

# THE **Physiologist** MAGAZINE

SEPTEMBER 2023

HOW GENERATIVE AI SUCH AS CHATGPT MIGHT AFFECT PUBLISHING **22**

WHAT OPEN ACCESS COULD MEAN FOR RESEARCHERS **26**

## LEADING THE WAY

Wolfgang Kuebler guides APS through a complex time in scholarly publishing.





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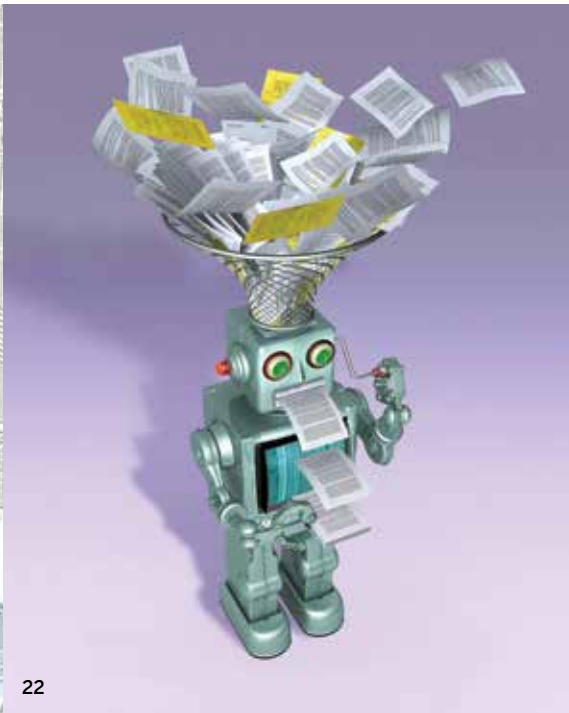
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# CONTENTS

## FEATURES



18 22



26

18

## Leading the Way

Wolfgang Kuebler guides APS through a complex time in scholarly publishing, as the Society's new publications chair.

BY CHRISTINA HERNANDEZ SHERWOOD

22

## The Future Is Now

The rapid growth of generative AI such as ChatGPT could have profound effects on research and publishing.

BY LAUREN ARCURI

26

## Unlocking Open Access

Open access is on the horizon. What will this mean for researchers and publishers?

BY SCOTT SLEEK

# CONTENTS

## DEPARTMENTS

### THE EDITOR'S DESK

---

#### **4** A Celebration of Publishing

### EVOLUTION WITH COLETTE E. BEAN

---

#### **8** Understanding Open Science

Exploring ways to make research more transparent, rigorous, reproducible, useful and trustworthy to science and society with Colette E. Bean, MA, APS chief publishing officer, and Tracey Weissgerber, PhD, a member of the APS Publications Committee.



### IN REVIEW

---

#### **10** Education Enthusiasm

### LAB NOTES

---

#### MENTORING Q&A

#### **12** I've Earned My PhD. Now What?

How to successfully transition from graduate student to postdoc.

#### POLICY IQ

**14** White House calls on agencies to update public access policies.

#### UNDER THE MICROSCOPE

#### **16** Rapid Fire Q&A

Gregory D. Funk, PhD, shares how he would describe science to a child, the adventurous activity every scientist should try and a surprising fact about himself.



### TRANSPORT

---

**35** Career successes and milestones of APS members.

### NEWS FROM THE FIELD

---

**36** New Chapter Advisory Committee chair shares goals; Communications industry recognizes APS with top media awards; APS creates new learning module; Society jointly launches neuroscience webinar series.

### DATES & DEADLINES

---

**38** Calls for awards and papers and upcoming events and webinars.

### THE LAST WORD

---

#### **40** Unveiling the Wonders of Physiology to the Next Generation

Austin Robinson, PhD, uses his own experience to spark a passion for science in others.

Read the comparative physiology blog

# Life Lines

by

# Dr. Dolittle

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# A Celebration of Publishing

BY COLETTE E. BEAN, MA



Dear Reader,

Here at APS, we publish 16 peer-reviewed journals and an eBook program dedicated to empowering discovery to improve health. As chief publishing officer, it is my great honor to collaborate with our editors, Publications Committee, member leaders and staff on our program of well-regarded publications. Each publication in the program is focused on building community and producing high-quality physiology content that can elevate the discipline. The program is widely read and cited with over 106 million pageviews (2017–2022), 1.35 million cumulative citations (2017–2022) and over 382,000 Altmetric mentions in online posts (all-time).

In member surveys, our publications are consistently identified as one of the top Society member benefits, and our publishing contributes 85% of the total operating revenue that supports the programs and services we provide our members. So, I was thrilled when APS Chief Community and Learning Officer Meeghan De Cagna, MSc, CAE, suggested we dedicate an issue of the magazine to publications. In this issue, we are sharing some of the important trends in scientific publishing—an industry that is undergoing a rapidly accelerating period of change to embrace a more open and transparent future.

While this evolving landscape poses challenges for our publishing program and the

Society, it also offers significant opportunities to reimagine how we publish. Ultimately, an open future holds tremendous promise to break down barriers, accelerate scientific discovery and enable our physiology community to communicate their science to the broadest audience possible.

## PUBLISHING-FOCUSED FEATURES

On page 18, you can read about Wolfgang Kuebler, PhD, MD, FAPS, who began his three-year term as APS publications chair in April. Kuebler shares how he's thinking about publishing right now as he leads APS through changes in scholarly publishing.

Our other two features cover two of the hottest topics right now in publishing: open science and artificial intelligence (AI). On page 22, hear from experts on what generative AI tools like ChatGPT could mean for scholarly publishing.

These tools could have a profound impact on the way research is conducted and communicated—but we need to stay updated on the risks and ethical concerns. I hope this article helps to educate and inform you about the critical discussions around AI that we need to have.

On page 26, we dive into open access—what does it really mean and how will it affect researchers and APS as a whole? We explain the timeline of changes, outline the different open access models and define some important terms you should become familiar with.

You will hear more from us over the coming year about the exciting ways APS expects to adapt to continue to meet the needs of our members, authors and readers. In the meantime, I hope you will find this issue to be informative and thought-provoking. If you have questions about our publishing program, feel free to email us at [publications@physiology.org](mailto:publications@physiology.org). 📧

Colette E. Bean, MA, is APS chief publishing officer.

**“While this evolving landscape poses challenges for our publishing program and the Society, it also offers significant opportunities to reimagine how we publish.”**

# Contemplating graduate school as the next step in your education and career?

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## Interested in listing your program?

Contact **Jacob White** for more information.

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# THE Physiologist MAGAZINE

VOL. 66 | SEPTEMBER 2023

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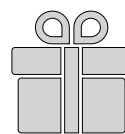
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# Understanding Open Science

Colette E. Bean, MA, APS chief publishing officer, spoke with Tracey Weissgerber, PhD, a member of the APS Publications Committee and group leader at the QUEST Center for Responsible Research at the Berlin Institute of Health at Charité. Weissgerber is a physiologist who now studies research itself. She looks at ways to make research more transparent, rigorous, reproducible, useful and trustworthy to science and society.

**Bean:** Could you explain your view on what open science is and give a few examples?

**Weissgerber:** At its most basic level, open science is about making our materials and our products of the scientific work that we do more open, more available and accessible to others, and making our scientific process more transparent. That might include sharing the data that we generated on a data repository so that others can reuse it for different studies. It might include sharing the code that you use to analyze the data. It can also include making software, or a tool that you have developed, openly available to others, or making educational resources that you've created open so that others can reuse them.

One of the things that's really critical to open science is that we diversify our understanding about what a research output is. Right now, our system is very

focused on publications, which are primarily about the results. But when we think about it, a lot of the work really goes into creating these many other pieces—the data, the code, developing the methods and the procedures. And so,

allowing [our colleagues] to reuse our methods, our data, and to cite those materials so that the researchers who've created those materials can get credit for their work, is really important.

The other piece of open science is about scientific rigor and reproducibility. Just making something open doesn't mean that it's high quality. We also want to know about the experimental design. We want to know if the authors are using procedures like blinding or randomization or pre-registration to help us evaluate the risk of bias and the quality of the way that the study was done. This information is really important because it tells us how useful the results might be, how much confidence we should have in those results, what kind of follow-up work might be needed or nuance in the interpretation.

**Bean:** Can you talk about the importance of open science as it relates specifically to biomedical research?

**Weissgerber:** One of the things that's especially important about biomedical research is that we ultimately want therapies that work for patients. We want things that translate and that solve problems in the world. So it's really important to go beyond thinking about "What do I need to do as a scientist to build my career?" And also to think about "What is the end goal of this? Who is my research trying to help?" ... Making our materials open, making them high quality, making them rigorous and trustworthy and useful to others can help us accelerate that process of discovery.

But in order to do that, we have to change the way that we assess scientists. We need to go beyond rewarding people for their grants and their publications, and we need to start also rewarding them for those other types of research outputs they produce, [such as data sets, software and educational tools].

Right now, there's one way to be a successful scientist, and it's about grants and papers, which focus on results. And when you're focusing just on the results, you incentivize people to keep their methods and their data private because they want to have those things to generate more new results as a competitive advantage. If we were to open up what we think of as a research output and start giving credit to people who



Above: Colette E. Bean, MA;  
right: Tracey Weissgerber, PhD



are good in these other areas, we would provide more paths for being successful scientists. That's really fundamental for allowing science to advance quickly and efficiently.

**Bean:** What do you think are the most impactful open science practices and recommendations?

**Weissgerber:** Right now in open science there's a lot of emphasis on open access, which is publications, [and on] open data. What we're not hearing much about is open methods. And I think this is a huge oversight for several reasons. First of all, reproducibility starts with methods. So if we don't know what you did, we can't reproduce it and we can't implement it in another setting. The second reason is that if you care about open data and you want to be able to reuse that data, you have to understand how it was generated to use it responsibly. And then the third reason is that of all of the things that science produces, methods are perhaps one of the most useful. It's more likely that someone might be able to reuse your methods or adapt them for another context than they would be able to reuse your data.

I would really encourage scientists to look at how to use protocol repositories, how to share their reusable step-by-step protocols and publish their study design protocols so that others can understand and use these things. I'm currently organizing a group called PRO-MaP, which stands for Promoting Reusable and Open Methods and Protocols. We have just released draft recommendations for actions that four stakeholder groups can take.

**Bean:** What are some of the challenges of open science?

**Weissgerber:** The first big challenge is that right now it's not adequately rewarded or incentivized. So if we think about making our data [and protocols] available ... each of those steps take time. We're still not adequately rewarding people who take the extra time to do these practices. The second challenge we have is a knowledge gap. A lot of people simply aren't aware of practices [or tools] they could be using. There's a lot of training to be done to get people to understand, "How do I use these tools and how does that benefit my research group?"

