

Spring, 2013

Pharmacology News

MESSAGE FROM THE CHAIR

The department has had a successful year in terms of teaching, research, and service. As we move towards May graduation, I congratulate in advance our Ph.D. and M.S. students who are completing their curriculum requirements this semester and will be receiving their degrees. I wish all of you success in the future and thank you for choosing our department. I also would like to congratulate our faculty for their success in teaching and research. Details of their activities are included in this newsletter. Lastly, I want to thank the faculty, students, and staff for making our seminar series a success. We have had many excellent speakers present departmental seminars and they have all told me they have had an enjoyable visit meeting with students and faculty.

PHARMACOLOGY NEWS

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IN THE NEWS



Dr. Howard Mielke has received media attention for his research on lead in the environment, especially soil lead, and its negative developmental and health consequences. He has been quoted by USA TODAY, 3/10/2013, has been a guest on the Melissa Harris-Perry TV show, www.nbcnews.com/id/50385886/ns/msnbc/, and featured in Mother Jones magazine <http://www.motherjones.com/environment/2012/12/soil-lead-researcher-howard-mielke>. Howard began studying lead content of residential environments in the 1970's and discovered that the areas where we live (and our children play) are, basically, hazardous waste sites for lead contamination. When most people think of lead poisoning they think of lead paint, however, the lead additives in gasoline were, and continue to be, the major culprit. Whether inside a house or outside in the soil, lead ingestion has huge developmental consequences for our children. A child playing outside can ingest enough lead in just one hand lick to exceed the daily tolerable intake limit. Unfortunately, federal attention has not

been given to regulating the lead in the soil where our children play. In his mapping of cities, Howard and his colleagues have found that areas that show high lead in the environment (mostly soil lead) frequently have low school scores and are areas the police often highlight as high crime areas. This connection has been clearly documented in the mapping of cities. Howard continues to work to bring local, state, and national attention to this problem and its affordable solution. He has worked with cities (Baltimore, St. Paul, Minneapolis, New Orleans, Detroit, and most recently, Atlanta) on mapping projects and with local groups on soil lead intervention in child play areas. According to the USA TODAY article, the EPA has said that no action is currently being taken to revise the federal hazard standard for soil – which allows five times more lead in play areas than what health modeling by the state of California shows is needed to protect children from losing I.Q. points. Because federal requirements are slow to change, Dr. Mielke and his colleagues have focused their consciousness raising efforts on cities and private groups (religious groups and private property owners) about the risks and by providing a solution. By importing clean soil from sites outside of cities and putting a 15 cm clean soil layer on top of a geotextile covering, the risks of lead contamination in children play areas can be reduced to safe levels. This relatively inexpensive treatment can mean vastly improved developmental functioning and perhaps a reduction in crime for cities.

ESTROGEN RESEARCH NETWORK

On January 25th, 2013, **Dr. Sarah Lindsey** established the “Estrogen Research Network”. She organized a seminar as part of the D.W. Mitchell Lecture Series co-sponsored by the Provost’s Faculty Seminars in Interdisciplinary Research. Jill Daniel, Ph.D., (right) Associate Professor of Psychology & Neuroscience on Tulane’s uptown campus, spoke on “Effects of midlife estrogen use on the aging female brain”. This seminar was also the inaugural event for the Estrogen Research Network, whose mission is to bring together investigators who do not interact on a regular basis but with a common interest in estrogenic signaling to foster interdisciplinary scientific discussion, generate novel hypotheses, promote new collaborations, and increase funding and publications in this field. This seminar was preceded and followed by a research meeting for all principal investigators interested in estrogen. At least six Tulane departments were represented: Cell & Molecular Biology, Ecology & Evolutionary Biology, Psychology, Biochemistry, Physiology, and Pharmacology as well as researchers from other local universities and colleges. The meetings before and after the seminar went extremely well, and attendees discussed how soon they could meet again. The second seminar in this series will feature Cheryl Watson, PhD, Professor of Biochemistry & Molecular Biology of The University of Texas Medical Branch at Galveston, Galveston, TX presenting “How Xenoestrogens Disrupt Physiologic Estrogen Signaling via Nongenomic Pathways”, April 19th, 12:00 p.m., Pharmacology Seminar Room. We are extremely grateful to the Provost’s Office; without their generous support we could not have organized such an exciting event! For more information on the Estrogen Research Network, please contact **Dr. Sarah Lindsey**, lindsey@tulane.edu.

