

Pharmacology News

Volume 13, Issue 2
Spring 2024

TULANE UNIVERSITY SCHOOL OF MEDICINE DEPARTMENT OF PHARMACOLOGY

Message from the Chair: Dr. David Busija

The Pharmacology Department continues to prosper and to make major advances in the areas of collaborative research and funding, graduate student education, service, and medical student instruction. There have been several recent noteworthy achievements that I would like to highlight. **First**, the members of our faculty this year have more than doubled external grant support since fiscal year 2020, reflecting the quality and innovative aspects of our research at a time when the NIH funding payline is very restricted. **Second**, several of our junior faculty members had their first experience serving on NIH study sections this year. **Dr. Ibolya Rutkai**, Assistant Professor, has served once on the Brain Injury and Neurovascular Pathology (BINP) Study Section and once on the NINDS Special Emphasis Panel ZNS1 SRB. **Dr. Jorge Castorena-Gonzalez**, Assistant Professor, served on the Integrative Vascular Physiology and Pathology (IVPP) Study Section. Service on NIH Study Sections, as junior faculty on an ad hoc basis, provides insight into the process by which grant applications are judged and also provides a conduit for appointment as permanent members on those study sections. **Third**, **Dr. Prasad Katakam**, Professor, received the **Mario Toppo Distinguished Scientist Award** from the Association of Scientists of Indian Origin in America in April. **Fourth**, **Dr. Joy Intapad**, Assistant Professor, has undertaken the arduous but particularly important role as a member of the Institutional Animal Care and Use Committee. **Fifth**, we have continued our tradition of purchasing state of the art equipment to enhance our research efforts and to build collaborative bridges on campus. *This year we purchased the "gentleMACS Cell Dissociation and Separation Equipment (Miltenyl Biotec)," which allows the collection of viable single cell types from any tissue. For example, we can separate endothelial cells, neurons, microglia, etc., from brain in order to perform cell-specific RNA sequencing or proteomics, or the culturing of purified cell types.* Additionally, the use of the MACS® tissue storage solution preserves viability of cell types for up to 48 hours. And **sixth**, our graduate and medical student teaching programs under the direction of **Dr. Craig Clarkson** continues to prosper, providing excellent instruction in our educational programs. Our Masters Program in Pharmacology continues to have excellent results in aiding our students in entering medical and dental schools.

Dr. John McLachlan Announces Retirement

John A. McLachlan, Ph.D., *tenured Professor in the Department of Pharmacology and formerly the Celia Scott Weatherhead and Albert J. Weatherhead III Distinguished Chair in Environmental Studies, is retiring on May 31, 2024, after 30 years at Tulane University and over 5 decades as a scientist, administrator, educator, and mentor.* John received his B.A. degree from Johns Hopkins and his Ph.D. from George Washington University. Following post-doctoral training with David P. Rall, M.D., Ph.D., a member of the National Academy of Medicine and founder of the National Institute of Environmental Health Sciences (NIEHS) in the Research Triangle of North Carolina, John advanced through positions of increasing responsibility to become the Scientific Director of NIEHS, where he provided leadership to over four hundred employees and developed programs in gene-environment interaction. He also implemented translational research projects in pulmonary, reproductive science and neuroscience, at a time when translational science/medicine was in its infancy. While at NIEHS, John's scientific contributions led to his discovery of the mechanisms by which environmental chemicals alter fetal development. John retired with the rank equivalent to Navy Captain in 1994 and was recruited to lead the multidisciplinary



A message from John, "I toast all of my friends and colleagues at Tulane and especially Pharmacology for the thirty wonderful years I have had there."

plinary Tulane and Xavier Universities Center for Bioenvironmental Research (January 1995 through December 2011), which included over fifty faculty members from the Schools of Medicine, Public Health and Tropical Medicine, Science and Engineering, Liberal Arts, Law, Architecture, Social Work, Pharmacy, and Business. In his first five years in New Orleans, John also established a program on the Environment and Women's Health, formed the nation's first Center in Environmental Astrobiology, and initiated the Mississippi River Interdisciplinary Research Program. John's Environmental Endocrinology Laboratory focused on environmental signaling, especially on environmental and synthetic agents that can interact with the estrogen receptor.

