Pharmacology News

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TULANE UNIVERSITY SCHOOL OF MEDICINE DEPARTMENT OF PHARMACOLOGY

Message from the Chair: Dr. David Busija

Despite adversity from several directions, including the ongoing COVID pandemic, a three day electrical power outage during the summer, and widespread and prolonged effects of Hurricane Ida, the department continues to prosper and to make major advances in the areas of collaborative research and funding, graduate student education, and medical student instruction. ***Drs. Prasad Katakam, Ricardo Mostany, and Sarah Lindsey*** have worked together on several projects and have secured substantial, new funding in the form of two Multiple-Principal Investigator grants from the National Institute of Aging (NIA) and National Institute of Neurological Disorders and Stroke and from two individual projects on Dr. Jill Daniel's (Brain Institute) Program Project Grant from the NIA. What makes these collaborations remarkable is that these faculty members have distinct primary interests—***Dr. Katakam on mitochondrial dynamics in the brain circulation, Dr. Mostany on neuronal plasticity, and Dr. Lindsey on estrogen receptors and sex differences.*** **See article below**. This intradepartmental collaboration reflects the institution-wide interactions across three campuses and sharing of resources which characterizes the faculty, students, and staff at Tulane University. Our graduate and medical student teaching efforts under the direction of ***Dr. Craig Clarkson*** continue to be successful. We have recruited 22 students with excellent credentials to our Masters in Pharmacology Program and our previous students continue to achieve a high level of acceptance into medical and other professional schools. The students recognize that our program provides a firm foundation for their medical school studies and aids them in gaining acceptance. **See article on page 4.** The excellence of our Pharmacology teaching efforts to the medical students is reflected in the most recent medical school graduation questionnaire from May 2021, where 91% rated preparation by our teaching as good (39%) or excellent (53%) in preparing them for clinical clerkships compared with 81% (38% and 43%, respectively) of medical schools reporting.

Drs. Prasad Katakam, Ricardo Mostany, and Sarah Lindsey were awarded $3,167,804 from the NIH National Institute of Aging for R01 Grant: ***Peroxynitrite is a Molecular Determinant of Impaired Microvascular Energetics in Alzheimer's Disease***

Drs. Prasad Katakam, Ricardo Mostany, and Sarah Lindsey celebrate successful grant award at famous New Orleans restaurant.

Alzheimer's disease (AD) is the most common neurodegenerative disease of aging, accounts for the majority of dementia cases, and is preceded by ***microvascular dysfunction***. Considering that women comprise two-thirds of people living with AD, this award will investigate the novel mechanisms regulating the microvascular bioenergetics that underlie the ***sex-dependent differences in vulnerability in the development of AD***. Recently, Drs. Katakam, Mostany, and Lindsey made technological breakthroughs in measurements of mitochondrial function and bioenergetics in brain microvessels. Employing novel bioenergetic assays, they identified aging-induced impairments of oxidative phosphorylation and glycolytic functions in brain microvessels that appear to present prematurely in a mouse model of AD. ***Notably***, preliminary observations identified sex-dependent differences in bioenergetics of brain microvessels in female mice. The pharmacology collaborators will examine the impact of sex on the free radical-induced responses in cellular energetics of brain microvessels, neurovascular coupling, and cognitive function. They expect that their studies will provide breakthrough findings to identify novel therapeutic targets in preventing the development and progression of AD in females.

Dr. David Busija, **Regents Professor and Chair of Pharmacology**, will be awarded the **Carl J. Wiggers Award** by the American Physiological Society (APS) at the Experimental Biology 2022 meeting in Philadelphia. ***The Wiggers Award is presented to a scientist who is a Fellow of the Cardiovascular Section of the APS, who has made outstanding contributions to cardiovascular research throughout their career, has been an active and committed member of the section, and who will attract outstanding new members to the Cardiovascular Section from the United States and abroad.***

Faculty News: All presentations, participation, lectures, and posters were accomplished by Zoom or Webinar

Dr. David Busija

- ***Grant Submissions:*** NIH, November 2021
- ***Grant Reviewer:*** NIH-CSR ZRG1 BDCN Y (02) Study Section, ad hoc member
- ***Professional Service: (1)*** Treasurer, Association of Medical School Pharmacology Chairs, and ***(2)*** Finance Committee, APS