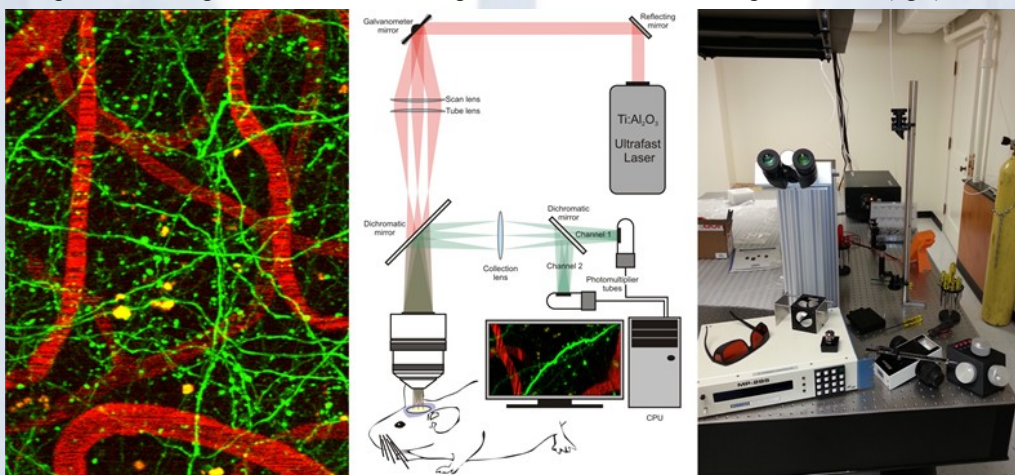


Noteworthy News

DR. RICARDO MOSTANY BUILDS A TWO-PHOTON IN VIVO MICROSCOPE

The Pharmacology Department is pleased to note that soon they will have a two-photon excitation microscope. **Dr. Mostany** is building the microscope for his research to study plasticity in the cortical circuits during aging, ischemia, or effects of environmental agents on brain architecture. He has provided us with a description of his two-photon microscope system.

Two-photon excitation (2PE) microscopy is based on the excitation of a conventional fluorophore simultaneously by two photons of near infrared wavelengths (left). These intrinsic properties of two-photon microscopy provide this technique with several advantages with respect to conventional fluorescence or confocal microscopy: it allows the precise observation of fluorescent structures deep into a sample because the long wavelengths used for 2PE travel better through tissue; phototoxicity of the sample is minimized because lower energy photons are used and because the excitation of the fluorophore is confined to the focus of the laser, not affecting the tissue above or below the focal plane. Because of these properties 2PE is ideal for *in vivo* imaging, allowing the researcher to examine the same cellular structure or activity multiple times. The basic components of a two photon excitation imaging system (middle) include a two-photon light source (Ti:Sapphire Ultrafast Laser), scanning mirrors, a series of optical components to focus the laser beam onto the sample and to collect and separate different wavelengths of emitted light, and the photomultiplier tubes that receive the emitted photons from the sample and convert them into electrical currents that subsequently the computer is able to compile into an image. Some of the actual components can be observed in the picture on the (right).



Brittni Scruggs, a PSP student in **Dr. Bruce Bunnell's** lab, successfully defended her dissertation on December 11, 2012.

Shijia Zhang, a BMS student, also in **Dr. Bunnell's** lab, successfully defended his dissertation on March 14, 2013.

Dr. Ibolya Rutkai, postdoctoral fellow, working with **Dr. David Busija** has been selected to receive the 2013 CV Section of the American Physiological Society Clinical Science Young Investigator Award.

Oral Presentation: "Novel mitochondrial mechanisms mediate enhanced vasodilation of rat middle cerebral arteries to mitochondrial depolarization following ischemia-reperfusion injury" at the Topic Session: "Novel Signaling Molecules in Vascular Injury and Inflammation" on Mon-

day April 22, 2013. She will also present a *Poster* at EB and at Tulane Research Day.

