THE Physiologist MAGAZINE
JULY 2026



FOCUSED ON FUNCTION

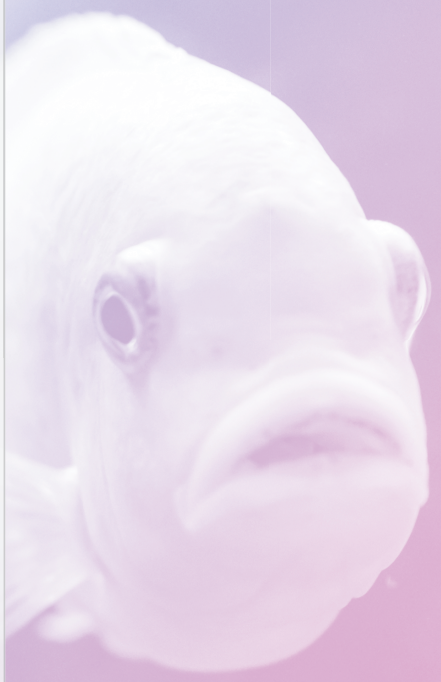
David M. Pollock has spent 40 years listening to what the kidney is trying to tell us.

PLUS: **MENTORS' BEST CAREER TIPS 24** | **MULTIPLE MODELS, STRONGER SCIENCE 28**

Comparative Physiology Conference

September 17–20, 2026

Orlando, Florida



Advance Registration Deadline:
July 31

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Submit your abstract and register at physiology.org/comparative2026.

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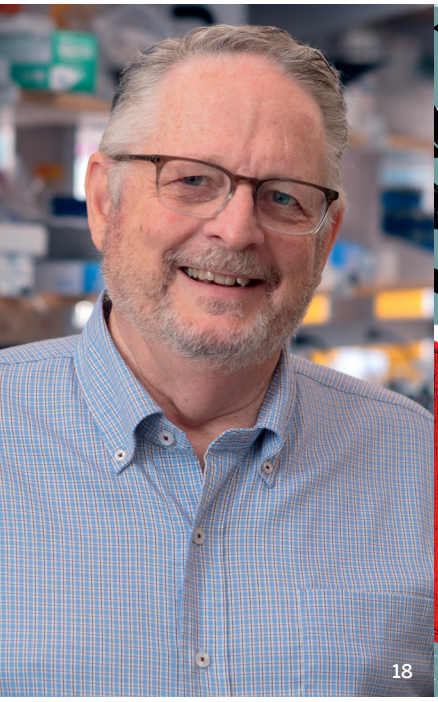







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Science Voices Needed Now

BY AMANDA BERTHOLF, MA



Science runs on long timelines. Careers, institutions and discoveries build slowly and deliberately on what came before. A researcher spends 40 years advancing our understanding of a single organ. A society accumulates 139 years of knowledge, advocacy and community. A federal investment made in the 1940s becomes the backbone of American biomedical innovation. That's the nature of the work. Right now, that work is under extreme pressure, which is why what's happening to federal research funding needs your voice.

Proposed changes to how federal research grants are awarded and managed would fundamentally alter the infrastructure that makes long-term science possible. APS is taking action, and there is still time for your voice to be heard. Turn to page 41 or visit **physology.org/proposedrule** for details on how to submit a public comment before the deadline.

"Proposed changes to how federal research grants are awarded and managed would fundamentally alter the infrastructure that makes long-term science possible."

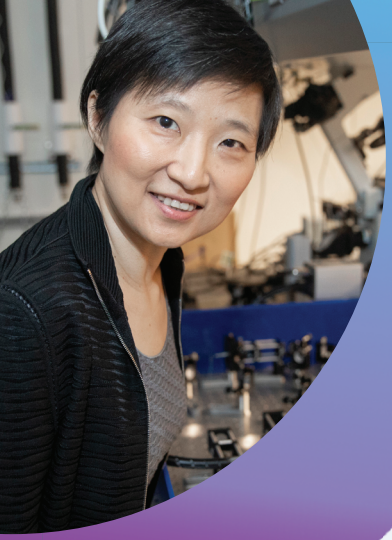
It is at this moment that APS welcomes its new CEO, Erika Shugart, PhD, FAAAS. She arrives fully aware of what is at stake. "The U.S. still drives science worldwide," she says. "Our science is second to none because of the huge federal investment that has been made, going back to the 1940s." She knows the fight ahead is long and critically important, and she is ready for it. Read more about Shugart's background and her vision for APS on page 34.

While animal models have been an essential foundation of physiology for decades, there are now more non-animal models than ever available to researchers. In our feature article "The Whole Toolbox" on page 28, we explore how physiologists are using multiple methodologies to enhance their research—combining new approaches with traditional ones to strengthen science.

Strengthening science is a passion of this issue's member profile: leading renal researcher David M. Pollock, PhD, FAPS. He has spent more than 40 years advancing the understanding of the kidney. Now, he's the newest editor-in-chief of the APS journal *Function*, which explores the connection between physiology research and other disciplines. Read how Pollock got his start and how he views *Function's* role in science on page 18.

In every edition of this magazine, our Mentoring Q&A column features advice from a mentor based on questions from a student or trainee. As we were brainstorming ideas for this issue, we realized we had amassed a huge collection of valuable tips and inspiring words from physiology leaders. So, on page 24, we've gathered some of that advice in one place, which we're calling "The Wisdom Archive." I hope it sparks an idea or gives you a bit of extra inspiration in your daily work.

Amanda Bertholf, MA, is APS director of communications and the editor-in-chief of *The Physiologist Magazine*. Send questions or comments to the editor at tphysmag@physiology.org.



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physiology.org/jobs



THE Physiologist MAGAZINE

VOL. 69 | JULY 2026

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APS*select*

How the Body Responds to GLP-1s



Losing weight is not just about food restriction but also how the body responds. In a study published in the *American Journal of Physiology-Endocrinology and Metabolism*, researchers compared weight loss from dieting with weight loss from semaglutide, a GLP-1 receptor agonist used to treat obesity. The study showed that minipigs following a restricted diet lost more lean mass and ended up with more body fat than those treated with semaglutide. The animals also expended less energy and had changes in muscle and mitochondrial function that may make it easier to regain weight. Semaglutide appeared to help preserve a healthier body composition and prevent some of these energy-conserving responses. How weight is lost may matter as much as how much is lost and point to new biological pathways that could help improve long-term obesity treatment.

Source: **doi.org/10.1152/ajpendo.00480.2024**

All images: iStock

IN BRIEF

The Latest Research from APS Journals

Explore new peer-reviewed findings published across the Society's journals.



In weightlessness, people had a harder time producing steady, coordinated force with both hands, showing that gravity helps the brain control movement.

doi.org/10.1152/jn.00632.2025



Heat training at moderate altitude helps athletes make more hemoglobin but did not lead to immediate performance improvements.

doi.org/10.1152/japplphysiol.00777.2025



Delayed-onset muscle soreness slows the speed at which the brain processes body movements, even though movement accuracy is not affected.

doi.org/10.1152/jn.00004.2026

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What Spit Reveals About Stress

Researchers analyzed saliva samples from 60 West Point cadets before and after an intense three-minute hand-to-hand combat match to understand how acute physical stress affects metabolism. In the study, published in *Physiological Genomics*, samples were collected at the start of the trial, then after three months of training immediately before and after the final match. Researchers found no major metabolic differences between the baseline and pre-match samples of more than 400 metabolites. But immediately after the fight, the body's chemistry shifted dramatically. Levels of 81 metabolites—many linked to carbohydrate, lipid and amino acid metabolism—spiked, suggesting a rapid increase in energy availability. Saliva metabolomics is a quick and noninvasive solution for capturing the body's rapid energy response to acute stress. That could make it a valuable tool for studying military performance, athletic competition and human physiology under pressure. Source: **doi.org/10.1152/physiolgenomics.00197.2025**

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Why Asthma Hits Women Harder



Sex differences in asthma severity are well-known, but the biology behind them is still being untangled. A study published in the *American Journal of Physiology-Lung Cellular and Molecular Physiology* helps separate two major contributors: sex chromosomes (XX or XY) and gonadal characteristics (ovaries and testes). Both factors influenced the body's response after exposure to house dust mite, a common asthma trigger. Researchers studied mice with typically male and female gonadal traits, as well as those with male and female chromosomes. The animals with ovaries developed more lung inflammation and mucus-producing goblet cell changes, and those with XX chromosomes had higher levels of eosinophils, a type of white blood cell involved in asthma. The findings offer new clues about why asthma is often more severe in women and may help guide more personalized approaches to asthma research and treatment. Source: **doi.org/10.1152/ajplung.00210.2025**



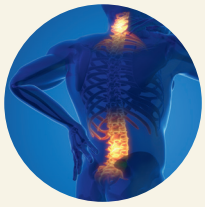
Drinking sugary beverages while exercising redirects some of the blood from active muscles to the gut for digestion without raising overall heart output.

doi.org/10.1152/japplphysiol.00954.2025



Estrogen helps protect the aging female brain by supporting brain cell connections, metabolism and mitochondrial function.

doi.org/10.1152/ajpregu.00031.2026



Reduced theta-gamma phase-amplitude coupling in the brains of people with chronic pain interferes with normal pain processing and daily function.

doi.org/10.1152/jn.00492.2025



Study finds wide variation in what students think "alive" means, even before starting introductory biology courses.

doi.org/10.1152/advan.00139.2025

LAB NOTES

MENTORING Q&A YOUR QUESTIONS ANSWERED
STREAMING SCIENCE APS JOURNAL PODCASTS
POLICY IQ PHYSIOLOGY ON THE HILL AND IN THE HALLS
UNDER THE MICROSCOPE OUR MEMBERS, UP CLOSE
PUBLISH WITH POLISH BUILD A BETTER RESEARCH PAPER
IN DEPTH DIVING DEEP INTO SCIENCE
STATS & FACTS PHYSIOLOGY BY THE NUMBERS



Sidney Strause



Junie Paula Warrington, PhD

MENTORING Q&A | PHD LIFE

Trainee Truths

Lessons for the PhD years and beyond.

Each issue, we ask a student or early-career member to pose their career questions to an established investigator and mentor. Here, **Sidney Strause**, a PhD candidate at Marshall University, asks **Junie Paula Warrington, PhD**, what it takes to succeed in science. Warrington is an associate professor in the Department of Neurology and director of the Program in Neuroscience at the University of Mississippi Medical Center.

Illustrations by Kagan McLeod

Q: How has your definition of success evolved?
A: My definition has not changed much over the years. I have always believed that if I have genuinely done my best, then I have succeeded, regardless of the outcome. That perspective has allowed me to navigate both achievements and setbacks with a consistent sense of purpose. Over time, this definition has expanded to include my mentees' success. Seeing them grow, gain confidence and reach their goals is deeply meaningful, and I view their success as a reflection of my own. I try to instill the same mindset in them: Success is not just about outcomes or titles, but about effort, integrity and growth.

Q: What do you think trainees misunderstand about building strong mentoring relationships?
A: Trainees often view mentorship as something passively received rather than actively built. Many expect mentors to automatically know their needs or to fill every role without clear communication. In reality, strong mentoring relationships are collaborative and evolve over time. Effective mentorship requires trainees to articulate goals, seek feedback intentionally and follow through. No single mentor can meet every need, which is why building a mentoring network of scientific mentors, career advisers and peer mentors is encouraged. Mentorship works best when expectations are transparent and the relationship is viewed as a shared investment.

Q: What is one piece of advice you would give to trainees navigating uncertainty?
A: Get comfortable making progress without having all the answers. Uncertainty doesn't mean you are off track; it means you are doing something that matters and evolves. Focus on building skills, relationships and a body of work you are proud of, rather than chasing a perfectly defined endpoint. Careers are rarely linear; mine wasn't.

