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Washington University in St. Louis
SCHOOL OF MEDICINE

Department of Cell Biology & Physiology Newsletter

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Message from the Chair

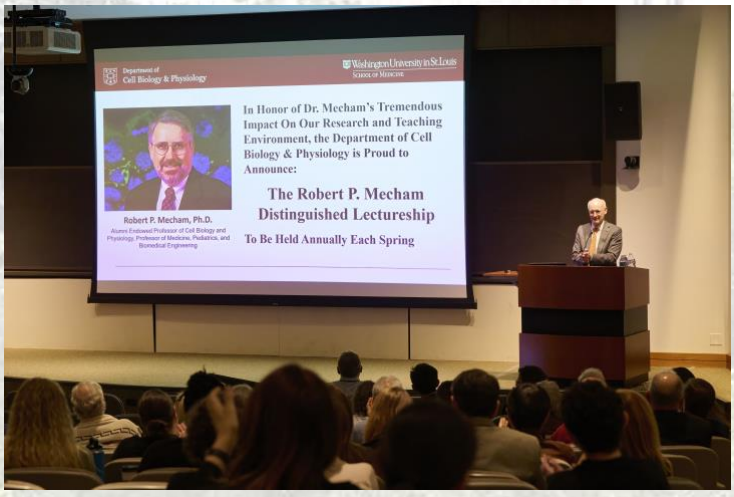
Welcome to the Cell Biology and Physiology newsletter! We started working on a newsletter in 2019, and we were hoping to get it out the door in the spring of 2020. Well, those plans got somewhat waylaid, but we are excited to finally get this newsletter to you. The last three years have been difficult times for all of us, but over the last six months things have started to return to normal. During 2022, we held our first joint scientific retreat between our department and the molecular cell biology graduate program. Despite a few glitches, the retreat was a rousing success and highlighted just how much we had missed during the isolation related to the pandemic. 2022 also saw three new faculty join our department, along with the retirements of Drs. Mercer and Mecham. These retirements offered bittersweet moments, but the occasions to gather in celebration of these valued colleagues were especially touching after our recent social distancing. We also created lasting tributes to their careers with the Mercer Student Travel Award and the Mecham Distinguished Lectureship. As you will see in the newsletter, we hope that you will consider a donation to support these activities in perpetuity. Happy 2023 to all!

Announcements

- Drs. Sergej Djuranovic and Zhongsheng You have been promoted to Professor of Cell Biology & Physiology on the investigator track.
- Dr. Slavica Pavlovic-Djuranovic has been promoted to a tenure-track position in Cell Biology and will lead the Pavlovic-Djuranovic Lab as PI.
- Robert P. Mecham Lectureship created to honor the career of Dr. Mecham. To be held annually each Spring.
- The You Lab received a write-up by the WUSM news team highlighting their recent publication in *Molecular Cell*.
- The annual Mercer Student Travel Award will be handed out to one PhD or MSTP student performing thesis research in CB&P. PhD students in their third year or later and MSTP students in their second year or later are eligible to apply. The $1,500 award fund can be used for a conference or short course and must be used within one year of receiving the award. To apply, please send your CV and an essay describing why attending the meeting or course will benefit your research and career development to Terese Hall (tereseh@wustl.edu). The application deadline is May 1st!

Upcoming Events

- CB&P Faculty Seminar Series resumed January 17, 2023. The Seminar is held every Tuesday at 1:00 PM in McDonnell Medical Sciences Building, room 423.
- MCB/CBP Work-in-Progress (WIP) Series resumed January 6, 2023. The WIP Series is held every Friday at 3:00 PM in McDonnell Medical Sciences Building, room 423.
- The labs of CB&P take turns hosting Happy Hour every Friday at 4:00 PM in the South Medical Building Break Room.
- Geralle Powell of the Djuranovic/Pavlovic-Djuranovic Labs will defend her thesis on March 1st, 2023.
- Samantha Chin of the Jansen Lab will defend her thesis on March 2nd, 2023.