Dr. Stephen Braun

- ***Grant Award:*** Co-PI, "Characterization and Differentiation Properties of Mesenchymal Stem Cells," Alliance for Cardiovascular Research, 7/01/21-6/30/23, $550,000
- ***Submitted Grants: (1)*** R01, MPI: Drs. Stephen Braun, Partha Chandra, Ricardo Mostany; and ***(2)*** MPI subcontract, Dr. Stephen Braun
- ***Grant Reviewer: (1)*** 2021 NIAID Study Section, Special Emphasis Panel RFA-AI-20-076: New Technologies for the In vivo Delivery of Gene Therapeutics for an HIV Cure (R01) ZAI1 KSW-A (S1); and ***(2)*** 2021 NIAID Study Section, Special Emphasis Panel RFA-AI-21-012: Understanding Post-Transcriptional Regulation of Intact and Defective HIV RNA (R61/R33) 2022/01 ZAI1 PP-A (J1) 1
- ***Journal Reviewer:*** *Stem Cell Reviews and Reports, Pathogens, J of Gene Medicine, Frontiers in Microbiology*

Dr. Jorge Castorena-Gonzalez

- ***Editorial Boards:*** *Microcirculation,* Lymphatic System Research Special Topics Issue (Guest Editor)
- ***Professional Service:*** Membership Committee: The Microcirculatory Society, Inc.
- ***Grant Reviewer:*** American Heart Association (AHA) Cell Transport (Basic Sciences 6) Postdoctoral Fellowship Award, Fall 2021
- ***Journal Reviewer:*** *Muscle and Nerve*

Dr. Partha Chandra

- ***Grant Submissions: (1)*** NIH R01, PI, 8/27/21; and ***(2)*** NIH R01, MPI with Drs. Stephen Braun and Ricardo Mostany, 8/27/21
- ***Journal Reviewer:*** *Scientific Reports, American Journal of Physiology-Regulatory, Integrative and Comparative Physiology, META GENE*

Dr. Suttira Intapad

- ***Grant Submission:*** NIH R01, 11/2021
- ***Invited Speaker:*** Department of Physiology Seminar Program, Tulane University SOM, "Sphingolipids in Preeclampsia and Intrauterine Growth Restriction," 10/11/2021
- ***Symposium Moderator:*** Session Co-Chair: "Sex Differences in Hypertension," Seventh Conference on New Trends in Sex and Gender Medicine, APS, 10/19-22/21
- ***Editorial Board Member:*** *The Kidney 360 Journal, Frontiers in Physiology*
- ***Journal Reviewer:*** *Scientific Reports, Frontiers in Physiology*

Dr. Prasad Katakam

- ***Grant Award:*** Multi-PI R01 with Drs. Mostany and Lindsey, "Peroxynitrite is a Molecular Determinant of Impaired Microvascular Energetics in Alzheimer's Disease," National Institute on Aging, National Institutes of Health, $3,167,804, direct and indirect costs, 9/1/2021-6/30/2026
- ***Grant Submissions:*** Six NIH R01 grants as Co-I
- ***Invited Speaker: (1)*** Department of Molecular & Cellular Physiology, LSU Health Sciences Center-Shreveport, "Paradoxical Effects of Nitric Oxide Synthase Inhibition on Mitochondrial Respiration," 9/22/2021; ***(2)*** Tulane Hypertension and Renal Center of Excellence "Novel Effects of Nitric Oxide Synthase Inhibition on Mitochondrial Respiration," Tulane SOM, 7/8/2021
- ***Grant Reviewer: (1&2)*** Adhoc member: NIH Integrative Vascular Physiology and Pathology, 10/2021, and NIH Acute Neural Injury and Epilepsy, 6/2021; ***(3)*** NIH Special Emphasis Panel Member: "The Blood-Brain Barrier, Neurovascular System and CNS Therapeutics, 9/2021; and ***(4)*** University of Utah Center for Aging Pilot Grant, 10/2021
- ***Mentor:*** AHA HBCU Scholar Program (Mentee: Kennedy Singleton, Xavier University College of Pharmacy)
- ***Professional Service: (1)*** Chairman: Nominations Committee, APS Cardiovascular Section; and ***(2)*** Chairman: Awards Committee, Microcirculatory Society