Q: How do you manage burnout, and how do you support your trainees through it?
A: I manage burnout by making time for things that ground me and provide perspective, especially my faith. Taking deliberate breaks to reconnect with what matters outside of work helps me maintain balance and sustainability. For my trainees, I focus on creating an environment where they feel supported as whole people. I encourage open conversations about workload and stress and organize activities that foster connection. Burnout thrives in isolation, so my goal is to build community.

Q: What is a hard truth about academic science that you wish was discussed more openly?
A: Merit alone is rarely enough. While rigor, creativity and productivity matter, outcomes are also shaped by academic politics: who advocates for you, who controls resources, how decisions are made behind closed doors, and whose work is perceived as important at a given moment. This can be discouraging, especially for trainees who are taught that excellence will automatically be recognized. Understanding power structures, building genuine professional relationships, and choosing environments with transparent leadership are as critical to success as experimental skill. Ignoring academic politics does not make them disappear; it leaves you unprepared.

"Burnout thrives in isolation, so my goal is to build community."

Check out more mentoring advice in the feature article on page 24.

Got a career question you'd like to submit? Email it to tphysmag@physiology.org. We may use it in an upcoming Mentoring Q&A.

STATS & FACTS

85%

of the Nobel prizes awarded in physiology or medicine have been dependent on research with animals.

Speaking of Research

Humans share more than 98% of their DNA with mice.

Stanford Medicine

>99%

of animals used in research are specifically bred for research.

Speaking of Research

~95%

of all animal research is conducted on mice, rats and fish.

Americans for Medical Progress

"Without the use of animals and human beings, it would have been impossible to acquire the important knowledge needed to prevent much suffering and premature death not only among humans, but also among animals."

Albert B. Sabin, MD, developer of the polio vaccine

STREAMING SCIENCE | SOUNDBITE FROM APS JOURNAL PODCASTS

The Root of It

Hair does more than most people think. In this *Physiological Reviews* podcast episode, Associate Editor George Cotsarelis, MD, of the University of Pennsylvania, and author Ralf Paus, MD, of the University of Manchester, explore the hair follicle as a sensory "mini organ" that produces growth factors, harbors a rich microbiome and even functions as a detox organ. The conversation moves well beyond androgens to examine the broader physiology driving male pattern androgenetic alopecia and where treatment is headed next. As Paus puts it, the follicle "can smell and it can taste" and "can even see." The future of hair research, it turns out, may depend on learning to speak its language.

Explore the *Physiological Reviews* article behind the discussion at bit.ly/androgen-hair-loss and scan the QR code to listen to the full podcast episode.

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POLICY IQ | RELATIONSHIP BUILDING

Where Physiology Meets Policy

Advancing the discipline depends on engaging with NIH.

Active and informed engagement with the National Institutes of Health (NIH) is one of the most effective ways physiologists can shape the policies and priorities that guide the nation's biomedical research enterprise. NIH depends on input from the scientific community to understand needs, identify the impacts of policy proposals, and ensure that federal investments support a diverse, innovative and productive science portfolio. Here are a few ways you can engage.

BUILD RELATIONSHIPS

Program officers are essential partners for investigators. They are responsible for managing research grant portfolios and serve as the primary contact for scientific, technical and programmatic matters. They can clarify funding announcements, discuss project fit and provide personalized guidance on resubmissions. Reaching out early in the application process, with a concise concept summary or draft of the aims page, can help focus these conversations. Maintaining communication with program officers keeps physiological research visible within NIH.

PARTICIPATE IN RFIS

Requests for Information (RFIs) provide opportunities to shape NIH decision-making. NIH often posts RFIs in advance of significant policy changes and issuance of strategic plans to understand how those proposals may affect the community and to gauge community response. RFIs are announced in the NIH Guide (**bit.ly/NIHGrantGuide**) and the Federal Register (**federalregister.gov**).

CONTRIBUTE TO OPPORTUNITIES

NIH hosts public workshops, listening sessions and advisory committee meetings to explore opportunities and challenges related to scientific issues or policy changes. These events allow researchers at all career stages to share data-driven insights and highlight emerging areas where physiology intersects with NIH priorities.

Mechanisms for input usually appear on the NIH website. For example, APS recently submitted comments to a Council of Councils Advisory Council meeting on the reorganization of the NIH Division of Program Coordination, Planning, and Strategic Initiatives (view at **physiology.org/nih-dpcpsi**). Comments may be submitted as part of a formal group, such as APS; informal group, such as a group of colleagues; or individually.

SERVE ON STUDY SECTIONS

Physiologists play a critical role in ensuring that peer review panels reflect the breadth of biomedical science. Service on study sections benefits reviewers by providing insight into NIH priorities, strengthening the review process and improving grant-writing skills.

Early-career researchers can get started through the Center for Scientific Review's Early Career Reviewer Program. NIH also invites researchers to review proposals on an ad hoc basis. Nominating colleagues, especially those from underrepresented institutions and scientific areas, helps broaden reviewer diversity and ensures that physiology expertise is represented across NIH. APS and other scientific societies can also recommend researchers for consideration as reviewers based on areas of scientific expertise.

PARTICIPATE ON ADVISORY COUNCILS

NIH advisory councils advise on policy and program development, strategic planning and second-level peer review for institutes and centers at NIH. Physiology representation is critical to these committees to ensure scientific consideration in the NIH decision-making process.

ENGAGE THROUGH SOCIETIES

Societies play an integral role in coordinating responses that reflect broad disciplinary perspectives. Volunteering with the APS Science Policy Committee or Animal Care & Experimentation Committee is a way to gain experience working on specific agency policies. Learn more at **physiology.org/engagement-opportunities**.

Your Comments Needed

APS is urging members to comment by July 13 on a White House rule that would change how federal grants are awarded and managed. Read more on page 41.

UNDER THE MICROSCOPE | SCIENCE OUTREACH

Sharing Science

This researcher aims to ignite curiosity in science through social media and outreach.



Lindsey A. Ramirez, PhD, is a postdoctoral scientist at the University of Illinois Chicago and a former Porter Physiology Development Fellow. She investigates the areas in the brain that signal aversion to alcohol in the hopes of understanding the reason for individual differences in this behavior. Ramirez is passionate about blogging and creating science videos to make science more accessible and appealing.

TELEVISION TO TEST TUBES. As a little kid, I always had a curiosity to learn about the world around me. I participated in all the science fairs I could and meticulously conducted experiments in middle school and high school. As I took more biology and chemistry classes, I realized how much there was to learn about the world—and most of it was microscopic. I eventually learned that being a scientist was a career and that scientists were working to solve the world's biggest problems. I wanted to help solve those problems; I wanted to help people.

FIRE ALARM FIASCO. As a PhD student, I needed a way to tell rat pups apart. I used a nontoxic marker and drew an "O" on the females and an "X" on the males. I used a black marker for the control group and a red one for the experimental group. One day I was weighing the pups and the fire alarm went off. I panicked—if I didn't finish weighing the pups, I'd lose that datapoint in my experiment, and I wouldn't know which unmarked pups belonged to the control or experimental group. A few of my lab mates helped me finish weighing, and I made an executive decision to just mark the pups' backs with a big swatch of black or red—I could determine the sex later. We sprinted out of the building. The next day, I found the rat mom, who was normally white, was completely pink! In the rush to get all the pups marked during the fire alarm, we used more marker than usual. Through grooming and playing with the pups, some of that color transferred to her fur! Despite her temporary change in hair color, she and the pups were OK.

TRUST THROUGH TRANSPARENCY. Vanessa Sun is an up-and-coming scientist. She started documenting her journey in STEM when she was an undergraduate, continued as she completed her master's at MIT, and now during her PhD in atmospheric science. She posts on social media about her lab work and shares when things don't go as planned. Instead of dwelling on the problems, she shows her determination and moves forward. Her content is approachable and relatable. I admire her ability to build trust with her community by being transparent. This is something all scientists should strive to do so we can reach people from all backgrounds and ignite their curiosity in science.

CURIOSITY AND CONNECTION. I have an innate curiosity about the world, and attending lab meetings, conferences and seminars allows me to keep learning. I have learned a variety of lab techniques that I never thought I would: how to measure blood pressure and body composition, and computer coding and constructing fiber optic cables. I have gained so much knowledge, and sharing that to help others get through tough times and realize their true potential is extremely rewarding.

COMPLEX COLLABORATION. Many people think that a lot of the problems in physiology are solved since the field has been around for a long time. My physiology coursework made me realize how interconnected organ systems throughout the body are, and it makes research in this field complicated. Where one treatment may help one organ, it may poison another organ. In addition, a disease can vary depending on age, sex and environmental factors. So, research in physiology is not so straightforward and requires a lot of effort and collaboration.

Do you know someone we should meet? Email us at **tphysmag@physiology.org** and tell us more.

Photo courtesy of Lindsey A. Ramirez, PhD

PUBLISH WITH POLISH | PUBLISHING INFRASTRUCTURE

A Better Way to Submit

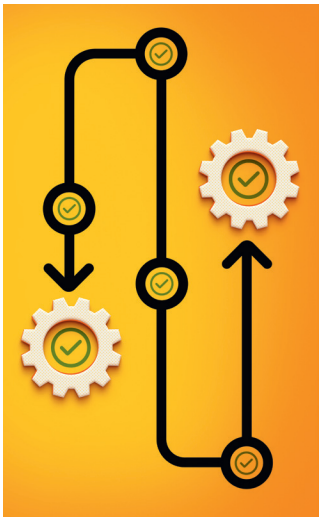
APS is rolling out ReView, a new manuscript submission and peer review management system.

Infrastructure may not seem exciting, but it's what keeps us moving forward and completing our daily activities. In the world of journals, submission systems control our highways—from origin (manuscript submission) through rest stops (peer review and revisions) to the final destination (acceptance and publication).

APS Publications is implementing a new manuscript submission and peer review management system. Following a rigorous review of proposals and vendors, we have selected River Valley Technologies' system ReView. We will be rolling out ReView to all 14 APS self-published journals in the coming months.

APS has chosen to migrate to ReView for many reasons, but improvements to the author submission process was a top priority. The system offers a modern user interface through an APS publisher portal where authors can access multiple APS journals from a unified login.

ReView organizes work in a user-friendly dashboard with easy-to-find tasks and onscreen prompts to help users navigate the system. After an author uploads their files, the system extracts metadata to autofill forms with title, abstract, names and affiliations. Authors



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then review and edit the information, reducing the time needed for manuscript data entry. The system can more easily handle LaTeX files, and it integrates with ORCID and other databases.

Given that the experience for reviewers and editors is also critically important to the success of APS journals, the Society has also prioritized the user experience for these groups. We will be migrating our user database to ReView, and the new system will offer improvements in visualization of task assignments and due dates.

In addition, we are expanding our research integrity screening tools, adding to our already rigorous peer review process. Improvements are planned to more easily transfer content between journals, and submitting revised manuscripts will again be streamlined by the metadata extractor.

Article acceptance is the desired final stop on the manuscript journey, and you'll see improvements there too. By simplifying the on-screen display of information related to open access publishing and APS membership status, authors will know their real-time discount eligibility. Publishing agreements will now be signed following acceptance, ensuring the most up-to-date documentation is obtained. Further, we're updating our billing processes to improve author payment options, as well as APS internal recordkeeping.

As these changes roll out successively to our journals, APS Publications is committed to making the transition period as smooth as possible. We will provide updates to our community of authors, reviewers and editors via multiple channels: emailed reminders, decision letters, newsletters, website ads, social media, and personalized outreach from managing editors.

If you are interested in submitting a manuscript to an APS journal, you can still find journal submission links at **journals.physiology.org/submit**, where we will continually update the status of each journal.