## Learn More about Open Science

### ReproducibiliTeach online course

- <http://youtube.com/@reproducibiliteteach>
- <https://bit.ly/ReproducibiliTeach>

### Recommendations on empowering early-career researchers

- <https://bit.ly/ECREmpower>

### 10 simple rules to implement open research practices

- <https://bit.ly/OA10rules>

### Draft recommendations from Promoting Reusable and Open Methods and Protocols (PRO-MaP)

- <https://osf.io/x85gh>

### Reproducibility for Everyone initiative

- [www.repro4everyone.org](http://www.repro4everyone.org)

The last thing is resources. Some of these skills also take resources to implement. You may need infrastructure [and] personnel, and there are costs associated with that. The challenge for scientists is if they have [only] so much funding on a grant, they always want to put it into the science. So, thinking about a change in the way that we fund science is really important to make sure that we are leaving adequate resources to support investigators in doing reproducible, rigorous and open research work.

**Bean:** Do you have any last thoughts?

**Weissgerber:** Some of this is also about normalizing a culture of transparency and openness. And part of that is understanding that science is messy and it's very complicated and we all make mistakes. ... My recommendation for people would be to try new things. We have to understand that science is evolving and what was considered great scientific practice 20 years ago is different from today because we have new capabilities and new tools. Trying out something new doesn't mean that you've been doing it wrong for the last 20 years. It just means that science is changing, and we all want to change with science so that we're doing the best research that we can do. 📞

Watch the conversation in full at [www.physiology.org/evolution](http://www.physiology.org/evolution).

## The joy of learning comes across in these social media posts.

Share your story with us and it may appear in the next issue of *The Physiologist Magazine*. Email your thoughts—and links to your social media posts—to [tphysmag@physiology.org](mailto:tphysmag@physiology.org).



**Orlando Laitano**  
@olaitano

I have successfully completed the Reviewer Certificate Program from the American Physiological Society (@APSPHysiology)! 🎓🔬 #ScientificReview #APSReviewerCertificate — strongly recommend this program for all involved in reviewing manuscripts.



10:16 PM · Jul 5, 2023

To learn more about the APS Reviewer Training Certificate Program, email [reviewercourse@physiology.org](mailto:reviewercourse@physiology.org).



**Fran**  
@Franmorena98

The more science I get to be a part of, the more I know I made the right choice. I love this job, regardless of the challenges, the hours, and sweat you put into it. #WomenInScience #myotwitter

10:04 AM · Jul 5, 2023

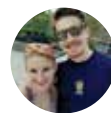


**Clintoria R. Williams, PhD, FAHA**  
@clintoria

Best adult summer camp ever!!!  
#KidneyCamp



3:53 PM · Jul 13, 2023



**Megan Rosa-Caldwell, PhD**  
@MuscleSciMegan

Sometimes sciencing is feeding a baby while emailing with reps about equipment quotes. Starting a new lab with a fresh baby is not for the faint of heart 😊. Good thing she's so cute #momacademia

9:58 AM · Jul 5, 2023



**Adrienne Lester King, PhD**  
@ALesterKingphd

EMPOWER is being recognized again. Being the Program Director is creating opportunities for young women of color! **#STEM #Environmentalhealth**



news.gsu.edu  
**EMPOWER Program at Georgia State Connects High School Students, Teach...**  
The EMPOWER program at Georgia State University is working to enhance the diversity of the environmental health research workforce by building ...

12:13 PM · Jul 7, 2023



**Caitlin Bemis**  
@missusblackburd

Over here teaching myself how to solder mouse nerve cuffs, no biggie.



12:11 PM · Jul 6, 2023



**Department of Physiology Anatomy & Genetics (DPAG)**  
@OxfordDPAG

What does it take to be a good **#scientist**? Akansha Mehta of **@WadeMartinsLab** & **@LiveseyJess** of **@StephCragg**'s lab have been giving children like **@SNSzydowski**'s son Alvin the chance to find out & even dress up as a scientist **@OxUniParks!** **@KavliOxford** **@DailyInfoOxford** **@OxfordMedSci**



9:21 AM · Jul 25, 2023



**Felipe Gorini**  
@FelipeGorini

Officially passed my qualification exam this morning **✅** I am extremely grateful for my mentor Blair Johnson (**@iu\_hiplab**) and Zac Schlader (**@EnviroPhys**) for such a “fun” conversation **😂** I can finally enjoy my summer!

5:30 PM · Jul 11, 2023

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# LAB NOTES

**MENTORING Q&A** YOUR QUESTIONS ANSWERED  
**POLICY IQ** PHYSIOLOGY ON THE HILL AND IN THE HALLS  
**RESEARCH FIZZ** BUZZ-WORTHY RESEARCH  
**STATS & FACTS** PHYSIOLOGY BY THE NUMBERS  
**UNDER THE MICROSCOPE** OUR MEMBERS, UP CLOSE  
**PUBLISH WITH POLISH** BUILD A BETTER RESEARCH PAPER

## STATS & FACTS

# 1,116

The number of international open access policies catalogued on the Registry of Open Access Repositories Mandatory Archiving Policies (ROARMAP) by the end of 2022.

ROARMAP

## RESEARCH FIZZ



### The Physiology of Sedentary Behavior

This review takes a body system-based look at the physiology of an inactive lifestyle.

*Physiological Reviews*, June 2023

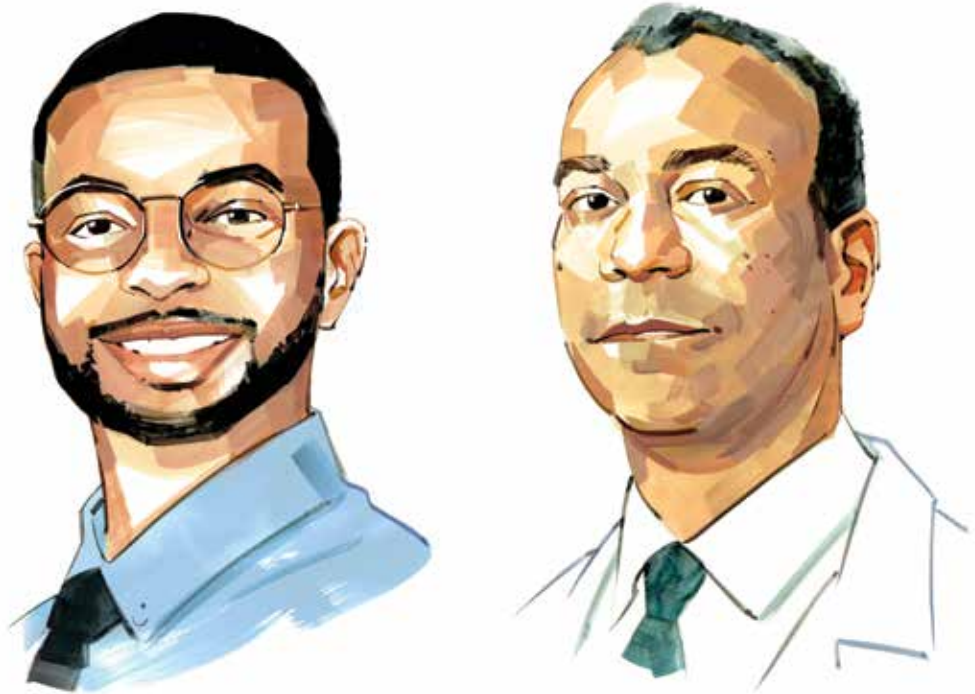
<https://doi.org/10.1152/physrev.00022.2022>

## STATS & FACTS

# ~70%

The portion of graduates with a PhD in artificial intelligence who work in private industry.

MIT Sloan School of Management



## MENTORING Q&A | POSTDOC PREPARATION

# I've Earned My PhD. Now What?

### How to successfully transition from graduate student to postdoc.

Each issue, we ask a student or early-career member to pose their career questions to an established investigator and mentor. Here, Rashaun Williams, a PhD student at the University of Wisconsin-Madison, asks Robert S. Hoover, MD, questions about preparing for life after earning his advanced degree. Hoover is professor of medicine and physiology, The Dr. A. Rudolph and Ruth Ryder Huberwald Chair, and chief of section of nephrology and hypertension in the Deming Department of Medicine at Tulane University School of Medicine in New Orleans.

Left: iStockphoto; right: Illustrations by Kagan McLeod

**“Striking a balance between research productivity and personal well-being is crucial. The pressure to publish should not come at the cost of the physical and mental health of researchers.”**

**Q: There is a current trend away from academia and postdocs after completing a PhD and a move toward alternative career paths. Why do you think that is, and how can we change that trajectory?**

**A:** There are many reasons for this trend. I believe one of the primary reasons for this is concern about securing consistent federal funding in this difficult funding environment. The pressure at many research-intensive institutions to maintain two R01-level grants to achieve tenure is an extremely difficult bar to surpass. I believe this has led to many seeking alternative pathways. One thing we can do to relieve some of the perceived pressure is to emphasize that there are many institutions where the funding bar is not quite as high. Additionally, academic institutions should work toward creating more realistic expectations for tenure. Rethinking the heavy reliance on R01 grants and considering alternative metrics for tenure evaluation could be ways to reshape this process to make it more appealing to young investigators.

**Q: What is your opinion on the adage “publish or perish” for graduate students and postdocs?**

**A:** Our work is only available for evaluation if it is published. Publications are our currency. So we must publish, but where there is room for flexibility is how and where we publish. As has been the case for many years, there is an overemphasis on impact factor. I believe we need to continue to try to focus on publishing good science in journals that have a fair and rigorous review process. Additionally, striking a balance between research productivity and personal well-being is crucial. The pressure to publish should not come at the cost of the physical and mental health of researchers. The “publish or perish” culture can be improved by fostering a more balanced and multi-faceted approach to evaluating research contributions.

**Q: What is the biggest transition between a graduate student and postdoc, and what advice do you have?**

**A:** I believe the biggest transition from graduate student to postdoc is becoming more independent as

you move closer to your faculty or industry career. I always tried to foster a sense that the project is the postdoc’s project, not the mentor’s project. Also, a great postdoc-principal investigator relationship should entail the postdoc contributing new ideas that can lead to a line of research that can develop into an independent project that allows separation from the mentor. This development and nurturing of independent and novel ideas is a critical part of becoming a postdoc. Depending on the type of postdoc, this can also be the first time managing a budget (training grants and F32 fellowships provide small budgets), which is an important, but underemphasized, skill.

**Q: What would you advise trainees do to advance themselves professionally away from the bench?**

**A:** The most important thing to do is to take care of your mental health. Whether this be through hobbies, working out, meditation or other means, being mentally healthy is critical to putting yourself in a position to excel.