Recent Additions

- Yungpeng Li joined the Nichols Lab as a Research Technician I (February 2023).
- Arian Madani joined the Ashrafi Lab as a Research Assistant (February 2023).
- Taylor Malachowski joined the Stewart Lab as a Graduate Student (January 2023).
- DeHaven McCrary joined the Jansen Lab as a Graduate Student (January 2023).
- Polina Lishko joined CB&P as a BJC Investigator (January 2023).
- Vaibhav Deshmukh joined the Pagliarini Lab as a Postdoctoral Researcher (January 2023).
- Dilip Swain joined the Lishko Lab as a Postdoctoral Researcher (January 2023).
- Chun-Kan Chen joined CB&P has an Assistant Professor (February 2023).
- Zirui Chen joined the Ashrafi Lab as a Graduate Student (November 2022).
- Usna Khan joined the Crewe Lab as a Research Technician II (November 2022).
- Snigdha Tiash joined the Crewe Lab as a Staff Scientist (October 2022).
- Harit Panda joined the Major Lab as a Postdoctoral Researcher (October 2022).
- Karis Chapman joined the Grants Team as a Grant Specialist I (September 2022).
- Citlalli Vergara joined the Lishko Lab as Postdoctoral Researcher (September 2022).
- Patrick Forny joined the Pagliarini Lab as a Postdoctoral Researcher (August 2022).
- Ilah Bok joined the Major Lab as a Postdoctoral Researcher (July 2022).
- Sarah Watson joined as the Media/Marketing Administrator (June 2022).
- Jahmiera Richee joined the Stratman Lab as a Research Technician I (June 2022).
- Ranjit Chauhan joined the Crewe Lab as a Staff Scientist (June 2022).

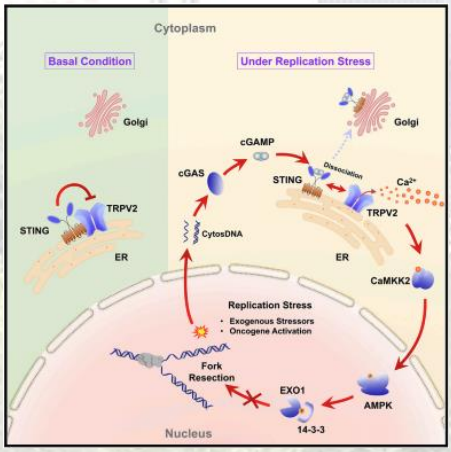
Accomplishments

- Drs. Sergej Djuranovic and Zhongsheng You have been promoted to Professor of Cell Biology & Physiology on the research track effective January 1, 2023.
- Tyson Todd of the Blumer Lab successfully defended his dissertation on December 16, 2022 and has completed his PhD in Cell Biology.
- Dr. Slavica Pavlovic-Djuranovic has been promoted to a tenure-track position in Cell Biology and will lead the Pavlovic-Djuranovic Lab as PI.

Publications

- Ismail VA […] Kast DJ: The NTPase activity of the double FYVE domain-containing protein 1 regulates lipid droplet metabolism (Journal of Biological Chemistry; February 2023).
- Remedi MS, and Nichols CG: Glucokinase inhibition: A novel treatment for diabetes? (Diabetes; February 2023).
- Nichols CG: Personalized therapeutics for K_{ATP}-dependent pathologies (Annual Review of Pharmacology and Toxicology; January 2023).
- Matamoros M […] Nichols CG: Conformational plasticity of NaK2K and TREK2 potassium channel selectivity filters (Nature Communications; January 2023).
- Guerra RM, and Pagliarini DJ: Coenzyme Q biochemistry and biosynthesis (Trends in Biochemical Sciences; January 2023).
- Li S […] You Z: Cystolic DNA sensing by cGAS/STING promotes TRPV2-mediated Ca2+ release to protect stressed replication forks (Molecular Cell; January 2023).
- Singh GK […] Nichols CG: A unique high-output cardiac hypertrophy phenotype arising from low systemic vascular resistance in Cantu Syndrome (Journal of the American Heart Association; December 2022).
- Ikle JM […] Nichols CG: Genome-edited zebrafish model of *ABCC8* loss-of-function disease (Islets; December 2022).
- Crewe C […] Scherer PE: Deficient caveolin-1 synthesis in adipocytes stimulates systemic insulin-independent glucose uptake via extracellular vesicles (Diabetes; December 2022).
- Myeong J, and Klyachko V: Rapid astrocyte-dependent facilitation amplifies multi-vesicular release in hippocampal synapses (Cell Reports; December 2022).
- Chin SM […] Jansen S: N-terminal acetylation and arginylation of actin determines the architecture and assembly rate of linear and branched actin networks (Journal of Biological Chemistry; November 2022).

