



Newsletter–Spring 2022 Edition



Message from the Section Chair: Lynn Hartzler

Dear comparative and evolutionary physiologists,

We look forward to seeing you at the Experimental Biology (EB) meeting in Philadelphia this year. If you have not yet registered, there's still time to do so at

www.experimentalbiology.org/registration. Our Comparative & Evolutionary Physiology Section (CEPS) Programming Committee chair and Joint Program Committee (JPC) representative, Dane Crossley, PhD, has put together an exciting program for our section. My thanks to Dane for his efforts on programming over the past several years.

Even as we finish preparations for EB 2022, we are in the midst of planning for two upcoming meetings. Dan Warren, PhD, is leading the organizing efforts for the 2022 APS Intersociety Meeting in San Diego in late October and shares an update in this newsletter. In addition, plans for the inaugural [American Physiology Summit](#) are well underway to meet in Long Beach, California, April 20–23, 2023. Two of our CEP Section members are serving on the [organizing committee](#): Hannah Carey, PhD, FAPS, and Jim Hicks, PhD, FAPS. Many thanks to both of them for their work; especially for their dedication to highlighting the strengths that comparative and evolutionary physiologists bring to the larger physiology community. Hannah and Jim share some highlights of their efforts later in this newsletter.

APS 2023 will still feature the traditional symposia and featured topics with which we are familiar, but it will also have more symposia focused on interdisciplinary work. As comparative and evolutionary physiologists, we cross over with every other section at APS, so we are in an ideal position to co-organize these sessions. Please contribute proposal ideas for all of these types of sessions for APS 2023.

It is gratifying to acknowledge the excellent research being done in comparative and evolutionary physiology, and our CEPS awards are always a highlight of our business meeting/awards banquet at EB. Karen Sweazea, PhD, is our CEPS award chair, and I thank Karen for leading the efforts to select our award winners from among the impressive applications. Please see Karen's section of our newsletter announcing this year's CEPS awardees. We invite you to join us to celebrate these award winners at our banquet at EB to be held at the Iron Hill Brewery. I'm grateful to Kendra Greenlee, PhD, for her work organizing the banquet for our section. Please see her newsletter contribution regarding banquet details.

I am delighted to have Patricia Schulte, PhD, give the 2022 Comparative and Evolutionary Physiology Section's Distinguished Krogh Lecture. Please join us for this special EB session on Sunday, April 3, at 1:30 p.m. Novo Nordisk Foundation is our sponsor for the August Krogh Award, and I thank them for their generosity.

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Thank you for your support of the CEP Section and your contributions. If you would like to participate in our Steering Committee activities more directly, please let me know. All the best, *Lynn Hartzler*



Experimental Biology 2022 Program Update: Dane Crossley

Our program for EB 2022 is exciting and consists of two symposia and a featured topic trainee session. The first symposium will be held on Sunday, April 3, at 3:30 p.m. and is titled "Predicting Species Physiological Responses to a Changing Climate." The second symposium will be held on Tuesday, April 5, at 8:30 p.m. and is titled "Functional Integration Across the Oxygen Cascade in the Face of Challenging." This year's annual August Krogh lecture will be given by Patricia Schulte, PhD, and is titled "Physiology in the Anthropocene: Insights from Intraspecific Variation in Response to Environmental Stressors." Finally, we will have our annual trainee session on Tuesday, April 5, from 1:30 to 3 p.m. Below you will find the details regarding this year's meeting.

August Krogh Distinguished Lectureship of the APS Comparative and Evolutionary Physiology Section (supported by Novo Nordisk Foundation)

Sunday, April 3, 1:30–3 p.m., Room 204B

- "Physiology in the Anthropocene: Insights from Intraspecific Variation in Response to Environmental Stressors"
Presenter: Patricia Schulte

Symposium: "Predicting Species Physiological Responses to a Changing Climate"

Sunday, April 3, 3:30–5 p.m., Room: 204 B Session chair: Lynn Hartzler

- 3:30–4 p.m. Epigenetic Mechanisms of Reef Corals' Acclimatization and Adaptation to Rapid Climate Change
Presenter: Hollie Putnam
- 4–4:30 p.m. Osmoregulatory Plasticity in Fishes: Interplay between Environmental Conditions and Systemic Hormones
Presenter: Jason Breves
- 4:30–5 p.m. Effects of low temperature stress during metamorphosis in a solitary bee
Presenter: Kendra Greenlee

