

Physiology News

April-June 2023 Volume 6 Issue 2

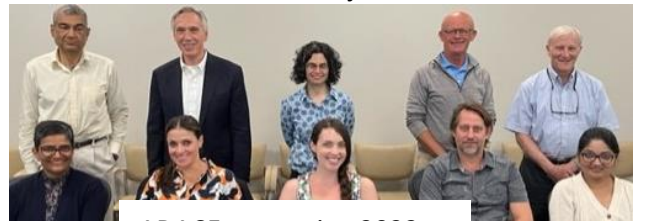
Chair's corner

Patricia E. Molina, MD, PhD

The 2023 summer heat will be record high! And the only thing anywhere near record breaking is the overall continued success of our department. This Spring we watched five graduate students (Poret, White, Cucinello-Ragland, Bourgeois, Templeton-Jager) defend their dissertations and complete their work with multiple accomplishments and honors. We received confirmation of two R21 grants (Drs. Maiya and Gardner) and rumors of a third (Dr. Simon), all from NIAAA (it pays to be loyal). We also received confirmation of successful renewal of the PREP grant (Harrison-Bernard). Dr. Siggins was promoted to Associate Professor and Dr. Simon was granted tenure. We participated in the inaugural APS Summit, Alcohol and Stress meeting, and RSA. Our visibility was great! Not only did we attend, but several of our faculty and trainees organized, chaired, and spoke at various symposia. We hosted our first ADACE Mentoring Retreat, and it was a success according to our selected mentees and guest mentors. We did all of this and more while welcoming T35-supported summer research trainees and leading them into the world of scientific discovery. But wait, there is more! WE RELOCATED! And we survived! Some with casualties, but all in all I would say we did well. Finally, this summer we welcome a new member of our faculty, Dr. Janos Pálóczi. Please help me welcome him and guide him as he integrates in our activities.



As captain of this ship, when looking to the future and constantly scouting for collective opportunities and challenges I may sometimes lack in trying to stop and recognize how important and necessary each and everyone's contribution is to our collective success. Let me take a moment to say THANK YOU! Jason, Bobby, and Liz for your leadership in our move to CSRB. Thank you, Melissa, for organizing all the documents that had to be sent to storage and for being creative in finding ways of reorganizing our supplies. Thank you, Angelica, for serving as a contact with facilities and keeping us aligned. Thank you, Nick, and Mary, for your leadership in relocating the neurobehavioral labs. Thank you, Ale, and Sydney, for moving the TBI lab. Thank you, Curtis, for helping us organize freezer content and relocation. Thank you, to the Graduate students, you were awesome and jumped into action as soon as we got the green light to move. And to every one of you that found ways of helping, of communicating when there were special needs, for serving as leaders of what could seem mundane, but very critical actions. You all make Physiology an awesome team! I am so proud of working with you.



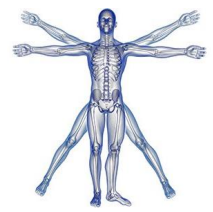
Finally, raises were the cherry on the top for this season. Keep up the good work! Stay focused on your personal well-being. You cannot be successful professionally if you do not feel well. Take your time off and enjoy it! Pay attention to your loved ones (and pets). And smile, always smile. Makes things better!

With best wishes for a cool summer!

Patricia



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Using Roads Less Traveled in Research

Patrick McTernan, PhD

"Two roads diverged in a wood and I – I took the one less traveled by, and that has made all the difference" – Robert Frost. I will never forget having to recite this poem (*The Road Not Taken*) word for word from memory in English class at Brother Martin High School, and how I may have been influenced by Frost's message. Of course, that tells us that at some point we must take decisions without the full knowledge and understanding of where the "road" will lead us in our lives. All of us are working toward becoming successful in our careers. Though many in their journey may never attempt a path "less traveled" or risk getting into a situation where they may become "lost" in new surroundings, I am one of those that did make the decision to do something completely unknown to me. Below will be my story of choosing a path less traveled, and I hope this experience can be beneficial to you, the reader.

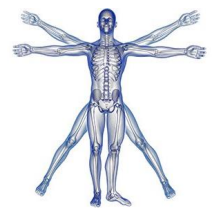
My journey began by receiving a bachelor's from Louisiana State University (LSU), and during my time at LSU, began my research career working in Dr. Fred Rainey's lab on the radiation/desiccation-resistant microorganism *Deinococcus radiodurans*. The goal of the lab was to discover bacteria on Earth that could live on other planets in our solar system, i.e., Mars, and it was here I fell in love with research and discovery. I will never forget the feeling of the first relevant results I obtained or how awesome it was to see my results published shortly before I graduated. I could have stayed on this career path as a microbiologist/ecologist looking for new strains of radiation-resistant bacteria (I had a graduate advisor ready to accept me), but I was set on understanding more the molecular mechanisms that allow these extremophilic organisms to adapt and colonize these hazardous conditions all around our world.