- Weihl CC […] True H: Loss of function variants in DNAJB4 cause a myopathy with early respiratory failure (Acta Neuropathologica; November 2022).
- Manicki M […] Pagliarini D: Structure and functionality of a multimeric human COQ7:COQ9 complex (Molecular Cell; October 2022).
- Murray NH […] Pagliarini D: Small molecule inhibition of the archetypal UbiB protein COQ8 (Nature Chemical Biology; October 2022).
- Rensvold JW […] Pagliarini DJ: Defining mitochondrial protein functions through deep multiomic profiling (Nature; October 2022).
- Murray NH […] Pagliarini DJ: 2-Propylphenol allosterically modulates COQ8A to enhance ATPase activity (ACS Chemical Biology; October 2022).
- Davis MJ […] Nichols CG: K_{ATP} channels in lymphatic function (American Journal of Physiology Cell Physiology; October 2022).
- Dehkharghanian T […] Ashrafi G: Semiautomated analysis of an optical ATP indicator in neurons (Neurophotonics; October 2022).
- Abello J […] Stratman AN: Peristaltic pumps adapted for laminar flow experiments enhance in vitro modeling of vascular cell behavior (Journal of Biological Chemistry; August 2022).
- Yang Z […] You Z: Context-dependent pro- and anti-resection roles of ZKSCAN3 in the regulation of fork processing during replication stress (Journal of Biological Chemistry; August 2022).
- Bhadra AK […] True HL: Disease-associated mutations within the yeast DNAJB6 homolog Sis1 slow conformer-specific substrate processing and cand be corrected by the modulation of nucleotide exchange factors (Nature Communications; August 2022).
- Foraker R […] Goldfarb D: Enabling hotspot detection and public health response to the COVID-19 pandemic (Preventing Chronic Disease; June 2022).
- Crewe C: The challenges of interrogating adipose tissue extracellular vesicle functions in physiology (Communications Biology; June 2022).
- Faget DV, and Stewart SA: Stress response regulates cancer fibroblasts (Nature Cell Biology; June 2022).
- Rensvold JW […] Pagliarini DJ: Defining mitochondrial protein functions through deep multiomic profiling (Nature; June 2022).
- Agajanian MJ […] Major MB: Protein proximity networks and functional evaluation of the casein kinase 1 gamma family reveal unique roles for $CK_{1\gamma3}$ in WNT signaling (Journal of Biological Chemistry; June 2022).
- Erath J, and Djuranovic S: Association of the receptor for activated C-kinase 1 with ribosomes in Plasmodium falciparum (Journal of Biological Chemistry; June 2022).



1 Graphical abstract from You et al: Cystolic DNA sensing by cGAS/STING promotes TRPV2-mediated Ca2+ release to protect stressed replication forks

Grants & Awards

- Nathaniel York: Hyperglycemia induced hyperexcitability: A novel role for KATP in the progression of Type 2 diabetes; NORC; February 2023-September 2024.
- Amber Stratman: Mechanosensitive mechanisms regulating cellular coordination during tissue morphogenesis and patterning; NIH/NIGMS; January 2023-December 2023.
- Colin Nichols: Pilot Project Award; WUSM Hope Center for Neurological Disorders; January 2023-December 2024.
- Amber Stratman: Challenge Prize; Cincinnati Children's 2022 Bench to Bassinet Pediatric Cardiac Genomics Consortium and Cardiovascular Development Data Resource Center.
- Zhongsheng You: Molecular mechanisms of DNA damage signaling and repair; NIH/MIGMS, May 2022-April 2026.
- Jiayu Ye: Understanding how senescent stromal cells contribute to mammary gland tumorigenesis; NIH/NCI, June 2022-May 2025.
- Sheila Stewart: Senescent stromal cells sculpt the tumor microenvironment to drive breast tumorigenesis; Siteman Cancer Center/Foundation of Barnes Jewish Hospital/FFANY, July 2022-June 2023.
- Dave Piston: Novel molecular mechanisms for extracellular release of proteins implicated in metastatic cancer; NIH/NCI/SLU, August 2022-June 2027.
- Dave Piston: Restoration of normal glucagon secretory dynamics by direct manipulation of alpha cell signaling; Helmsley Charitable Trust, October 2022-September 2025.
- Ben Major: Early phase I window of opportunity trial of pyrimethamine as an inhibitor of NRF2 in HPV-negative head and neck squamous cell carcinoma; Foundation for Barnes Jewish Hospital, January 2023-December 2025.
- Silvia Jansen: Molecular determinants of kidney podocyte architecture in health, injury, and recovery; NIH/NIDDK, July 2022-April 2026.
- Jim Huettner: Engineering glial scar for brain tissue regeneration after traumatic injury; DoD, August 2022-July 2024.
- Sergej Djuranovic: Development of ASOs to restore normal MYT1L levels; RTW Charitable Foundation, November 2022-October 2023.
- Sergej Djuranovic; Increasing mRNA translation to treat neurodegeneration; Chan Zuckerberg Initiative, August 2022-July 2026.
- Chun-Kan Chen: Systematic identification of RNA sequences and protein components regulating circular RNA translation; NIH/NIDDK, February 2023-January 2025.
- Ken Blumer: G alpha-Q/11 signaling and inhibition in ocular melanoma; Washington University Dean's Office, January 2023-June 2023.
- Ghazal Ashrafi: Cellular mechanisms of bioenergetic plasticity; NIH/NIGMA, August 2022-June 2027.

