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MISSOURI PHYSIOLOGICAL SOCIETY
An independent chapter of APS

Quarterly mophys newsletter

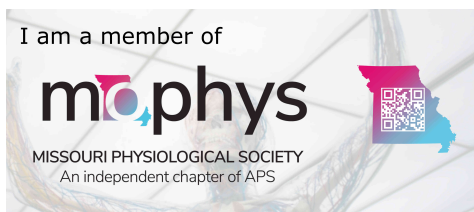
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mophys members presenting at APS summit

Missouri physiologists will have a strong representation at the APS summit in Long Beach. There will be 12 oral presentations and 48 posters from Missouri-based institutions, presented by 25 graduate students, 15 postdocs, 13 investigators, 4 undergraduates, and 3 undergraduate faculty. A full list of our MO contributions at the APS summit can be downloaded [here](#). Support the science of your fellow Missourians and note the incredible amount of mophys members!



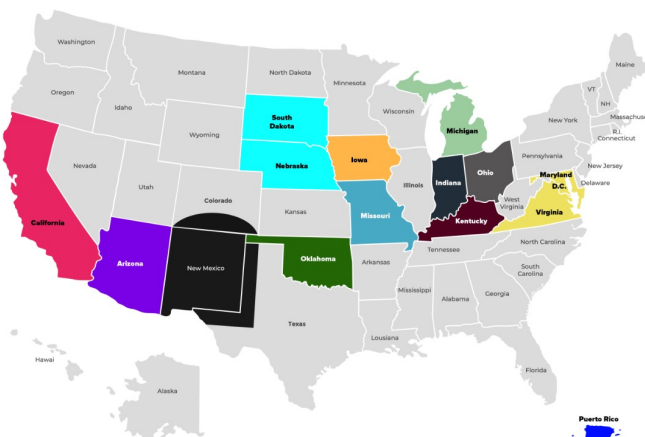
If you are presenting at the APS summit, consider printing out the mophys logo ([click here to download](#)), attach it to your poster, and show your affiliation with Missouri physiologists.

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Chapter events at APS summit

APS chapters are taking off and mophys is at the forefront to connect Missouri physiologists. Check out the APS summit chapter events and learn how you can promote Physiology in Missouri. We hope to see all of you at one of the Chapter events in Long Beach.



(Friday, April 21, 4–5 p.m.)

Topic: Chapter Award Presentation and an Introduction to APS Chapters

Description: Join us for an introduction to APS chapter activities. Meet member leaders and Chapter Advisory Committee members. Chapter award winners will be announced.

(Saturday, April 22, 7:30–8:30am - *breakfast served*)

Topic: Everything You Need to Know about APS Chapters

Description: Join us to learn about joining or forming an APS chapter. Learn about the benefits of joining or forming a chapter and

how they operate. Meet and network with Chapter Advisory Committee members.

(Saturday, April 22, 4–4:30 p.m. & Sunday April 23, 9:30–10 a.m.)

Topic: Engage with Your Local Community with APS Chapters

Description: Join us to learn about joining or forming an APS chapter. Learn about the benefits of participating and forming a chapter and how they operate. Meet and network with Chapter Advisory Committee members.

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Missouri's Rick Samson as the new APS president



Missouri’s own Rick Samson, Ph.D., D.Sc., has been selected as the new APS President for the coming year! Dr. Samson is a professor at the Saint Louis University School of Medicine, where he is also the Vice Chairman for the Department of Pharmacology and Physiology, as well as the Director of the School of Medicine Biomedical Science Graduate Programs.

Currently, his research focus is related to neuropeptide function within the hypothalamus and brainstem, especially as they are related to metabolic and cardiovascular function. Dr. Samson will be a tremendous fit for this position at APS and mophys would like to extend our biggest congratulations to him!