As far as advancing your career, it is critical to network. You should volunteer in organizations that are consistent with your scientific interests. This is important not only to support organizations such as APS but also to establish your reputation. A large part of the promotion process in academia is related to establishing that you are a national and/or international expert in your field. This is demonstrated not only by publications and grants but also by national service and presentations at national meetings. Serving in roles for organizations like APS is important.

I also encourage my postdocs to attend social events such as receptions and dinners. This is where connections are made that may lead to appointments on committees, presentations at conferences and collaborations. Relationship building is an essential part of any academic career. ☺

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

**“A large part of the promotion process in academia is related to establishing that you are a national and/or international expert in your field. This is demonstrated not only by publications and grants but also by national service and presentations at national meetings. Serving in roles for organizations like APS is important.”**

RESEARCH FIZZ



**Arterial stiffness preceding metabolic syndrome in 3,862 adolescents: a mediation and temporal causal longitudinal birth cohort study**

This study shows a significant increase in the risk of developing metabolic syndrome in participants as they matured from teens to young adults.

*American Journal of Physiology-Heart and Circulatory Physiology*, June 2023

<https://doi.org/10.1152/ajpheart.00126.2023>

STATS & FACTS

**~86%**

The portion of National Institutes of Health-funded articles, reviews and conference papers published under a gold, green or bronze open access license in 2021.

Association of Scientific, Technical and Medical Publishers

RESEARCH FIZZ



**Molecular responses to acute exercise and their relevance for adaptations in skeletal muscle to exercise training**

This review examines muscle responses at the molecular level to exercise.

*Physiological Reviews*, July 2023

<https://doi.org/10.1152/physrev.00054.2021>



POLICY IQ | OPEN ACCESS

**White House Calls on Agencies to Update Public Access Policies**

Federal research agencies were recently directed to make all publications and data resulting from funded research freely accessible without embargo. The new guidance was issued in August 2022 by Alondra Nelson, PhD, in her role as deputy director for science and society at the Office of Science and Technology Policy (OSTP). Agencies are already in the process of updating their public access policies, which must be in effect by December 31, 2025.

A similar OSTP memo in 2013 directed federal research agencies to make publications resulting from federally funded research publicly available, but that policy allowed up to a 12-month embargo.

Citing the goal of advancing equity of access to the results of federally funded research, the new guidance eliminates that embargo and extends the recommendation to research agencies with less than \$100 million in annual research expenditures. In addition to calling for access to scientific publications,



the 2022 OSTP memo includes peer-reviewed book chapters, editorials, peer-reviewed conference proceedings and scientific data underlying scholarly publications.

The 2022 OSTP memo also calls for agencies to take steps to ensure research integrity and strengthen trust in publicly funded science.

**The plan further specifies that publication costs may be charged to grants but that NIH will monitor trends in publication fees to ensure that the cost of publishing does not become a barrier to investigators with limited resources.**

These steps include collecting and making public certain metadata associated with scholarly publications and data resulting from federally funded research, such as author and co-author names, affiliations and sources of funding; dates of publication; and unique digital persistent identifiers for all research outputs.

Agencies that were already subject to the 2013 public access policies, including the National Institutes of Health (NIH) and the National Science Foundation (NSF), were given 180 days to develop and share public access plans with OSTP. Those

plans were reviewed and sent back to the agencies for further refinement and policy development.

#### PROPOSED NIH UPDATES

NIH revealed a draft of its public access plan on February 21, 2023, requesting feedback from the scientific community and the public on how to ensure equity in publication

opportunities for investigators, steps to improve equity in access and accessibility of publications, methods for monitoring costs associated with providing access, and considerations for improving the findability and transparency of research.

The proposed NIH plan would modify the existing policy by removing the 12-month embargo but continue to allow investigators to comply by either submitting the final peer-reviewed manuscript or the final published article to PubMed Central. The plan further specifies that publication costs may be charged to grants but that NIH will monitor trends in publication fees to ensure that the cost of publishing does not become a barrier to investigators with limited resources. To satisfy the 2022 OSTP memo's recommendations for sharing the

data that underly publications, NIH plans to employ the agency's newly implemented Data Management and Sharing Policy, which went into effect for all grants on January 25, 2023.

#### PROPOSED NSF UPDATES

NSF has also issued an updated public access plan specifying that publications based on NSF-supported research should be made freely available without embargo through deposit in the NSF Public Access Repository.

Like NIH, NSF proposes to accept either the final peer-reviewed manuscript or the final published article and to continue current policy that allows researchers to charge publication costs to grants.

The NSF policy will be implemented through updated terms and conditions of awards, and compliance will be monitored through annual project reports. NSF plans to align the agency's existing requirements for managing and sharing data with the recommendations in the 2022 OSTP memo by issuing additional guidance to award recipients.

OSTP has requested that agencies finalize their public access policies by December 31, 2024, to be implemented and in effect by December 31, 2025. 📌

#### STATS & FACTS

# 40%

The portion of surveyed academics who rated a journal making content freely available as "highly important" when deciding where to publish.

Ithaka S+R U.S. Faculty Survey 2021

#### RESEARCH FIZZ



#### Beating the heat: military training and operations in the era of global warming

This study discusses how the growing frequency and intensity of heat waves around the world threaten military training and operations.

*Journal of Applied Physiology*, July 2023

<https://doi.org/10.1152/jappphysiol.00229.2023>

#### STATS & FACTS

# 7

The number of top technology companies that signed on to a White House pledge to place voluntary guardrails on artificial intelligence systems before their release to the public.

*The Washington Post*

STATS & FACTS

# 100 million

The estimated number of monthly active users gained by ChatGPT within two months of launching.

Reuters

RESEARCH FIZZ



**60** A practical guide to graduate school interviewing for historically excluded individuals

This perspective piece aims to guide graduate school applicants from historically marginalized groups through the interview process.

*American Journal of Physiology-Heart and Circulatory Physiology*, June 2023

<https://doi.org/10.1152/ajpheart.00123.2023>

STATS & FACTS

# 21%

The portion of surveyed researchers who said they would be willing to read AI-assisted articles.

LexisNexis

UNDER THE MICROSCOPE

## Rapid Fire Q&A

Gregory D. Funk, PhD, shares how he would describe science to a child, the adventurous activity every scientist should try and a surprising fact about himself.

**Q: What inspired you to become a scientist?**

**A:** A third-year zoology lecture at the University of British Columbia when we were told the mechanisms underlying the increase in ventilation at the onset of exercise were not understood. That demystified science for me. I thought, “If researchers could not figure out something so obvious, maybe they were not so smart after all.” I was so naïve. Soon after, Bill Milsom, PhD, accepted me as an honor’s student, I published two papers in my fourth year, and I was hooked.

**Q: How has the pandemic changed the way you work?**

**A:** In January 2020, I had only just heard of Zoom.

Now I spend hours each day in Zoom meetings, bemused with people—including myself—who still speak while muted. It can be efficient and more inclusive, but I greatly miss the personal connections.

**Q: “Old school” technique you’re most proud of mastering?**

**A:** Blind, whole-cell patch clamp recording.

**Q: Most challenging laboratory technique you’ve learned to use?**

**A:** Perforated, blind, whole-cell patch clamp recording.

**Q: Favorite lab mishap story that you can share without incriminating the innocent?**

**A:** I returned after a week away from the lab to learn that none of the experiments of my four trainees had worked. They described the brain slices that normally generate a breathing-related rhythm as “dead, fuzzy, swollen.” We figured out that they had been perfusing their brain slices with distilled water. Someone did not finish making the perfusion solution.

**Q: Best “MacGyver” moment in the lab?**

**A:** To teach a week-long graduate course, “methods in respiratory physiology,” Vivian Biancardi (an MSc student at the time) and I set up in one day an electrophysiology rig. We were recording field potentials from brain slices in a small outbuilding at UNESP Campus Rio Claro, Brazil, using the contents of my suitcase and whatever Vivian could find. Our proudest feature was the grounding system: The recording chamber connected to the table (metal sheet of roofing), which connected (via a student touching the table and holding one end of a 20-foot cable

Far left: iStockphoto



Funk with his laboratory team the evening of Robert Reklow’s PhD defense. Reklow is the 14th PhD student to graduate from Funk’s lab. Left to right, Suey van Baarle, PhD; Funk; Reklow; Vivian Biancardi, PhD; Neeharika Reddy, MSc student; and Jun Ren, PhD.



Funk hiking with his laboratory team at Grassi Lakes in Alberta.

### Q: Least favorite part of your job?

**A:** “Administratium”—dealing with and trying to change processes designed to increase administrative efficiencies that impede research and teaching.

spliced together from the cords of two table lamps) through the bathroom window to a steel rod we hammered into the dirt ... then we had a lightning storm.

### Q: If you could meet any scientist (living or dead) who would it be and why?

**A:** Knut Schmidt-Nielsen, who has been referred to as the father of comparative physiology. I am a biology geek at heart and began in comparative physiology with Bill Milsom, PhD. To hear his story firsthand and his adventures exploring physiological adaptations to extreme environments would be awesome.

### Q: If you could do a sabbatical with any scientist (living or dead) who would it be and why?

**A:** Anyone working on control of sleep and breathing in marine mammals, such as Daniel Costa, PhD, at University of California, Santa Cruz.

### Q: If you were a model organism, which model organism would you be?

**A:** An owl. A rodent diet is not so appealing, but almost silent flight—very cool. While not a conventional model organism, barn owls in particular were important in determining mechanisms of sound localization.

### Q: No. 1 guilty pleasure?

**A:** Gin and tonic at the end of the day (best gins: Malfy, pink grapefruit from Italy, or Scapegrace from New Zealand).

### Q: Favorite way to spend a free hour?

**A:** In a kayak, in the surf.

### Q: Most valuable quality in a colleague?

**A:** Integrity.

### Q: Tell us a surprising fact about you.

**A:** I distract myself and unwind by carving bone/mammoth ivory ([www.gregfunkcarvings.com](http://www.gregfunkcarvings.com)), so I have a unique collection of treasures in my basement.

### Q: Favorite part of your job?

**A:** Trainees.

### Q: How would you describe your job to a child?

PUBLISH WITH POLISH | JOURNAL POLICY

## AJP-Heart Supports Research Design across Sex and Genders

In January 2023, the *American Journal of Physiology (AJP)-Heart and Circulatory Physiology* began requiring authors to consider sex as a biological variable in cardiovascular research (or provide strong scientific justification otherwise). This policy aligns with the National Institutes of Health’s expectation that “sex as a biological variable will be factored into research designs, analyses and reporting in vertebrate animal and human studies.”

*AJP-Heart* first announced the policy in 2021 to allow researchers sufficient time to prepare. At that time, the editors had already gathered evidence that articles including more than one sex/gender increased from 35% in 2019 to 63% in 2021. So, how is it going? Since the policy went into effect, only 2% of manuscript submissions have been declined due to a lack of sex/gender balance.