STATS & FACTS

The United Kingdom consumes over 300 times more fish each year than the total number of all animals used in medical research each year.

Understanding Animal Research

~70%

of human genes have at least one zebrafish ortholog, and 84% of genes known to be linked with human diseases have zebrafish counterparts.

"Zebrafish: A Versatile and Powerful Model for Biomedical Research." doi.org/10.1002/bies.70080

What makes someone an effective mentor?

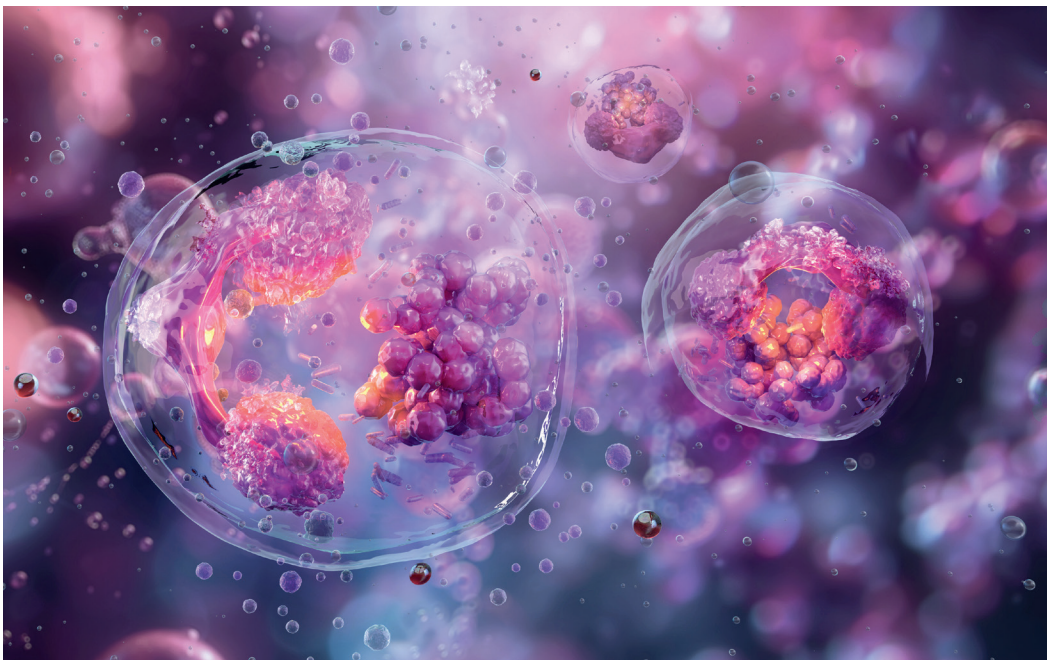
- Enthusiastic
- Sensitive
- Appreciative of differences
- Respectful
- Unselfish
- Supportive

"Nature's Guide for Mentors"

IN DEPTH | BIOCHEMICAL PROCESSES

Imaging Insights

New imaging techniques help turn complex chemistry into insights about disease.



Elizabeth Neumann, PhD, assistant professor in chemistry at the University of California (UC), Davis, develops new imaging methods to study the molecular and cellular architecture of diseases. Her collaborative research approach brings analytical chemistry into the clinical context to uncover biochemical processes and treatment targets. Neumann was a Game Changer presenter at the American Physiology Summit in April.

How did you focus on developing new imaging tools?
As an undergrad, I became interested in figuring out the chemistry behind how different organs work. After seeing that scientists are sometimes limited by the tools available, I began learning how to build new imaging tools to explore clinical questions.

Most of what we know in biology and clinical science comes from transcriptomics and proteomics, which capture earlier stages of biochemical pathways. I focus on what happens downstream—what those genes and proteins do in terms of metabolic outcomes and phenotype.

One of our primary tools is matrix-assisted laser desorption ionization mass spectrometry imaging (MALDI MSI), which involves firing a laser at a piece of tissue to ionize the molecules so they can be measured with a mass spectrometer. Scanning the laser across the tissue lets us build chemical images that show us small molecules and distinct molecular states. We've advanced this method so that it can be used to capture single cell metabolomic states, which is incredibly exciting.

How are you pushing the limits of imaging approaches?
We've developed a way to use MALDI MSI to look at the effects of pharmaceuticals on entire organisms at one time. For drug development, seeing how multiple organs respond metabolically and chemically makes it possible to catch potential side effects before they become a problem or spot secondary benefits that usually only show up after years of use.

Another major focus in my lab is bringing multiple types of molecular measurements onto a single instrument. Every platform has its own dynamic range, data structure and molecular focus. We're working to converge these measurements into one mass spectrometer so we can align variables directly and generate fully integrated datasets.

What are these tools helping you discover?
In just the last year, we've started working on answering some important

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questions about how diseases work. We're working with Lee-Way Jin, a longtime pathologist at UC Davis, to study Alzheimer's disease, specifically a lipid known as phosphatidylinositol 38:4 (PI 38:4) that's elevated in the brains of people with the disease. Other studies have shown that those with higher levels of this lipid have poorer outcomes. By using MALDI MSI to map lipids within brain microenvironments, we found that it's possible to modulate the expression of this lipid with diet. These changes appear to be associated with microglial activation.

"Using advanced imaging techniques to create robust data lets us see and explain biology in ways that were impossible before."

We're also collaborating with Aijun Wang from UC Davis, who developed a new fetal stem cell therapy for spina bifida. Together, we want to understand how spina bifida forms and how diet contributes. Many factors may contribute to this congenital neural tube defect, but it's unlikely a single nutrient or toxin is to blame. More likely, downstream effects are at play—and our imaging technology could help uncover them.

Another area we're studying, in collaboration with Dionna Williams at Emory University, is how the antiretroviral medicines used by people with HIV impact kidney health. Renal failure is a significant problem in these patients. We found that glomeruli—tiny, ball-shaped structures in the kidneys that act as the first step in filtering blood—show a binary response after antiretroviral treatment. About half of the glomeruli remain metabolically elevated or disrupted, while the other half return to normal. This suggests that antiretroviral therapy does not produce a uniform effect in the kidney.

What's your advice for successful collaboration?
Speaking with clinicians saves an enormous amount of time, and their interpretation of our data can move the work forward in ways that we couldn't do alone. However, making these collaborations work means communicating in a way that is meaningful for them. For this reason, I focus on teaching my graduate students the value of explaining their work to people outside their field.

When a question really grabs me, I'm not afraid to find someone who shares that interest, even if it means cold-emailing people until someone responds. I also think students should have a say in their projects. Our project examining microplastics started after I asked my student, Karina Vargas, what she was interested in. Now, we're using MALDI MSI in whole animals to see what organs the plastics travel to and how they change metabolic states and affect tissue health.

What makes your work game changing?
The visual aspect of our work makes it game changing. Images are easy to communicate and easy for people to understand. I spend a lot of time thinking about how to visualize data in a way that's clear and captivating because how we communicate is just as important as the data itself.

At the same time, the data we're generating is robust, repeatable and shows how organs respond, in close to real time, to different perturbations. We're looking across multiple biological classes, and that richness feeds directly into AI and machine learning. Using advanced imaging techniques to create robust data lets us see and explain biology in ways that were impossible before.

Interview conducted by science writer Nancy D. Lamontagne. Send questions or comments to tphysmag@physiology.org.

STATS & FACTS

"In some cases, your PI will be fully invested in your career progression; in other cases, they will have limited ability or interest. You should work with her to take best advantage of her expertise but also be proactive in looking elsewhere for the mentoring you need to advance your career."

"Getting the Mentoring You Need." Science.org

4 essential leadership skills for scientists:

- Collaboration
- Adaptability
- Communication
- Creating a shared vision

The Association for Women in Science

40%

of postdocs surveyed said their supervisor was disorganized and a poor communicator.

"With Great Power Comes Great Responsibility: How Scientific Supervisors Shape the Wellbeing of Early-Career Researchers." doi.org/10.64898/2026.05.05.722947

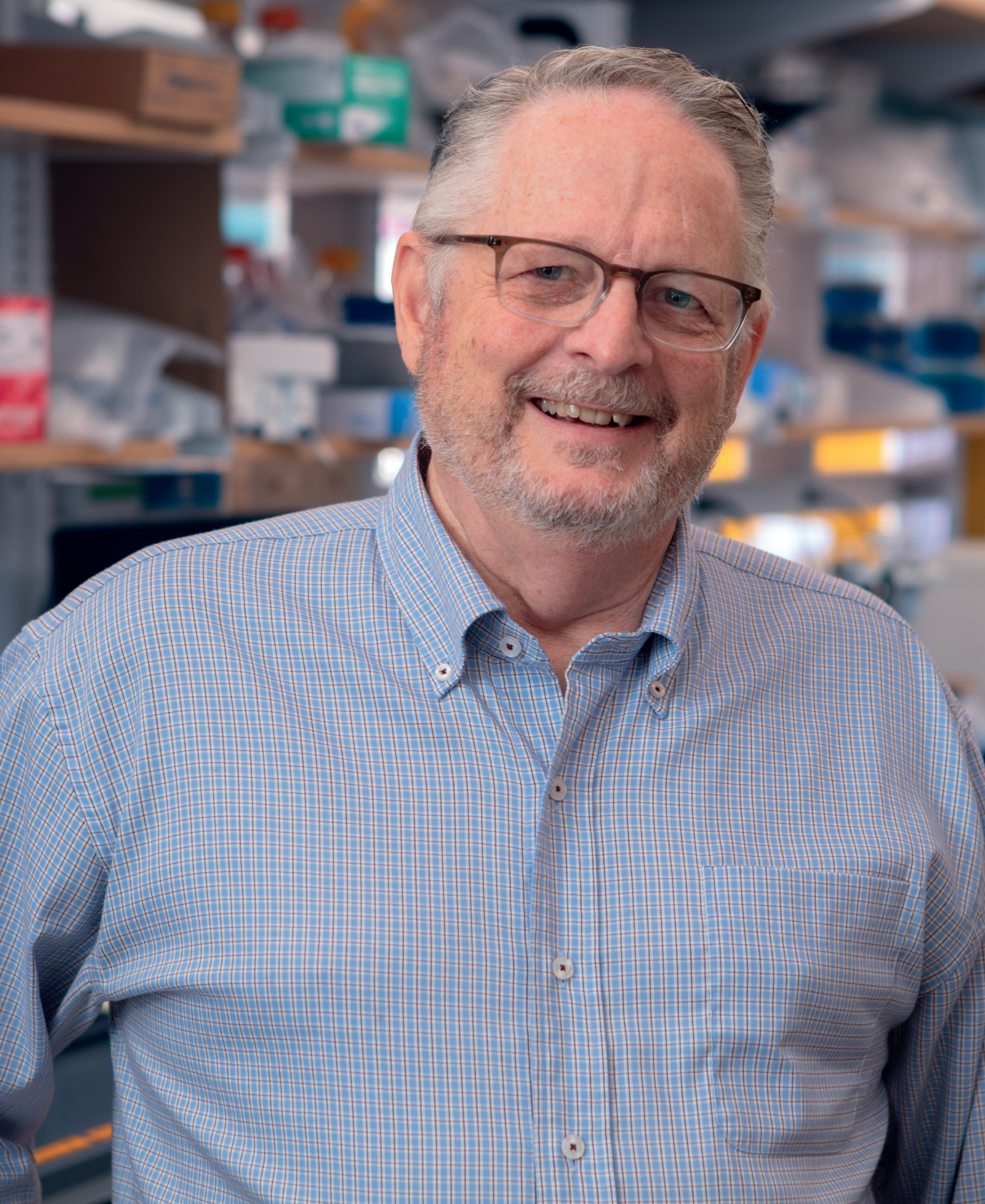




Photo by Randal Crow

FOCUSED ON FUNCTION

David M. Pollock has spent 40 years listening to what the kidney is trying to tell us.