Dr. McLachlan's scientific findings have been published in over 208 journal articles, 78 book chapters, 6 edited books, and he has presented his findings at numerous conferences and universities. He has provided scientific advice to numerous private and government agencies. Most recently, John has been instrumental in the acquisition of several large grants to Tulane University, has participated in the M.S. Program in Pharmacology, and has mentored several junior faculty members in the department.

We are thankful for John's many contributions and wish him well in retirement.

Faculty News

Dr. David Busija

- **Grant Submissions:** (1) R01: PI, 2/2024; (2) R21: PI, 3/2024
- **Journal Reviewer:** *American Journal of Physiology*
- **Professional Service:** (1) American Physiological Society (APS) Finance Committee; (2) Editorial Board: *American Journal of Physiology-Heart and Circulatory Physiology*; (3) Secretary Treasurer of APS - Cardiovascular Section; (4) Councilor for the Association of American Pharmacology Chairs

Dr. Stephen Braun

- **Grant Awards:** (1) NIH 1R01DA056875, MPI on Subcontract, PI: Eden Tanner, Jason Paris, "Ionic Liquid-Assisted Drug Delivery to Brain Reservoirs for Treatment of Neuro HIV," 07/2024-06/2028
- **Submitted Grants:** (1) NIH, (Role: PI, Co-I: Partha Chandra), 5/7/2024; (2) NIH, (Role: PI), 05/2024 (3) Alzheimer's Association, Rainwater Charitable Foundation (Role: PI on Subcontract, PI: Simona Capsoni), 12/2023; (4) NIH, (Role: PI on Subcontract, PI: Guigen Zhang), 12/2023
- **Service to SOM:** PhD Thesis committee: Justin Magrath (MD/PhD candidate)
- **Journal Reviewer:** *iScience*
- **Editorship:** Associate Editor for article: *Frontiers in Bioengineering and Biotechnology*

Dr. Jorge Castorena-Gonzalez

- **Invited Speaker:** (1) "Role of Trpv4 Channels in Regulating Lymphatic Vascular Dysfunction: Implication in Obesity and Metabolic Syndrome," Department of Pharmacology and Physiology, University of Missouri, Columbia, MO, 4/9/24
- **Moderator of a Symposium:** Gordon Research Conference (GRC), Lymphatics 2024: "The Lymphatic System, Stem Cells, and Metabolism," Ventura, CA, 3/5/24
- **Grant Reviewer:** (1) NIH Integrative Vascular Physiology and Pathology (IVPP), 2/26-27/24; (2) UK Research and Innovation, 3/21/24
- **Journal Reviewer:** *Microcirculation*
- **Professional Service:** (1) Council Member and Membership Committee Member - The Microcirculatory Society, Inc.; (2) Awards Committee - APS Cardiovascular Section
- **Editorial Boards:** *Frontiers in Physiology* (Editor)

Dr. Partha Chandra

- **Grant Submission:** (1) R01, 2/2024 (Role: Co-I, PI: David Busija); (2) R21, 3/2024 (Role: Co-I, PI: David W Busija), (3) R21, 3/2024 (Role: Co-I, PI: Vicki Traina-Dorge); (4) R01 5/2024 (Role: Co-I, PI: Steve Braun)
- **Invited Speaker:** (1) "Fibrinogen in mice brain microvessels induces mitochondrial-dependent blood-brain barrier dysregulation with aging," Department of Pharmacology, Tulane SOM, New Orleans, LA, 11/3/23; (2) "Actin cytoskeleton proteins in mice cortical microvessels decreased with aging," APS Summit 2024, Foundational Science Session: "Cellular Mechanism of Stress, Inflammation, and metabolism," Long Beach, CA, 4/5/2024
- **Poster Presentations:** (1) "Actin cytoskeleton proteins in mice cortical microvessels decreased with aging," APS Summit 2024, Foundational Science Session: "Cellular Mechanism of Stress, Inflammation, and metabolism," Long Beach, CA, 4/5/2024; (2) "Plasma circulating extracellular vesicles indicate dysregulation of synaptic vesicle-associated signaling pathways in SHIV-infected rhesus macaque," Long Beach, CA, 4/6/2024
- **Grant Reviewer:** UK Research and Innovation: Biotechnology and Biological Sciences Research Council, 3/2024
- **Journal Reviewer:** *Science Signaling*, *Journal of Extracellular Vesicles*