In promoting this policy, *AJP-Heart* editors acknowledge that “rigorous study design includes randomization, data collection and analysis conducted across sexes and genders in a blinded manner” (<https://bit.ly/AJPHeart>). This is echoed in the APS Journals Rigor and Reproducibility Checklist ([www.physiology.org/RigorEditorialPolicy](http://www.physiology.org/RigorEditorialPolicy)), which makes clear the importance of reporting on sex of vertebrate animals and gender of study participants. Ultimately, more complete data lead to more reliable results.

For more information on *AJP-Heart*’s Sex and Gender in Study Design policy, check out the listed editorials at [www.physiology.org/SexGenderPolicy](http://www.physiology.org/SexGenderPolicy). Another helpful resource for authors and editors is the Sex and Gender Equity in Research guidelines at <https://bit.ly/SexEquity>. 📄

**A:** I am a brain scientist. I study the bits in your brain that make you breathe and how we might fix them when things go wrong.

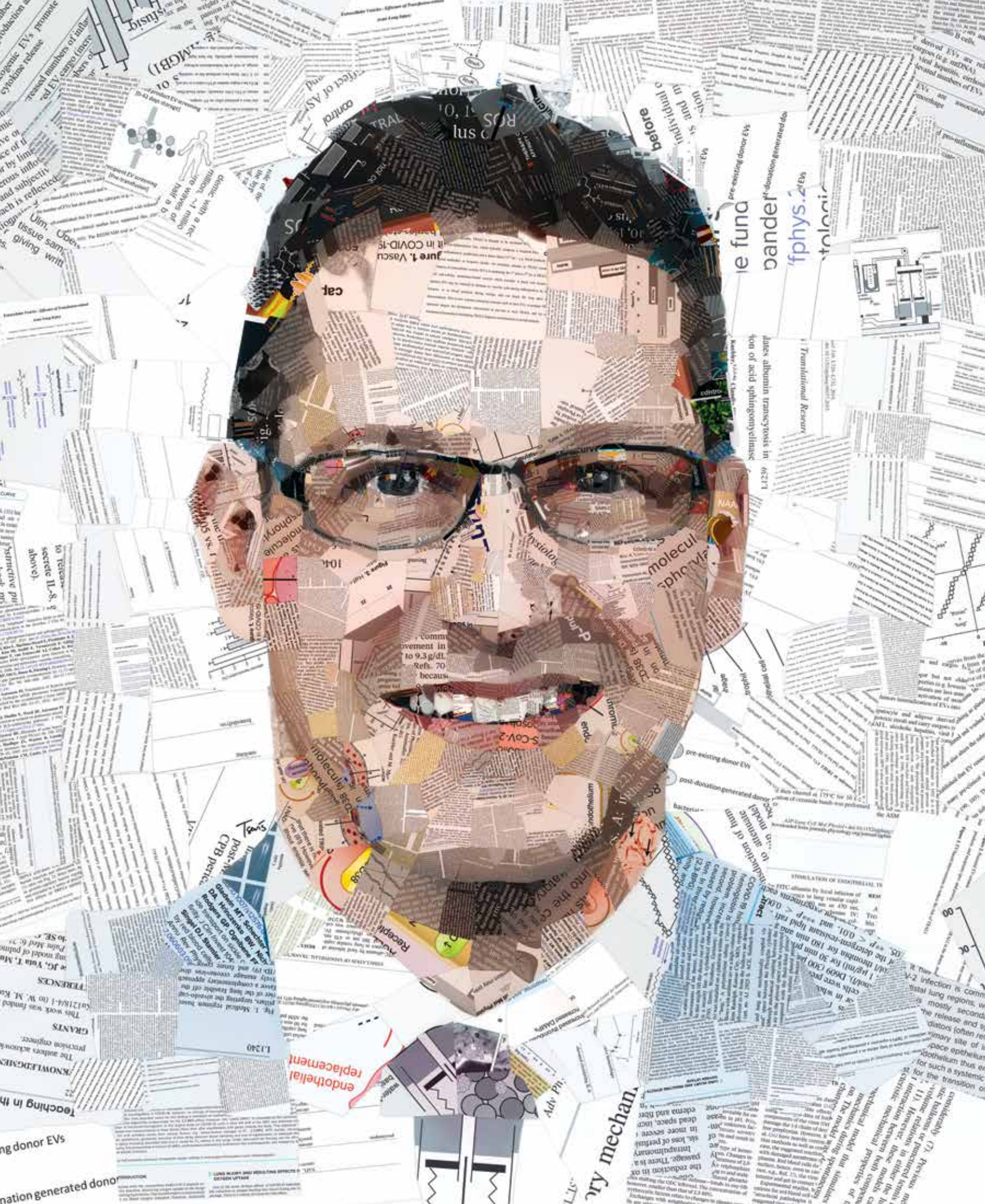
### Q: Favorite charities you support?

**A:** Canadian Cancer Foundation, Canadian Wildlife Federation, APS.

### Q: One thing every researcher or scientist should try at least once in their life?

**A:** Skydiving or surfing, but skydiving is easier. 📄

**Gregory D. Funk, PhD, is professor and chair of the Department of Physiology and associate dean of research, graduate programs, for faculty of medicine and dentistry at the University of Alberta in Canada. He has been an APS member since 2008. Funk is a past chair of the APS Respiration Section and was the 2023 Julius H. Comroe Jr. Distinguished Lecturer.**



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# Leading the Way

Wolfgang Kuebler guides APS through a complex time in scholarly publishing, as the Society's new publications chair.

**BY CHRISTINA HERNANDEZ SHERWOOD**

Open access. Artificial intelligence. Reader interaction. For Wolfgang Kuebler, PhD, MD, FAPS, who began his three-year term as APS publications chair in April, the rapidly changing landscape of scholarly publishing presents both challenges and opportunities.

“It’s really a fascinating time to work on publishing,” says Kuebler, chair and professor in the Institute of Physiology at Charité–Universitätsmedizin Berlin, one of the largest university hospitals in Europe. “I’m thrilled to be in a position to witness that.”

Kuebler, whose own translational research has been published in several of the Society's 16 journals, will shepherd the APS portfolio of research publications through a complex time in scholarly publishing. As advancements in artificial intelligence (AI) continue to grow, Kuebler and the APS Publications Committee crafted an updated policy for APS journals that explicitly outlines how chatbots can, and cannot, be used. (The OpenAI chatbot ChatGPT, for instance, cannot be listed as a co-author.) The policy was approved in May.

By the time Kuebler's term ends in April 2026, research journals will be entering the brave new world of open access. The U.S. federal government requirement to make publicly funded research immediately available to readers will be in effect by then.

Public dollars fund most research published in APS journals, Kuebler says, so under open access, readers will be able to view most of the journals'

## “The mission is for APS journals to embrace the opportunities that now come with a changing publishing landscape.”

articles without a subscription. This is a shift that will potentially affect the publication program's revenue streams, but it will also provide access to the newest scientific information to researchers around the globe.

It will be up to Kuebler—who previously served one year as chair-elect under the outgoing chair, David Gutterman, MD, FAPS—and the 12 members of the APS Publications Committee to grapple with what these changes will mean for the Society.

“The mission is for APS journals to embrace the opportunities that now

come with a changing publishing landscape,” Kuebler says. “We have to navigate APS to be at the forefront of this change without losing our identity and our mandate, which is to serve our Society and to serve our discipline.”

### DISSEMINATING SCIENCE DIFFERENTLY

For Kuebler, steering APS through changes in scholarly publishing will likely mean a combination of maintaining traditions and embracing modernity.

The traditional journal model—in which authors submit their work, the journal's experts review it, and it is published or declined—is unlikely to vanish anytime soon, he says. “We need vetting of science,” Kuebler says. “I'm a strong believer that it wouldn't be helpful for science if we just put everything out there and said, ‘Let everybody determine what is right or wrong.’ We need some sort of authority.”

At the same time, changes like open access will force a shift in the way readers interact with scholarly work. This means, for instance, thinking about how readers can comment on journal articles. “Change is often considered as a threat,” Kuebler says. “And I agree we have to think about it carefully. But I think there has to be change. We also have to embrace the modern times.”

These issues will affect Kuebler directly. A medical doctor by training—though his 14- and 18-year-old daughters claim he's not “a real doctor” because he hasn't treated patients since



Kuebler with his wife, Wenqing, and daughters, Sophie and Julie.



Kuebler with the joint lab team Kuebler-Szulcek-Grune at the Institute of Physiology in Berlin.

before they were born—Kuebler now focuses on translational physiology research. His recent publication credits include *Cell*, *Science Translational Medicine* and *Physiological Reviews*.

“Scholarly publishing to me is an essential part of the generation of knowledge in science,” he says. “It is not only the dissemination of new findings and ideas but also their critique and vetting by your peers, which is an essential critical step in the generation of knowledge. And, of course, it is ultimately a recognition of all the hard work your trainees, your co-workers and collaborators, and yourself put in to develop this knowledge.”

### THE BEAUTY OF THE LUNG

As Kuebler crafted his PhD thesis in the early 1990s, he worked in a laboratory at the Institute of Surgical Research at the University of Munich specializing in microcirculation. “It was imaging of real-life scenarios, usually in animals, of how the blood flows through the tissue and how blood cells interact with the vessel wall,” he says. “That technique was fascinating for me because you could see in real time how physiology was unfolding.”

There was much to see in the physiology of the lungs and vascular system. “The lung is a beautiful organ,” he says. “At the same time, it’s very complicated

in the way it functions. It has remained a focus of my work ever since.”

Kuebler can even connect his favorite hobby—hiking the Alps along the German-Austrian border—to his scientific passion. “Scientifically,” he says, “the high altitude of the mountains is a fantastic physiological environment to study.”

Kuebler’s research on acute lung injury, specifically the breakdown of the barrier between blood vessels and air sacs that causes fluid to enter the lungs, became strikingly relevant during the height of the COVID-19 pandemic. Kuebler and his team are developing therapeutic concepts, possibly new drugs or existing drugs used in new ways, to prevent or repair barrier leaks.

“Once you can strengthen or rebuild this barrier, it doesn’t matter what virus or bacteria is wreaking havoc in your lungs,” he says. “It doesn’t cause massive lung injury because you maintain this physiological barrier. Barrier protection is a universal concept that would provide general application no matter what the next pandemic is.”

Kuebler’s group also studies potential treatment options for high blood pressure in the lungs that is caused by left heart disease—the most common form of pulmonary hypertension. This work, which sits at the intersection of

pulmonology and cardiology, is an ideal area of focus for a physiologist, says Kuebler, the son of a cardiologist.