Symposium: "Functional Integration Across the Oxygen Cascade in the Face of Challenging Environments"

Tuesday, April 5, 8:30–10 a.m., Room: 202 B Session chair: Naim Bautista

- 8:30–8:35 a.m. Introduction by Naim Bautista
- 8:35–8:55 a.m. Frog Super-brain: Investigating a Neural Network that Transforms Itself to Function without Oxygen
Presenter: Lara Amaral-Silva
- 8:55–9:15 a.m. Evolved Increases in Hemoglobin-oxygen Affinity and Bohr Effect Coincided with the Aquatic Specialization of Penguins
Presenter: Anthony Signore
- 9:15–9:35 a.m. New Insights into the Allosteric Effects of CO₂ and Bicarbonate on Deoxygenation of Crocodilian Hemoglobin
Presenter: Naim Bautista
- 9:35–9:55 a.m. Mountaineering Mammal Surveys Yield New Discoveries Regarding Elevational Limits and Physiological Tolerances of Andean Mice
Presenter: Jay Storz
- 9:55–10 a.m. Conclusion

**Featured Topic: Comparative and Evolutionary Biology Section Trainee Session**

Tuesday, April 5, 1:30–3 p.m., Room 202 B Session chair: Scott Kirkton

- 1:30–1:45 p.m. Rapid Hypoxia-induced Upregulation of Glutathione-Related Genes May Protect Elephant Seal Endothelial Cells against Oxidative Stress
Presenter: Kaitlin Allen
- 1:45–2 p.m. Plate-based Respirometry to Assess Zebrafish Embryo Bioenergetics in Situ in Changing Environmental Conditions
Presenter: Erik Rollwitz
- 2–2:15 p.m. Prolactin Directs Branchial and Intestinal Gene Expression of Solute Transporters and Aquaporins in Mummichog (*Fundulus heteroclitus*)
Presenter: Serena Bradley
- 2:15–2:30 p.m. Direct Reprogramming of Dermal Fibroblasts Derived from Northern Elephant Seals into Muscle Cells
Presenter: Emily Lam
- 2:30–2:45 p.m. Insights into the Evolution of Non-shivering Thermogenesis from UCP1 of the Naked Mole Rat (*Heterocephalus glaber*)
Presenter: Michael Gaudry

Experimental Biology 2022 CEPS Business Dinner Tickets

We are looking forward to gathering in Philadelphia for the last EB meeting. Remember to buy your 2022 CEPS Business Dinner tickets online before March 28. The CEPS dinner will be held on Monday, April 4, at 7 p.m. at the Iron Hill Brewery (1150 Market St). We will have a delicious plated dinner with salad; your choice of chicken, salmon or pasta; coffee; tea; soft drinks; and dessert. Tickets are \$65 for faculty and \$40 for students. Come early for the trainee mixer, which will be held in the same location starting at 5:30 p.m. CEPS members, postdoctoral fellows, students and friends of CEPS are all encouraged to attend and meet this year's Krogh Distinguished Lecturer and honored guest, Patricia Schulte, PhD. During our dinner we will celebrate the accomplishments of this year's recipients of the CEPS Section awards (see below). You will also get to hear about the work the CEPS committee is doing for your section. Order tickets at <https://ebus.physiology.org/PersonifyEbusiness/APSStore/Banquet>.

Report from Awards Chair: Karen Sweazea

CEPS Section Award Winners

Congratulations to the 2022 Comparative Section award recipients. Awardees will be recognized at the CEPS Section Business Meeting on Monday, April 4, at 6:30 p.m.

New Investigator Award: Dr. Joseph Santin, University of North Carolina at Greensboro

Horvath Award: Michael Gaudry, Stockholm University

Dr. Dolittle Travel Award: Elizabeth Evans, Graduate Student, University of Dayton

CEPS Section Award Winners cont.