BY MELANIE PADGETT POWERS

"Your kidney is just 0.5% of your body weight but receives nearly 25% of your cardiac output. And did you know the kidney also controls blood pressure?" Renal physiologist David M. Pollock, PhD, FAPS, explains kidney function as a great professor does, with the expectation you'll find it as fascinating as he does. Unlike the brain, he says, the kidney reveals its function through its structure. Just by looking at it, you can understand the logic of filtration and regulation.



Left to right: Pollock Lab members and alumni—known as the "Pollockians"—gather at the 2026 American Physiology Summit. Pollock and his wife, Jennifer Pollock, PhD, FAPS, also an APS past president.

A leading renal pathophysiology researcher, Pollock has spent more than 40 years advancing our understanding of the kidney. Pollock is the James A. Schafer Professor of Medicine and co-director of the Cardio-Renal Physiology and Medicine Section at the University of Alabama at Birmingham (UAB). He is an APS past president (2014–2015) and is the editor-in-chief of the APS journal *Function*.

Growing up in Indiana, Pollock didn't know he would become a scientist. He was interested in a lot of different things, including music, woodworking, basketball and other sports. But he was skinny and not so tall, so instead of playing a team sport, he became an athletic trainer. That introduced him to physiology, though he might not have called it that yet.

At the University of Evansville in his home state, most of the science majors talked about heading to medical school. But that didn't interest Pollock. Like with so many origin stories, it was a teacher who made the difference.

"I found physiology," Pollock says. "I had a really nerdy, goofy professor. Some people didn't like him, but I thought he was kind of cool. He taught medical physiology. We used Guyton's textbook for our undergrad class—it was a big, fat textbook. And I loved reading that book. It was easy to read, and I found it fascinating."

Pollock had found his major. After graduation, he continued his physiology education at the University of Cincinnati, where he earned his PhD. That's where he discovered his research focus. His PhD adviser was interested in salt regulation, and that passion rubbed off on Pollock.

Early in his career, Pollock worked at Abbott Labs in Chicago, setting up models of kidney disease. But when the company decided to stop their hypertension research, the higher-ups wanted to move Pollock to another division. He realized he didn't have much control over the big picture and no longer wanted to work based on market decisions.

He and his wife, Jennifer Pollock, PhD, FAPS, a fellow physiologist, decided to return to academia. They were both offered tenure-track positions at the Medical College of Georgia, where they stayed for 20 years before moving to UAB.

DIVING INTO KIDNEY RESEARCH

Back in academia, Pollock first focused on the endothelin. He thought to himself, "There's lots and lots of endothelin in the kidney, and we really don't know that much about what it's doing there." His lab later uncovered how endothelin regulates renal handling of high-salt diets and important preclinical evidence for use of endothelin antagonists in the treatment of several types of kidney disease.

At UAB, much of his work has focused on how the kidneys are affected by circadian rhythms—

Photos, this page, courtesy of David M. Pollock, PhD, FAPS



Left to right: Pollock and his family at his daughter's wedding. Pollock builds a puppet stage for his granddaughters in his garage workshop.

including blood pressure control and end-organ damage. His research includes collaborations with several other UAB labs also studying circadian rhythms.

Pollock's interest in circadian rhythm was piqued while measuring blood pressure in rats through telemetry. By implanting small radio transmitters in the animals, the lab could monitor blood pressure 24/7.

"Normally, blood pressure is higher during the day and goes down at night, and if it doesn't go down at night, it's bad," he explains. "When you get salt-sensitive hypertension and dysfunction in this endothelin system, the rhythm and blood pressure are much bigger. They're very hypertensive, but the rhythm gets bigger too. So the day-night difference gets bigger. And I always wondered what would cause that."

Enter the circadian rhythm. "We know that the molecular clock in the cells within the kidney are what keep it rhythmic," he says.

A CLOSER LOOK

6 Questions with David Pollock

What's your best piece of career advice?
Don't let the highs and lows distract you. Keep calm and do science.

You're an amateur woodworker. What has been your favorite piece to make?
A dining room table out of reclaimed lumber.

Tell us about your love for music.
I like all kinds of music. We went to the symphony last weekend. We went to Nashville and saw Pat Metheny, a jazz guitarist. My very favorite is Steely Dan. And I love singing. I'm in the church choir, and I'm a baritone in the church chamber chorus.

What do you like to read when you're not reading research papers?
I read biographies, and I like nonfiction like "Drive" by Daniel Pink. I read "Rigor Mortis: How Sloppy Science Creates Worthless Cures, Crushes Hope, and Wastes Billions," which is something APS folks should read.

What do you do to de-stress?
Jennifer and I like to watch British detective shows on BritBox.

What's a fun fact about you that people don't know?
Larry Bird (NBA legend) spent the night at my house one time at the University of Evansville. He was looking for a smaller school after leaving Indiana University, and my college roommate was a friend of his from high school.

"You always will excrete more salt during the day versus night, no matter when you eat it. So if you eat salt at night, you hang on to it and get rid of it the next day. If you eat it during the day, you get rid of it that day. So the time at which you take salt in is going to affect how quickly it comes out. And this is related to the endothelin system."

His current research includes examining time-restricted eating. Obese mice will develop renal fibrosis over time. But Pollock and his collaborators have shown that time-restricted feeding—only giving them food during their active parts of the day—eliminates the kidney fibrosis and improves blood vessel health. In contrast, feeding mice only when they should be sleeping contributes to kidney and vascular fibrosis.

In humans, time-restricted eating should not be confused with intermittent fasting, Pollock says. Time-restricted eating is restricting food to only a short period of six to eight hours during the day. It also doesn't focus on reducing caloric intake, but instead, on improving your metabolism.

"A lot of this is tied to the biological rhythms of all your physiological systems—your liver, your gut, your heart, your brain. They all have a rhythm. And at night, they're supposed to rest, repair and sleep. Your blood pressure goes down. But if you're up, moving around, doing stuff like looking at screens and eating, you're making your digestive system, your brain, your heart, work when they are supposed to be resting. Your physiological systems are not designed to function that way constantly," Pollock says. "So, we are trying to figure out what causes health risks with our modern 24-hour society."

TAKING THE HELM AT *FUNCTION*

In 2026, Pollock became the editor-in-chief of APS' *Function*, which publishes major advances that extend physiological mechanisms in the understanding of biology and the changes associated with disease states.

Function was launched in 2020 as an open access journal with Oxford University Press. This year, APS brought *Function* in-house, assuming full publishing operations. This strategic shift allows APS to continue strengthening *Function's* position as a leading open access journal for physiology and enhancing the publishing experience for authors, reviewers and readers.

"A lot of what I view *Function* as is connecting physiology to the rest of the scientific world," Pollock says. "*Function* provides an incredible opportunity to bridge the gap between all this awesome science that's going on out there—the technique based, the different disciplines—and bring it back to the complex biological system."

Function offers a venue, he says, for physiologists to connect their research to the broader scientific community, as well as for the researchers who may not consider themselves physiologists but who are conducting physiologically relevant research.

This is also an important time for physiology to continue to elevate its importance across fields, to lawmakers and to the greater society, as stable funding has diminished and scientific attacks have increased. Pollock argues that if you ask any hospital physician what the most important scientific discipline is nearly all would say "physiology" because it's so critical to medicine.

He focuses on that relevance whenever he is reviewing papers or grants, asking himself, "Why should I care about this?"

The answer? "I care about it if it tells me something about improving the human condition. That's exactly what physiology can do."

AT A GLANCE

Where Physiology Meets Big Questions



Function was created to do what its name suggests: get to the bottom of how living systems work. The open access APS journal publishes groundbreaking research that integrates data across genes, cells and organs to uncover the mechanisms driving health and disease. The journal welcomes research from across physiology and related fields—systems biology, computational biology, genomics, pharmacology and more—as long as it advances understanding of physiological and pathophysiological mechanisms at any scale, from molecular to organismal. Read the latest research, review current calls for papers and submit your own work at **journals.physiology.org/journal/function**.

american physiological society®

Deadlines

The APS Publications Committee plans to interview candidates in the fall of 2026.

Terms:
New editors-in-chief will serve three-year terms from July 1, 2027, to June 30, 2030, with the ability to extend for an additional three years.

Applications due:
August 31, 2026

How to Apply

A cover letter, letter of recommendation and curriculum vitae should be submitted at **journals.physiology.org/calls-for-eics**.

CALL FOR APPLICATIONS
EDITOR-IN-CHIEF

American Journal of Physiology-Cell Physiology®

Nominations are invited for the position of editor-in-chief of the *American Journal of Physiology-Cell Physiology* (**ajpcell.org**) to succeed Liliana Schaefer, MD, who will complete her term as editor on June 30, 2027.

American Journal of Physiology-Gastrointestinal and Liver Physiology®

Nominations are invited for the position of editor-in-chief of the *American Journal of Physiology-Gastrointestinal and Liver Physiology* (**ajpgi.org**) to succeed Mark R. Frey, PhD, who will complete his term as editor on June 30, 2027.

Physiological Genomics®

Nominations are invited for the position of editor-in-chief of *Physiological Genomics* (**physiolgenomics.org**) to succeed Hilary A. Coller, PhD, who will complete her term as editor on June 30, 2027.



The Wisdom Archive

APS mentors share their advice on how to build a sustainable, rewarding career.

Cultivating a successful career in physiology takes more than scientific knowledge and a passion for uncovering the unknown. Interpersonal skills, leadership traits, and the ability to push through or pivot when times get tough are just a few of the many qualities necessary to help you build a rewarding career.

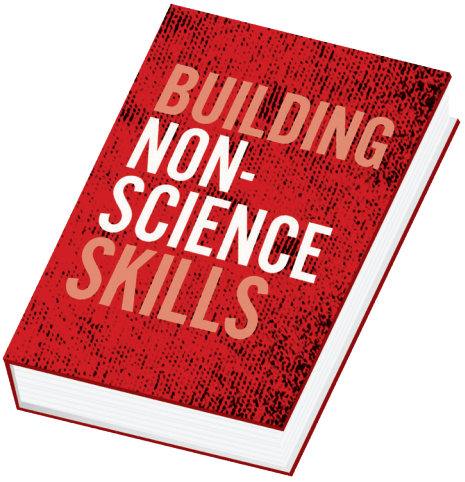
But skills like these don't develop overnight—and they rarely develop in isolation. Mentors, sponsors and trusted colleagues play a significant role in shaping how you learn, adapt and grow.

Experienced physiologists have been sharing words of wisdom in *The Physiologist Magazine's* Mentoring Q&A column since 2019. Drawing on the expertise of nearly 50 APS members who have contributed, we've identified themes that have come up the most. Here, we've compiled the best of what they had to say.

Illustration by Jay Vollmar

THE ESSENTIALS

Time management, active listening, clear communication and the ability to adapt are important to a sustainable career and take practice to develop. Lessons learned:



Develop thick skin.

"Start to get comfortable with the element of 'surprise' and learn to deal with the unexpected."
—Steven J. Elmer, PhD, associate professor, Michigan Technological University

Fight against imposter syndrome. You've earned your way.

"All good researchers must have a great deal of patience and perseverance to weather many of the ups and downs associated with conducting scientific research and with developing a successful academic or industry-based research career."
—Irving Joshua, PhD, FAPS, professor, University of Louisville

Prioritize your health, well-being and sleep.

Unplug. Find a stress reliever that works best for you.

Learn to say "no" so you can say "yes" to the things that matter.