“Most disciplines are very organ focused and siloed, whereas physiology has the advantage that it’s overarching,” Kuebler says. “Physiology crosses boundaries. It crosses disciplines and organs because it tries to understand how [the body] works. ... In some cases, it’s highly molecular biology. In others, it’s a more immunological process. All of it is physiology, and you have to bring that together and work across organs to understand how it works.”

### FINDING A HOME AT APS

Kuebler was born and has lived much of his life in Germany, although he has spent a few brief stints in the U.S. He trained at Brigham and Women’s Hospital in Boston and completed a two-year postdoctoral fellowship at Columbia University in New York. He also completed an eight-year professorship in the University of Toronto Department of Physiology.

Today, Kuebler lives in Berlin and is among the 2,100 APS members who reside outside the U.S. “I’ve always considered APS an international society,” he says, “rather than a national society.”

Kuebler has embraced his new role as APS publications chair during an exciting time in scholarly publishing. But it’s only the latest in his longtime involvement with the Society. An APS member since 1998, he has served in various roles over the years, including as chair of the Respiration Section and chair of the Section Advisory Committee. He is also a fellow of APS.

“It’s my scientific home base,” he says. “I like to be involved. I like to give back because APS has really given me a home for my work and my research.” ☞





# NOW THE FUTURE IS

The rapid growth of generative AI such as ChatGPT could have profound effects on research and publishing.

BY LAUREN ARCURI

**E**arlier this year, ChatGPT burst onto the scene, quickly becoming one of the hottest topics in science. As a form of generative artificial intelligence (AI), users input prompts and questions, and ChatGPT generates content such as emails, essays, blog posts and resumes.

Although AI has been around for decades, the rapid advancement, easy accessibility and fast adoption of ChatGPT created a lot of discussion and debate. This “disruptor” has the potential to change every type of industry in our society. In the scientific realm, it could revolutionize the way research is conducted and communicated—but it comes with significant risks and ethical concerns.

ChatGPT is a type of large language model (LLM) that uses a combination of machine learning tools and natural language processing. While users may feel like ChatGPT is “understanding” them, in reality it is simply “predicting” what comes next, says Phill Jones,

PhD, co-founder of digital and technology at MoreBrains Cooperative. LLMs take a series of words and predict what the most likely word is to come next, based on the language data sets that the model has been trained on.

## THE EFFECT ON SCHOLARLY PUBLISHING

Some scholars have compared this phase of generative AI to the birth of email. When email first became available, people thought it would replace the postal service. But the postal service survived, and email’s effects have stretched far beyond a replacement for paper mail, influencing everything about how we communicate. The

implications of generative AI are likely to be similar as it transforms how we work, communicate and produce information. But experts say the specifics of those transformations are not fully crystallized yet.

“AI will not replace people. People will continue to be a necessary part of the publishing ecosystem. We will always need to be mindful of bad data and research being spread,” says Damita Snow, CAE, senior manager of publishing technologies and a publishing diversity, equity and inclusion specialist at the American Society of Civil Engineers. Snow has spent the past four years studying the ethics of AI usage. “It’s not that we can keep bad



**“We need to sharpen our skills further and equip ourselves with more effective tools to detect and mitigate scientific misconduct and maintain high-quality scientific rigor.”**

**—Chhavi Chauhan, PhD**

research from happening. It’s happening already. But we can surely try our best to mitigate harm.”

To help ensure the ethical use of AI in APS publications, APS has developed policies to mitigate the improper use of AI and AI-assisted tools. “These tools do not qualify for authorship and cannot be considered an author of any article published in APS journals,” says Christopher England, PhD, APS associate publications director, program development, policy and ethics. “Our policy at APS is also supported by the Council of Publishing Ethics.”

Any AI-assisted tool must be properly referenced in the “materials and methods” section of an article if the tool was used as part of the design or performance of the experiments or in generating the conclusion. In other cases, the tool can be used for helping authors edit or write the manuscript. “In these situations, the author should mention it in the acknowledgements section,” England says.

Authors for APS journals must list the specific AI tool used, the version, the process it was used for and the reason. They must also certify that it is used in a manner that does not conflict with APS ethical policies and take full responsibility for the content. “At any point in time, authors may be asked to supply the methods of the application, if not already specified,” England says. That includes syntax and query

structure, such as the prompt used to generate the response.

Using AI tools to generate figures is a newly emerging and growing part of the field. As always, APS policy is that “it’s not acceptable to fabricate, alter or delete specific features within an image used in a manuscript,” England says.

#### **HOW CAN AI BE USED?**

There are many potential applications of LLMs such as ChatGPT in research that can streamline the publishing process. “Publishers are interested in using AI as a tool to enhance what they can offer and possibly [create] new products for new types of markets,” Jones says. “That’s something a lot of people are interested in due to the economic shifts in the publishing market.”

For example, an LLM can take a research paper and create a high-quality abstract based on the key concepts and findings. It can also enhance structure and coherence of the manuscript, such as suggesting more effective organization of content and enhancing readability. And it can improve language and style, similar to Grammarly, an AI-based tool that has been in use for several years already and is an enhancement of word-processor-based grammar tools. Because of the speed with which AI can generate content, it can help disseminate research more quickly.

“The obvious first place to look is processing the information that people have in their databases and the articles that they’ve published over the years and regenerating that information in different formats to make it accessible to different audiences,” Jones says. For example, ChatGPT could create a summary of a scientific research paper that is easier for a lay audience to understand. It could also help outline and edit articles in a much more powerful and simpler way.

“AI will allow publishers to gather even more data on their members and customers and to personalize their needs based on behavior,” Snow says. AI can also be used to collect and analyze search engine optimization and how content is being received by audiences. “It can help assess what subject areas they should focus on and what they may need to reevaluate,” she says.

AI tools “could be a huge resource to improve processes and efficiencies and make the submission process simpler for authors,” says AI ethicist Chhavi Chauhan, PhD, a molecular biologist and board member of the Digital Pathology Association. Similar to the autocomplete for online forms that is currently available, an AI-aided submission process could capture information critical for the publication in a way that is less taxing for the author. “It’s faster because it’s done in a more automated way,

and it saves the editorial staff's time, too," she says.

Another way that generative AI may be helpful for publishing is to help generate the article text itself. This is where the ethical issues can get a bit sticky. "Maybe there's a line to be drawn, but people have been using grammar and spelling correction in word processors for a long time and no one's concerned about that," Jones says. "The red flags have come up when we're talking about generating large chunks of text that the authors may or may not review before submission. That's what makes a lot of publishers nervous."

Those concerns make many AI ethicists nervous, too. "Content synthesized by LLMs lacks scientific accuracy and logical flow, is not critical in terms of elaboration of data and various contexts, and is never, ever novel," Chauhan says. "Generative AI cannot create content with deep, novel insights that a human author may offer based on their experience, failed experiments, conferences, talks, poster presentations, elevator conversations and the like. These experiences and insights can be deeply meaningful and instrumental in elevating the impact of any research."

Also, once someone pastes content into an LLM, the content becomes a part of the data set and can then be used to synthesize the response for the next set of prompts by someone else, compromising confidentiality and novelty of the idea.

### **ETHICAL RISKS EXAMINED**

The societal implications of using AI to generate content is an important discussion. Ethical issues span several areas, including rigor, reproducibility, bias, intellectual property, equity and diversity.

One of the challenges with assessing the ethical application of AI is that most of the time, "AI is a black box,"

says Georgios Kararigas, PhD, an APS member and professor of physiology at the University of Iceland. "We have an input, and we get an output. But how is this output generated? In many cases, this isn't clear."

Tools such as the Z-Inspection process that Kararigas co-developed, which evaluates AI tools to determine if they are trustworthy, can help make sense of a complicated set of questions around the ethics of AI.

The prevalence of paper mill papers—research that has been falsified to generate citations—is not new, but there is concern that AI will make it easier and cheaper to generate these papers. "And it could be harder to detect because the text may be more plausible than the old-fashioned method of generating a fake paper," Kararigas says. "There's also a concern about the level of sophistication" of the fake papers.

Another concern is research integrity. Chauhan says in the current "publish or perish" scholarly publishing world, quantity has been rewarded over quality and that propagation of false information, disinformation and misinformation is commonplace. A real concern is that generative AI may help spread this false information as LLMs are only as good as the data they're trained on—and it's not transparent what those data are. "We need to sharpen our skills further and equip ourselves with more effective tools to detect and mitigate scientific misconduct and maintain high-quality scientific rigor in all published content," she says.

Inequity is yet another serious issue that may become more prominent in the age of AI. "I caution about the use of generative AI exacerbating the existing inequities while creating new ones that may arise from the digital divide," Chauhan says. Countries' AI regulations vary, and in


some countries, including the U.S., there are no regulations at all.

"This is going to lead to a lack of diversity in the training data sets for some models. So, the outputs they will generate are not going to be the same. Some LLMs may be trained on more credible data sets than others," Chauhan says. In addition, she warns that in the future, AI creators may decide to monetize the models, leading to inequity in access. "I would like to appeal and warn against dissecting scholarly publishing into the world of the haves and the have-nots."

### **LOOKING TO THE FUTURE**

As generative AI and other AI-based tools are developed and the existing ones evolve, there are many possibilities for how they will be applied. Researchers say the future may take us in any number of directions. Generative AI has the power to streamline the process of generating text and information. But it must be used responsibly and ethically. If so, it holds massive transformative potential for the way we do research, work and communicate.

Ethicists are calling for the creation of AI ethics boards and offices of research integrity at the institutional and national levels. They stress the need to focus and emphasize critical thinking skills for students, educators, researchers and reviewers.

At APS, England says, "We will continue to monitor ethical issues related to AI and update our policies as needed. In addition, we will continue to explore ways to implement AI tools that are beneficial to our community, such as the recent integration of SciScore, a tool used to help our authors identify ways to improve the rigor and reproducibility of their work." 



# Unlocking Open Access

Open access is on the horizon. What will this mean for researchers and publishers?

**BY SCOTT SLEEK**

**T**he global adoption of open science is changing the way researchers communicate their science and transforming the way scholarly journals will generate revenues. These policies emanate from the global open access (OA) movement, which supports free, unrestricted access to peer-reviewed scientific papers. Open access supporters say the public should be able to freely download, share and reuse articles, preprints and data. What does this mean for publishers, scientific societies and researchers?

Illustration by Davide Bonazzi

“If your research is federally funded in the U.S., you really need to start ensuring that you’re asking for enough funds as a part of your grant to continue to publish in the journals of your choice.”

—Colette E. Bean, MA



The open access evolution hit its peak in the U.S. in 2022, when the White House Office of Science and Technology (OSTP) announced an updated requirement: All federally funded research must be available







for free immediately upon publication. The policy becomes fully effective by the end of 2025.