Dr. Suttira Intapad

- **Award Review Panel:** American Heart Association (AHA) Career Development Award, 2/21/2024

Dr. Prasad Katakam

- **Award:** Mario Toppo Distinguished Scientist Award, Association of Scientists of Indian Origin in America, 4/6/2024
- **Grant Award:** Louisiana Clinical and Translational Science (LA CaTS) Center Pilot Funding (7/1/2024-6/30/2025), "Cerebral Microvascular Dysfunction and Neuroinflammation-A Novel Mechanism Mediating Cardiovascular Risk in Chronic Disease," (Role: Co-I, PI: Rajesh Mohandas, LSUHSC, New Orleans).
- **Grant Submissions:** Co-investigator on four NIH

Faculty News continued

R01 grants and co-sponsor of an AHA postdoctoral fellowship grant, LA.

- **Invited Speaker:** "Impact of Hypoglycemia on Cerebral Microvasculature," Medical College of Wisconsin, Milwaukee, WI, 5/1/2024
- **Grant Reviewer:** (1) NIH Study Section: Acute Neural Injury and Epilepsy Study Section (ANIE), Member, 1/12/24; (2) AHA Innovative Project Award Vascular Basic Sciences 1, 1/19/24; (3) AHA Career Development Award Vascular 2, Chairman, 2/21/24; (4) AHA Strategically Focused Research Network (SFRN) on Inflammation in Cardiac and Neurovascular Disease, 2/27/24; (5) AHA's Second Century Early Faculty Independence Award, 3/6/2024; (6) 2024 LA CaTS RMS Applicants Review, 3/22/2024
- **Professional Service:** (1) Chairman, Nominating Committee, APS-CV Section; (2) Chairman, Nominating Committee, Microcirculatory Society

Dr. Sarah Lindsey

- **Grant Awards:** (1) NIH U2C DK133422, Deep South KUH Premier Research and Interdisciplinary Mentored Education (PRIME), Associate Director of Training Core: 3% effort, PI: Gutierrez, University of Alabama, Birmingham, AL; (2) NIH P20 GM152305, Tulane COBRE in Sex-Based Precision Medicine, Director of Enrichment and Research Project Mentor: 17.5% effort, PI: Mauvais-Jarvis and Krousel-Wood, Tulane SOM, New Orleans, LA
- **Grant Submissions:** (1) AHA Established Investigator, 1/2024
- **Invited Speaker:** (1) "Impact of Estrogen Loss on Vascular Health," Department of Physiology, Tulane SOM, 11/13/23; (2) "Estrogen protects against arterial stiffness," University of Florida Center for Integrative Cardiovascular and Metabolic Disease, Gainesville, FL, 1/24/24
- **Grant Reviewer:** (1) Graduate Women in Science (GWIS) National Fellowship Program, 5/2024; (2)

AHA, Transformational Project Awards - Vascular, 5/2024

- **Journal Reviewer:** *American Journal of Physiology-Renal Physiology*
- **Editor and Editorial Boards:** (1) Editorial Board: *Biology of Sex Differences*; (2) Editorial Board: *American Journal of Physiology-Heart and Circulatory Physiology*

Dr. Ricardo Mostany

- **Award:** Tulane Graduate Studies Student Association Faculty Award, 2023–2024
- **Grant Submissions:** (1) NINDS, R01, (Role, Co-I, PI: Engler-Chiurazzi) 2/2024; (2) NIAID, R01, (Role: Co-I, PI: Zvezdark) 2/2024; (3) Ivy Foundation Translational Adult Glioma Grant Award, Ben and Catherine Ivy Foundation, 2/2024
- **Journal Reviewer:** *Neural Regeneration Research*
- **Professional Service:** Society for Neuroscience: Trainee Professional Development Awards (TPDA) Selection Committee