Thus, I continued down this scientific "road" and went to graduate school at the University of Georgia (UGA) where I received a PhD in Biochemistry and Molecular Biology working in the lab of Dr. Mike Adams. What drew me to this lab was how effective they were at showing that extremophilic organisms could be used to create substances for industrial purposes, such as biofuel production, by manipulating the metabolic pathways of the anaerobic hyperthermophilic euryarchaeota *Pyrococcus furiosus*. My focus at this time was on how the enzyme Hydrogenase, still today one of my favorite redox enzymes in the world, could be manipulated to take electrons generated from metabolized sugars to produce the biofuel H₂. This had everything I wanted as a research area. I was exploring mechanisms of metabolism that allowed me to truly understand how extremophilic organisms have adapted to their harsh environments. The information generated could be useful for downstream applications that could help our planet become more carbon neutral. So, now comes the part of the story where I took a different "road."

After years of working on extremophilic organisms, I wasn't fully convinced this was the only career path for me. This of course was a shock to many, but I, as any graduate student should do, looked at what others were doing after they graduated. Most everyone from my lab moved on to industry jobs, leaving extremophile



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research behind forever. This was because funding and job opportunities were extremely limited in the research field. Further, everyone wants to make money after they spend over half a decade working on their PhD. Due to this overall realization, I too decided after graduating to follow the same “road” as everyone before me and pursued a career in industry. This led me to join a startup company in New Orleans, and it quickly became apparent that this was not the path I wanted to travel, and so I began looking for other career options that would get me back into the extremophile world, but I also looked at career options that would be completely different for me. This included biomedical research.

I did have some interest in medical research, as I grew up with my mother who is a physician who treated people with HIV at LSUHSC, and so I decided to apply to LSUHSC even though I had no background on eukaryotic macroorganisms. I thought I would never hear back from the number of applications that I submitted but was surprised and delighted when I received an email and call that LSUHSC was interested and that I would be working within the Comprehensive Alcohol HIV/AIDS Research Center (CARC). Once I started, I was so exhilarated to be in a completely new world of research. Though it was fun at the start, it was quick that I became “lost” on this new path. Trying to keep up with everyone around me, understanding all the new aspects of this new research field, and determining which project/idea I wanted to work on as a T32 postdoc was exceptionally difficult, until all a sudden I found a “clearing”. A mammalian cell that acted like a bacterium (i.e., clonal expansion), and that cell was the **T cell**. To my joy, these cells could be grown and treated in culture like a bacterium, and this allowed me to bridge my previous training in archaea/bacteria to my current project investigating T cell metabolism.

From this experience, the overall observation I can share is that putting yourself in a situation where you have zero expertise benefits you in the end. For me, it allowed for the discovery of new skills within biomedical research, but also to contribute a different perspective from my previous training that I never would have thought to be working with when I received my PhD. In truth, we all have the training that can be used in other scientific fields and if you are thinking about taking the chance to pursue a completely different field of research, you may find yourself in a similar situation to better your skillset and grow as a researcher.

Maybe that road “less traveled by” will make “all the difference”.

Recognition

Dr. Jason Gardner was awarded the 2023 Allen A. Copping Excellence in Teaching Award. Established in 1997, the awards represent the preeminent recognition given to faculty for teaching each year. Department heads as well as student and resident leaders coordinate the faculty nominations and a School of Medicine standing committee reviews the nominations.

Dr. Robert Siggins was promoted to Associate Professor.

Grants

Taylor Fitzpatrick-Schmidt – NIH/NIAAA F30 NRSA award titled “Interactions of Alcohol and Pain in the Context of HIV”.

Dr. Jason Gardner- NIH/NIAAA R21 entitled “Role of novel RNA binding protein LARP6 in alcoholic cardiomyopathy”.

Dr. Rajani Maiya- NIH/NIAAA R21 to investigate molecular signatures of social stress-escalated drinking at single cell resolution.

Dr. Sydney Vita- Submitted a K01 to NIH/NIAAA.