The National Institutes of Health (NIH) and other U.S. federal agencies had already been requiring public access to the research they fund after a 12-month embargo. Similar changes are underway in Europe and other parts of the world, with some policies already in effect and others becoming fully effective in December 2024.

### NEW WAY OF DOING BUSINESS

The new OSTP public-access requirements will alter the traditional business model for many scholarly publishers who derive revenue through subscriptions. Publishers and scientific societies may now need to shift to other revenue sources, such as article processing charges (APCs), to cover

## Open Access Models

-  **Diamond OA or Platinum OA:** No fees are charged to authors or readers; publication may be funded entirely by the community, such as nonprofits, institutions or consortia.
-  **Gold OA:** Researchers, their institutions or their funders pay an article processing charge (APC) when an article is accepted, and the final version of record of the article is made open access immediately upon publication. Authors keep the copyright to their work under a Creative Commons license.
-  **Bronze OA:** Publications are free to publish and free to read but are not openly licensed for reuse.
-  **Green OA:** Gives authors a self-archiving option of the accepted version of their manuscript. The researchers can post this earlier version of the article in a freely accessible online repository. The authors avoid an APC. The publisher or affiliated society often keeps the copyright to the work. There may be an embargo on when the content is available to the public.
-  **Hybrid:** Offers authors the option of paying an APC to make their article open access. These journals publish a mix of gated and open access content.
-  **Subscribe to Open (S2O):** Converts subscriptions to open access without relying on APCs. Under this model, if enough institutions renew their subscriptions under the S2O terms, the publisher commits to making the content open for that subscription year so all readers can access content and researchers are not required to pay an APC to publish in the journal. Otherwise, the journal remains gated and continues to be accessed by paying subscribers.

the cost of running their publishing programs and other activities. U.S.-based scientists working under multi-year grants may now face publishing fees they didn't anticipate when they originally applied for funding. Others will need to factor in the costs of APCs in their new grant applications.

"If your research is federally funded in the U.S., you really need to start ensuring that you're asking for enough funds as a part of your grant to continue to publish in the journals of your choice," says Colette E. Bean, MA, APS chief publishing officer, who oversees APS' 16 journals.

Publishers and scientific societies (including APS) are using or testing various business models to adapt to OA. Some publishers are adopting what is known as "gold OA," which charges APCs to authors (institutions or funders may also pay on behalf of the author) under a Creative Commons license. Other publishers are experimenting with Subscribe to Open (S2O), a model that taps institutional library subscription income to support a transition to OA without relying on APCs (see glossary on page 28 for more detail about S2O).

Many journals, including APS publications, operate a hybrid model. Authors have the option of paying an APC to have their articles freely available immediately under a Creative Commons license; otherwise, the content remains available through a traditional subscription for the first 12 months after publication.

Some researchers and funders are encouraging a self-archiving approach called "green OA." Under this model, after an article is accepted, the researchers can post an author-accepted manuscript version in a publicly available online repository while the publisher continues to curate and maintain a final version. Green OA allows authors to avoid APCs, with the publisher

or affiliated organization often retaining the copyright.

APS already has two gold OA journals, *Physiological Reports* and *Function*, and a free journal called *Advances in Physiology Education*. The Society continues to explore other viable business models, Bean says.

"APS' publishing portfolio is going to need to evolve as a part of the changes that we're seeing," she says.

"We're working in a very focused way to ensure the long-term sustainability of the program and of the Society. We are committed to continuing to serve our members and authors while enabling the transformation to open access that is going to occur in the next several years."

#### ADDRESSING OA CHALLENGES

Many scientists believe that publishers will try to make up for the loss in

## Open Access Terms to Know

**Article processing charges (APCs):** Fees paid by an author (or their lab, grant or library) that are used to support the costs associated with the process of publishing a journal article as open access.

**Creative Commons license:** Gives permission to share and use an author's work. There are several different types of Creative Commons licenses (<https://creativecommons.org/licenses>). The most commonly used for open access is CC BY, which lets others distribute, remix, adapt and build upon an author's work, even commercially, as long as the author is credited for the original work.

**National Institutes of Health (NIH) Public Access Policy:** Initiated in 2008, it requires researchers supported by NIH to submit final peer-reviewed journal manuscripts to the PubMed Central digital archive. The articles are made freely available on PubMed Central after an allowable embargo period of up to 12 months.

**OSTP Public Access Nelson Memo:** A 2022 notification issued by the White House Office of Science and Technology Policy (OSTP) calling for all federally funded research to be made available for free without embargo. All agencies must introduce their open access plans by December 31, 2025.

**Plan S:** An initiative launched in 2018 by the European Commission and a consortium called cOAlition S. Under Plan S, all research supported by public or private grants must be published in open access journals or platforms without an embargo. The policy comes into full effect in December 2024.

**Rights retention strategies:** Require researchers to put their submitted work under a Creative Commons license rather than transferring copyright to the publisher.

**Transformative or transitional agreements:** Contracts negotiated between research institutions and publishers in which institutions pay an annual fee that will enable their researchers to access and publish journal articles open access at no cost.

#### Versions of Works

- **Preprint:** The version of the manuscript submitted for publication (before peer review and before being accepted for publication).
- **Accepted manuscript:** Final peer-reviewed version of the manuscript accepted for publication (not yet copyedited or "typeset").
- **Version of record:** Final, authoritative published version, often with the publisher's design and page numbers.

# The credibility of the APS journal *Function* was built in part by creating a strong editorial board of renowned scientists and waiving article processing charges in the journal's start-up phase.

subscription revenues by accepting high volumes of articles paid for through APCs. Journals may end up publishing articles they might previously have rejected because they need the income, critics say.

But APS' newest OA journal, *Function*, is avoiding the temptation to sacrifice quality for quantity, says Editor-in-Chief Ole Petersen, CBE, FRS, of Cardiff University in Wales.

"We have taken the policy that we are not necessarily wanting *Function* to be a high-volume journal," he says. "I think APS sees the advantage in creating an open access journal that is seen as high quality. It takes time before a journal becomes sufficiently well-known and gets a large volume of submissions."

Launching a fully OA journal has its challenges, Petersen says. Researchers may balk at submitting manuscripts to an unknown publication, especially if it requires an APC. Petersen says he built the journal's credibility in part by creating a strong editorial board of renowned scientists. He also attracted submissions by waiving APCs in the journal's start-up phase.

"And of course, it helps that it's published by a bona fide publisher like the American Physiological Society," he adds.

Quality is also the top priority for *Physiological Reports*, says Editor-in-Chief Josephine C. Adams, PhD, a professor of cell biology at the University of Bristol in the United Kingdom. APS collaborates with The Physiological Society in the U.K. to publish the journal, which launched 10 years ago and includes peer-reviewed research, case reports and reviews.

"Something people worry about is that gold open access journals accept everything," she says, "and they don't want to be part of a journal that is accepting everything. We're not in that category. Our emphasis is on good quality, sound physiological research."

Journal editors advise researchers that their institutions can often cover the publishing fees. And other business models are emerging to ensure that scientists, including those in the early-career stages, can afford to publish their work. APS has introduced "read, publish and join" agreements, which allow institutions to pay for a combined package of unrestricted journal access, research publications and a free one-year APS membership for the corresponding author, Bean says.

OA supporters cite data indicating that open articles receive more downloads and citations compared with

papers that sit behind a paywall. But some scholars caution that certain OA models could create new inequities in the scientific enterprise. In March 2023, a group of 13 top university libraries sent a letter to OSTP raising concerns about the pay-to-publish gold OA models that open access requirements are spawning. They warned that the APCs could disenfranchise scholars from less-resourced institutions, disciplines and countries.

"It means the inequity of not being able to get past the paywall becomes the inequity of not being able to pay for open publishing," says Daniel Dollar, associate university librarian for scholarly resources at Yale University.

The Council of the European Union shares those concerns. In May 2023, the Council recommended publishing models in which neither readers nor authors pay. Publishers complain that the non-binding recommendation offers no funding model to cover publication costs.

## EXPLORING A WAY FORWARD

Institutions and publishers alike are exploring alternative ways to help researchers publish. Some institutions are forming consortia to pool money that can cover APCs. Many are experimenting with repositories and other models to provide support for publishing.

Researchers also will need to educate themselves about data-deposition requirements because the OSTP mandate also calls for the sharing of data and materials, as well as manuscripts, Bean says. NIH introduced its own data management requirements starting in 2023.

"That is a pretty significant change," she says. "They'll need to have data management plans. They'll need to have a real plan in place for where they're going to deposit their data and to make it available to the public." 📌



# Publish With APS and Support Your Scientific Community

When you publish with the American Physiological Society (APS), you strengthen the community of scientists solving major problems affecting life and health.

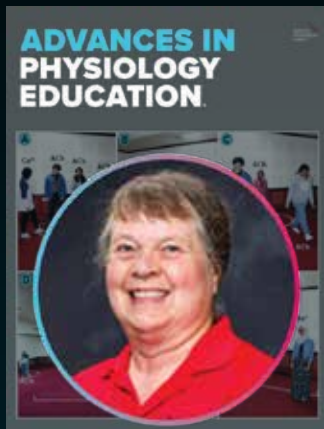
As a self-publishing society, APS reinvests income back into the research community we serve and the science we support.

## Publish with Purpose with APS



# Publish with APS Leadership

When you publish with the Society's 16 distinguished journals, you align with an esteemed group of leaders who advise and regularly publish their discoveries. The journal editors and committee chairs below provide guidance on preparing your manuscript, submitting your article, publishing ethics, the peer review process and more.



**Advances in Physiology Education**  
Barbara E. Goodman, PhD, FAPS



**AJP-Cell Physiology**  
Liliana Schaefer, MD



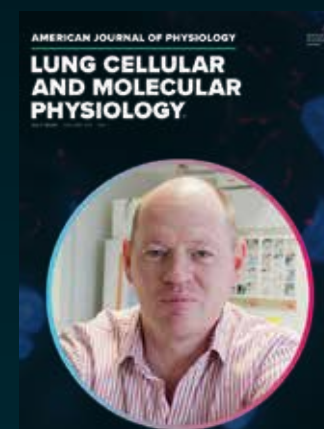
**AJP-Endocrinology and Metabolism**  
Ana Domingos, PhD



**AJP-Gastrointestinal and Liver Physiology**  
Mark R. Frey, PhD



**AJP-Heart and Circulatory Physiology**  
Merry L. Lindsey, PhD



**AJP-Lung Cellular and Molecular Physiology**  
Rory E. Morty, PhD



**AJP-Regulatory, Integrative and Comparative Physiology**  
Gina L. C. Yosten, PhD



**AJP-Renal Physiology**  
Heddwen L. Brooks, PhD



**APSselect**  
Linda C. Samuelson, PhD, FAPS

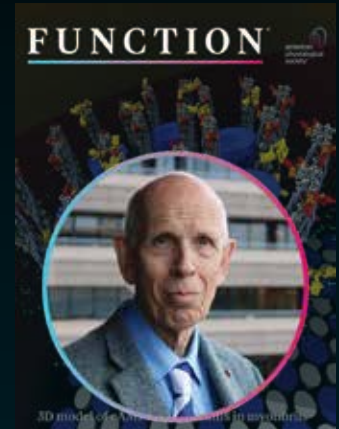
Leaders in the scientific fields represented in the journals that they cultivate, use their expertise to serve the advancement of physiology research. Learn about us with APS at [journals.physiology.org](https://journals.physiology.org).