Dr. Sarah Lindsey

- ***Grant Award:*** Multi-PI R01 with Drs. Mostany and Lindsey, "Peroxynitrite is a Molecular Determinant of Impaired Microvascular Energetics in Alzheimer's Disease," National Institute on Aging, National Institutes of Health, $3,167,804, direct and indirect costs, 9/1/2021-6/30/2026
- ***Invited Speaker: (1)*** North American Menopause Society, “Disrupting a Disruptive Environment,” 9/22/2021; ***(2)*** Tulane Department of Biomedical Engineering, “Sex, Estrogen, and Aging in Cardiovascular Disease,” New Orleans, LA, 9/30/2021; ***(3)*** Tulane Hypertension & Renal Center of Excellence, “Postmenopausal Cardiovas-

Faculty News continued

cular Disease: Chasing a Moving Target," New Orleans, LA, 10/14/2021; ***(4)*** Cardiovascular Translational Research Center, University of South Carolina, "Optimizing the Cardiovascular Response to Menopausal Hormone Therapy," 10/19/2021; and ***(5)*** Argentinean Society of Physiology, "Vascular Remodeling: Impact of Sex, Menopause, and GPER," 10/21/2021

- ***Mentor:*** AHA HBCU Scholar Program (Mentee: Anthony Brooks-Ervin, Undergraduate at Dillard University, majoring in Biology)
- ***Journal Reviewer:*** *Hypertension, European Journal of Pharmacology*
- ***Grant Reviewer: (1)*** AHA, Co-Chair for Fellowships in Cardiorenal Basic Sciences, and ***(2)*** Department of Veterans Affairs, Reviewer for Mental Health and Behavioral Sciences

Dr. Howard Mielke

- ***Award:*** Ranked as "World Lead Expert" by Expertscape's PubMed-based algorithms, announced Tuesday, 10/26/2021, "The expertise of Howard W. Mielke ranks in the Top 0.0094% of 63,827 published authors worldwide on Lead from 2011 through 2021 ..."
- ***Invited Speaker: (1)*** Panel with Mel Chin, "Fundred Initative:" Bill for IL, a campaign to advance public education and community engagement to reduce environmental health threats posed by lead poisoning, Smart Museum of Art, The University of Chicago, 3/22/21; (***2)*** Pediatrics & Neonatology Conference, "Abusive National Policies that Neglect the Needs of Children. Consequences of Lead (Pb) Exposure Prevention Policies in New Orleans, USA vs. Oslo, Norway," 6/30/21; ***(3)*** Global Summit on Cardiology & Cardiovascular Medicine, "The coevolving rise and decline of lead (Pb) aerosols and risks of death from coronary heart disease," 7/12/21; ***(4)*** Summer Conference on Lead and Healthy Housing, "Legacy Lead Matters: The results of an Oslo and New Orleans study of play area soil samples," 7/12-16/21; ***(5)*** Raptor Lead Conference, "Health Perspective of the Cost of Lead to Birds and Humans," Boise, Idaho, 10/9/21; and ***(6)*** European Society of Medicine Congress 2021, "Children's astonishing blood lead decrease in New Orleans and elsewhere: Does soil lead play a continuing role in children's declining blood lead?" Vienna, Austria, 11/11-13/21
- ***National Service:*** ***(1)*** Member: CDC Lead Exposure Prevention Advisory Committee. In this capacity I strongly supported the reduction of the blood lead reference value from 5 to 3.5 micrograms per deciliter. Ruckart PZ, Jones RL, Courtney JG, et al. Update of the Blood Lead Reference Value — United States, 2021. MMWR Morb Mortal Wkly Rep 2021;70:1509–1512. doi: http://dx.doi.org/10.15585/mmwr.mm7043a4; and ***(2)*** Technical resource to the EPA Technical Review Workgroup (TRW), scheduled for 12/9/2021