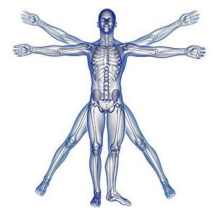
New Faces



Nicholas Harris joined the Gardner lab as an MD/PhD student. Nick is already working on the F30 and American Heart Association grant applications.



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Stephanie (Sumin) Lee joined the Edwards lab.

Nick and Sumin passed their USMLE Step 1 exams with flying colors.



Megan Mire joined the Comprehensive HIV/AIDS Alcohol Research Center as a Research Associate. Mire will be under the direct supervision of Larry Coleman.

Dr. Janos Pálóczi, Ph.D. joined the department as a Tenure Track Assistant Professor. Dr. Pálóczi is from the Pacher lab at the NIH/NIAAA and has a K99/R00 from the NIH/NIAAA. Dr. Paloczi's research focuses on alcohol-associated cardiovascular injury.



Leadership activities

Dr. Jason Gardner is President-Elect of the LSUHSC SOM Faculty Assembly.

Professional services

Congratulations to the Third Triumvirate (**Taylor Fitzpatrick-Schmidt, Kourtney Weaver, and Eden Gallegos**) for securing the SGS SGA Presidency and key cabinet positions. They have an ambitious agenda and large war chest for implementing.

The **T35 Medical Student Alcohol Research Internship (MSARI)** welcomed seven new Fellows in June: **Kaitlyn Allen, Amy Brouillette, Dylan Castor, Katherine Copenhaver, Brice Davis, Charlotte Pearson, and Catherine Rockwell**. The T35AA021097 grant was also submitted for renewal in May.

Dr. Lisa M. Harrison-Bernard is the new Associate Editor for the American Physiological Society journal, *Advances in Physiology Education*.

Dr. Lisa M. Harrison-Bernard welcomed 5 new PREP Scholars to LSUHSC on June 1, 2023. The Scholars are photographed in front of the LSUHSC

Tiger as follows: **Victoria Rodriguez** (mentor: Dr. Zabaleta), **Katelyn White** (Dr. Kim), **Caitlynn Diggs**



(Dr. Quayle; front row), **Nicholas Horne** (Dr. Gardner), **Dwayne Crenshaw** (Dr. Lentz; back row).

Publications

Cucinello-Ragland JA, Alrashed NH, Lee S, Davis EC, Edwards KN, Edwards S (2023). Sex-specific biobehavioral regulation of persistent inflammatory pain by alcohol. *Alcohol: Clin Exp Res* doi: 10.1111/acer.15104.

Edelman EJ, Dziura J, Deng Y, DePhillippis D, Fucito LM, **Ferguson T**, Bedimo R, Brown S, Marconi VC, Goetz MB, Rodriguez-Barradas MC, Simberkoff MS, **Molina PE**, Weintrob AC, Maisto SA, Paris M, Justice AC, Bryant KJ, Fiellin DA (2023). Contingency management with stepped care for unhealthy alcohol use among individuals with HIV: Protocol for a randomized controlled trial. *Contemp Clin Trials*. PMID: 37230168.

Jacotte-Simanca A, Molina P, Gilpin N (2023). JZLI84 Increases Anxiety-Like Behavior and Does Not Reduce Alcohol Consumption in Female Rats After Repeated Mild Traumatic Brain Injury. *bioRxiv*. doi: 10.1101/2023.05.30.542943

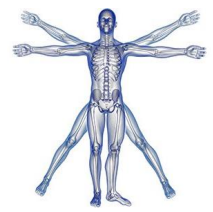
Levitzky, M.G., Hall, S. Kaye, A.D., **McDonough, K.** *Anestezi Uygulamasinda Klinik Fizyoloji*. McGraw-Hill (Lange Series) Ankara Nobel Tip Kitabevleri, 2021, 304 pp. (Turkish translation of *Clinical Physiology in Anesthetic Practice*.)

Paliarin F, Duplantis C, Jones AF, Cucinello-Ragland J, Basavanhalli S, Blaze E, Doré E, Neel AI, Sun H, Chen R, **Edwards S, Gilpin NW**, Messing RO, **Maiya R (2023).** A cre driver line for genetic targeting of kappa opioid receptor expressing cells. *eNeuro* doi: 10.1523/ENEURO.0043-23.2023.

Schwartzenburg JB, Cruise SC, Reed RE, Hutchinson CM, Mirzalieva OS, **Edwards KN, Edwards S, Gilpin NW, Molina P**, Desai SD (2023). Neuropathological outcomes of traumatic brain injury and alcohol use in males and females: studies



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using preclinical rodent and clinical human specimens. *J Neurotrauma* doi: 10.1089/neu.2023.0074.