"Effective communication is crucial, and learning to confidently communicate with leaders in the field, peers and laypersons will expand your network and ensure you always make a positive impression."
—Jennifer C. Sullivan, PhD, professor, Medical College of Georgia

KNOW YOURSELF

Every step of training brings new decisions—about what you want to do next, where you want to go and what type of team you want to work with. Getting clear on your priorities early can make a difference in your trajectory. Lessons learned:



Name your priority: Research? Running your own lab? Publishing in top-tier journals? Teaching? Advancing treatment via industry?

"Having a great team has helped me both balance my commitments along with helping me say no."
—Kedra Wallace, PhD, professor, University of Mississippi

"Working and interacting with great people always makes the harder times seem easier."
—Daniel Gagnon, PhD, associate professor, University of Montreal

When interviewing for positions, ask yourself: Does this feel like a place where I can be open and honest, where I would be comfortable to have difficult discussions and feel like my mentor will listen to my questions and concerns?

"Find a group of peers you can lean on for help and advice when you need it. I belong to a wonderful 'research neighborhood' that includes four to five investigators who all study human vascular function. … It's comforting to know I can pick up the phone or walk down to their office and ask for advice."
—Julie K. Freed, MD, PhD, associate professor, Medical College of Wisconsin

THE SHIFT

Running your own lab is one of the most rewarding, and humbling, transitions in a scientific career. The skills that make you a great researcher won't automatically make you a great manager. Building a productive, supportive lab culture takes intention, flexibility and a willingness to learn on the job. Lessons learned:



Don't let perfect be the enemy over good. You often can't buy everything immediately. Prioritize what you need to do your first experiment.

"Hire a good technician who will be a good teammate. A working relationship where you can trust that your tech will not be afraid to share with you their ideas or let you know what works or does not work is important."
—Catherine Uyehara, PhD, chief, Department of Clinical Investigation, Tripler Army Medical Center

Don't always tell trainees what to do—listen and provide feedback.

Hold team huddles once a week to discuss lab operations and share data.

"Trainees enjoy my lab environment because they see me putting my all into their career development, which makes the job enjoyable."
—Adam J. Case, PhD, associate professor, Texas A&M University

"Lab management styles vary greatly, so gather insights from multiple senior researchers to find what resonates with you. … Think of your role as running a small business: You're responsible for securing funding, purchasing supplies and managing a team."
—Paul J. Marvar, PhD, associate professor, George Washington University

BE SEEN

Your research won't speak for itself. Sharing and promoting your work isn't just about visibility; it's also about building relationships and networks that can help sustain your career. From conferences and committees to social media, every interaction is an opportunity to connect with audiences that include academic or industry leadership, the public, the physiology and larger scientific community, and lawmakers. Lessons learned:



Use social media to promote your research—which can lead to collaborations. Choose the most relevant platforms for your audience.

"Excel at using [social media] to stand out from the crowd and attract people to your research as it may open up boundless opportunities."
—Naveen Sharma, PhD, professor, Central Michigan University

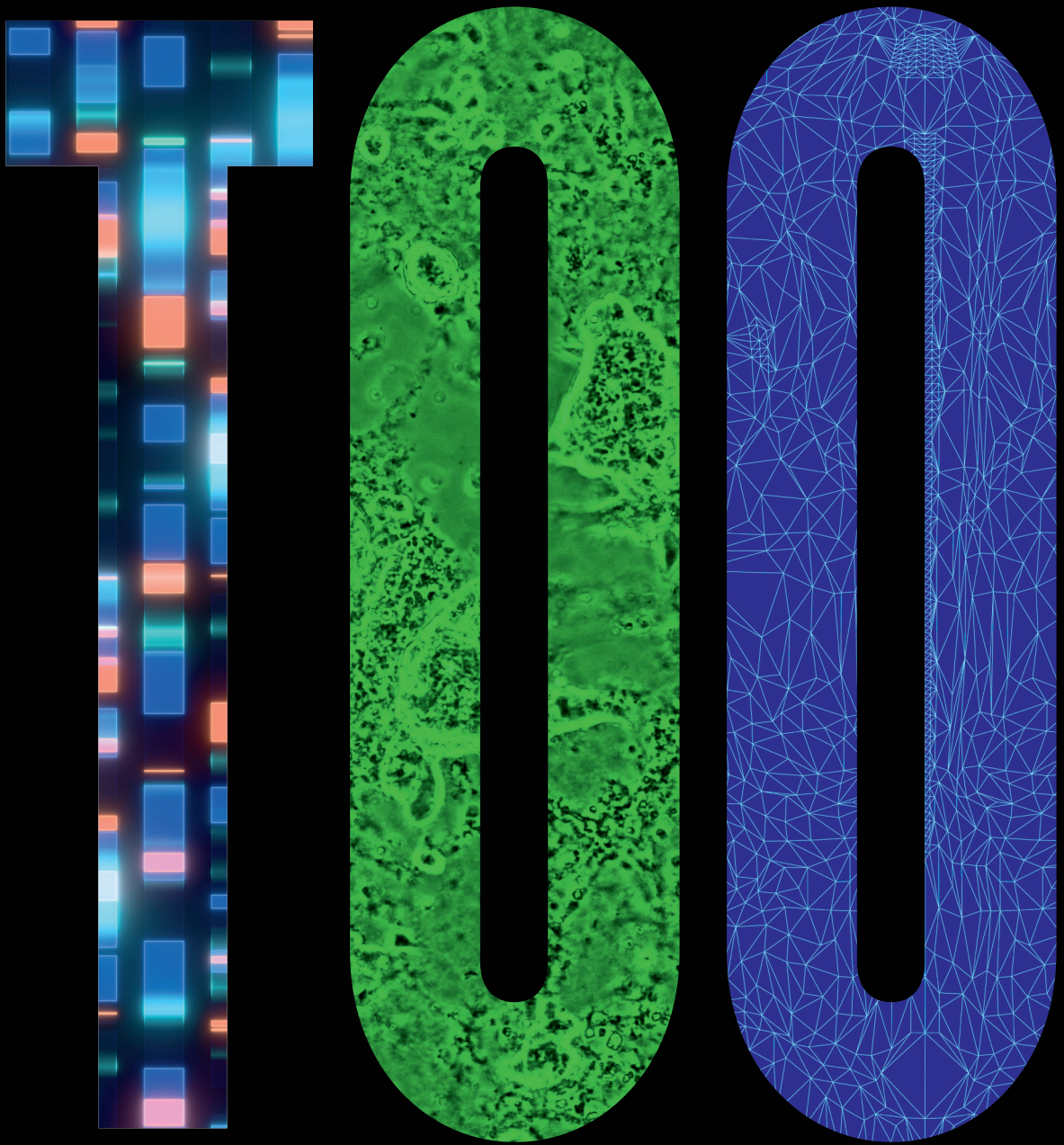
"It is important to have an 'elevator pitch' to convey your research—how you might explain your work to your friend who has no scientific background in two minutes or less."
—Manda L. Keller-Ross, PhD, DPT, PT, associate professor, University of Minnesota

Attend APS and other relevant conferences—and go to the social events. Volunteer for committees and tasks.

"Volunteer in organizations that are consistent with your scientific interests. … Relationship building is an essential part of any academic career."
—Robert S. Hoover, MD, professor, Tulane University

*The job titles and universities that appear with quotes are taken from when they originally appeared in the magazine.

THE WHOLE



How multi-model approaches help strengthen science.

BY DARA CHADWICK





The right set of tools can make all the difference in the outcome of any job, including scientific research. Today, physiologists have more options than ever in scientific models. Many are embracing both animal models and emerging "new approach methodologies" (NAMs) in their quest to answer complex physiological questions. While traditionally NAMS has meant "non-animal models" and is often how scientists define the term, the National Institutes of Health has begun to use the term "new approach methodologies."

Using multiple methodologies in complementary ways is strengthening scientific research. A combined approach helps researchers have more confidence in their findings and gives their findings more relevance than any single model may be able to do.

Caitlin Vonderohe, PhD, DVM, assistant professor at Baylor College of Medicine in Houston, Texas, studies the intestines of preterm infants, including those who develop necrotizing enterocolitis (NEC), a disease that develops in the first weeks of life.

"Some infants who develop NEC have their small intestine resected and live with short bowel syndrome," she says. "But in severe cases, the death rate is up to 50%. Despite the time and energy spent on this disease, we don't know exactly why it happens."

Vonderohe is working to understand how NEC may be both prevented and treated. She says that layering non-animal models into her existing animal model is unlocking new insights, such as why human milk—the gold standard for preventing NEC—works in this way. She's also repurposing an adjunct chemotherapy agent that converts arginine in the blood into citrulline as a potential treatment. "It's been really effective to prevent NEC in my model," she says. "But we don't yet know why it works."

Vonderohe, a member of the APS Animal Care & Experimentation Committee, uses a preterm piglet model to explore these questions because they are predisposed to all the same diseases as preterm infants.

Vonderohe says they are able to recapitulate the clinical presentation of these infants. This allows her to study how nutritional interventions and drugs affect the development of different diseases that occur secondary to preterm birth.

Vonderohe also uses NAMs to study prematurity and NEC. In her current project, she notes that the conversion of the amino acid arginine to a non-protein amino acid, citrulline, is effective at preventing NEC in the pig model. Her team also uses cellular models called enteroids—which were cultured from biopsies, containing stem cells, of human intestine—to explore how amino acids affect inflammation in the gut.

"When you culture enteroids, they replicate all the cell types found in the lining of the small intestine," she says. "We work with our collaborators to make our own mini-guts and co-culture them with other cells like hepatocytes and immune cells, depending on which cells we think may be bad actors and contribute to NEC in infants," she says.

Layering her animal model with NAMs lets her team ask both fundamental and complex physiological questions about NEC and its potential treatments, Vonderohe says.

"Our animal models are so valuable because we can't study preterm infants directly," she says. "They're so delicate and they're physiologically different from infants born at term. It's difficult to replicate that physiology in a petri dish."

COMPLEMENTARY, BUT NOT INTERCHANGEABLE

Eric Lazartigues, PhD, FAPS, director of the Cardiovascular Center of Excellence and professor of pharmacology and neuroscience at Louisiana State University Health in New Orleans, uses both animal and non-animal models in his research. His laboratory studies how the brain controls the regulation of blood pressure through the autonomic nervous system.

Lazartigues uses a transgenic mouse model to study the renin-angiotensin system. "We have animals that are either overexpressing components of the renin-angiotensin system in specific cells in the brain or are lacking receptors and enzymes within those cells," he says. "By comparing animals and challenging them with protocols that elevate blood pressure,

AT A GLANCE

Understanding NAMs

NAMs or "new approach methodologies" are tools that use technology to expand research options for physiologists. NAMs include:

2D Cell Culture Models

Cells cultured in a single layer on a flat surface used to study specific cellular processes.

Primary benefits

These models offer a high degree of control, reproducibility and scalability. They typically require no special equipment, making them more cost-effective.

Limitations

These models deliver isolated results that don't reflect the complexity of whole-organism interactions.

2D Co-culture Models

Different cell types are cultured together. Within 2D co-culture models, cells may interact with one another in different ways, depending on how the experiment has been designed.

Primary benefits

Cell signaling may occur in this model, allowing researchers to study essential cell functions and responses.

Limitations

Cultured cells function within a limited environment and don't reflect cell behavior within a whole organism.

3D Cell Culture Models, Spheroid, Organoid

Cells cultured using a supportive structure, such as a scaffold, which allows cells to develop in varied directions and form structures that resemble organs.

Primary benefits

Researchers can replicate processes and environment within an organism, allowing cells to communicate and interact within the model.

Limitations

Model methodologies vary, making standardization difficult. These models are also expensive, require specialized equipment and have limited scalability.

Microphysiological Systems, Organ-on-Chip

Microfluidic cell culture devices that function as 3D human organs, containing varied cell types and incorporating microfluidics to simulate physiologic conditions.

Primary benefits

These models show how cells and tissue behave and interface within a specific physiological environment.

