

Pharmacology News

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TULANE UNIVERSITY SCHOOL OF MEDICINE DEPARTMENT OF PHARMACOLOGY

Message from the Chair Dr. David W. Busija

The department has had a very successful year in terms of teaching, research, and service. As we move toward the May 2014 graduation, I would like to 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 will enjoy seeing them during the graduation ceremonies. I wish all of them success in the future and thank them for choosing our department for their graduate studies. I also would like to congratulate our faculty for their activities that 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 on campus to present departmental seminars and they have all told me that they had an enjoyable interactions with students and faculty.

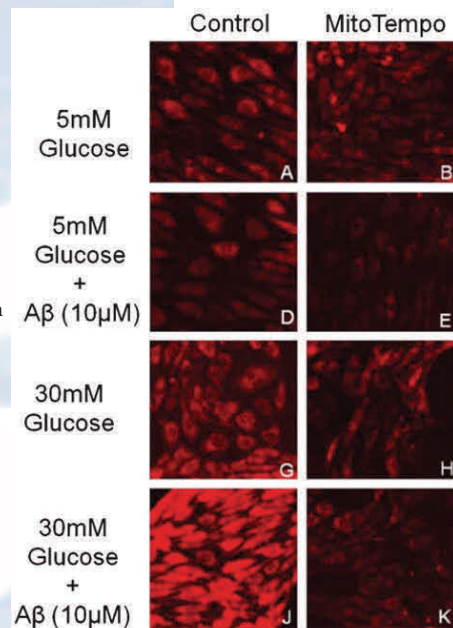
In The News

Dr. David Busija's research was recently featured on *New Orleans Fox 8 News* and Tulane's *New Wave* for discoveries made by researchers in his laboratory. His study, "Increased susceptibility to amyloid- β toxicity in rat brain microvascular endothelial cells under hyperglycemic conditions," published in the *Journal of Alzheimer's Disease*, 2014;38(1):75-83 has been of interest to the scientific community because it is the first laboratory documentation that high glucose levels increase the susceptibility of brain microvascular endothelial cells to A β toxicity supporting the idea that hyperglycemia is a major risk factor for vascular injury associated with Alzheimer's Disease. These findings support growing evidence pointing to glucose levels and vascular damage as contributors to dementia. Although neuronal involvement is a major factor in Alzheimer's development, recent evidence indicates that damaged cerebral blood vessels compromised by high blood

sugar play a role. Even though the links among Type 2 diabetes, brain blood vessels and Alzheimer's progression are unclear, hyperglycemia appears to play a role. The laboratory investigations were conducted by Dr. Cristina Carvalho under the direction of Dr. Busija. At the time of the study, Dr. Carvalho was a pre-doctoral candidate from the University of Coimbra in Portugal and her work in Dr. Busija's lab was an further exploration of work she began with at the University of Coimbra with Dr. Paula Moreira.

Dr. Carvalho studied cell cultures taken from the lining of cerebral blood vessels, one from normal rats and another from mice with uncontrolled chronic diabetes. They exposed the cells to beta amyloid and different levels of glucose and later measured their viability. Cells exposed to high glucose or beta amyloid alone showed no changes in viability. However, when exposed to hyperglycemic conditions and beta amyloid, viability decreased by 40 percent. Researchers suspect the damage is due to oxidative stress from the mitochondria.

Cells from diabetic mice were more susceptible to damage and death to beta amyloid protein, even at normal glucose levels. Increased toxicity of beta amyloid may damage the blood-brain barrier, disrupt normal blood flow to the brain, and decrease clearance of beta amyloid protein. The study's findings underscore the need to aggressively control blood sugar levels in diabetic individuals.



The combination of high glucose and beta amyloid protein lead to an increase in production of reactive oxygen species (free radicals) in cultured brain endothelial cells.