Siggins R, McTernan P, Simon L, Souza-Smith FM, Molina PE (2023). Mitochondrial Dysfunction: At the Nexus between Alcohol-Associated Immunometabolic Dysregulation and Tissue Injury. *International Journal of Molecular Sciences*. doi: 10.3390/ijms24108650.

Simon L, Primeaux SD, Levitt DE, Bourgeois B, Johannsen NM, Peters A, Ahmed J, Marshall RH, Fairchild AH, Ferguson TF, Molina PE (2023). An Aerobic Exercise Intervention to Improve Metabolic Health Among People Living with HIV with At-Risk Alcohol Use: The ALIVE-Ex Research Study Protocol. *AIDS Res Therapy*. Doi: 10.1186/s12981-023-005320-2.

Simon L, Bourgeois B, Poret, J, Molina PE (2023). Skeletal Muscle and Adipose Tissue: Targets or Relays for Interorgan Axis in Alcohol-Induced Tissue Injury? Book chapter in Sebastian Mueller and Markus Heilig (Eds): *Alcohol and Alcohol-related Diseases*.

Souza-Smith FM, Molina PE, Maiya R (2023). Proteomic Analysis of Lymph and Plasma from Chronic Alcohol Treated Rats. *Life Sciences*, doi: 10.1016/j.lfs.2023.121818.

Steinman MQ, Kiosses WB, Blednov YA, Burkart MD, **Edwards S**, Roberts AJ, Roberto M (2023). Alcohol dependence induces a pro-inflammatory switch in interleukin-1-beta signaling of GABAergic signaling in the mouse medial prefrontal cortex. *Brain, Behavior, and Immunity* 110:125-139.

Van Savage J, **Avegno EM (2023).** High dose administration of DREADD agonist JHU37160 produces increases in anxiety-like behavior in male rats. *Behavioral Brain Research*, 452, 114553.

Symposiums organized at National and International Meetings

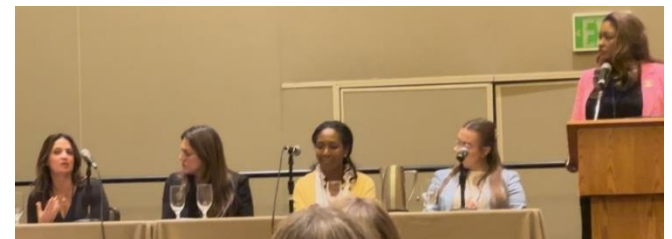
Dr. Elizabeth Avegno was moderator for the Enoch Gordis Research Recognition Awards – Student Finalists at the 2023 *Research Society on Alcohol Annual Meeting*.

Dr. Scott Edwards chaired the symposium “Neuroendocrine Mechanisms of Stress and Alcohol

Use Disorder symposium” at the 2023 Volterra Alcoholism and Stress Conference

Dr. Scott Edwards chaired the symposium “Intersection of Pain-Related Negative Affect and Alcohol Use Disorder Risk” at the 2023 *Research Society on Alcohol Annual Meeting*.

Drs. Tekeda Ferguson and Flavia Souza Smith were guest panelists at the Workshop along with RSA President Dr. Lara Ray, and, Dr. Amelia Talley chair of the RSA Diversity Committee and Associate Dean Associate Dean of Diversity, Equity, & Inclusion at Texas Tech University. “Mentorship and Personal Intersectionality-How Both Impact Current



& Future Scientists: A DEI Workshop” at the 2023 *Research Society on Alcohol Annual Meeting*.

Dr. Rajani Maiya chaired a symposium with Dr. Tiffany Wills “Bidirectional Interactions between Alcohol and Stress in the Extended Amygdala”. **Dr. Franciely Paliarin** gave a talk titled “BLAKORs regulate social stress escalated drinking” as part of the symposium at the 2023 *Research Society on Alcohol Annual Meeting*.

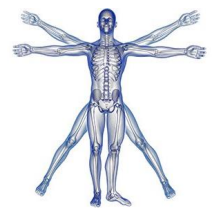
Dr. Rajani Maiya chaired the symposium “Advanced genomic strategies for understanding alcohol use disorder” and gave a talk as part of this symposium titled “Transcriptional signatures of social stress escalated drinking” at the 2023 *Research Society on Alcohol Annual Meeting*

Dr. Patricia Molina chaired a symposium and was speaker “Neuroendocrine Mechanisms of Stress & Alcohol Use Disorder at the 2023 Volterra Alcoholism and Stress: A Framework for Future Treatment Strategies Conference.