Dr. David Busija, *Invited Speaker*: University of Mississippi Medical Center, March 18, 2013, Department of Pharmacology and Therapeutics. Topic: "Mitochondrial mechanisms in cerebral vascular control in health and disease."

Invited Speaker: East Carolina Medical School, March 4, 2013, Department of Anatomy and Cell Biology. Topic: "Cerebral vascular control mechanisms in health and disease."

Keynote Speaker: 7th Gulf Coast Physiological Society Meeting, Mobile, AL, May 31-June 2, 2013. Topic: "Regulation of the Cerebral Circulation."

Invited Presentation at Experimental Biology 2013 "Dysregulation of cerebral blood flow: new horizons" from 3:45 PM-

4:15 PM on Sunday, 4/21/13 during the Featured Topic Session: Vascular Cognitive Impairment: Emerging Concepts and Pathophysiology.

Dr. John McLachlan To save travel time and money, McLachlan delivered a *virtual* invited presentation via *Skype* to a Symposium in Amsterdam, Netherlands sponsored by DES Centnum and Netherlands Cancer Institute on *DES Effects - What More to Expect?* His talk, *Prenatal Exposure to DES: An Historical Perspective on the Future*. The presentation and question/answer session was conducted in real time while separated by the Atlantic Ocean and seven hour difference in time zones. Judging from feedback from the meeting organizers, it was a success and all done from New Orleans.

Invited Presentation: "Environment and women's health: Emerging trends and future directions", Symposium on Women's Reproductive Environmental Health at

the National Institutes of Environmental Health Sciences, NIH on January 30 2013 in the Research Triangle Park, NC.

Dr. Ricardo Mostany, *Invited Speaker*: "Altered synaptic dynamics during normal brain aging". 16th Annual Southeast Ultrafast Conference. Coherent-Georgia Institute of Technology, Atlanta, GA, January 2013.

Invited Speaker: "Structural and functional plasticity in peri-infarct cortex after stroke". Tulane University Neuroscience Program, Neuroscience Seminar Series. October 2012.

Invited speaker: "Two-photon excitation microscopy: applications in neuroscience". Tulane University School of Medicine Neuro Club, September 2012.

Dr. Prasad Katakam, *Oral Presentation*: Abnormal ER and mitochondrial communication underlies ER stress in

Noteworthy News, continued

cerebrovascular insulin resistance." Experimental Biology, Boston, MA, Monday April 22, 2013 during the Featured Topic Session: "Novel Pathways Regulating Microvascular Tone and Function."

Dr. Debasis Mondal, *Invited Seminar*: "Drug-efflux transporters in facilitating a sanctuary site for HIV-1". Stem Cell Interest group. Pennington Biomedical Research Center, Baton Rouge, LA. December, 2012.

Patent Approval: . Conjugates of Anti-HIV Drugs and Somatostatin Analogs # PCT/US02/30143, # PCT/US03/06657 (DOCKET NO: 07005/015W01)

Invited Lecture: "Antibacterial Drugs". Delgado Community College, New Orleans, LA, 02/2013
Invited Lecture: "Antiviral & Antifungal Drugs". Delgado Community College, New Orleans, LA, 3/2013

Dr. Samantha Gerlach, postdoctoral fellow working with

Dr. Debasis Mondal received a *Travel Award*, to attend the 9th Australian Peptide Conference. Queensland, Australia to present, "Efficacy of naturally occurring pore-forming peptides as potent anti-HIV agents." 2013.

Jean-Pyo Lee and **Lei Huang**, *Poster*: "Neural Stem Cell Therapy in the Ischemic Brain" American Academy of Neurology 65th Annual Meeting in San Diego, March, 2013.

Somhrita Dutta, Neuroscience Graduate student working with **Dr. Busija**, received a second place *Jean Yocum Harlan Award for Outstanding Graduate Student Presentation* at the Tulane University Neuroscience Program Retreat, March 2, 2012 for her presentation: "mTOR Pathway Mediates Diazoxide Preconditioning in Cultured Neurons." She will present a *Poster* at Tulane Research Day, April 3-4 and at Experimental Biology, April, 21-22, 2013 in Boston, MA.