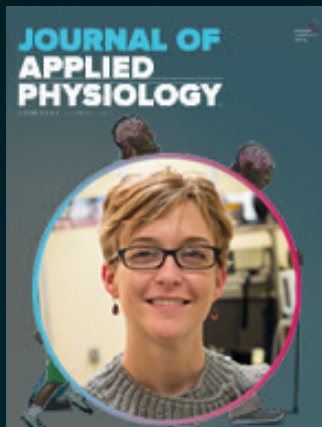
**Book Committee**  
Gary C. Sieck, PhD, FAPS



**Comprehensive Physiology**  
Y. S. Prakash, MD, PhD



**Function**  
Ole Petersen, MD, CBE, FRS



**Journal of Applied Physiology**  
Lacy Alexander, PhD, FAPS



**Journal of Neurophysiology**  
Jan Marino Ramirez, PhD



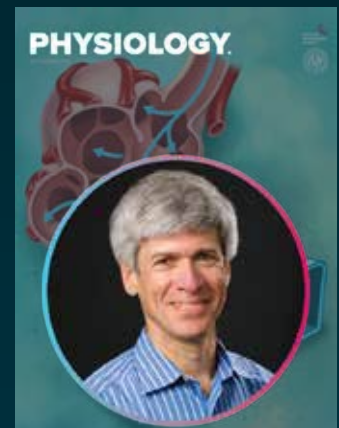
**Physiological Genomics**  
Hilary A. Collier, PhD



**Physiological Reports**  
Josephine C. Adams, PhD



**Physiological Reviews**  
Sadis Matalon, PhD, FAPS



**Physiology**  
Michael J. Caplan, MD, PhD, FAPS

# APS Publication Programs



## Spotlight Cover Program

This is an easy and effective tool to visually highlight your work and raise your profile with an international audience. Sharing and promoting your article is critical to increasing citations and impact. Submit artwork when you upload your revised manuscript, and images chosen will be featured on the journal's website.



## Read, Publish & Join

The innovative, first-of-its-kind custom publishing model Read, Publish & Join builds transformative agreements in conjunction with institutions and their libraries. Agreements bundle reading and publishing under an annual fee with the added bonus of membership for publishing authors.



## Reviewer Training Certificate Program

This free training program gives clear and practical advice to researchers for improving the quality of the reviews they provide, as well as introducing key principles to those who are newer to the review process. Complete the course and become an APS certified reviewer.



## Publications Podcasts

*American Journal of Physiology-Gastrointestinal and Liver Physiology, American Journal of Physiology-Heart and Circulatory Physiology, Journal of Neurophysiology and Physiological Reviews* offer podcasts demonstrating scientific content in a new and exciting way.

## Patricia Halpin Appointed to International Physiology Committee and Advisory Positions

**Patricia Halpin, PhD**, professor of biological sciences and biotechnology at the University of New Hampshire, was selected to become a member of the International Union of Physiological Sciences (IUPS) Education Committee. The IUPS Education Committee organizes international workshops at the annual IUPS Congress and smaller workshops around the world.



Halpin was also appointed to serve as an adjunct adviser to the South Asian Association of Physiologists for the 2023–2024 term. She has been an APS member since 1995.

## Terry Hinds Named University of Kentucky College of Medicine Faculty of the Year

**Terry D. Hinds Jr., PhD**, was named Faculty of the Year for 2022–2023 from the Department of Pharmacology and Nutritional Sciences at the University of Kentucky College of Medicine, where he is an associate professor. In 2022, Hinds' department was ranked No. 1 in pharmacology by the Blue Ridge Institute for Biomedical Research Ranking Tables of National Institutes of Health Funding to U.S. Medical Schools. His lab focuses on the molecular mechanisms and signaling involved in obesity, fatty liver disease and insulin-resistant diabetes and how these are related to cardiovascular diseases. Hinds has been an APS member since 2016.



## Mingyu Liang New Department Chair at University of Arizona-Tucson

**Mingyu Liang, MB, PhD**, was appointed chair of the Department of Physiology at the University of Arizona College of Medicine-Tucson in June 2023. He was previously vice chair for interdisciplinary and translational research in the Department of Physiology at the Medical College of Wisconsin (MCW) and founder/director of the MCW Center of Systems Molecular Medicine. Liang's research in the areas of genomics, epigenomics, precision medicine, regulatory RNA and cellular metabolism focuses on hypertension and cardiovascular and kidney diseases. He has been an APS member since 1997.



## Diana Martinez Receives Rising Star Alumni Award

**Diana Martinez, PhD**, assistant professor of biomedical sciences at Cooper Medical School of Rowan University in New Jersey, is a recipient of New Jersey Institute of Technology's College of Science and Liberal Arts' (CSLA) Rising Star Alumni Award. This annual award honors "a recent CSLA alumnus who has already made great strides in their field." Martinez studies the central mechanisms that lead to cardiorespiratory dysfunction in sleep disorders. She has been an APS member since 2016.



## Kenneth McKeever Becomes Fellow of the Equine Science Society

**Kenneth H. McKeever, PhD, FACSM, FAPS**, a professor in the Department of Animal Sciences at Rutgers University in New Jersey and associate director of research at the Rutgers Equine Science Center, has been selected as a fellow of the Equine Science Society. The status of fellow recognizes "distinguished service to the horse industry and to the Equine Science Society over the member's many years of service." McKeever's research focuses on comparative exercise and cardiovascular physiology. He has been an APS member since 1992.



## David Poole Received Faculty Research Excellence Award

**David C. Poole, PhD, DSc, FAPS**, university distinguished professor and Coffman Chair for Distinguished Teaching Scholars at Kansas State University (KSU) in the Department of Kinesiology and Department of Anatomy and Physiology, received the KSU College of Health and Human Sciences Faculty Research Excellence Award. The award "recognizes superior accomplishment in research, scholarly and creative activities and discovery." Poole was honored for his work on the microcirculation and for the development of state-of-the-art models of capillary function. He currently is chair of the APS Environmental & Exercise Physiology Section and has been an APS member since 1990.




## William Rainey Receives Endocrine Society Mentor Award

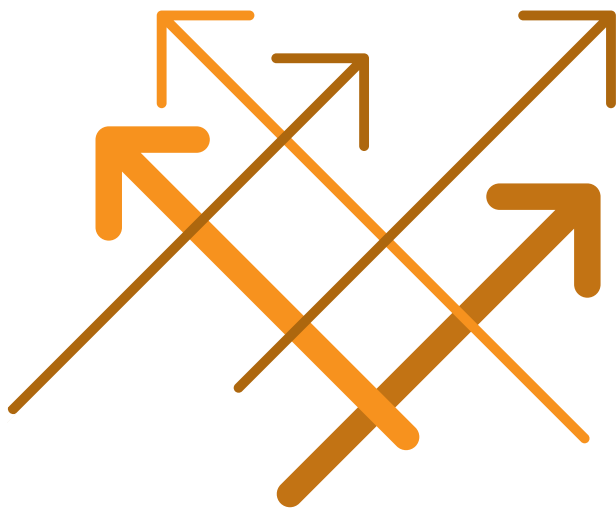
**William Rainey, PhD**, the Jerome W. Conn Professor of Molecular & Integrative Physiology and Internal Medicine



at University of Michigan Medicine, is the 2023 recipient of the Endocrine Society's Outstanding Mentor Award. The award "recognizes a career commitment to mentoring and a significant positive impact on mentees' education and career." Rainey's research explores the mechanisms that regulate steroid production by the adrenal cortex. His dedication to the field and his mentees has shaped a new generation of endocrinologists. Rainey has been an APS member since 2007.

## Loren Wold Named *The FASEB Journal* Editor-in-Chief

**Loren E. Wold, PhD, FAPS**, has been named editor-in-chief of *The FASEB Journal*. He is The John G. and Jeanne Bonnet McCoy Chair in Cardiovascular Medicine at The Ohio State University (OSU), associate dean for research operations and compliance in the OSU College of Medicine and professor in the Division of Cardiac Surgery of the Department of Surgery. Wold's research focuses on environmental triggers of heart disease, with a focus on air pollution and e-cigarette exposure. He began his term as editor on August 1, 2023, and has been an APS member since 1999. 



## CHAPTER NEWS

## New Chapter Advisory Committee Chair Shares Goals

APS has named **Naveen Sharma, PhD**, a professor for the School of Health Sciences at Central Michigan University and a longtime APS member, chair of the Chapter Advisory Committee. Sharma began his three-year term on May 1, 2023. In this leadership role,



Sharma is responsible for ensuring strong, positive relationships between APS and its chapters.

"I am excited to take on the responsibilities of the role and help promote the benefits chapters can have for increasing physiology accessibility to communities, educators, researchers and trainees," Sharma says.

APS chapters are independent organizations that work to support the Society's mission. Each chapter has its own leadership group, which works to provide outlets for members to get involved in the field. Throughout the year, chapters run physiology outreach activities such as health-based educational webinars for underserved populations and high-quality scientific conferences that feature research from local trainees ranging from undergraduates to postdocs.

"One of our goals in the coming years is to expand the chapter program by facilitating the development of new chapters," Sharma says. "We also want to ensure existing chapters remain healthy, viable and active by advocating for resources."

In addition to providing outlets for physiology outreach and research, chapters help early-career scientists gain service and leadership experience, which lays a foundation for future APS committee participation as they advance in their careers.

APS supports the activities of chapters in several ways, including providing grants for keynote speakers at annual chapter conferences and honoring high-performing chapters and individual members through the newly created Chapter of the Year and Extra Mile awards.

"We hope to further enhance the relationship between APS and regional chapters," Sharma says. "As APS supports chapter activities, chapters plant the seeds for the growth of future physiologists and APS members."

For more information about APS chapters, or if you are interested in starting an APS-affiliated chapter, visit [www.physiology.org/chapters](http://www.physiology.org/chapters).