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mophys member awards at Cardiovascular day

Mizzou's Cardiovascular Day took place on March 7th, and we had a strong representation of our society at this event. mophys members presented a total of 13 posters and gave 3 of the main talks. In addition, mophys members **Larissa Ferreira dos Santos** (top image, MU) received the 1st prize for her poster, and **Hailey Schmitz** (bottom, ATSU) was awarded for giving the best flash talk. Congratulations!



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News from MO schools

A.T. Still University

Introducing Physiology at ATSU. Physiologists in other parts of the state may or may not know that A.T. Still University grew out of Kirksville College of Osteopathic Medicine (KCOM), which is the founding Osteopathic Medical School. The University now has a campus in Mesa, Arizona, with a second medical school named School of Osteopathic Medicine in Arizona (SOMA). KCOM has 6 full-time physiology faculty who teach medical and dental students as well as mentor Masters of Biomedical Science students. Faculty often mentor medical students or undergraduate students from nearby Truman State University in their active research laboratories.

Missouri S&T

Dr. Chen Hou recently published an article linking energy investment in biosynthesis and proteostasis. The energy requirement for biosynthesis plays an important role in an organism's life history, as it determines growth rate and tradeoffs with the investment in somatic maintenance. Dr. Hou's group hypothesizes that physiologically the difference in the energy cost is partially attributed to the differences in protein retention and turnover rate: Species with higher energy costs may have a lower tolerance to errors in newly synthesized protein. (*Insects* 2023, 14(3), 241; <https://doi.org/10.3390/insects14030241>)

Missouri State University

Update on our physiology efforts here at Missouri State: A year ago we reorganized our curriculum to include 3 tracks in a Biomedical Sciences degree; Anatomy and Physiology, Cell and Molecular Biology, and Human Health Sciences, to serve students interested in going on to professional or graduate schools. Our A&P track now has 35 students and continues to grow each month. Students take a 2-semester course sequence in physiology (Cell and Organ) and then electives in both anatomy and physiology, including pathophysiology, neuroscience, CV, respiratory, etc. In addition, we did something similar in our graduate program, now offering an A&P track, which currently has 3 graduate students in it. These are the first A&P degree path on our campus.

Saint Louis University

Representatives from SLU and the planning committee are excitedly planning our mophys annual meeting to be held Saturday, October 30th. We have recently received fantastic news about fundraising for the meeting, with gracious funds provided by several SLU and WashU departments. Several mophys members recently participated in our Sigma Xi-Scientific research honor society annual research symposium held on April 3rd. This was a great celebration of the biological/life, physical/engineering, and social/behavioral sciences that are performed here at SLU.

Truman State University

mophys student member Thomas Schodl from Truman State University received the [Barry Goldwater Scholarship](#). The Scholarship Program honoring Senator Barry Goldwater was designed to foster and encourage outstanding students to pursue research careers in the fields of the natural sciences, engineering, and mathematics.

Multi-week, hands-on lab exercise for upper-level undergraduate Animal and Human Physiology courses. Dr. Brett Berke teaches an undergraduate lab course for Human Physiology at Truman State and describes one of his multi-week, hands-on lab exercise that is useful for upper-level undergraduate Animal Physiology and Human Physiology courses. Find the detailed description [here](#).

University of Missouri-Columbia

University of Missouri announces initiative for NextGen MURR. MU announces an initiative to build a new, larger research reactor that will expand critical cancer-fighting research and medical isotope production at MU. The new project, NextGen MURR, will build on the internationally recognized excellence

of the MU Research Reactor (MURR), the highest powered research reactor in the U.S.

Jaume Padilla receives the 2023 EEP Impact Award. Jaume Padilla, associate professor of nutrition and exercise physiology, will be presented with the 2023 Environmental and Exercise Physiology (EEP) Impact Award at the American Physiology Summit 2023 in Long Beach, California, in April. The EEP Impact Award recognizes a mid-career primary EEP member who has either established a line of impactful research or has made a seminal discovery in the areas of environmental, exercise, thermal, or applied physiology. The American Physiological Society is a global multidisciplinary community that spotlights scientific discoveries in physiology and related disciplines.