Dr. Ricardo Mostany

- ***Grant Award:*** Multi-PI R01 with Drs. Mostany and Lindsey, "Peroxynitrite is a Molecular Determinant of Impaired Microvascular Energetics in Alzheimer's Disease," National Institute on Aging, National Institutes of Health, $3,167,804, direct and indirect costs, 9/1/2021-6/30/2026
- ***Grant Submissions: (1)*** National Institute of Mental Health R01, August 2021, (Braun and Chandra PIs; Mostany Co-I); and ***(2)*** National Institute on Aging, R01 November 2021, (Belancio PI; Mostany Co-I)
- ***Professional Service:*** Selection Committee: Society for Neuroscience Trainee Professional Development Awards
- ***Grant Reviewer: (1)*** Agence Nationale de la Recherche (ANR), France. Collaborative Research Projects 2021. June 2021; ***(2)*** NIH Center for Scientific Review (CSR), Fellowships: Sensory and Motor Neuroscience, Cognition and Perception (ZRG1 F02B-E (20) L), June 2021; and ***(3)*** NIH Center for Scientific Review (CSR), Fellowships: Sensory and Motor Neuroscience, Cognition and Perception (ZRG1 F02B-E (20) L), October 2021
- ***Journal Reviewer:*** *Journal of Neuroscience*

Dr. Ibolya Rutkai

- ***Grant Award:*** PI: "Role of mitochondrial quality control in vascular aging" LA CaTS Center Pilot Grants Program, 07/01/2021-6/30/2022, $50,000
- ***Grant Submission:*** NIH NIA, R01, 5/26/2021

University and SOM Committees: Dr. Braun: Tulane Primate Research Center (TNPRC) Space Committee; ***Dr. Busija:*** Basic Science Chairs, BMS Curriculum Task Force; ***Dr. Clarkson:*** BMS Curriculum Task Force, Curriculum, BMS Steering, Student Professionalism & Promotion, Phase 2 Curriculum Advisory, Innovation Council; ***Dr. Lindsey:*** BMS Student Association Faculty Advisor, Tulane School of Medicine Grievance Committee, Vice Chair: Institutional Animal Care and Use; ***Dr. Intapad:*** Faculty Advisory, BMS Social Media-Recruiting; ***Dr. Katakam:*** Chairman: BMS Curriculum, BMS PhD Admissions, BMS Steering (Standby), GMF Faculty Advisory and Admissions, GMF Personnel and Honors Committee; and SOM Admissions Committee; ***Dr. Mostany:*** Nominating, Student Professionalism and Promotion Committee, Tulane Brain Institute Executive Committee, Search Committee member for the Tulane Brain Institute Director position (Presidential Chair), Chair: Tulane Brain Institute Seminar Series, President, Greater NOLA Society for Neuroscience Chapter.

Laboratory News: **Pharmacology (Pharm), Brain Institute (BI), Biomedical Sciences (BMS), Neuroscience Undergraduate (NU), Neuroscience Program (NP), School of Science and Engineering (SSE), Biomedical Engineering (BE), Tulane National Primate Research Center (TNPRC)**

Laboratory of Dr. David Busija

Dr. Siniša Čikić, Postdoctoral Fellow (Pharm) was accepted by the American Society of Pharmacology and Experimental Therapeutics for the Mentoring Network.

Laboratory of Dr. Suttira (Joy) Intapad

Benjamin Bhunu, Graduate Student, (BMS) ***(1)*** gave an Invited Talk, "Acute Systemic Treatment with Sphingosine -1- Phosphate Receptor 1 Agonist Diminishes Sex-difference In Renal Function Seen In Intrauterine Growth Restricted Mice," AHA Hypertension 2021 Scientific Sessions, 9/27-29/21 (AHA Hypertension 2021), and ***(2)*** was senior author on a publication. **Please see page 6.**

Isabel Riccio, (NU) received the Neuroscience Program Senior Scholar Award.

Laboratory of Dr. Sarah Lindsey, Our webpage

Dr. Benard Ogola, Postdoctoral Fellow (Pharm), ***(1)*** gave an Invited Talk, "G Protein-Coupled Estrogen Receptor: A New Player in Female CVD," and ***(2)*** presented a poster, "Aging in Male Mice is Characterized by Arterial Stiffening and Diastolic Dysfunction," at AHA Hypertension 2021, and ***(3)*** was senior author on a publication. **Please see page 6.**

Dr. Bruna Visniauskas, Post-doctoral Fellow (Pharm) gave an Oral Presentation: "Sex Differences in Circadian Blood Pressure," AHA Hypertension 2021. Dr. Visniauskas and received three awards: ***(1)*** the Tulane BIRCWH Award for Research in Women's Health and Sex Differences in Cardiovascular and Related diseases, ***(2)*** the American Foundation of Hypertension Research and Education Award for Under-represented Minorities, and ***(3)*** the APS New Trends in Sex and Gender Medicine Abstract Award. ***Congratulations Dr. Visniauskas!!***

Isabella Kilanowski-Dorah, PhD student (BMS) presented a Poster: "Estrogen and the G Protein-coupled Estrogen Receptor in Arterial Stiffness," AHA Hypertension 2021.