Limitations

Organs-on-chip can be complex, costly to create, difficult to scale and don't contain all the cell types involved in organ function.

Computational Models, Digital Twin

Computer models that simulate an organism's biology and physiology. Using these models, physiologists may study disease progression and treatment.

Primary benefits

Computational models allow physiologists to simulate cellular mechanisms and test physiological scenarios without animal studies or human subjects.

Limitations

Computational models are limited to representing biologic processes that are already known. Determining appropriate parameters can be challenging, and validating computational models requires technical expertise.

Data Mining

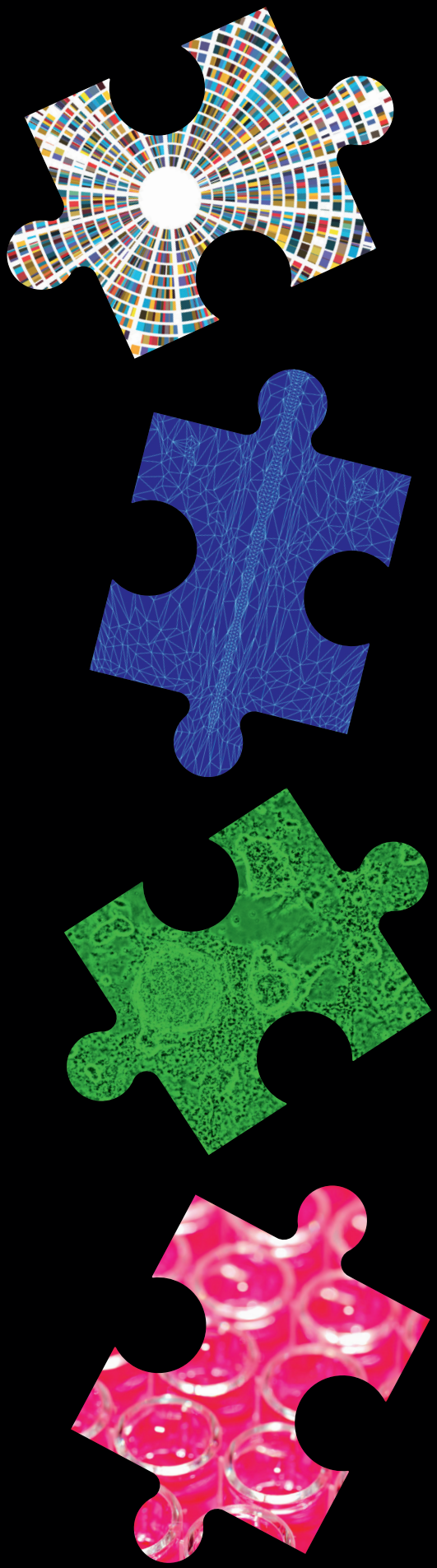
Analyses of large datasets to find patterns, identify relationships between variables and make predictions.

Primary benefits

Mining large datasets allows physiologists to study patterns and variables across millions of samples, increasing research speed and reaching beyond results of isolated experiments.

Limitations

Large datasets can create information overload in identifying which data are relevant to a specific research question. Data quality and validation of models are also concerns in using these tools.



we can identify the role of these components in a cell-specific manner."

The integrative model that animals provide is critical, he says. "You need a physiologically intact, integrative model when you're looking at a system that impacts multiple organs. That doesn't mean we're not using other models that are more focused, but at the end of the day, we need to come back to the integrative model," he says.

Lazartigues also uses NAMs, including cell cultures to learn about the mechanisms of neurons and microglia. His team co-cultures cells to see how they interact.

"The models have evolved," he says. "Non-animal models now integrate more natural complexity. Co-culture first appeared years ago, and now there are multiple co-cultures available because people realize a single cell may not be as relevant as having multiple cells from different origins acting on each other."

NAMs help validate signaling pathways and enhance the translational relevance of research. With more sources, researchers can feel more confident that their results are clinically relevant, Lazartigues says.

One challenge of having more options is determining which models are best to use. That depends on the question you're trying to answer, Vonderohe says.

"For every research project, we ask if we are sufficiently powered to answer the question," she says. "Can we get organoid tissue to first

BEYOND THE LAB

The Policy Landscape

The debate over animal research today has moved beyond ethics boards and activist campaigns. It is now driving federal policy decisions with direct implications for how biomedical research is funded and conducted. In recent months, federal agencies have taken significant steps to reduce animal use in research. U.S. Health and Human Services Secretary Robert F. Kennedy Jr. has called for "a dramatic reduction in animal testing." The U.S. Food and Drug Administration (FDA) has announced plans to phase out animal testing requirements for certain drugs, including monoclonal antibodies. And the National Institutes of Health (NIH) has launched an initiative to prioritize human-based research technologies and established a new Office of Research Innovation, Validation and Application to coordinate the effort across its portfolio.

APS remains committed to ensuring researchers have access to the range of resources they need to answer fundamental questions about life and health. In comments submitted to a 2025 FDA-NIH workshop on reducing animal testing, the Society noted that while NAMs offer genuine promise, particularly in preclinical testing and drug development, their application in basic and fundamental research is different and carries limitations that policy must account for.

APS also called on agencies to engage the broader scientific community before implementing changes to funding and peer review and to ensure that new criteria do not introduce unintended bias. Clear, written policies are essential to maintaining trust between federal agencies and researchers. As federal agencies navigate this transition, APS brings both scientific expertise and input from the member community to inform policy that is rigorous, evidence-based and effective. Learn more at **physiology.org/animalresearch**.

One challenge of having more options is determining which models are best to use. That depends on the question you're trying to answer.

answer the question in a granular way? If the question persists, what type of pig experiment do we design around this?"

Animal models remain an essential component of physiological research, according to Robert Hester, PhD, FAPS, a past president of APS and semi-retired professor of physiology at the University of Mississippi Medical Center (UMMC). Animal models and NAMs are complementary, but they're not interchangeable.

"The environment of a tissue in a cell culture lacks some aspects of the environment within the human body, such as the many hormones present in the human body," Hester says. "You can learn how tissue works in a culture, but you have to look at how that tissue works in different environments."

THE GROWING ROLE OF MACHINE MODELS

Physiologists are also using scientific tools such as artificial intelligence (AI) and computational models. These tools help researchers integrate data, design experiments and simulate the variability of humans.

Hester has continued building on previous mathematical analyses of former UMMC Department of Physiology Chair Arthur Guyton and graduate student Tom Coleman to develop a computational model called HumMod. The model includes more than 9,000 variables related to cardiovascular, endocrine, metabolic, neural, renal and skeletal systems. The customizable Windows-based mathematical model simulates human physiology, enabling in silico clinical trials and digital twin creation.

It's a valuable clinical training tool, Hester says. "You can have a patient start bleeding in virtual space and explore what to give them to stop it," he says. "The model helps you understand the physiological consequences of different approaches."

The model can also use an individual's data to create a digital twin that shows potential physiological changes, as well as how the individual may physiologically respond to interventions. "The original purpose was to help researchers plan experiments to answer specific questions," Hester says. "That's still the value of the model for physiologists."

Ryan Melvin, PhD, associate professor and principal data scientist in the Department of Anesthesiology and Perioperative Medicine at the University of Alabama at Birmingham, says his work includes high-resolution physiologic data, predictive analytics and generative AI.

As an example of high-resolution physiologic data, Melvin described an AI platform that captures signals from patient monitors at up to 500 samples per second. A predictive analytics model helps answer questions such as "Is this patient likely to come back?"

Most of Melvin's generative AI work includes administrative and supportive uses, such as summarizing data and flagging weaknesses. While he sees enormous potential for AI tools in research, he also notes that large language models are not completely reliable. He's optimistic about the potential of coding agents over chat-based AI tools in physiological research—particularly when it comes to experiment design.

"With AI, researchers could spend less time chasing experimental rabbit holes and help preserve resources," he says. That's because AI can work as a simulator to help with experiment design. If you only have the resources to do three experiments, you might simulate 10 experiments with AI and pick the three that show the most promise.

As for the safety of intellectual property when using AI tools? "I would be fine putting my million-dollar ideas into AI, but not my billion-dollar ideas," Melvin says.

These are emerging technologies, and there are not that many experts out there, Vonderohe says. "It's great to be on the cutting edge, but when we're thinking about safety, it's important to make sure everything is being validated properly," she says. "Check your sources. Put your critical thinking hat on."



A *Perfect* Fit

A career in science communications and policy has led to Erika Shugart assuming the role of APS CEO.

BY AMANDA BERTHOLF, MA

Erika Shugart grew up in Oak Ridge, Tennessee, a town built for science. Originally established as a production site for the Manhattan Project, it has been home to world-class research ever since. Shugart's father was an ecologist. Her friends' parents were scientists. Dinner table conversations revolved around birds and animals and environmental science.

It wasn't until her family moved to Charlottesville, Virginia, when Shugart was in high school that she realized most people didn't grow up this way. "I honestly thought, when I was a kid, that everyone wanted to be a scientist," she says. "I thought that was the preferred career path, and suddenly I realized, oh, people want to do different things."

Shugart, PhD, FAAAS, never strayed from science. Today, she is the CEO of APS, a role she stepped into in March, after the retirement of Scott Steen, CAE, FASAE. She brings more than two decades of leadership experience across the scientific society landscape, a PhD in biology from the University of Virginia, and a career spent doing something she considers just as vital as the science: connecting the world outside to what happens in the lab.

The Physiologist Magazine sat down with her in early April, about 30 days into her tenure.

A DIFFERENT PATH

Despite knowing she wanted a career in science, midway through graduate school, Shugart pivoted. She realized the life of a research scientist, at least in the form her graduate work was taking, was not the life for her. The frustration caused by dealing with experiments that didn't work and uncertain timelines wasn't a fit for how she was wired. Shugart wanted to work with fixed endpoints and clear outcomes.

So, she started looking at what else she could do during a time when conversations around alternative careers in science were taking shape. She began blogging about exploring differ-

Photo, facing page, by Brian O'Doherty



At the 2026 American Physiology Summit in Minneapolis in April, Erika Shugart, PhD, FAAAS, addressed attendees at the closing. She also met with members in the PhysioHub and chatted with APS President Sue Bodine, PhD, FAPS.

ent career paths, and two areas kept calling her: science policy and science communication. Both, at their core, were about the same thing. "I wanted to help connect science to society," she says, "because I felt that is essential for a well-functioning society."

Shugart finished her PhD and landed an internship at the National Academy of Sciences working on science communication about science policy. It was, she says, the perfect combination of her interests. From there, she built a career that took her through the Marian Koshland Science Museum of the National Academies, the American Society for Microbiology, the American Society for Cell Biology (ASCB) and, most recently, the National Science Teaching Association (NSTA).

Her graduate research was about as focused as science gets. "My thesis—understanding transcription during growth regulation—was like looking at one transcriptional regulator," she says. "Very, very focused." It was exactly the kind of reductionist work that defines much of biological science, breaking things down to their smallest parts. What draws her to physiology now is the opposite. Her brain, she says, sees larger patterns—how things fit together—rather than individual pieces. "That aligns with how physiologists view the world," Shugart says. "Physiology takes those pieces and puts them back together into a bigger whole—a larger understanding of what's going on in the human body and our health."

Her background feels more relevant now than at perhaps any other point in her career. Science sometimes stands apart from the rest of society, Shugart says, treated as something outside of culture, when in fact it shapes nearly everything. "Making sure the public can access high-quality, dependable information—that we continue to make new discoveries because there's so much we don't know—is important," she says.

A NATURAL MATCH

Shugart had been watching APS from a distance for years. Her first CEO role was at ASCB, an association housed in the same building as APS headquarters. She crossed paths with previous APS leadership and knew the Society's reputation. "APS was on a list of places I'd love to work," she says. But the timing had never aligned. When Steen took the role in 2018, she was early in her ASCB tenure. Then she moved on to NSTA.