Elizabeth Parks Receives the 2023 American Diabetes Award. Elizabeth Parks, professor of nutrition and exercise physiology, will be presented the American Diabetes Association’s **2023 Edwin Bierman Award** for her outstanding scientific contributions to the understanding and treatment of diabetes and macrovascular complications. She will be recognized and give the Bierman lecture at the American Diabetes Association’s 83rd Scientific meeting in June in San Diego, CA.

University of Missouri-Kansas City

Research activity at UMKC: Researchers from the UMKC School of Science and Engineering have published 8+ manuscripts so far in 2023 in journals such as Advanced Therapeutics, J Molecular Biology, Current Biology, iScience, and J Biological Chemistry.

We would like to know the exciting things going on at Missouri schools. mophys will promote your local meetings to a chapter-wide audience. Just send us some basic information about your meeting and we will display it on the mophys website and include it in the mophys newsletters. This is a great way to draw more attention to your school and your science!

Did you recently win an award or publish important new data? We would also like to share these exciting news and accomplishments with our mophys community to highlight individual members and the science/teaching done in Missouri.

All it takes is an email to: contact@mophys.org

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A message from the mophys committees

Communications committee:

Do you have an exciting event in MO science that you would like to promote to other **mophys** members? You may [submit your announcements](#) about local meetings, publications, important accomplishments, and open positions to the communications committee to be put in the next quarterly newsletter or on the [mophys website!](#)

Attending the American Physiology Summit in Long Beach? Stop by the many posters and presentations from **mophys** members. Make sure to send or tag us in your photos featuring MO science. See you in Long Beach!

Follow us on Twitter [@Mo_Phys](#) and on Instagram [@missouriphysiologicalsociety!](#)

Annual meeting committee:

Mark your calendars and spread the word, the 2023 **mophys** annual meeting will be held in the Education Union at Saint Louis University on Saturday, September 30th.

Get ready for **mo** science, **mo** collaboration, and **mo** fun! Thanks to our generous sponsors, this year's **mophys** meeting is one you won't want to miss.

Sponsors:

SLU School of Medicine
SLU Department of Biochemistry & Molecular Biology
SLU Department of Pharmacology and Physiology
SLU Department of Microbiology and Immunology
SLU Office of the Vice President of Research
Washington University Department of Cell Biology and Physiology

Membership committee:

Thus far, in 2023, nine new members have joined! The membership committee continues to recruit and expand the membership base to provide MO great connections and opportunities, but we need your help! **Please spread the news of mophys to your friends and colleagues and let them know there are several ways to get involved, including volunteer and conference opportunities.** We have also reached out to potential sponsors for our annual meeting this year and are awaiting their budget review for a decision to be made. (membership@mophys.org).

Nominations committee:

The Ambassadors of mophys also comprise the Nominations committee, and our main charge is to collect nominations for the President-Elect position for 2024. If you would like to nominate yourself, or know of other outstanding candidates, please let the mophys nominations committee (nominations@mophys.org) know!

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Publications from mophys members

Missouri physiologists are a heterogeneous group of active scientists answering basic science questions as well as studying physiology in health and disease. Since the beginning of 2023, several papers have been published by members of the *Missouri Physiological Society* on topics ranging from cardiac muscle to vascular diseases, angiogenesis, liver diseases, neurophysiology, and more. If we missed your contribution, drop us a line, and we will be glad to add it. Keep up the good work Missouri Physiologists!

- **Kelty, T. J.; Dashek, R. J.; Arnold, W. D.; Rector, R. S.** Emerging Links between Nonalcoholic Fatty Liver Disease and Neurodegeneration. [Seminars in Liver Disease.](#) doi: 10.1055/s-0043-1762585.

