dixon hampered her career from afar, refusing to move forward with any of the draft publications she'd submitted to him. He told her that the only way he'd help her was if she visited him at his university, where, she knew, she would have to endure his sexual harassment. So she stayed away—and had nothing to show for all her hard work. "I got my degree, but I lost everything else."

Seven years after graduating, and after receiving psychological care, Morgan felt able to tell her alma mater about Dixon's behavior. While the statute of limitations prevented legal action, he was barred from having female advisees or being alone with a woman in his office. His colleagues learned of his behavior and refused to work with him. However, he retains his position, although he has never made full professor.

Meanwhile, Morgan, who now teaches at a predominantly undergraduate university, wonders what might have been. "I like what I do, but I didn't continue with a research career," she says. "I have never been comfortable working with undergraduate students one-on-one in a low-traffic area of our facility. It's changed me forever."

SUE BARMAN RECEIVES MICHIGAN STATE UNIVERSITY'S OUTSTANDING FACULTY AWARD

APS Past President **Sue Barman, PhD**, of Michigan State University (MSU), was a recipient of MSU's 2019 William J. Beal Outstanding Faculty Award. Barman is honored for "her significant accomplishments as a scholar, teacher and leader in the College of Human Medicine and the field of physiology."

APS MEMBERS ELECTED TO FASEB BOARD OF DIRECTORS

Two APS members have been elected to the Federation of American Societies for Experimental Biology (FASEB) board of directors. **Hannah Carey, PhD, FAPS**, of the University of Wisconsin-Madison School of Veterinary Medicine, will become the next president of FASEB. Carey was the 80th president of APS (2007–2008). **Kevin Kregel, PhD, FAPS**, will fill the role of FASEB vice president for science policy. Kregel is the associate provost for faculty at the University of Iowa. Carey and Kregel start their FASEB terms on July 1.

DAVID MATTSON APPOINTED CHAIR OF PHYSIOLOGY DEPARTMENT AT MEDICAL COLLEGE OF GEORGIA

David Mattson, PhD, has been appointed chair of the department of physiology at the Medical College of Georgia. In addition, he will be a Georgia Research Alliance Eminent Scholar in Hypertension. Mattson was formerly a member of the faculty at the Medical College of Wisconsin (MCW), where he served as president of the MCW Faculty Council.

APS MEMBERS ELECTED TO NATIONAL ACADEMY OF SCIENCES

The following APS members were elected to the National Academy of Sciences on April 30:

Edward S. Boyden, PhD, Y. Eva Tan Professor in Neurotechnology and professor, departments of brain and cognitive sciences and biological engineering, Massachusetts Institute of Technology

Edward M. Callaway, PhD, Audrey Geisel Chair in Biomedical Sciences and senior fellow, Crick-Jacobs Center for Theoretical and Computational Biology, Salk Institute for Biological Studies, La Jolla, Calif.

Gloria M. Coruzzi, PhD, Carroll and Milton Petrie Professor of Biology, Center for Genomics and Systems Biology, New York University

David D. Moore, PhD, R.P. Doherty Jr. Welch Professor, departments of molecular and cellular biology, medicine, and molecular and human genetics, Baylor College of Medicine, Houston

Mark T. Nelson, PhD, University Distinguished Professor and chair of pharmacology, University of Vermont

Rudolf Zechner, PhD, director, BioTechMed-Graz, and professor, Institute of Molecular Biosciences, University of Graz, Austria

The National Academy of Sciences is a private, nonprofit institution that recognizes achievement in science and provides science, engineering and health policy advice to the federal government.

Got exciting career news to share? Let us know! Email tphysmag@the-aps.org.

MEET THE EDITOR

Barb Goodman

Advances in Physiology Education

Barbara E. Goodman, PhD, FAPS, will begin her term as editor-in-chief of *Advances in Physiology Education* on January 1, 2020.

"I have been involved with *Advances* since joining the editorial board in 1999 and becoming an associate editor in 2001.