The Forty-Second Annual Schüeler Distinguished Lectureship in Pharmacology



L to R: Dr. Busija, Dr. Gustafsson, Dr. McLachlan

The Department of Pharmacology was honored to host Dr. Jan-Åke Gustafsson on March 14, 2014 for the 42nd Annual Schüeler Lecture. The Schüeler lecture was established in 1971. Of the 41 distinguished scientists who have given this annual lecture, most are members of the U.S. Academy of Sciences and 14 have received the Nobel Prize. Dr. Gustafsson is recognized worldwide for his translational research on steroid hormones and nuclear receptors. His achievements have represented breakthrough discoveries which have led to true paradigm shifts in his field and his research has been cited 80,101 times. He was the first to show that a nuclear receptor, the glucocorticoid receptor, is composed of three separate structural and functional domains, a ligand binding domain, a DNA binding domain, and a third domain identified by its immunogenic properties. Recently the Gustafsson laboratory again made the seminal and unexpected discovery of estrogen receptor beta, a second estrogen receptor, which shows functions far beyond reproductive physiology and a promising target in pharmaceutical development of novel drugs. Dr. McLachlan gave the introduction for the lecture. Dr. Gustafsson's spoke on "Biology and pathology of estrogen receptor beta and liver X receptor beta." He was also an honored guest at a dinner hosted by the department.

Faculty News

Dr. David Busija

- *Editorial Board:* Reappointed to the Editorial Board of the *American Journal of Physiology; Heart & Circulatory Physiology*, January, 2014. Prior appointments to this Board include: 1991-1993; 1995-2000; 2006-2012.
- *Grant Submissions:* (1) AHA, Jan. 2015; (2) NIH, Feb. 2014.
- *Other:* Elected Treasurer of the Association of Medical School Pharmacology Chairs, Feb. 2014.

Dr. Barbara Beckman

- *Outreach:* Member of the American Association of Medical Colleges, MCAT15 Validity Study committee.

Dr. Stephen Braun

- *Poster Presentations:* "Host Transcription Factors C/EBP β and Sp1 Associate with the HIV-1 Tat Protein to Potentiate Viral Reactivation from U937 Monocytic Cells." Debasis Mondal, Upal Roy, Edith Walker, Katelyn Robillard, Carter KD Guice and Stephen E. Braun. American Society of Microbiology Meeting, Texas South Central Branch. Nov. 1-5, 2013, New Orleans, LA.
- *Invited Speaker:* "Challenges of Bone Marrow Transplant and Gene Therapy in the Krabbe Monkey", Krabbe Translational Research Network Conference, Ft. Lauderdale, FL, March 12-14, 2014.

Dr. Bruce Bunnell

- *Invited Speaker:* (1) "Adult stem cells from adipose tissue and bone marrow ameliorate the symptoms of experimental autoimmune encephalomyelitis," 5th International Conference for Regenerative Surgery, Rome, Italy, Dec. 2013. (2) "Comparison Of The Therapeutic Effects Of Human And Mouse Adipose Stem Cells In A Murine Model Of Acute Lung Injury," IFATS 2013, New York, NY, Nov. 2013. (3) "Anti-inflammatory Properties of Mesenchymal Stem Cells, 4th Annual North American Veterinary Regenerative Medicine Conference," Atlanta, GA, Nov. 2013. (4) "Adult stem cells from adipose tissue and bone marrow ameliorate the symptoms of experimental autoimmune encephalomyelitis," TERMIS-AM 2013, Atlanta, GA, Nov. 2013. (5) "Adipose-derived cells: Standardization and Application," MSC 2013, Adult Stem Cell Therapy and Regenerative Medicine, Cleveland, OH, Oct. 2013.
- *Moderator:* (1) ASC Molecular Biology, Cancer and Gene Therapy, IFATS 2013, New York, NY, Nov. 2013. (2) Acting locally, affecting globally (Systemic Regenerative Effects) TERMIS-AM 2013, Atlanta, GA, Nov. 2013.
- *Reviewer:* (1) Therapeutic Approaches for Genetic Diseases Study Section, NIH, Bethesda, MD, March, 2014. (2) Grant Proposal Review Committee, Regenerative Medicine, Maryland Department of Health, Baltimore, MD, March, 2014. (3) Co-Chair, IMST-J Cell, Molecular, and Computational Biology Review Panel, NIH, Bethesda, MD, Oct. 2013. (4) Co-Chair, 10 NIBB K Review Panel, NIH, Bethesda, MD, Oct. 2013.

Dr. Phil Kadowitz

- *Seminar Speaker:* "Analysis of TRPV4 responses in the pulmonary and systemic bed." LSU Dept. of Physiology, 1/23/14.