Dr. Howard Mielke, *Invited Talk*, "Lead: the Global Poison-Humans,

Animals and the Environment", presented at the American Association for the Advancement of Science, February, 2013.

Conference Presentation, "Science and Policy to Protect Future Generations", March, 2013, to be published in *Chemosphere*.

Invited presentation, "Community lead (Pb) domains and exposure disparities: case study of pre and post-Katrina New Orleans.", Society of Toxicology, March, 2013. Other *Presentations and Workshops* in April: (1) "Lessons from New Orleans on the role of chemistry of the environment in children's health disparities, Chemistry Day, Tennessee State University. (2) LA Department of Environmental Quality's Annual Lead and Asbestos Workshop Healthy Housing Conference. (3) Healthy Housing Conference "Creating a Balanced and Community-Wide Approach for a Primary Lead Prevention Program."

Dr. Sarah Lindsey, *Seminar*.

"GPR30 mediates estrogen-sensitivity in a model of angio-

tensin II-dependent hypertension", Tulane University Department of Cell and Molecular Biology, March 3, 2012.

Larae Lee, graduate student working with **Dr. Stephen Braun**, received the Young Soo Choi Scholarship Award, Korean Toxicologists Association in America Special Interest Group, Society of Toxicology Endowment Fund. Abstract title: "The potential therapeutic role and toxicity of Secreted Antiviral Entry Inhibitory (SAVE) peptides in transduced MSCs for AIDS."

Dr. Milton Hamblin will be Chairing the session, "Novel Signaling Molecules in Vascular Injury and Inflammation" at Experimental Biology, April 22, 2013, Boston, MA.

Abstract for Tulane Research Day, "Mouse Aortic Endothelial and Smooth Muscle Cell Characterization: Estrogen Receptors and LOX-1 Signaling", April 3-4, 2013.

Faculty Publications

Katakam PV, Wappler EA, Katz PS, Rutkai I, Institoris A, Domoki F, Gáspár T, Grovenburg SM, Snipes JA, **Busija DW**. Depolarization of mitochondria in endothelial cells promotes cerebral artery vasodilation by activation of nitric oxide synthase. *Arterioscler Thromb Vasc Biol.* 2013 Apr;33(4):752-9. PMID: 23329133. *Editorial Commentary*: Freed JK and Gutterman DD. Mitochondrial Reactive Oxygen Species and Vascular Function: Less Is More. *Arterioscler Thromb Vasc Biol.* 2013;33:673-675. PMID: 23486769.

Howard W. Mielke, Christopher R. Gonzales, Eric Powell, Paul W. Mielke. Environmental and health disparities in residential communities of New Orleans: the need for soil lead intervention to advance primary prevention. *Environment International* 51:73-81, January, 2013.

Mostany, R.; Anstey, J.E.; Crump, K.L.; Maco, B.; Knott, G.; Portera-Cailliau, C. Altered synaptic dynamics during normal brain aging. *Journal of Neuroscience* 2013, 33(9):4094-4104.

Scruggs, B.A., Annie C Bowles, A.C., Zhang, X., Semon, J.A., Kyzar, E.J., Myers, L., Kalueff, A.V. and **Bunnell, B.A.** (2012) High-throughput screening of stem cell therapy for Globoid Cell Leukodystrophy using automated neurophenotyping of Twitcher mice. *Behavioural Brain Research*, 236C:35-47. PMID: 22951180

Bonvillain, R.W., Danchuk, S., Sullivan, D.E., Betancourt, A.M., Semon, J.A., Eagle, M.E., Mayeux, J.P., Gregory, A.N., Wang, G., Townley, I., Borg, Z., Weiss, D.J. and **Bunnell, B.A.** (2012) A non-human primate model of lung regeneration: detergent-mediated decellularization and recellularization with mesenchymal stem cells. *Tissue Engineering*, 18:2437-2452. PMID: 22764775