After leaving NSTA, Shugart spent a year doing interim and consulting work, actively searching for her next scientific home and interviewing with several organizations. Then came APS. "When I was having conversations with the Search Committee, I realized how much it was a good fit personality-wise," she says. "The conversations flowed. It was a dialogue. It didn't feel like an interview. I walked away from each interview more excited about the organization."

The more she learned, the more confident she became that she could make a real difference. Shugart saw APS as a society with a strong publications portfolio, an engaged membership and exciting emerging areas—meetings, professional development—where her experience was directly applicable. "I was just thrilled when I got the offer," she says.

Shugart says when she arrived, what she found more than confirmed what she had anticipated. APS membership has a culture that isn't a given in the association world; culture can vary widely from organization to organization. What struck her most in her early conversations with board members and volunteers is how much they feel like APS is their professional home. They built their community with the Society, many joining during graduate school. "They're gracious with their time," she says. "It's been wonderful to engage with members who care so deeply and have a strong sense of community."

THE FIRST 90 DAYS

Shugart describes herself as a deliberate onboarder. So deliberate that she has spent several years on a side project interviewing fellow CEOs about how they navigated their own transition; it's research for a book she's writing on the subject. "I've thought about how to do this well," she says. "It's been interesting putting it into action. Some of my plans have worked great, and in some cases, I didn't do what I intended to do."

To get started, she mapped her first months of onboarding into a plan. The initial 30 days were devoted almost entirely to listening: conversations with APS Board members, section chairs, journal editors-in-chief and APS staff. In April, the American Physiology Summit in Minneapolis gave her a chance to hear from members directly and see the community in action. The next phase of onboarding involves external stakeholders and a deeper review of background materials, leading into a July board meeting where Shugart plans to begin shaping a shared direction with APS leadership.

"It works out nicely to have that opportunity to do the learning, then sharing, then discussion—not just a unidirectional conversation," she says. "I listen, then I have a chance to share and get reaction and then listen again."

That approach is intentional. Shugart acknowledges that she tends to draw conclusions quickly, so she's

A CLOSER LOOK

5 Extras Not on Erika Shugart's CV

From cloud forests to lumpy pots, here's Erika Shugart in her own words.

Favorite place to visit. My father's work took our family abroad, including to Australia. On the border between Queensland and New South Wales sits Lamington National Park, and just next to it is a private retreat called O'Reilly's, nestled in a cloud forest. The birds there are extraordinary—bowerbirds, giant parrots that fly down and eat right from your hand. My biggest dream was to bring my own kids there someday. A couple of years ago, I did. Watching them experience the same delight I had as a child, feeding the birds, hiking the trails, made it one of my favorite trips.

Best piece of advice. My father told me when I was in my 20s, when I was agonizing over a decision: Get the best information you have, make the decision, and then walk through that door and don't look back. That has stayed with me ever since.

Hidden talent. I've been doing ceramics for almost a decade now, both hand-building things and throwing pots. It was a wonderful and horrible initial experience because I wasn't very good, and it can be hard to get right, especially on the wheel. It reminded me of what it's like to be an early learner. There were a lot of lumpy, bumpy things that I made for a long time. At this point, I've made a whole dinner set, large-scale vases ... and am continually improving.

Historical figure you'd invite for dinner. Eleanor Roosevelt. When I think back about the period when she was first lady, this was in the middle of the Great Depression. People weren't happy about the way things were going. But she was this incredibly bright, talented leader who did amazing things within the constraints that society had her in at the time.

Three traits you value in a colleague. Curiosity. If you're dealing with somebody whose mind is closed, or who's uninterested, it's hard to connect, especially if you have differences. Honesty. Knowing I can trust them, because if you don't have trust, communication is difficult. Sense of humor. Things go wrong, things happen, and to be able to laugh and find the humor in all sorts of circumstances is a great trait to have.

mindful to pump the brakes. "It's just like the scientific method," she says. "You come in, you see some information, you make an educated guess, you form a hypothesis, but then you've got to stop and think: Let me make some more observations."

She is also candid about what kind of leader she is and isn't. "There's an expectation that leaders are going to lead from the front, have a big flag and say, follow me," she says. "That is not the kind of leader I am." What she practices instead is servant leadership, a leadership philosophy that prioritizes the needs of others and emphasizes shared decision-making.

MEETING MEMBERS

Early conversations with members have surfaced both concerns and a desire for alignment. The concerns, Shugart says, are widespread and real: federal funding challenges, policy decisions and the sense that physiology is being sidelined or folded into a broader category of biological science.

The biological science societies, she says, are a fractured group—a wide Venn diagram of overlapping membership across many organizations, where the same researcher may identify as a physiologist one day and a cell biologist the next. She is assessing what that means strategically for APS, but her instinct points toward the Society as a convener across disciplines. "Physiologists are the uniters across the biological sciences. How do we help APS become that thought leader? That's an opportunity for us."

Members have also expressed their thoughts to Shugart on how the Society could extend its international presence, reach basic science researchers who may not have a home elsewhere, and sustain the momentum of the Science Life Depends On campaign. Seeing APS' work on Capitol Hill land with a positive reception gave her confidence. "We've already taken a key step in explaining the importance and centrality of physiology," she says.

MAJOR MOMENT FOR SCIENCE

Shugart is excited to continue the work and carry the momentum from the Science Life Depends On Capitol Hill Day briefing and science fair. She knows it is a long and critically important fight.

"The U.S. still drives science worldwide," she says. "Our science is second to none because of the huge federal investment that has been made, going back to the 1940s. Vannevar Bush's 'Science: The Endless Frontier' laid out an agreement that the federal government is going to support science and that science is going to support our nation and the world."

Scientists, Shugart says, have upheld their end of that agreement. "People live longer, people are healthier, and we're safer. There is almost nothing in this world that isn't better for humans because of the work science has done."

The case for investing in science is clear. "For every dollar spent on science, we get multiple dollars back into the economy," Shugart says. "We are a driver of positive economic growth. We need the government to continue to hold up their end of the bargain."

Her approach to advocacy reflects her science communication background: finding shared values, standing on common ground and keeping the conversation going. Congress has shown bipartisan support for research funding, she says, and that matters. "We just need to continue to align with our values and take steps to make the case on the Hill, with people at all levels. That's the chance to make a difference."

Shugart also sees this moment physiology is having as an opportunity that APS cannot allow to pass by. GLP-1 drugs, Alzheimer's research, omics—physiology is at the center of the biggest health stories in current events. But when you ask the average person, or even a policymaker, to name the science behind those breakthroughs, they're likely to say "biology" or just "science."

"We need to make physiology a household name," Shugart says. Just like astronomy is the understanding of space, physiology is the understanding of the systems of our body, and how they all work together. It's a brand issue, and we can work on the brand."

WHAT MEMBERS SHOULD KNOW

When asked what she hopes members take away from her first 30 days, Shugart's answer is immediate: that they've been heard. "You can be talked at, and it doesn't mean the person hears you," she says. "I want them to know that they have been heard. I've really taken what they've said to heart."

The second thing she hopes APS members feel is optimism. She hears the worry in these conversations, and she understands it. But she also sees something else: a community pulling together and people showing up for each other.

While still in the early days of her role, Shugart knows there is a lot of work ahead of her. But her direction is clear: Listen, build trust, and when it's time to move, move collaboratively. She also takes author Anne Lamott's advice for tackling big tasks to heart: When the task in front of you feels overwhelming, take it bird by bird. It hits close to home, Shugart says, because she's also a birder.

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Access awards and fellowships designed to move your work and career forward. Apply for APS awards to gain recognition in your field and access new and meaningful opportunities.

Learn more about all award opportunities and apply for the awards highlighted below at physiology.org/awards.

Claude Bernard Distinguished Lectureship of the Teaching of Physiology Section	$1,000	Honors an established investigator with a history of excellence in education who is making outstanding contributions to teaching and learning	July 14
Julius H. Comroe Jr. Distinguished Lectureship of the APS Respiration Section	$1,000	Honors an outstanding contributor to the disciplinary areas of physiology represented by the Respiration Section	Aug. 15
Anne R. Crecelius High Impact Scholar Award	$5,000	Honors a member who demonstrates sustained high quality of work, consistency in effort and a commitment to advancing the physiology educator community	Aug. 31
Joseph Erlanger Distinguished Lectureship of the APS Central Nervous System Section	$1,000	Honors a scientist who has made major and meritorious contributions to the scientific areas represented by the Central Nervous System Section	Sept. 2
Solomon A. Berson Distinguished Lectureship of the Endocrinology & Metabolism Section	$1,000	Honors a distinguished scientist for their outstanding contributions to the areas of endocrinology and metabolism physiology research	Sept. 2

ELECTIONS

New Interest Group and Section Chairs Elected

Meet the 2026–2029 APS section and interest group chairs.

Interim Chair, Cardiovascular Section
Shawn B. Bender, PhD, FAPS
Associate Professor, Pathobiology and Integrative Biomedical Sciences
University of Missouri

Central Nervous System Section
Stefany Primeaux, PhD
Associate Professor, Physiology
Louisiana State University Health Sciences Center New Orleans

Endocrinology & Metabolism Section
Liz Simon, PhD
Assistant Professor, Physiology
Louisiana State University Health Sciences Center New Orleans

Nutrition Interest Group
Lauri O. Byerley, PhD
Associate Professor, Research, Physiology
Louisiana State University Health Sciences Center New Orleans

Respiration Section
David D. Fuller, PhD, FAPS
Professor, Physical Therapy
University of Florida

Teaching of Physiology Section
Lisa Carney Anderson, PhD
Associate Professor, Integrative Biology and Physiology
University of Minnesota

OUTGOING CHAIRS

APS thanks our outgoing chairs for their service and dedication to the Society.

Cardiovascular Section
Julie Freed, MD, PhD (elected to the APS Board of Directors)
Associate Professor, Executive Vice Chair, Director of Clinical Research
Medical College of Wisconsin

Central Nervous System Section
Gene "Lee" Bidwell III, PhD
Professor, Neurology
University of Mississippi Medical Center

Endocrinology & Metabolism Section
Licy L. Yanes Cardozo, MD
Professor, Pharmacology and Medicine (Endocrinology)
University of Mississippi Medical Center

Nutrition Interest Group
Chad M. Paton, PhD
Associate Professor, Food Science and Nutrition
University of Georgia

Respiration Section
Chris M. Waters, PhD, FAPS
Professor, Physiology
Medical College of Georgia, Augusta University

Teaching of Physiology Section
Alice R. Villalobos, PhD
Associate Professor, Department of Medical Education
Texas Tech University Health Sciences Center

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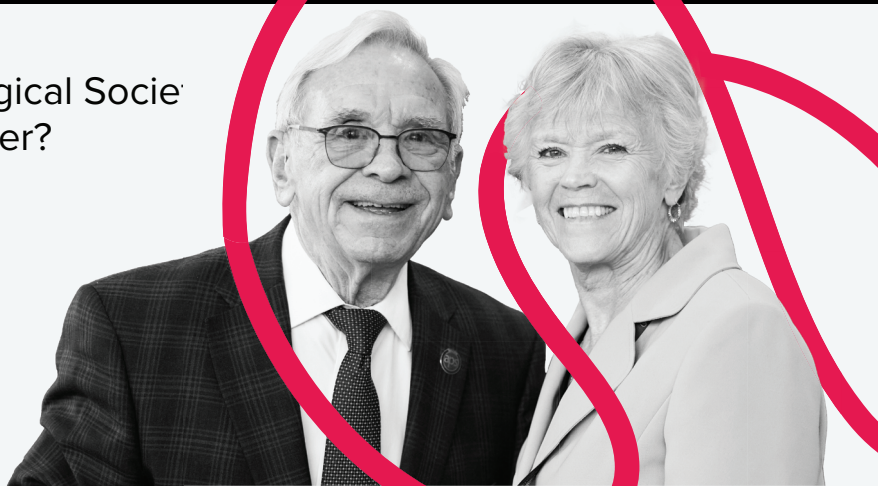

PUBLICATIONS

New *American Journal of Physiology-Renal Physiology* Editor-in-Chief Named

Janos Peti-Peterdi, MD, PhD, became editor-in-chief of the *American Journal of Physiology (AJP)-Renal Physiology* on June 1. A professor and acting vice-chair



of the Department of Physiology and Neuroscience and Medicine and the director of the Vito M. Campese MD/UKRO Kidney Research Center at the University of Southern California (USC), Peti-Peterdi brings extensive expertise in renal physiology and kidney disease pathobiology to the role.