Dr. Robert Siggins chaired the symposium Bioenergetic dysregulation; cross-organ mechanism of alcohol-associated pathology with **Dr. Patricia Molina** and gave a talk “Effects of alcohol on bioenergetics in cells of the immune system and its impact on immune activation and senescence.” **Dr. Simon** introduced the symposium and **Dr. Patrick**



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McTernan was the discussant at the 2023 *Research Society on Alcohol Annual Meeting*.

Dr. Liz Simon chaired the symposium “Alcohol: an accelerator of biological aging with **Dr. Patricia Molina** and gave a talk “Alcohol and dysfunctional skeletal muscle mass: implications in aging.” Dr. David Welsh introduced the symposium and **Dr. Patricia Molina** was the discussant at the 2023 *Research Society on Alcohol Annual Meeting*.

Presentations

Avegno EM, Van Savage J, Cruise SC, Gilpin NW (2023). Orexin activation in VTA and extended amygdala subregions during alcohol withdrawal and contribution to anxiety-like behavior in rats. (Poster) 2023 *Research Society on Alcohol Annual Meeting*.

Dr. Scott Edwards presented Understanding Patient Environments as They Relate to Outcomes: Stress & Healing at the LSU Health New Orleans Foundation’s Opioid Mitigation Initiative (OMI).

Gallegos E, Molina PE, Simon L. Metabolic and Fibrotic Alterations in Macaque Liver: Implications of Chronic Binge Alcohol and Calorie-Dense Diet. (Poster) 2023 *Research Society on Alcohol Annual Meeting*.

Dr. Lisa Harrison-Bernard gave 2 hours of Medical Renal Physiology Review to the Pediatric Nephrology Fellows at Children’s Hospital.

Dr. Rajani Maiya gave a talk “Transcriptional signatures of social stress-escalated alcohol consumption at the Genes, Brain, and Behavior meeting held in Galway, Ireland on May25th as part of the outstanding travel award series.

Dr. Rajani Maiya presented at the Department of Neuroscience Brown University. “Molecular and Circuit Mechanisms Linking Social Stress and Addiction.”

Maiya lab T35 student **Selby White** and Research Associate **Evan Dore** presented a poster titled “Characterizing rodent diet influences on Alcohol intake” at the 2023 *Research Society on Alcohol Annual Meeting*.

McTernan, P.M., Siggins, R.W., Welsh, D.A. Simon L., and Molina, P.E. Alcohol Disrupts Mitochondrial Membrane Polarization Within

Differentiating CD4⁺T Cells. (Poster) 2023 *Research Society on Alcohol Annual Meeting*.

Dr. Patricia Molina gave a talk “Bidirectional Translational Studies on Alcohol Interaction with HIV Disease Pathogenesis.” Enhanced Interdisciplinary Research Training Institute on Hispanic Drug Abuse (eIRTI) Annual Summer Training Program. Los Angeles, CA. June 2023.

Dr. Flavia Souza-Smith was invited to give a talk at Vasculata 2023 in New Orleans on “Immunometabolic Consequences of Lymphatic Dysfunction.”

Outreach and community service

Physiology alum **Dr. Allyson Schreiber** will be starting a Neonatal Intensive Care Unit (NICU) Fellowship at Washington University in St. Louis in July.

Dr. Elizabeth Avegno, Dr. Jessi Cucinello-Ragland, Dr. Lisa Wilson, and Dr. Scott Edwards organized an outreach activity at College Track New Orleans in April focused on helping college-bound students understand the risks of alcohol and substance use in college environments.

Notable Events



Dr. Brianna Bourgeois successfully defended the PhD dissertation “Extracellular vesicle myomirs ameliorate chronic binge alcohol mediated decreased skeletal muscle stem cell differentiation.



Dr. Taylor Templeton-Jager successfully defended the PhD dissertation “Sex differences in cocaine self-administration.”



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Drs. Cucinello-Ragland, Poret and Whitehead graduated with PhDs.

Ghosty **Edwards** reports that the dog days of summer have begun.



Dr. Lisa M. Harrison-Bernard welcomed a new grandson, Carlo Anthony Comeaux on June 6, 2023. Pictured are Corey, Cain, Carlo, and Madeline Bernard Comeaux.



LSU Health