Strong, A.L., Semon, J.A., Strong, T.A., Santoke, T.T., Zhang, S., Harris E. McFerrin, H.E., Jeffrey M. Gimble, J.M. and **Bunnell, B.A.** (2012) Obesity-associated dysregulation of calpastatin and MMP-15 in adipose-derived mesenchymal stem cells results in their enhanced invasion. *Stem Cells*, 30:2774-2783. PMID: 22969001

Faculty Publications

Tomchuck, S.L., Norton, E.B., Garry, R.F., **Bunnell, B.A.**, Morris, C.A. Lucy C. Freytag, L.C. and Clements, J.D. (2012) Mesenchymal stem cells expressing foreign antigen elicit humoral immune responses. *Frontiers in Cellular and Infection Microbiology: Novel approaches to vaccine development*, 2:140. PMID: 23162801

Bonvillain, R.W., Zhang, S., Eagle, M.E., Danchuk, S., **Bunnell, B.A.** and Sullivan, D.E. (2012) Battling inflammation in acute lung injury and acute respiratory distress syndrome: stem cell-based therapy targeting the root cause of acute lung injury. *J of Pulm and Resp Med*, in press.

Zhang, S., Danchuk, S.D., Imhof, K.M.P., Semon, J.A., Scruggs, B.A., Bonvillain, R.W., Strong, A.L., Betancourt, A.M., Sullivan, D.E. and **Bunnell, B.A.** (2013) Comparison of the therapeutic effects of human and mouse adipose-derived stem cells in a murine model of lipopolysaccharide-induced acute lung injury. *Stem Cell Research and Therapy*, 4:13. PMID: 23360775\

Lasker GF, Pankey EA, Allain AV, Murthy SN, Stasch JP, **Kadowitz PJ**. The selective Rho-kinase inhibitor azaindole-I has long-lasting erectile activity in the rat. *Urology*. 2013 Feb;81(2):465.e7-14. .PMID:23374844

Murthy SN, Pankey EA, Banka AA, Badejo AM Jr, Wekerle R, Vilija V, Izadpanah R, **Kadowitz PJ**, Fonseca VA. Effects of insulin detemir on balloon catheter injured carotid artery in Zucker fatty rats. *J Diabetes Complications*. 2012 Nov;26(6):470-5. Epub 2012 Jul 4.

Lasker GF, Pankey EA, Allain AV, Dhaliwal JS, Stasch JP, Murthy SN, **Kadowitz PJ**. Analysis of Erectile Responses to BAY 41-8543 and Muscarinic Receptor Stimulation in the Rat. *J Sex Med*. 2013 Mar;10(3):704-18. Epub 2012 Sep 18.

Pankey EA, Badejo AM, Casey DB, Lasker GF, Riehl RA, Murthy SN, Nossaman BD, **Kadowitz PJ**. Effect of chronic sodium nitrite therapy on monocrotaline-induced pulmonary hypertension. *Nitric Oxide*, 2012 Jun 30;27(1):1-8. .004 Epub 2012 Mar 14.

Ma L, Yang Y, Sikka SC, **Kadowitz PJ**, Ignarro LJ, Abdel-Mageed AB, Hellstrom WJ. Adipose tissue-derived stem cell-seeded small intestinal submucosa for tunica albuginea grafting and reconstruction. *Proc Natl Acad Sci U S A*. 2012 Feb 4;109(6):2090-5. Epub 2012 Jan 23.

Amin A., Choi SK, Galan M, Kassan M, Partyka M, **Kadowitz P**, Henrion D, Trebak M, Belmadani S, Matrougui K. Chronic inhibition of endoplasmic reticulum stress and inflammation prevents ischaemia-induced vascular pathology in type II diabetic mice. *J. Pathol*. 2012 Jun;227(2):165-74. Epub 2012 Feb 17.

Li X, Abdel-Mageed AB, **Mondal D**, Kandil E. 2013. The NF- κ B signaling pathway as a therapeutic target against thyroid cancers. *Thyroid*. 23(2):209-18. PMID:23273524.