His research centers on the juxtaglomerular apparatus, the anatomical site within the kidney that controls blood flow, filtration and renin secretion. His team has advanced understanding of how the macula densa regulates kidney tissue remodeling, regeneration and nephron function. He also directs USC'3s National Institutes of Health-funded Multi-Photon Microscopy Core, where his laboratory pioneered intravital multiphoton microscopy techniques.

Peti-Peterdi served as associate editor of *AJP-Renal Physiology* from 2013 to 2020 and is a longtime member of the APS Renal Section. He has received the APS Young Investigator Award (2005), American Society of Nephrology Young Investigator Award (2015) and American Heart Association Established Investigator Award (2006).

Learn more about *AJP-Renal Physiology* at **journals.physiology.org/journal/ajprenal**.

ADVOCACY

APS Urges Members to Comment on Federal Grant Changes

A proposed rule from the White House Office of Management and Budget (OMB) would fundamentally change how federal research grants are awarded and managed. APS is urging members to weigh in before the July 13 deadline. APS is submitting formal comments and coordinating with coalitions across the scientific community. Individual comments carry real weight—OMB must consider all public input before finalizing the rule. Read more about the rule changes and how you can submit a comment at **physiology.org/proposedrule**.

MEMBER NEWS

Daria Ilatovskaya, PhD, an associate professor of physiology at the Medical College of Georgia, is



the 2026 recipient of the *American Journal of Hypertension* John H. Laragh Research Award for Basic Science. The award honors outstanding investigators in the field of hypertension who are under 45 years of age. Ilatovskaya's research focuses on the sex differences in the mechanisms of blood pressure regulation and renal mitochondrial bioenergetics.

Joseph Watso, PhD, an assistant professor in the Department of Health, Nutrition and Food Sciences at Florida State



University (FSU), is the 2026 recipient of FSU's Outstanding Graduate Teaching Award. The award honors faculty who help graduate students develop their disciplinary expertise, whether in formal coursework or through advising on theses or dissertations. Watso was recognized for enhancing student training through the development of an advanced exercise physiology lab course and expanding mentoring opportunities through hands-on research, funding initiatives and professional development in publishing and peer review.

TASK FORCES

APS Board Approves Scientific Excellence Initiatives

The APS Board of Directors has approved two recommendations from the Scientific Excellence Task Force, which was charged with strengthening the Society's scientific standing and positioning physiology within the broader biosciences.

The Board approved the creation of a Committee for Scientific Excellence to advise the Board and APS staff on matters affecting the scientific quality, vitality and reputation of the Society and the discipline. The committee will work to ensure APS programs, publications and meetings reflect high standards of scientific rigor and innovation.

The Board also approved the establishment of a new APS award for scientific discovery. The Society's highest research honor, the award will recognize an active scientist or team of scientists whose recent discovery has advanced the understanding of physiology or transformed an area of biomedical science. The award will launch in 2028.

DATES & DEADLINES

AWARDS APPLICATION DEADLINES

Award deadlines vary and may be subject to change. For the latest information, including award descriptions, amounts, eligibility requirements and to apply, visit **physiology.org/awards**.

JULY 14

Ernest H. Starling Distinguished Lectureship of the Water & Electrolyte Homeostasis Section

Claude Bernard Distinguished Lectureship of the Teaching of Physiology Section

AUG. 15

Julius H. Comroe Jr. Distinguished Lectureship of the Respiration Section

AUG. 31

Anne R. Crecelius High Impact Scholar Award

SEPT. 2

Joseph Erlanger Distinguished Lectureship of the Central Nervous System Section

Solomon A. Berson Distinguished Lectureship of the Endocrinology & Metabolism Section

OCT. 6

Henry Pickering Bowditch Award Lectureship

Physiology in Perspective Walter B. Cannon Award Lectureship

CALLS FOR PAPERS

ONGOING CROSS-JOURNAL CALLS FOR PAPERS

Cardiorenal physiology

Explore our ongoing cross-journal calls for papers on key women's health research topics:

- Alzheimer's disease
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- Breast cancer
- Cardiovascular disease
- Hormone replacement therapy and menopause
- Migraines
- Novel perspectives on sex as an investigative variable
- Pregnancy and postnatal conditions:
  - Endometriosis
  - Gestational diabetes
  - Preeclampsia
  - Polycystic ovary syndrome

Join APS in advancing our mission to improve health care outcomes and promote greater scientific understanding of women's health. Learn more about this special call for papers at **journals.physiology.org/womens-health-research-initiative**.

American Journal of Physiology-Cell Physiology

Jan. 4, 2027

- Cellular Dysfunction in Cardiovascular Diseases
- Decoding Fibrosis
- Exploring Autonomic Signaling and Cell Physiology
- Mechanisms Underlying Diversity in Cancer Cachexia
- Mitochondrial Channels/Transporters: From Physiology to Pathophysiology
- Myogenic Stem Cells: From Single Cell Biology to Muscle Physiology

Jan. 5, 2027

- Crosstalk of ECM and Cellular Metabolism in Development, Aging and Disease
- Metabolic Syndrome and Cancer

American Journal of Physiology-Endocrinology and Metabolism

Jan. 4, 2027

- Clinical Metabolism
- Exercise Metabolism
- Immunometabolism
- Liver Metabolism

American Journal of Physiology-Gastrointestinal and Liver Physiology

July 31

- Cell and Animal Models of Gastrointestinal Disease
- The Microbiota-Gut-Brain Axis

American Journal of Physiology-Heart and Circulatory Physiology

Feb. 2, 2027

- Unraveling Cellular and Subcellular Mechanisms, Diagnostic and Therapeutic Innovations in Heart Failure Across the Ejection Fraction Spectrum
- Interorgan Communication in Cardiovascular Disease
- Core Skills in Cardiovascular Research
- Emerging Technologies in Cardiovascular Physiology
- Stress, Exercise and Cardiovascular Disease
- Role of Leukocytes in Cardiovascular Disease
- Spotlight on Cardiovascular Health Disparities
- Transformative Cardiometabolic Advancements

American Journal of Physiology-Lung Cellular and Molecular Physiology

Dec. 4

- Exploring Macrophages and Environmental Exposures in the Lung

Jan. 15, 2027

- Artificial Intelligence and Machine Learning Approaches in Respiratory Research
- Cystic Fibrosis and Other Lung Diseases in the CFTR Modulator Era

American Journal of Physiology-Regulatory, Integrative and Comparative Physiology

Sept. 30

- Integrative Physiology of Gut-Brain Communication
- Physiological Adaptations to Environmental Stressors and Challenging Conditions

Dec. 15

- Interoception in Physiology and Disease

American Journal of Physiology-Renal Physiology

June 30

- Mechanism of Renal Ion Transport and Sensing in Health and Disease in Honor of Dr. Steven Hebert
- Epigenetics in Kidney Health and Disease

Dec. 31

- The Impact of Obesity and Hypertension on Kidney Disease

Comprehensive Physiology

July 31

- Liver-Lung Interactions in Health and Disease

Dec. 28

- Microbiome: A Critical Modulator of Multiple Organ Cross Talk in Health and Disease

Function

Oct. 1

- Circadian Biology: Timing Matters in Physiology and Pathophysiology
- Immunobiology and Inflammation: Emerging Roles in Physiology and Pathophysiology
- Obesity and Metabolic Physiology: From Molecular Mechanisms to Systemic Implications

Journal of Applied Physiology

Jan. 15, 2027

- Physiological Impacts of Modern Environmental Exposures

Jan. 29, 2027

- The Physiology of Exercise Limitation in Chronic Obstructive Pulmonary Disease

Physiological Genomics

Nov. 6

- Single Cell Analysis

Dec. 4

- Gene Therapy and Multi-Omics Approaches for Precision Medicine
- Environmental Effects on Physiological -Omics
- Spatial -Omics

MEETINGS & EVENTS

2026 CONFERENCES

Comparative Physiology Conference
September 17–21
Orlando, Florida

Save the date!
The American Physiology Summit
April 1–4, 2027
Denver

The Middle Miles

BY NATHANIEL JENKINS, PHD

I came to running the same way I came to my current research program: without a road map and with a lot of doubt. I was a baseball player most of my life, and when I hung up the glove, I spent the next 10 years training in the weight room where I was comfortable. Science, meanwhile, I understood through the lens of applied neuromuscular and cardiovascular exercise physiology. I was trained for a particular race, and I knew its course well.



My research pivot came first. In 2018, a pilot grant through a National Institutes of Health Center of Biomedical Research Excellence (COBRE) gave me my foray into early life adversity research. It was a chance to ask questions that plagued me personally about how the body responds to stress, how early adversity embeds biologically to shape cardiovascular risk across a lifetime and whether we can do anything about it in adulthood. But reality was less orderly than the opportunity. I had no formal grant writing training, no postdoc experience to draw from, and no reason to think I belonged in this space except for the belief of COBRE leadership. With their support, I figured it out as I went.

"What I've learned from research and running is that the principles are the same. There's no substitute for showing up."

The pivot to running followed in 2021, after a one-mile warmup jog left me humbled and reassessing my fitness. My lab today looks almost nothing like the one I'd originally imagined, and the same is true of my running.

What I've learned from both is that the principles are the same. There's no substitute for showing up. The aerobic base gets built slowly, invisibly, one unremarkable workout at a time. A research program isn't too different. The major grants, big papers, reputation and impact are not the product of a singular "eureka!" moment. Instead, a program is built by consistent effort, sustained through uncomfortable and humbling periods where the payoff is uncertain. The middle miles can be hard and unglamorous, and perhaps that's the point.

Any runner understands what it feels like near maximal lactate steady state. It is uncomfortable and will make you doubt yourself, but it is also sustainable. I've tried to read discomfort and doubt the same way during my career: conducting interdisciplinary work without a road map, scaling steep learning curves, watching strings of grants go unfunded, and building credibility from scratch while colleagues are hitting their stride. But maybe that discomfort and self-doubt are a sign that you're close to something worth achieving.

I've had a lot of training partners and pacers. These are the mentors who've poured into me, the graduate students and postdocs who believed in me and the work before it had publications or funding to justify it, the collaborators who offered expertise I didn't have, the reviewers who saw ideas worth developing, and my family, who has loved and supported me through it all. Asking people to follow you into territory that isn't fully mapped isn't just taking a risk with your own prospects. It is also asking others to take that risk, believing the outcome will be worth it. That weight has made me more deliberate and a better scientist, mentor and person.

So, to those just beginning careers in the physiological sciences, you don't need to have your route figured out. The course will reveal itself as you run, especially in the middle miles. And if you're fortunate, you will look to your left and right and realize that you are never out there alone.

Nathaniel Jenkins, PhD, is an associate professor in the Department of Kinesiology and faculty member in the UW Cardiovascular Research Center at the University of Wisconsin-Madison. Send questions or comments to tphysmag@physiology.org.

Illustration by Brett Affrunti



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