- **Brengle, B. M.; Lin, M.; Roth, R. A.; Jones, K. D.; Wagenseil, J. E.; Mecham, R. P.; Halabi, C. M.** A new mouse model of elastin haploinsufficiency highlights the importance of elastin to vascular development and blood pressure regulation. Matrix Biology. doi: 10.1016/j.matbio.2023.02.003.
- **Jacobsen, N. L.; Morton, A. B.; Segal, S. S.** Angiogenesis precedes myogenesis during regeneration following biopsy injury of skeletal muscle. Skeletal Muscle. doi: 10.1186/s13395-023-00313-3 PMC9926536
- **Humphrey CM, Hooker JW 4th, Thapa M, Wilcox MJ, Ostrowski D, Ostrowski TD.** Synaptic loss and gliosis in the nucleus tractus solitarius with streptozotocin-induced Alzheimer's disease. Brain Research. doi: 10.1016/j.brainres.2022.148202
- **Sharpea, M; Pylesa, K.; Hallcox, T.; Kamma, D.; Piechowskia, M.; Fiskc, B.; Alberta, C. J.; Carpenterd, D. H.; Ulmasovb, B.; Forda, D. A.; Neuschwander-Tetrib, B. A.; McCommis, K.** Enhancing Hepatic MBOAT7 Expression in Mice with Nonalcoholic Steatohepatitis. Gastro Hep advances. <https://doi.org/10.1016/j.gastha.2023.02.004>
- **Pellizzari, S.; Hu, M.; Amaral-Silva, L.; Saunders, S. E.; Santin, J.** Neuron populations use variable combinations of short-term feedback mechanisms to stabilize firing rate. PLOS Biology. <https://doi.org/10.1371/journal.pbio.3001971>
- **Moore, M. P.; Wang, X.; Shi, H.; Meroni, M.; Cherubini, A.; Ronzoni, L.; Parks, E. J.; Ibdah J. A.; Rector, R. S.; Valenti, L.; Dongiovanni, P.; Tabas, I.** Circulating Indian Hedgehog is a Marker of the Hepatocyte-TAZ Pathway in Experimental NASH and is Elevated in Humans with NASH. JHEP Reports. <https://doi.org/10.1016/j.jhepr.2023.100716>
- **Sukhanov, S.; Higashi, Y.; Yoshida, T.; Danchuk, S.; Alfortish, M.; Goodchild, T.; Scarborough, A.; Sharp, T.; Jenkins, J. S.; Garcia, D.; Ivey, J.; Tharp, D. L.; Schumacher, J.; Rozenbaum, Z.; Kolls, J. K.; Bowles, D.; Lefer, D.; Delafontaine, P.** Insulin-like growth factor 1 reduces coronary atherosclerosis in pigs with familial hypercholesterolemia. JCI Insight. doi: 10.1172/jci.insight.165713.
- **Ostrowski, D.; Heesch, C. M.; Kline, D.; Hasser, E. M.** Nucleus tractus solitarius is required for the development and maintenance of phrenic and sympathetic long-term facilitation after acute intermittent hypoxia. Frontiers of Physiology. doi: 10.3389/fphys.2023.1120341
- **Puech, C.; Badran, M.; Barrow, M. B.; Runion, A. R.; Gozal, D.** Solriamfetol improves chronic sleep fragmentation-induced increases in

sleep propensity and ameliorates explicit memory in male mice. [Sleep](#).