Dr. Ibolya Rutkai

- **Moderator of a Symposia:** "Critical Role of Vascular Metabolism in Regulation of Brain, Heart and Lung Function" Session Co-chair, APS Summit 2024 Long Beach, CA 4/4/24–4/7/24
- **Poster Presentation:** "Compounding Effects of Aging and Sex on Cerebrovascular Endothelial Mitochondria," APS Summit 2024, Long Beach, CA, 4/4/2024–4/7/2024
- **Grant Reviewer:** (1) NIH Brain Injury and Neurovascular Pathologies (BINP) Study Section, Ad-hoc member, 2/2024; (2) NINDS Special Emphasis Panel ZNS1 SRB - M (19) ADRD Initiative, Ad-hoc member, 3/2024
- **Outreach:** Judge, Research Appreciation Day (RAD) for graduate students, virtual, University of North Texas Health Science Center, TX, 3/21/2024– 3/28/2024

University and SOM Committees: **Dr. Braun:** Tulane Primate Research Center (TNPRC) Space Committee; **Dr. Busija:** Tulane Professionalism Program Advisory Board; **Dr. Castorena-Gonzalez:** Tulane SOM Nominating Committee; **Dr. Clarkson:** Curriculum Committee, Phase 2 Curriculum Subcommittee, Professionalism & Promotion Committee, BMS: Masters Program Subcommittee; **Dr. Lindsey:** SOM Grievance, SOM Curriculum, SOM BMS Retreat, University Senate, Tulane Professionalism Program Peer Messenger; **Dr. Intapad:** Institutional Animal Care & Use Committee (IACUC); **Dr. Katakam:** Vice-Chairman GMF Personnel and Honors Committee, Member PSPP Advisory Committee SOM, Faculty Mentor BIRCWH Investigator, Member of MS and PhD Admissions Committee; Interviewer for PSP, BMS, PHD, and MD Programs; Member of MS PhD Admissions Committee; Interviewer for PSP, BMS PhD, and MD programs; **Dr. Mostany:** Director: Tulane Brain Institute Neuroscience PhD Program, Tulane Brain Institute Executive Committee, SOM Student Professionalism and Promotion, School of Science and Engineering Graduate Studies Committee.

Masters in Pharmacology Graduate Spotlight: Tuhin Choudhary, MD/MPH Class of 2024



I am the first in my family to pursue medicine and came to medicine from a non-traditional background. I was incredibly grateful for the opportunities that arose through completing the Masters in Pharmacology Program at Tulane School of Medicine. As an undergraduate, I thought to pursue a career in research, but later realized I wanted a career that would engage my foreign language skills as well as my scientific interests. I decided to pursue medicine. However, this decision came during my last year of college and I needed more preparation for medical school.

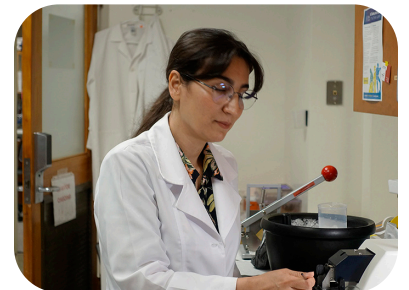
Therefore, I looked for a masters program that would allow a good transition between undergraduate and medical school and some guidance on applying to medical school. *I decided on the Masters in Pharmacology Program at the Tulane School of Medicine because the program emphasizes developing cultural competence, giving back to the community, and maintains a small cohort of students.* The small class size was a very different learning environment than at my large undergraduate school. I am very grateful to have found a great mentor like Dr. Katakam. I also developed great friendships. Many of my peers from the master's program continued as classmates into medical school; it was great to start medical school with friends and a support system already in place. Also, one of my peers from the master's program with whom I started medical school will now be a co-intern when we start residency.

While in medical school, I helped re-launch the student run clinic in New Orleans East, had the chance to pursue research for the first time, and also pursued a master's in public health to get a greater understanding of the social determinants of health. Most importantly though, I learned from my patients in New Orleans about the inequities that exist in our society. *I am excited to continue my journey at the Tulane School of Medicine in a combined Medicine/Pediatrics residency. Through a combined residency, I hope to acquire perspective on health inequities, help reduce health disparities, and deliver healthcare with cultural humility.*

Dr. Tuhin Choudhary, M.D., M.P.H.