Laboratory of Dr. Prasad Katakam

Dr. Siva S. Sakamuri, Postdoctoral Fellow (Pharm) ***(1)*** gave seminar in the Department of Pharmacology Seminar Series, "Characterization of Bioenergetics in Cultured Primary Brain Microvascular Endothelial Cells," 10/2021; and ***(2)*** authored a poster with members of the Mostany lab. **Please see below.**

Laboratory of Dr. Ricardo Mostany Our website

Alexis Ducote, Ph.D. student (BI), defended his Ph.D. Prospectus exam on August 17, 2021. ***Congratulations Alexis!!***

Cemo Semmedi (BI), will defend her Qualifying exam on December 14, 2021! ***Congratulations Cemo!!***

Grosek N. (NU)***, Evans W*** (BI)***, Wissen W*** (NU)***, Sakamuri S,*** (Pharm) from the **Mostany** and **Katakam** labs presented a poster, "Investigating the effects of recurrent hypoglycemia on post-ischemic injury in vivo," Tulane Undergraduate Research in Neuroscience (TURN) Summer Program, 7/28/21**.**

Master's in Pharmacology Graduate Spotlight: Andrew Van, M.S., University of Alabama Birmingham School of Medicine (MS1)

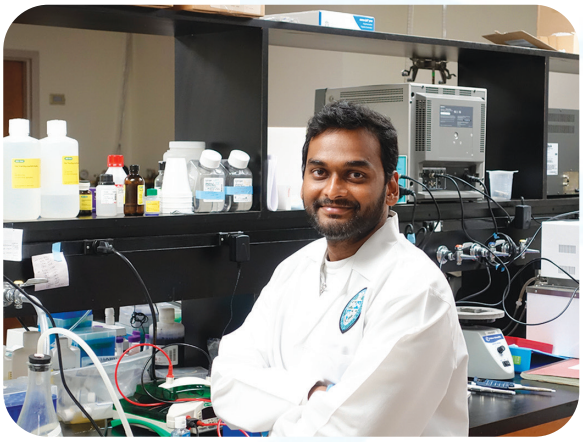
I was removed from my mother's home at a young age and placed in the custody of my baby sitter and her husband, who became my permanent guardians. Their selflessness and sacrifices are a large part of who I am today, but due to their situation, they weren't able to provide academic support or extracurricular experiences. I grew up in a low-income area outside Birmingham, AL that was home to failing school systems, and I was one of only a few of my peers to attend college. As a first-generation college student, my undergraduate career was challenging, and I could have performed better academically. ***However, I earned my bachelor's degree with a formative passion for medicine.***

My spot in Tulane's Master of Science in Pharmacology program was a chance to prove to myself and medical school programs that I could succeed in medical school. At Tulane, it was an honor to learn under incredible mentors like Drs. Katakam and Clarkson in an institution dedicated to serving its community. ***The program's robust curriculum provided me with an opportunity to expand my knowledge, redefine my learning style, and become empowered to take my own initiative for academic growth.*** It also offered me an opportunity to experience a city that was vastly different from my own, but in some ways remarkably similar.