Dr. Prasad Katakam

- *Reviewer:* American Heart Association Endothelial Biology 2, Fall 2013.
- *Grant Award:* Priority Rank: 1, "Impact of Hypoglycemia and Insulin on Hypoxia-Reoxygenation Injury in Brain Microvascular Endothelial Cells: Role of Calcium Microdomains," Louisiana Board of Regents Support Fund Research and Development Program: Research Competitiveness Subprogram, 081A-14, Duration: 3 years (\$45,000 per year).
- *Grant Submissions:* (1) American Heart Association, (2) NINDS R21.

Dr. Jean-Pyo Lee

- *Invited Speaker:* "Multimodal human neural stem cell-based brain repair," LSU Neuroscience Program. Feb. 3, 2014.
- *Grant Award:* School of Medicine Faculty Research Pilot grant. One year, starting June 2014-May 2015. Total award \$25,000.

Dr. Sarah Lindsey

- *Reviewer:* American Heart Association Peer Review, Cardiac Biology, Fall 2013.
- *Grant Submission:* NIH, Feb. 2014.

Dr. Howard Mielke

- *Other:* Fox 8 News feature: Lead content of Mardi Gras beads and alternative bead choices for the safety of our environment.

Dr. Debasis Mondal

- *Invited Speaker:* "Host Transcription Factors C/EBP β and Sp1 Associate with the HIV-1 Tat Protein to Potentiate Viral Reactivation from U937 Monocytic Cells." American Society of Microbiology Meeting, Texas South Central Branch. New Orleans, LA. Nov. 1-5, 2013.
- *Poster Presentations:* (1) Asim B. Abdel Mageed, Debasis Mondal, Madhu Lal, Marc Ferrer. "Neoplastic reprogramming of patient-derived adipose stem cells by prostate cancer cell-associated exosomes." Grantees Meeting: The Inaugural exRNA Communication Meeting, Bethesda, MD. Sept., 25 -27, 2013. (2) Debasis Mondal, Upal Roy, Edith Walker, Katelyn Robillard, Carter KD Guice and Stephen E. Braun. "Host Transcription Factors C/EBP β and Sp1 Associate with the HIV-1 Tat Protein to Potentiate Viral Reactivation from U937 Monocytic Cells." ASM Meeting, Nov.1-5, 2013. New Orleans, LA.
- *Reviewer:* (1) Department of Defense; Prostate Cancer Research Program: Training-Clinical and Experimental Therapeutics Study Section, Nov. 29-31, 2013. (2) Ochsner Translational Medicine Research Initiative Grants. Dec. 9-12, 2013.
- *Grant Submissions:* NIH, 10/28/2013.

Dr. Ricardo Mostany

- *Invited Speaker:* (1) "Age-related structural plasticity of cortical neurons: Does the aging brain learn differently from the young brain." Aging COBRE/Aging Interest Group Meeting. Tulane University, New Orleans, LA. Dec. 2013. (2) "Alteration of synaptic dynamics in the aging brain - A problem or a solution?" Department of Cell Biology and Anatomy, Fall 2013 Seminar Series. Louisiana State University, New Orleans, LA. Oct. 2013.
- *Grant Submissions:* (1) McKnight Foundation, Jan. 2014; (2) Microrzyza Crowdfunding, Dec. 2013.

Service to Tulane SOM: **Dr. Bunnell:** Co-Chair for the Research Strategic Planning and Research Advisory Committee; **Dr. Busija:** Chairman of the Basic Science Chairs; **Dr. Mondal:** Chair of the Medical School Faculty organization; **Dr. Lindsey:** Faculty Advisory Committee and BMS Admissions Committee; **Dr. Katakam:** Nominating Committee; **Dr. Hamblin:** University Senate, **Dr. Clarkson:** Curriculum Committee; **Dr. Kadowitz:** Personnel and Honors Committee; **Dr. Beckman:** Personnel and Honors and Grievance Committees.