Advances publishes articles on topics that include curriculum and course design, best practices in outreach and active learning and innovative teaching ideas. During my tenure as editor, I am interested in broadening the scope of *Advances* to feature anything that physiology educators do in their teaching lives that would be helpful to other educators, such as student advising, mentoring student researchers and all forms of evidence-based teaching research. There also will be a special call for papers on professional development at all stages in a physiologist's career. The journal will also feature articles related to the presentations at the biennial APS Institutes on Teaching and Learning and the featured topics, symposia and posters from the Experimental Biology meetings.

I see *Advances* as the key journal for establishing and strengthening the PECOP (Physiology Educators Community of Practice) both throughout the U.S. and globally and for offering a platform for collaborations among physiology educators. Let's continue to contribute our educational scholarship to *Advances*!"

Our New CSO: Dennis Brown, PhD

A longtime member and past president will serve as lead science spokesperson.

Dennis Brown, PhD, has joined the APS staff as the Society's first-ever chief science officer (CSO). In this new role, he will serve as the Society's primary scientific spokesperson and advocate, overseeing the science policy, scientific meetings, and education and member communities departments.

Brown's credentials as a top-tier researcher, along with his long history of service to APS, made him the ideal candidate for this important role. Brown currently serves as professor of medicine at Harvard Medical School and director of the Massachusetts General Hospital (MGH) Program in Membrane Biology. He has also held key leadership positions at APS, including serving as the Society's 90th president and as editor-in-chief for both *AJP—Cell Physiology* and *Physiological Reviews*. Starting this month, Brown will split his time between APS headquarters in Rockville, Md., and Boston, where he will retain his affiliation with both Harvard and MGH.

In his new role as CSO, Brown joins the APS senior executive team along with the chief operations officer, Robert Price, CAE, CPA, and the chief engagement and partnerships officer, Meeghan De Cagna, MSc, CAE. APS is in the process of hiring a chief publishing officer to replace Rita Scheman, who retired in June.

"Dennis' energy and ideas will be a huge asset to APS as we build the future of the Society," said APS Executive Director Scott Steen, CAE, FASAE. "Dennis will play a key role in helping us develop new ways to support and grow the global community of researchers working in the physiological sciences."

ADVICE TO MY YOUNGER SELF

We asked some of our emeritus members for a piece of advice they would tell their younger selves. Here's what they had to say:

"If you plan to continue researching, it is important to define your own research area. Remember to read about the disruptiveness index in science."

—Niels Juel Christensen, MD, is professor emeritus at Herlev Hospital in Denmark.

"Put family first. Follow your heart. Find a great mentor. Focus and become expert in something. Persevere even when (especially when!) the going gets tough. And most critical, remember that the journey is more important than the finish because life is a long race, not a sprint."

—Douglas P. Zipes, MD, is distinguished professor and emeritus professor of medicine, pharmacology and toxicology at the Indiana University School of Medicine.

"Stick always to your laboratory data; do not try to work things out but to stoggedly proceed. This is wisdom I learned from my mentors: Are the data true, are they new, are they important?"

—Wolfgang Jelkmann, MD, is professor emeritus at the University of Lübeck in Germany.

Read more from these members at www.the-aps.org/tphysmag.