<https://doi.org/10.1093/sleep/zsad057>

- **Amaral-Silva, L.; Santin, J. M.** Synaptic modifications transform neural networks to function without oxygen. [BMC biology](#). doi: 10.1186/s12915-023-01518-0
- **Shariffi, B.; Lloyd, I. N.; Cessac, M. E.; Harper, J. L.; Limberg, J. K.** Reproducibility and diurnal variation in middle cerebral artery blood velocity in healthy humans. [Experimental Physiology](#). doi: 10.1113/EP090873
- **Hanft, L. M.; Robinett, J. C.; Kalogeris, T. J.; Campbell, K. S.; Biesiadecji, B. J.; McDonald, K. S.** Thin filament regulation of cardiac muscle power output: Implications for targets to improve human failing hearts. [Journal of General Physiology](#). <https://doi.org/10.1085/jgp.202213290>
- **Young, B. E.; Padilla, J.; Shoemaker, J. K.; Curry, T. B.; Fadel, P. J., Limberg, J. K.** Sympathetic transduction to blood pressure during euglycemic-hyperinsulinemia in young healthy adults: role of burst amplitude. [American Journal of Physiology-Regulatory, Integrative and Comparative Physiology](#). doi: 10.1152/ajpregu.00162.2022
- **Kerr, N. R.; Kelty, T. J.; Mao, X.; Childs, T. E.; Kline, D. D.; Rector, R. S.; Booth F. W.** Selective breeding for physical inactivity produces cognitive deficits via altered hippocampal mitochondrial and synaptic function. [Frontiers in Aging Neuroscience](#). <https://doi.org/10.3389/fnagi.2023.1147420>

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Upcoming Meetings at a Glance:

- **Apr. 20-23, 2023** American Physiology Summit ([Long Beach, CA](#))
- **Apr. 27, 2023** Student Research Conference ([Kirksville, MO](#))
- **Sept. 30, 2023** 2023 mophys annual meeting ([Saint Louis, MO](#))
- **Nov. 3, 2023** Neuroday 2023 ([Saint Louis, MO](#))

[Click here](#) for full details.

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Job opportunities at Missouri schools

Research Technician and Undergraduates

Lab: Dr. Nicole Nichols at The University of Missouri, Columbia

Contact: nicholsn@missouri.edu

Nichols' team studies the role of plasticity as a therapeutic strategy for improving breathing and swallowing function and coordination in neurodegenerative rodent models using behavioral/whole animal techniques (e.g., plethysmography) to in vivo techniques (e.g., neurophysiology) down to molecular techniques (e.g., PCR and immunohistochemical analysis). The specific responsibilities for a research technician include: performing standard and special technical tasks that require accuracy and strict attention to detail; administration of drugs/solutions to animals; breathing studies; transportation of animals to MRI facility and oversight of animal health for the duration of the experiment; maintenance of lab operations and managing lab safety; ordering supplies; and occasional assistance and supervision of trainees and technical personnel from collaborating labs. We have multiple projects available so please contact me at if you are interested.

Postdoc and Graduate students

Lab: Dr. Gucan Dai at Saint Louis University

Contact: gucan.dai@health.slu.edu

Dai's lab is interested in understanding how ion channels called pacemaker HCN channels are involved in controlling the electrical activity of cells in the heart and nervous system, specifically in the transmission of pain signals. These channels play a crucial role in controlling cardiac pacemaking and the firing of nociceptive neurons that are involved in pain sensation. To gain a deeper understanding of how these channels work, Dai's lab studies their structure and how they are regulated by ligand and voltage in disease conditions such as neuropathic pain. By studying pacemaker channels in nociceptor neurons, we hope to develop new treatments that can alleviate neuropathic pain and reduce our reliance on opioids. Furthermore, we have a broader interest in elucidating

ion-channel mechanisms underlying other related diseases particularly irregular heartbeat, epileptic seizures and Alzheimer’s disease.

Graduate students

Lab: Dr. Joe Santin at The University of Missouri, Columbia

Contact:santinj@missouri.edu

Santin's lab at the University of Missouri is seeking PhD students for the Fall of 2024. Projects in the lab are currently funded by the NIH and focus on improving neural activity in diseases like epilepsy, brain injury, and stroke. We take a comparative approach and explore how unique animal models in nature evolved mechanisms to “solve” these problems. Training opportunities include whole animal, electrophysiology, and single-cell molecular biology approaches.

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- President elect: Kyle McCommis, Ph.D.
- Secretary: Tim D. Ostrowski, Ph.D.
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