Trainee News

George Lasker successfully defended his Ph.D. dissertation, "New Therapies For Erectile Dysfunction In Conditions Of Low Nitric Oxide Bioavailability: Investigation of Rho-Kinase Inhibitors And Soluble Guanylate Cyclase-Targeted Therapies" on Tuesday, 1/21/14. He completed his Ph.D. research with **Dr. Philip Kadowitz**. **Congratulations Dr. Lasker!**

Aditi Mathur successfully defended her Ph.D. dissertation, "Nelfinavir and Curcumin Coexposure Subverts ER-stress Towards Apoptosis to Sensitize Castration Resistant Prostate Cancer Cells to Docetaxel Therapy" on 10/28/13. She completed her Ph.D. studies with **Dr. Debasis Mondal**. **Congratulations Dr. Mathur!**

Amy Strong, successfully defended her dissertation in Dec. 2013. She completed her Ph.D. research with **Dr. Bunnell**. **Congratulations Dr. Strong!**

Rebecca Budish, working with **Dr. Sarah Lindsey**, passed her Thesis Prospectus meeting on October 30, 2013. **Congratulations Rebecca!**

Shreya Kashyap, working with **Dr. Sarah Lindsey**, received an **Honorable Mention** in the prestigious Goldwater Scholarship competition for outstanding students committed to research in science, mathematics, and engineering.

Somhrita Dutta, working with **Dr. David Busija**, will present a poster, "Involvement of reactive nitrogen species production in diazoxide-induced preconditioning in cultured cortical neurons of rats," at Experimental Biology, San Diego, CA, April 26-31, 2014. Somhrita also applied for an AHA pre-doctoral grant, January 14, 2014.

Dr. Ibolya Rutkai, working with **Dr. David Busija**, will give an oral presentation and two posters on "Effects of gender on mitochondria-derived middle cerebral artery function in rats" and "Preserved mitochondrial function in cerebral arteries following ischemia-reperfusion in the rat: the role of endothelium" at Experimental Biology, San Diego, CA, April 26-31, 2014. **Dr. Rutkai** applied for an AHA post-doctoral research grant, January 14, 2014.

Angellica Gordon, working with **Dr. Katakam** since October 2012, has received a Tulane Neuroscience Summer Research Program award for \$3,000. She presented a poster at Tulane Health Science Research Days (HSRD), April 2-3, 2014.

Ram Sure, working with **Dr. Katakam** presented a poster at Tulane HSRD, April 2-3, 2014.

Donna Edwards, working with **Dr. Debasis Mondal**, gave a poster presentation: "The Role of PRL-3 in Prostate Cancer." at the Southern Regional Education Board on Teaching and Mentoring Conference, Arlington, VA. 10/31-11/3/2013. She applied for a United Negro College Fund/Merck Graduate Science Dissertation Fellowship, 12/04/2013. She was awarded a BOR/SREB Dissertation Fellowship and nominated to the 64th Lindau Nobel Laureates Meeting for Graduate Students for 2014 and presented a poster at Tulane's HSRD, April 2-3, 2014.

Sharika Hagan, working with **Dr. Debasis Mondal** has applied for a *Burroughs Wellcome* post-doctoral enrichment program award for underrepresented minorities. Submitted: 1/14/2014.

Lauren Keys, working with **Dr. Mondal** will present her findings on "The anti-cancer efficacy of Curcumin against Castration Resistant Prostate Cancer cells" at Tulane HSRD, April 2-3, 2014.

Trivia Frazier and **Caasy Thomas-Porch**, working with **Dr. Bruce Bunnell**, both gave oral presentations at the International Federation for Adipose Therapeutics and Science in New York City, Nov. 2013.

Annie Bowles, working with **Dr. Bruce Bunnell** was chosen for "Best Presentation" at the annual Cell and Microbiology program retreat.