Mondal D, Liu K, Hamblin H, Lasky JA, and Agrawal KC. 2013. Nelfinavir Suppresses Insulin Signaling and Nitric Oxide Production by Human Aortic Endothelial Cells: Protective Effects of Thiazolidinediones. *The Ochsner Journal*: Vol. 13, No. 1, pp. 76-90.

Amrita Datta and **Debasis Mondal** 2013. "Development of Mouse Models for Cancer Research" in *Animal Biotechnology*. Elsevier/Academic Press. Life Sciences, USA. (*Accepted*).

Seminar Series - All seminars take place between 12:00 noon and 1:00 p.m. on Fridays.

April 5 — Dr. Raghu Vemuganti, Ph.D., Associate Professor, Department of Neurological Surgery, University of Wisconsin—Madison
"Role of microRNAs in ischemic brain damage."

April 12 — Dr. Frank Faraci, Ph.D., Professor of Internal Medicine and Pharmacology, University of Iowa Carver College of Medicine, Iowa City, IA.,
"Vascular disease during hypertension: The balance between angiotensin II and PPAR gamma"

April 19 — Dr. Cheryl S. Watson, Ph.D., Professor of Biochemistry and Molecular Biology, Center of Interdisciplinary Research on Women's Health & Medicine, University of Texas Medical Branch School of Medicine, Galveston, TX
"How Xenoestrogens Disrupt Physiologic Estrogen Signaling via Nongenomic Pathways"

Match 2013**Master's Program Highlights, Class of 2013**

The Department of Pharmacology wishes to congratulate Tulane School of Medicine class of 2013 on a successful match. It would also like to recognize those graduates who are also prior Master of Science in Pharmacology Degree Program graduates.

Neal Bost	Radiology-Diagnostic, Los Angeles, CA
David Cai	Otolaryngology, New Orleans, LA
Samita Das	Anesthesiology, New Orleans, LA
Matthew Gastaut	Internal Medicine, New Orleans, LA
	Radiation Oncology, Temple, TX
Albert Hor	Internal Medicine, Dallas, TX
David Newton	Family Medicine, Anderson, SC
Shelby Padway	Emergency Medicine, San Francisco, CA
Forest Swann	Surgery, Dallas, TX
	Ophthalmology, New Orleans, LA
Meghan Waters	Transitional, Seattle, WA
	Radiation Oncology, Seattle, WA
Martin White	Internal Medicine, New Orleans, LA

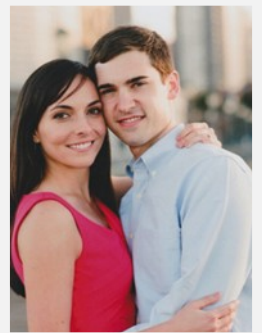
Again, congratulations and unbound success to the entire Tulane Medical School class of 2013.

Graduate Spotlight: Neal Bost

*Department of
Pharmacology's
Mission Statement:
We will educate and
train medical and grad-
uate students in the
principles of pharmacol-
ogy using modern tech-
niques and will conduct
state-of-the-art research
in pharmacology-related
fields in order to ex-
pand the frontiers of
science and medicine.*

My degree in Pharmacology provided me with a foundation of knowledge that has been an enormous help to me throughout my medical education, and will continue to help me throughout my career. The program not only prepared me for the world of clinical medicine, but also provided me with invaluable research experience and skills that I still employ today. In order to effectively teach the essential principles of medical pharmacology, students in the program are first taught basic physiology, anatomy, biochemistry, and pathology. Once I began medical school, I realized that early exposure to these concepts gave me a clear advantage over my fellow classmates. The faculty are brilliant, experienced researchers with a passion for teaching that is obvious the moment you meet them. I still keep in touch with the majority of my former classmates, many of whom have gone

on to enjoy great success in medicine and biomedical research. I recently matched into Diagnostic Radiology, and my classmates who continued on to medical school recently matched into highly sought after fields such as Otolaryngology, Radiation Oncology, and Emergency Medicine.

Neal Bost

Neal Bost & wife Erin

**Students and
Faculty**

SAVE THE DATE

Department of
Pharmacology

Annual

Crawfish Boil

**Saturday
April 13**

12:00 Noon to
4:00 p.m.

**Audubon Park
FLY Area**