Novo Nordisk Travel Awards:

- **Grace Heiting**, Undergraduate Student, Union College, Schenectady, New York
- **Andrew Sheahan**, Undergraduate Student, Union College, Schenectady, New York

Research Recognition Awards:

- **Nikolaus Bueschke**, Graduate Student, University of North Carolina at Greensboro
- **Lauren Cooley**, Graduate Student, San Jose State University
- **Kathy Pham**, Graduate Student, University of California at Riverside
- **Erik Rollwitz**, Graduate Student, Stockholm University
- **Amy Klink**, Graduate Student, University of Nevada, Las Vegas

2022 August Krogh Distinguished Lectureship

The CEPS Section's distinguished lectureship, the August Krogh Award, will be presented to Patricia Schulte, PhD, professor at the University of British Columbia, on Sunday April 3, at 1:30–3 p.m. in room 204B of the Pennsylvania Convention Center. Dr. Schulte will present a lecture titled:

"Physiology in the Anthropocene: Insights from Intraspecific Variation in Response to Environmental Stressors."

Dr. Schulte received her PhD in biological sciences from Stanford University in 1996. She began her early career as an assistant professor at the University of Waterloo, then joined the Department of Zoology at the University of British Columbia in 2001. She is an international leader in comparative ecological and evolutionary physiology and has made substantial contributions to the field of comparative physiology through her research investigating short-term responses to environmental change and long-term adaptive variation in the common killifish (*Fundulus heteroclitus*), through which she has improved the understanding of how genotype is related to phenotype as well as the consequences of this relationship on an organism's fitness in its natural environment. She was an early pioneer of using molecular approaches in a non-model organism to study alternative splicing of pre-mRNA and epigenetic regulation of genes. Her impact on the field is further evidenced by her publication of 158 manuscripts that have been cited over 10,000 times, as well as her authorship of a leading undergraduate animal physiology textbook. She has been invited to give 47 keynote presentations and 37 invited talks throughout her career, including a plenary lecture at the 2014 Comparative and Evolutionary Physiology Section Intersociety Conference. Her excellence in research has resulted in 11 distinguished research awards throughout her career, including the Society for Experimental Biology Bidder Lecture, University of British Columbia Killam Prize for Research, Award of Excellence from the Physiology Section of the American Fisheries Society and her recent induction into the Royal Society of Canada.





Trainee Advisory Committee Update: Liz Cambron

Welcome to New CEP Section Trainees!

My name is Liz Cambron, PhD, and I am your Trainee Advisory Committee (TAC) representative. My role is to advocate for you within the section and to APS. We have a few exciting opportunities and events coming up that I would like to alert you to. EB is almost here (April 2–5, 2022), and we have several events for you to look out for:

- CEPS Trainee Symposium: Tuesday, April 5, 1:30–3 p.m. Come support your fellow section trainees!
- CEPS Trainee Mixer: Monday, April 4, 5:30–6:30 p.m. Our first in-person mixer for trainees to mingle in over two years! Come network and stay for dinner and the business meeting at 7 p.m. **Don't forget to buy your tickets!**
- TAC Trainee Session: Overcoming Writer's Block: How to Write, Review and Promote your Manuscript. April 3–5, 7–8 a.m. Three morning sessions created specifically for trainee professional development.

Stay on the lookout for a **NEW TRAINEE NEWSLETTER** coming to your **CEPS Trainee Hub**. If you haven't been added, please reach out to Lynn Hartzler to make sure you're given access. This is where important messages will be shared with trainees. www.physiology.org/ceps-trainees-hub

THANK YOU! I am officially rotating off as the section's TAC representative. These past three years (although it's felt like only one and a half) have been an absolute pleasure serving as your representative. I'm excited to introduce your new incoming TAC representative: **Jessica Whitaker-Fornek**. Please join me in giving her a warm welcome and make sure to say hello at the mixer!

Committee on Committees Update: Joseph Santin

APS has several advisory committees in areas such as education, awards, finance, science policy, publications, communication, animal care, women in physiology and others. Appointment to these committees gives the Comparative & Evolutionary Physiology Section a voice within APS. There is an application process for membership on committees, and my role as our representative to the Committee on Committees is to advocate for well-qualified CEPS members when membership applications are reviewed. APS Council then makes the final appointments.

Please consider nominating a CEPS colleague or self-nominating for an APS committee. I can advise on the application if you have any questions. You can look on the APS website to see the functions of the various committees (www.physiology.org/community/aps-communities/committees?SSO=Y) and which committees currently have vacancies. Each of these committees offers a unique voice for our section, so please consider applying! If you have applied in the past and were not selected, DON'T be discouraged. Many factors go into selecting committee appointments and re-applications are meaningful in the selection process. Although committee applications for 2023 are currently being reviewed, please let me know if you have an interest in applying for a committee for 2024.