Student Highlight

The Stewart Lab recently welcomed a new member. Taylor Malachowski is a second-year graduate student in Molecular Cell Biology and the newest member of Dr. Sheila Stewart's team. Drawn by the Stewart Lab's focus on breast cancer research, Taylor will be investigating the role of senescence in nerve damage associated with chemotherapy-induced peripheral neuropathy. Taylor rotated with a few different labs during her first year but ultimately decided to join the Stewart Lab because she was interested in their research and appreciated Dr. Stewart's support for her research goals. Taylor enjoyed the lab environment and the representation of people at different levels, from lab techs to postdoctoral fellows. Originally from North Carolina, Taylor attended East Carolina University where she studied under Dr. Chris Geyer investigating spermatogenesis. Though she had her pick of other universities for her Ph.D., Taylor picked Wash U because she felt it was collaborative in an authentic way. Leaders in the department have created an environment that is more of a community and are willing to help students succeed in and out of the lab. We are so excited to draw students like to Taylor to CB&P and can't wait to see the amazing work she produces during her time here.

Faculty Highlight

Among the Department's accomplishments is the promotion of Dr. Slavica Pavlovic-Djuranovic to a tenure-track position and the creation of the Pavlovic-Djuranovic Lab. Slavica has been with CB&P for over ten years and has produced groundbreaking work in malaria research. Originally from Serbia, Slavica received her bachelor's degree from the University of Belgrade and completed her doctoral training at the School of Pharmacy and Chemistry in Tubingen, Germany. Slavica completed a postdoctoral fellowship at Johns Hopkins University in the Howard Hughes Medical Investigator Lab and afterward transitioned to work with Novel Laureate Peter Agre at the Johns Hopkins Bloomberg School of Public Health Malaria Research Institute to study the differences between chimp and human forms of malaria. After joining CB&P at Wash U, Slavica spent several years working in parallel with her husband, Sergej Djuranovic, I his lab studying long poly-adenosine (poly(A)) stretches that modify protein expression. As a tenure-track professor and PI, Slavica will focus on *Plasmodium falciparum*, a protozoan parasite that causes malaria in humans.

Plasmodium falciparum affects more than 50% of the human population every year, resulting in half a million deaths, with most victims under the age of five. The Pavlovic-Djuranovic Lab will attempt to determine why *Plasmodium falciparum* translates long poly(A) stretches and the resulting protein expression without issue when this is not seen in any other organism. Additionally, *Plasmodium falciparum* has two specialized ribosomes, A and S-type. Ribosomes are micromolecules that execute protein synthesis and are highly conserved. Slavica and her team will investigate these unique qualities or advantages of *Plasmodium falciparum* to develop better treatments for malaria The lab has had some early success inhibiting growth of *Plasmodium falciparum* This approach has even worked on treatment-resistant strains of malaria. Slavica also worked with Dr. Makedona Mitreva in the Department of Genetics to apply this technique to other parasites and has noted a similar positive result. The work of the Pavlovic-Djuranovic Lab has global implications and can help prevent millions of unnecessary deaths in the years to come. We are honored to have her as a member of our faculty.

Make an Impact

For over a century, the Department of Cell Biology & Physiology has led basic science research that has been the foundation of one the premier medical schools in the country. In these times when federal funding for discovery research is being questioned and cut, it is critical to have donors like you to help us sustain our research and education ventures. These activities are not only a part of our mission as an academic medical center but are essential for the translation of science into improved patient care. This year, we are especially welcoming funds to endow the new Mecham Distinguished Lecture.

Please consider giving today

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