NEWS FROM THE FIELD

CHAPTER NEWS

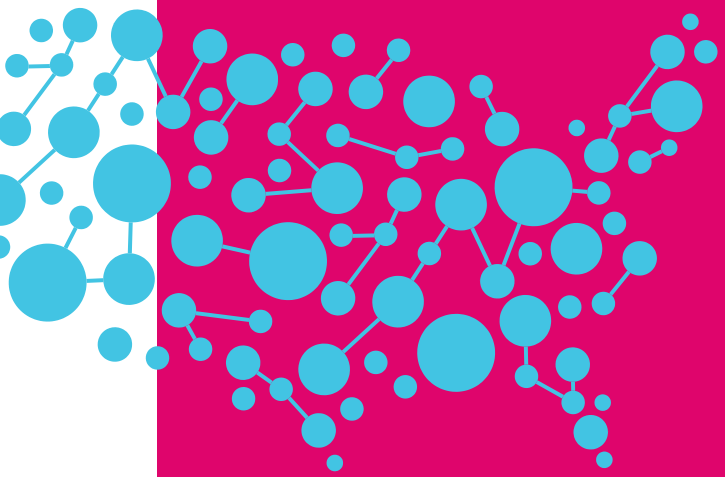
APS Enhances Chapter Program

Over the past year, the APS Council has worked closely with APS chapters to ensure thoughtful and compliant governance. As a result, the chapter program is now poised to expand. If you reside in a state that does not have an active chapter, now is a great time to consider starting one.

The chapter program has been in existence since 1995, yet many members remain unaware of what chapters offer to both the Society and their local scientific communities. Working at the grassroots level, chapter activities closely align with APS' strategic plan. Each active chapter has a unique way of contributing to the development of trainees, sharing of cutting-edge research and promoting best practice in education through its annual meeting and outreach activities.

If you want to start a chapter in your state, start by reaching out to other APS members who actively participate in a state chapter, asking them to share their thoughts on the value and purpose of the chapter program. Mari Hopper, chair of the Chapter Advisory Committee, can help connect you to these fellow members. Email your request or any other questions you have about chapters to mari.hopper@shsu.edu.

Learn more about APS chapters at www.the-aps.org/community.



OPPORTUNITY KNOCKS

Check out these featured job listings. To find your next career opportunity or to list your job announcement with us, visit www.the-aps.org/jobs.

ASSISTANT/ASSOCIATE PROFESSOR
SAM HOUSTON STATE UNIVERSITY

Sam Houston State University Proposed College of Osteopathic Medicine is seeking a full-time, tenure-track physiology faculty member. Faculty will instruct within the foundational sciences courses and be expected to provide instruction using various methods of content delivery, including small group, case-based and other interactive approaches. **Read more at www.the-aps.org/jobboard/shsu.**

ASSISTANT PROFESSOR OF PHYSIOLOGY
ARKANSAS COLLEGE OF OSTEOPATHIC MEDICINE

The assistant/associate professor of physiology will be responsible for developing interactive and didactic osteopathic medical education curricula centered around clinically relevant, systems-based physiological mechanisms of health and disease. Faculty duties will also include maintaining a viable scholarly/research agenda and engaging in institutional, community and professional service. **Read more at www.the-aps.org/jobboard/arcom.**

PROFESSOR AND CONNELL ENDOWED CHAIR IN DIABETES RESEARCH
UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

The department of physiology at the University of Tennessee Health Science Center invites applications and nominations from nationally and internationally renowned individuals for the position of Eldon D. & Ruth Connell Endowed Chair Professor of Diabetes Research. Current areas of research within the department include cardiovascular disease, diabetes, gastrointestinal disease, cancer, neurodegenerative diseases and ion channels. **Read more at www.the-aps.org/jobboard/uthsc.**

POSTDOCTORAL RESEARCHER
RUTGERS NEW JERSEY MEDICAL SCHOOL

A postdoctoral position is available in the lab of Annie Beuve, PhD, MS, in the department of pharmacology, physiology and neuroscience. The multidisciplinary lab seeks a highly motivated researcher to lead a project to integrate the molecular mechanisms of NO and cGMP signaling in vivo in the cardiovascular system of mouse models subjected to oxidative stress, using physiological and pharmacological approaches. **Read more at www.the-aps.org/jobboard/rutgers.**

AWARDS

Ernest H. Starling Distinguished Lecture of the APS Water & Electrolyte Homeostasis Section (Deadline: July 1, 2019)

Bodil M. Schmidt-Nielsen Distinguished Mentor and Scientist Award (Deadline: September 15, 2019)

Clifford Barger Underrepresented Minority Mentorship Award (Deadline: September 15, 2019)

G. Edgar Folk Senior Physiologists Award (Apply anytime)

More details: www.the-aps.org/researcherawards

CALLS FOR EDITORS

Nominations are invited for editor-in-chief of the following journals:

American Journal of Physiology—Cell Physiology

American Journal of Physiology—Regulatory, Integrative and Comparative Physiology

American Journal of Physiology—Renal Physiology

Journal of Neurophysiology (JNP)

Editorships will begin on June 30, 2020. Apply by July 15, 2019.