New Faces

Dr. Fatemeh Farahani earned her Ph.D. degree from Tarbiat Modares University, Tehran, Iran. Fatemeh is a new Postdoctoral Fellow in Dr. Mostany's laboratory in the Department of Pharmacology where she will be conducting research within the Program Project Grant: Estrogens, Cardiometabolic Health, and Female Cognitive Aging.



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, please contact Michael Johnson, Senior Development Officer
504-314-7282, or fjohnso4@tulane.edu

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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), Bachelor of Science in Public Health Studies (BSPH)

Laboratory of Dr. Castorena-Gonzalez

Mary Schulz, PhD Student (BMS), received a (1) Travel award to attend; and a (2) Poster Award for "Regulation of Lymphatic Contractile Function by Trpv4 Channels in Lyve1+ Macrophages and Lymphatic Endothelial Cells," presented at the Gorden Research Symposium (GRS)/GRC, Lymphatics 2024, Ventura, CA, 3/2024.

Tatia Goldberg, (BSPH), received a Poster Award for "Transcriptomic and Functional Sex-Based Differences of Trpv4-Mediated Regulation of Collecting Lymphatic Vessel Function," at the GRS/GRC, Lymphatics 2024, Ventura, CA, 3/2024.

Laboratory of Dr. Prasad Katakam

Dr. Ram Sure, Postdoctoral Research Fellow (Pharm) (1) gave a seminar, "Sex-Dependent Differences in Brain Microvascular Bioenergetics," Department of Pharmacology Seminar Series, Tulane SOM, 1/9/24; and (2) was first author on a poster, "Characterization of Sex-Dependent Differences in Brain Microvascular Bioenergetics," at APS Summit, Long Beach CA, 4/5/2024.

Dr. Lokanatha Oruganti, Postdoctoral Research Fellow, (Pharm) gave an invited talk, "Impact of Hexokinase 2 on Cerebral Microvascular Bioenergetics," Session: Critical Role of Vascular Metabolism in Regulation of Brain, Heart and Lung Function, APS Summit, Long Beach, CA, 4/7/24.

Kayla Hennigan, Dillard University Undergraduate and AHA HBCU Scholar, was first author on a poster, "Effect of Prorenin on Bioenergetics of Brain Microvascular Endothelial Cell," at the AHA HBCU Scholar Program Annual Meeting, Dallas, TX, 4/15/24.

Dr. Siva S. Sakamuri joined Auburn University at Montgomery AL as Assistant Professor in the College of Sciences. **Congratulations Dr. Sakamuri!!**

Laboratory of Dr. Sarah Lindsey, [Our webpage](#)

Dr. Bruna Visniauskas, Instructor (Pharm) was awarded a \$5,000 "Small Research Grant" from the Sleep Research Society Foundation. This grant is designed to support early career investigators. Awardees must be a member of the Sleep Research Society and/or the American Academy of Sleep Medicine. **Congratulations Dr. Visniauskas!!**

Chase Richard, (SSE), received a Research Supplement to Promote Diversity in Health-Related Research, **Congratulations Richard!!**

Laboratory of Dr. Ricardo Mostany [Our website](#)

Alexis Ducote, (NP) defended his doctoral dissertation, "Reduced volumetric volatility and decreased inhibitory stabilization of dendritic spines in the aging primary somatosensory cortex," on 1/10/2024. **Congratulations Alexis!!**

Courtney Hospes, (NU) was first author on a poster, "Alzheimer's disease alters synaptic C1q levels: a potential target for novel therapeutics," presented at the Tulane Research, Innovation, and Creativity Summit (TRICS), April 24-25, 2024 (TRICS 2024).

Cemo Semmedi, Ph.D. student (SSE) gave a seminar, "Amyloid- β pathology impacts age-related decline in neuroplasticity," at the Annual Retreat, Greater New Orleans Chapter of the Society for Neuroscience, Louisiana State University Health Sciences Center (LSUHSC), New Orleans, LA, 5/2/2024.