## MARKETING AND COMMUNICATIONS

### Communications Industry Recognizes APS with Top Media Awards

APS is pleased to announce that the Society has been recognized with seven awards for excellence in the areas of marketing and communications. In the AM&P Network EXCEL Awards, which honor excellence in association media, publishing, marketing and communications, APS won silver and bronze awards for *The Physiology Magazine* design and overall excellence; a silver award for the I Spy Physiology blog; and a bronze award for the APS Twitter feed.

APS also took home two Association Trends TRENDY Awards that honor the best marketing and communications pieces from associations and nonprofits: a silver award for the Center for Physiology Education for Best Product Launch and a silver award for Direct Marketing Piece/Promotion for the APS Resource Brochure.

In addition, APS won an Award of Excellence for the I Spy Physiology blog in the Communications Concepts APEX Awards, which honor communications excellence. Subscribe to I Spy Physiology at [www.ispyphysiology.com](http://www.ispyphysiology.com).



## CENTER FOR PHYSIOLOGY EDUCATION

### APS Creates New Learning Module

The autonomic nervous system (ANS) is critical for the integration and regulation of physiological systems. To provide a framework for better understanding of the ANS, the Center for Physiology Education has launched the Autonomic Nervous System Learning Module.



The new module is part of the Teaching and Learning Integrative Physiology Series. The series is focused on the core concepts of physiology and provides educators with the tools to develop and teach integrated physiology content. It addresses key

facts, misconceptions and core concepts in physiology relevant to the ANS. Learn more at [www.physiology.org/ANSmodule](http://www.physiology.org/ANSmodule).

## WEBINARS

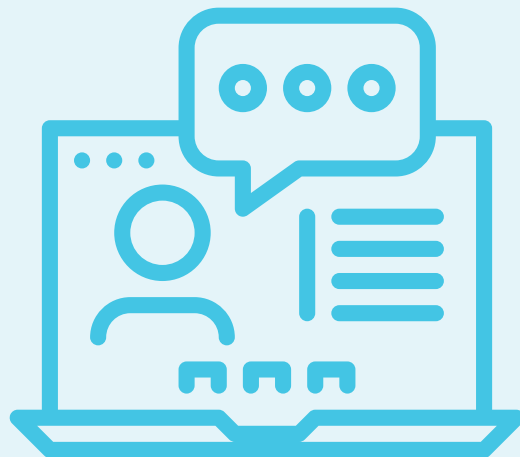
### Society Jointly Launches Neuroscience Webinar Series

APS, along with the Society for Neuroscience, the Federation of European Neuroscience Societies, the American Autonomic Society and InsideScientific, has introduced a joint webinar series covering late-breaking research, novel discovery, fundamental principles and research innovation in the field of neuroscience and related disease models.

The series, Neurophysiology: Exploring Basic Research & Clinical Consequences, is a program of interactive live events. It includes scientific lectures from researchers around the world, as well as technology and methods sessions focused on innovative laboratory techniques central to neuroscience research and related models of disease. Topics include:

- Neurodegenerative disease
- Brain mapping
- Behavioral neuroscience
- Mental disorders
- Neurotrauma
- Autonomic regulation

The series kicks off on September 7 with “Integrative Physiologic Responses to Exercise-heat Stress: Sex as a Biological Variable.” Nisha Charkoudian, PhD, division chief, Thermal and Mountain Medicine Division, U.S. Army Research Institute of Environmental Medicine, presented on the physiological responses to exercise-heat stress and implications for athletes and the military. Learn more about the series and register for future events at [www.physiology.org/neurophysiology](http://www.physiology.org/neurophysiology).



# DATES & DEADLINES

## AWARDS

**APS Fellows (FAPS)** (September 15)

**A. Clifford Barger Underrepresented Minority Mentorship Award** (October 10)

**Bodil Schmidt-Nielsen Distinguished Mentor and Scientist Award** (October 10)

**Annual Marion J. Siegman Lectureship Award** (November 14)

**Local Undergraduate Research Awards in Physiology**  
(Applications accepted on an ongoing, year-round basis)

More details: [www.physiology.org/awards](http://www.physiology.org/awards)



## CALLS FOR PAPERS

**American Journal of Physiology-Cell Physiology** (December 31, 2023)

- The Extracellular Matrix and its Derived Effector Molecules in Aging: Regulators and Therapeutic Targets
- Cellular and Molecular Effects of Antidiabetics Beyond Glycemic Control
- Decoding Fibrosis
- Ketones in Cellular Physiology: Metabolic, Signaling and Therapeutic Advances
- Musculoskeletal Biology and Bioengineering

**American Journal of Physiology-Endocrinology and Metabolism** (October 31, 2023)

- Immunometabolism
- Neural Controls of Metabolism

**American Journal of Physiology-Heart and Circulatory Physiology**

- Impact of Aging on the Cardiovascular System (September 30, 2023)
- Excitation-contraction Coupling, Electrophysiology and Arrhythmias (September 30, 2023)
- Sarcomere, Cytoskeleton and Mechanobiology Research (September 30, 2023)
- Cardiovascular Complications of Pregnancy (December 31, 2023)
- Molecular and Cellular Physiology of Heart Failure and Cardiomyopathy (December 31, 2023)
- Sleep, Circadian Rhythm and Cardiovascular Health (December 31, 2023)

**American Journal of Physiology-Lung Cellular and Molecular Physiology** (December 31, 2023)

- In It for the Long Haul: Understanding the Lasting Impact of COVID-19 on Lung Health and Disease
- Targeting Airway Immunity in Lung Disease

**American Journal of Physiology-Renal Physiology**

- Hypertension Mechanisms and Hypertension Target Organ Damage (September 30, 2023)
- Exercise and the Kidney in Health and Disease (December 30, 2023)
- Sex Differences in Renal Function, Transport and Hypertension (December 30, 2023)



**Journal of Applied Physiology**

- Impact of Climate Change on Health and Performance (September 1, 2023)
- Physical Activity, Mitochondria and Disease (December 31, 2023)

**Physiological Genomics** (December 31, 2023)

- Cancer 'Omics
- Integrative Physiology and Translational -Omics of Exercise and Physical Activity
- Methods and Approaches in 'Omics Research
- The Microbiome in Health and Disease
- The Physiology of Obesity

**Physiological Reports** (December 31, 2023)

- The Physiology of Obesity

More details: [www.journals.physiology.org/calls](http://www.journals.physiology.org/calls)

## WEBINARS

**APS-Aurora Scientific Cardiac Contractility Webinar** October 3, 2023



### APS DIVERSITY, EQUITY AND INCLUSION WEBINAR SERIES

**Careers Outside of Academia** September 27, 2023

**Disability Awareness** October 17, 2023

### NEUROPHYSIOLOGY WEBINAR SERIES

**Integrative Physiological Responses to Exercise-heat Stress: Sex as a Biological Variable** September 7, 2023

**Autonomic Regulation of Metabolic and Cardiovascular Functions in Health and Disease** September 13, 2023

**New Horizons: Gonadotropin-releasing Hormone and Cognition** September 20, 2023

**Impact of Sleep and Circadian Disruption on Human Health and Disease Risk** September 27, 2023

**Implantable Circuit-specific Treatments for Cardiovascular Dysfunction** October 11, 2023

**Bioelectronic Cardiovascular Neuromodulation** October 18, 2023

**Systemic and Intraspinal Pathology and Repair after Spinal Cord Injury in Rodents** October 25, 2023

**Unveiling the Primate Brain: Advanced Insights through Ultrasound Electrophysiology** November 1, 2023

**Cellular Brain Repair for Parkinson's Disease: Is the Answer in the (Biomaterial) Matrix?** November 8, 2023

More details: [www.physiology.org/webinars](http://www.physiology.org/webinars)



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Show your commitment to advancing the discipline of physiology by recruiting your friends and colleagues to join APS as new members.

**Regular members that recruit new regular or trainee members can save up to \$200 on their next APS membership renewal (\$25 off per new member referred).\***

How growing your APS community benefits you:

-  Expand your professional network to bring different ideas, foster diverse thoughts, expand conversation and offer unique ways of thinking.
-  Receive special recognition and bolster your professional standing as a recruiter on the APS website and in our widely distributed publications.
-  Provide others with the opportunity to succeed through access to valuable APS resources.

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# Unveiling the Wonders of Physiology to the Next Generation

BY AUSTIN ROBINSON, PHD

I still remember it vividly: As a teenager, I found myself Googling terms like “renin angiotensin aldosterone.” I had very little knowledge or passion for human physiology, but I was curious about my high blood pressure and how a medication called lisinopril worked.

A few years prior, I had participated in an immersive STEM program for underrepresented youth at Notre Dame University in Indiana. The program was focused on engineering, and my favorite activity was the week we disassembled and reassembled a computer. However, I still remember our discussions about the scientific method and testing hypotheses.

Looking back, I think my participation in the STEM program and my personal experience with elevated cardiovascular risk as a teen sparked my passion for human physiology. I went on to normalize my blood pressure through diet and exercise. Through advanced courses in physiology and biochemistry, and my own research projects, I grew to appreciate how and why various health behaviors and pharmaceutical drugs impact our physiology and health.

Now, as a faculty member, I strive to recreate for others the transformative experiences that shaped my own scientific journey. With the pressures of securing funding, “publish or perish,” and the heavy administrative load that comes with being a principal investigator, it’s easy to lose sight of what drove us to science. Science outreach has become an integral part of my story and one of the many ways I stay inspired.



Over the past few years, my laboratory has participated several times in programs for high school students that the Auburn University Truman Pierce Institute in Alabama sponsors. My team has immersed students in hands-on activities. We have shown students how to measure cardiorespiratory fitness using indirect calorimetry and incremental exercise on a treadmill. We have demonstrated beat-to-beat blood pressure assessments during exercise. We have also shown students how to image blood vessels using ultrasound and demonstrated how skeletal muscle blood flow rapidly and drastically increases during exercise.

It’s really inspiring to see how these immersive science experiences ignited a spark in the students. They asked questions and made connections. They wanted to know why exercise is good for blood pressure, how poor circulation can adversely affect health and why their hand goes numb when they sleep on their arm. These initiatives served to break down barriers and demonstrate that science is not confined to textbooks and lectures but surrounds us in everyday life. By sharing our excitement about science, we empowered students to make informed decisions about future career paths. A few students told us they had never considered science as a career before taking part in the program but now they were interested in finding out more about physiology.

Science outreach provides a platform for inclusivity, addressing racial and gender gaps that have long plagued STEM fields. Most of the students we have hosted have been African American teens from around the state of Alabama. My hope is that my lab continues to play a role in inspiring a new generation of science trailblazers. I would encourage all APS members to consider opening their labs to the next generation. It might just give you that little extra bit of inspiration you need to get through that next IRB or IACUC application and backlog of emails. 📧

**Austin Robinson, PhD, is an associate professor in the School of Kinesiology and director of the Neurovascular Physiology Laboratory at Auburn University in Alabama.**

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