More details: www.physiology.org/calls-for-nominations-april2019

CALLS FOR PAPERS

Journal of Applied Physiology (Deadline: August 31, 2019)

- Highlighted Topic: Translational Control of Muscle Mass

American Journal of Physiology—Endocrinology and Metabolism (Deadline: September 30, 2019)

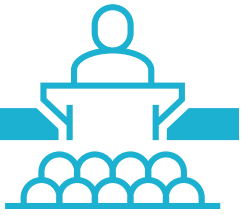
- Browning and Beiging of Adipose Tissue: Its Role in the Regulation of Energy Homeostasis and as a Potential Target for Alleviating Metabolic Diseases
- Immunometabolic Cross-talk and Regulation of Endocrine and Metabolic Functions
- Mitochondria Dysfunction in Aging and Metabolic Diseases
- Role of Gut Microbiota, Gut-brain and Gut Liver Axes in Physiological Regulation of Inflammation, Energy Balance and Metabolism

Advances in Physiology Education (Submit anytime)

- Curricular Integration of Physiology
- K–12 Outreach

More details: www.physiology.org/calls

CONFERENCES



Interface of Mathematical Models and Experimental Biology: Role of the Microvasculature Conference (September 11–14, 2019, Scottsdale, Ariz.)

- Advanced registration deadline: August 11, 2019
- Hotel reservation deadline: August 11, 2019
- Registration cancellation deadline: August 21, 2019

2019 APS Aldosterone and ENaC in Health and Disease: The Kidney and Beyond Conference (October 2–6, 2019, Estes Park, Colo.)

- Advanced registration deadline: September 2, 2019
- Hotel reservation deadline: September 8, 2019
- Registration cancellation deadline: September 12, 2019

More details: www.the-aps.org/meetings

Spark Curiosity

Gary Sieck, PhD, FAPS, urges educators to do more to ignite the passion for physiology in younger researchers.

Today, our physiology community is challenged with an identity crisis. Who are we as a scientific discipline? How do we distinguish ourselves from other disciplines? How do we contribute to the advancement of knowledge in biology and medicine? And how do we help shape up-and-coming researchers who will make the discoveries of tomorrow to ensure the future of the physiology is strong?

"Lecturing by PowerPoint is hardly the ideal mechanism to stoke a passion for life."

I would contend that as a discipline, we are part of an ageless fascination with life, that we distinguish ourselves by our emphasis on discovery of life function and that we contribute by displaying our curiosity and conveying our excitement about discovery in life science. As a teacher and mentor, I also feel an obligation to spark curiosity about life's functions in the next generation.

But are we effectively igniting curiosity and passion for physiology in the next generation of emerging scientists? Is it our responsibility as teachers to teach our students how to think?

I have benefited greatly from the influence of teachers and mentors, who have helped reinforce my curiosity in life, encourage my imagination in science and stoke my passion for physiology. I firmly believe that one of my greatest responsibilities is to retain my curiosity as a student no matter my age, while paying it forward as a teacher and mentor to others. Fortunately, physiologists are given many opportunities to be both curious students and motivating teachers in their careers. It is our obligation to seize these opportunities and display our passion in physiology.

Albert Einstein—who clearly understood the central role of curiosity in science and discovery—wrote, "the important thing is not to stop questioning. Curiosity has its own reason for existing." We need to communicate this message of life-long curiosity and imagination when recruiting the next generation of physiologists.