Dr. Irene Fernandez Ugidos, Postdoctoral Fellow (Pharm) gave a seminar and was first author on two posters, (1) Seminar: "Effect of hypoglycemia on neurovascular coupling in the diabetic brain," in the Department of Pharmacology, Tulane SOM; (2) Poster: "Ketamine-induced synaptic plasticity in the dorsomedial prefrontal cortex is abolished with aging," at TRICS 2024; and (3) Poster: "Effect of insulin-induced recurrent hypoglycemia on neurovascular coupling in the diabetic brain," at the Annual Retreat, Greater New Orleans Chapter of the Society for Neuroscience, LSUHSC, New Orleans, LA 1/29/24.

Jennifer Iglesias, Laboratory Technician in the **Mostany** Lab, was first author on a poster, "Impact of estrogen-free control diet on glucose levels and glucose tolerance test response in female mice," at TRICS 2024.

Zach Plumley, (NP) was first author on a poster, "Effects of high-fat diet and estradiol treatment on neurovascular coupling in the postmenopausal cortex," given at separate events; (1) TRICS 2024; and (2) the Annual Retreat, Greater New Orleans Chapter of the Society for Neuroscience. LSUHSC, 2/29/24, New Orleans, LA.

Laboratory News continued: 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), Bachelor of Science in Public Health Studies (BSPH)

Sebastian Milanes, (M1) was first author on a poster, "Cortical D1 dopamine receptor expression levels throughout aging," at TRICS 2024.

Victor Hernandez, (NU) was first author on a poster,

"Assessing stress responses in hypoglycemic animals: a deep learning approach using pose recognition and movement analysis," at TRICS 2024.

Publications

Hussain R, Tithof J, Wang W, Cheetham-West A, Song W, Peng W, Sigurdsson B, Kim D, Sun Q, Peng S, Plá V, Kelley DH, Hirase H, **Castorena-Gonzalez JA**, Weikop P, Goldman SA, Davis MJ, Nedergaard M. Potentiating glymphatic drainage minimizes post-traumatic cerebral oedema. *Nature*. 2023 Nov;623(7989):992-1000. doi: 10.1038/s41586-023-06737-7

Harrison MAA, Morris SL, Rudman GA, Rittenhouse DJ, Monk CH, Sakamuri SSVP, Hasan MM, Khatun SM, Wang H, Garfinkel LP, Norton EB, Kim S, Kolls JK, Jazwinski MS, **Mostany R**, **Katakam PVG**, Engler-Chiurazzi EB, Zvezdaryk, KJ. Intermittent cytomegalovirus infection alters neurobiological metabolism and induces cognitive deficits in mice. *Brain Behavior and Immunity* 2024, 117:36-50. doi:10.1016/j.bbi.2023.12.033

Gonzales CR, **Moca EN**, **Chandra PK**, **Busija DW**, **Rutkai I**. 3D Object Geometry of Mitochondria-Associated Signal: 3D Analysis Pipeline for Two-Photon Image Stacks of Cerebrovascular Endothelial Mitochondria. *Am J Physiol Heart Circ Physiol*. 2024 Mar 22. doi: 10.1152/ajp-heart.00101.2024.

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Horton AC, Wilkinson MM, **Kilanowski-Doroh I**, Ogola BO, **Lindsey SH**. (2024) Dihydrotestosterone Induces Arterial Stiffening in Female Mice. *Biology of Sex Differences*. 2024 Jan 23;15(1):9. doi: 10.1186/s13293-024-00586-3

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Gonzalez AA, **Visniauskas B**, Reverte V, **Sure VN**, Val-lotton Z, Torres BS, Acosta MA, Zemedkun M, **Katakam PV**, Prieto MC. Urinary Angiotensinogen Displays Sexual Dimorphism in Non-Diabetic Humans and Mice with Overweight. *Int J Mol Sci*. 2024 Jan 4;25(1):635. doi: 10.3390/ijms25010635

Pharmacology News is a publication of the Department of Pharmacology, Tulane University

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Department Administrator: Debbie Sanders

Senior Editor/Newsletter Preparation: Nancy Busija

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.