10th APS Intersociety Meeting in Comparative Physiology Update: Dan Warren

Mark your calendars! The 2022 Intersociety Meeting “From Organisms to Omics in an Uncertain World” will be held Friday, October 28–Monday, October 31, at the Westin Downtown in San Diego. Please visit APSComphys2022.org for updates about programming and the abstract submission deadline.

Traditionally, comparative physiologists have aimed to understand basic animal function while also gaining insights into ultimate causation and the evolutionary or adaptive significance of a physiological process or trait. But our work has become center stage as it provides extremely valuable insight into vulnerable species’ responses to climate change and other anthropogenic factors. Simultaneously, the dawn of the genomics era and major advances in computing power and imaging technologies have accelerated the integration of molecular, cellular, morphological, biomechanical, biophysical, ecological and evolutionary data into our work. This meeting will highlight how these integrative approaches are being used to understand both long-standing and applied problems in comparative physiology.

Thank you to everyone who submitted a symposium proposal, and we hope to see you all there!

Physiology Summit Leadership Committee Update: Hannah Carey and Jim Hicks

The Physiology Summit Leadership Committee (PSLC) has been meeting since early this year to develop special-topic sessions for the American Physiology Summit that will take place in Long Beach, California, April 20–23, 2023. These sessions will be scheduled outside of the traditional section-driven programming and the APS-wide lectures (Cannon and Bowditch).

The PSLC chose and extended invitations to two scientists to present General Session talks at the Summit (to open and close the conference; also open to the public). The first is Nobel Prize-winning sensory neuroscientist David Julius, PhD. The second is CEPS member, astronaut and comparative physiologist Jessica Meir, PhD.

The PSLC is now working on finalizing topics and speakers for eight 90-minute long “Game Changer” sessions that will address topics of particular relevance in today’s world and will attract a broad audience. Jim and Hannah are developing a session on conservation physiology and climate change (title forthcoming) that received unanimous support from PSLC members.

We are proposing one “Game Changer” keynote speaker whose research addresses animal ecophysiology/conservation physiology in the context of changing environments with a focus on increased global warming. A second speaker will address the mechanisms of heat-related pathophysiology in humans and how a warming planet is predicted to broadly comprise human societies. Following these two talks will be an expanded Q&A discussion of the information presented by both speakers.



Career Opportunities in Physiology Committee Updates: Tracy Baynard

The Career Opportunities in Physiology Committee (COPC) has been very busy this year, and we have four exciting updates to share with you!

1. We have organized several APS 2022 **mentoring symposia**, which will be held each morning Sunday through Tuesday at the upcoming EB meeting in Philadelphia. They are:
 - **Navigating Career Obstacles: Academic Ethics and Communication**
Sunday, April 3, 7–8 a.m., Room 203B
Speakers: Kim Barrett, PhD, and Paul O'Connor, PhD
 - **Navigating Career Obstacles: Career Interruptions**
Monday, April 4, 7–8 a.m., Room 203B
Speaker: Jennifer Pollock, PhD
 - **Navigating Career Obstacles: Handling Rejection**
Tuesday, April 5, 7–8 a.m., Room 203B
Speaker: Keisa Mathis, PhD
2. APS' 2022 **career symposia** will be offered in a different format this year. The COPC and APS' Career Gateway will be co-sponsoring a brown bag/lunch and learn webinar series on work-life balance, which will take place over three Wednesdays in May 2022. Speakers for the three-part series include Sharon Milgram, PhD, National Institutes of Health Office of Intramural Training and Education; June Gruber, PhD, University of Colorado, Boulder; and Antonius Tsai, MBA, University of Utah Health. Information will be posted as soon as the final dates/times are confirmed.
3. The winner of this year's **Visual Abstract Award** is Lindsey Ramirez, Medical College of Georgia, Augusta University.
4. Finally, we are excited to help promote **APS' new Career Gateway** portal. A successful scientific career requires more than just scientific expertise. To maximize a career in science, investigators, clinicians and educators need a well-rounded professional skill set, including leadership, management and intentional career planning. The APS Career Gateway provides physiologists professional development for every step of their career journey. Check it out at www.physiology.org/professional-development/career-professional-development/career-gateway?SSO=Y.



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