All too often, we fail to ignite the fire of physiological knowledge. Lecturing by PowerPoint is hardly the ideal mechanism to stoke a passion for life. We should not shirk our responsibilities as teachers of the next generation. Teaching should not be seen as a burden only to be relieved by acquiring grant funding.

As scientists, it is important for us to use our creative imaginations and our abilities to form new images, ideas and concepts that are not based solely on prior knowledge.

I have always had a passion for science, exploration and discovery since my earliest days. Luckily, my family and friends nourished this passion when I was growing up. My teachers guided me as a student and reinforced my passion. Now as a scientist, I've had great opportunities to explore my curiosity, use my imagination and make new discoveries. This isn't work—it's not a job—it's my life!

I only hope to inspire and promote a similar passion in my own students and trainees, much as my teachers did for me. And I hope the rest of you, my colleagues, take advantage of those opportunities to interject curiosity, possibility, imagination—and not too many PowerPoint slides—in your interactions with the future leaders of the discipline.

Gary C. Sieck, PhD, FAPS, is a professor of physiology and a Distinguished Mayo Investigator at the Mayo Clinic. He is a past president of APS.

Illustration by Brett Affrunti

Read the comparative physiology blog

Life Lines

by

Dr. Dolittle

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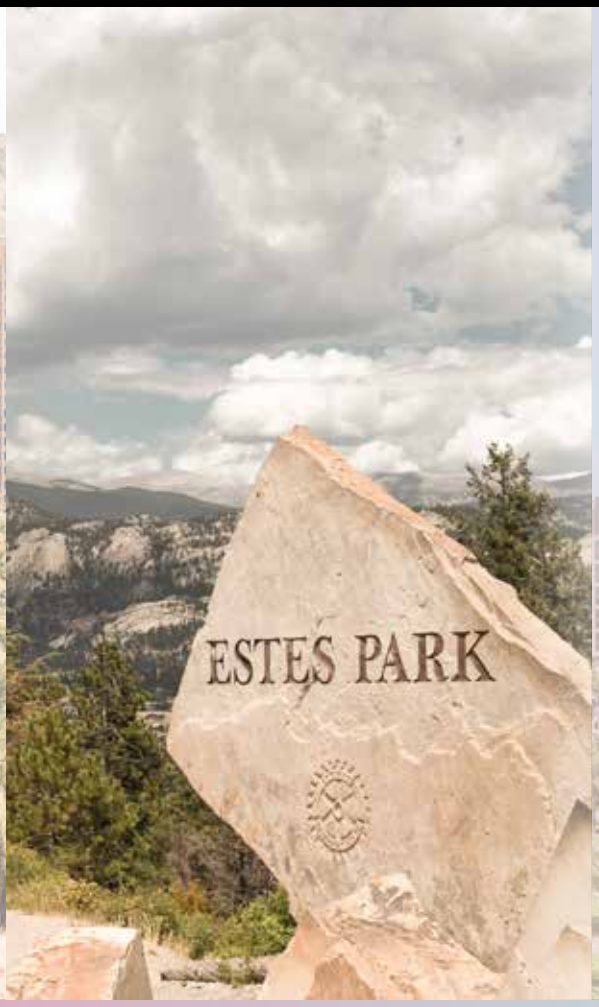

INQUIRY COLLABORATION DISCOVERY

2019 APS Interface of Mathematical Models and Experimental Biology: Role of the Microvasculature
September 11–14, 2019
Scottsdale, Arizona
Advanced Registration Deadline: August 11, 2019
the-aps.org/mathmodels

2019 9th Annual International Conference of Aldosterone and ENaC in Health and Disease: The Kidney and Beyond
October 2–6, 2019
Estes Park, Colorado
Advanced Registration Deadline: September 2, 2019
the-aps.org/enac

SAVE THE DATE: APS Annual Meeting at EB 2020
April 4–7, 2020
San Diego, California

APS members enjoy discounted registration.

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