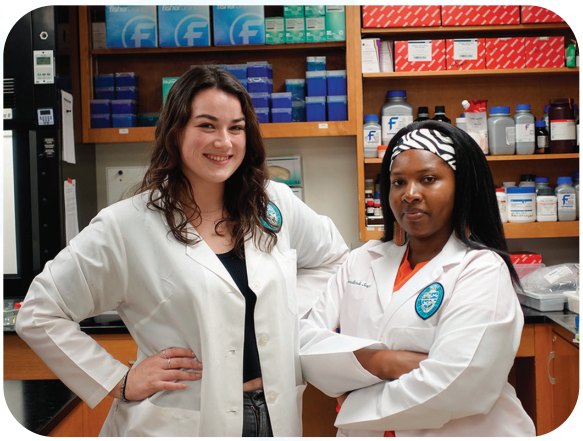
The pharmacological knowledge that I gained through the program will be foundational in furthering my medical education. I have been accepted to the University of Alabama at Birmingham School of Medicine, and I am confident that the Pharmacology master's program enhanced my scientific preparation and was a major deciding factor for schools offering me interviews.

The Tulane Master of Science in Pharmacology program gave me the tools to succeed, both in medicine and in life. I will cherish the lifelong relationships that I made through the program. I am incredibly grateful for Pharmacology's decision to invest in me, and I look forward to seeing the future cohorts that Tulane's Master of Science in Pharmacology shapes into excellent future clinicians.

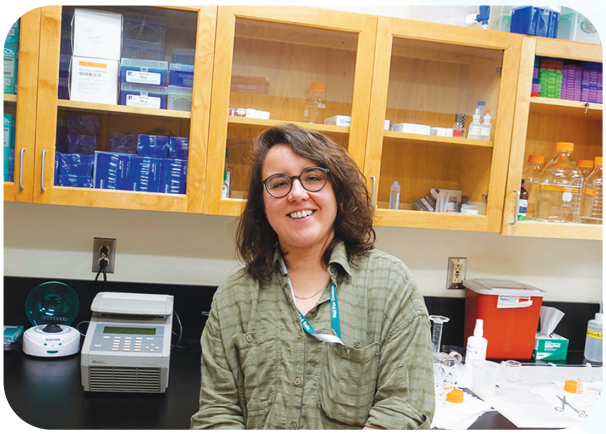
New Faces in Pharmacology



Dr. Venkata N. Sure, earned a Ph.D. in Pharmacology from Tulane University SOM and completed a Post-doctoral Fellowship at Georgia State University. He has returned to Tulane as a Post-doctoral Fellow to work with **Dr. Prasad Katakam** studying nitric oxide synthase isoforms in the brain vasculature.



Alex McNally (L) and ***Ariane Imulinde Sugi*** (R) have joined the **Lindsey Lab**. Alex has a M.S. in Microbiology and Immunology from Tulane and is the Laboratory Technician. Ariane has a B.S. in Biology from William Penn University and is a BMS Graduate student.



Jennifer Calvo Iglesias moved from Spain to join the **Mostany Lab** as Lab Technician. She manages the mice colony, performs lab maintenance, and assists other lab members with their projects. In Spain, Jennifer worked in a veterinary pharmaceutical company in quality control.

Victoria Akerstrom has a B.S. in Medical Technology. She joined the **Castorena-Gonzalez** laboratory as a Medical Research Technician. She is studying endothelial dependent mechanisms of lymphatic dysfunction in metabolic syndrome and type-2 diabetes associated with obesity.

Thank you to those who have donated to The Dr. Krishna C. Agrawal Education Fund to support our students

This endowed fund supports students in the Department of Pharmacology.

To read the biography of Dr. Krishna please go to: Agrawal Fund

To support Pharmacology students through The Dr. Krishna C. Agrawal Education Fund or to make a gift to the Department of Pharmacology,

contact Mark McKeown, Senior Director of Development for Tulane University School of Medicine, 504-314-7380, or mmckeown@tulane.edu

Tulane University School of Medicine Office of Development #8745, 1430 Tulane Avenue, New Orleans, Louisiana 70112

Publications

Chandra PK, Cikic S, Rutkai I, Guidry JJ, **Katakam PVG, Mostany R, Busija DW**. Effects of aging on protein expression in mice brain microvessels: ROS scavengers, mRNA/protein stability, glycolytic enzymes, mitochondrial complexes, and basement membrane components. *Geroscience.* 2021 Oct 28. Epub ahead of print. doi: 10.1007/s11357-021-00468-1

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Newsletter Oversight: Dr. Sarah Lindsey

Departmental Mission Statement:

We will educate and train medical and graduate students in the principles of pharmacology using modern techniques and will conduct state-of-the-art research in pharmacology-related fields in order to expand the frontiers of science and medicine.