Digitology, by Dave Maag



Katrina taught us valuable lessons. At that time, the Center where I worked lost two computers on the first floor of the JBJ from flooding. Luckily, we had maintained a file server on the second floor where our important financial and grant-related documents were stored. Even so, the computers we lost affected our productivity for months afterward. When we returned from evacuation, Computer Operations ensured regular computer backups were performed and developed an evacuation plan including file backup and taking the backup device with them. Another outcome from the Katrina experience was that all first floor staff switched to portable computers. **But, have we learned a sustained lesson from the Katrina experience?** My observation is that we have too readily forgotten. *My purpose here is to reinforce the importance of data backup.* **What is a backup?** The short explanation: a backup is an up-to-date copy of the user's irreplaceable data files stored on a device that is physically separate from the device being backed up. **Why do we backup?** There are two reasons for backing up files: (1) To aid the recovery from a computer-related disaster, and (2) So we can take a copy of our data with us in case of evacuation and/or if something happens to our computer. This safeguard will also allow personnel to continue teaching, performing research, or supporting work from off-site. **When should we back up our files?** As often as possible. Using proper software, individuals should run backup every night, or once a week at the very least. If you must resort to manually copying your files, then put a recurring event reminder in your calendar to backup regularly. **How do we backup?** We use both hardware and software to backup. The best hardware for a backup is an external hard drive that can be easily carried and connect to another computer. Portable USB hard drives are getting cheaper all the time and are your best bet. I recommend Western Digital or Seagate products. **Do not use the following for backup:** A USB thumb drive, CD or DVD, a second internal hard drive or second partition on your computer's primary hard drive, floppy disks, and Zip disks. Backup software can be confusing to choose. I prefer simplicity when dealing with these types of software. For Apple users, **Time Machine** does an excellent job and requires little interaction to configure and maintain. Windows users can use **Backup and Restore** in the Control Panel. This tool is less intuitive than Time Machine and less experienced computer users may need help picking the best options, which I will be glad to provide. My preference for Windows, is a free software called **Cobian Backup**. Its menus are fairly easy to understand and it is very stable. Another backup option for Windows or Apple is the utilization of cloud-based file storage services that are available now. Tulane faculty and staff have access to 25 gigabytes of space on Microsoft's OneDrive (formerly Skydrive) and another 25 gigabytes at Box (not Dropbox). These services may be preferable to some folks because there is nothing to carry or lose. However, 25 gigabytes is seldom enough space for all files. So ... **Back up soon ... Back up often.** For help, contact me at dmaag@tulane.edu. Cobian Backup can be downloaded at: <http://www.cobiansoft.com>.

New Faces in Pharmacology Research

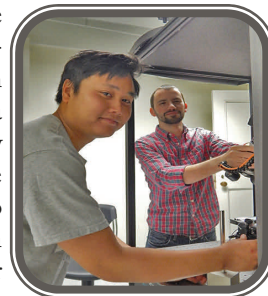


Angellica Gordon



Lauren Keys

Shreya Kashyap works in Dr. Lindsey's lab three days a week. She is a neuroscience student. Joanna Jao works for Dr. Milton Hamblin several days a week. She will graduate in December 2014 with a major in Public Health. Andrew Gundran, B.S., Clemson, a Master's student in the Neuroscience program and Andrew "Drew" Davidson, B.S., Lyon College, graduate student in the Cell & Molecular Biology Dept. have joined Dr. Mostany's lab to work toward their Ph.D. degrees. Angellica Gordon has been working several days a week with Dr. Katakam since October 2012. She will be graduating in May 2014 with major in Neuroscience. Ms. Lauren Keys works for Dr. Mondal. She is an undergraduate majoring in Neuroscience. Ms. Donna Edwards has joined the Department of Pharmacology as a Ph.D. student working with Dr. Mondal.



L to R: Andrew Gundran and Drew Davidson

Student Spotlight—Class of 2014

Masters of Science in Pharmacology Students

Saira Amjed, Garden City, NJ, graduated from Tulane. Saira has volunteered with Big Brothers/Big Sisters and Habitat for Humanity. She plans to study neurology and enjoys horseback riding in her spare time.

Annesha Basu, Sterling, VA, graduated from Univ. of Virginia. She has volunteered with several premed groups and is interested in pediatrics. Annesha enjoys dancing and hanging out with friends.

Shane Breazeale, Laguna Hills, CA, earned his BS at UC-Irvine. He has volunteered at several local hospitals. Shane is interested in cardiovascular pharmacology and reads for leisure.

Rachel Cohen, St. Louis, MO, graduated from Indiana Univ. She plans to study pediatric neurology and enjoys sports and making pottery when she isn't studying.

Vito D'Angelo, Jacksonville, FL, earned a BS in psychology at Univ. of North Florida. He has had experience as an emergency room scribe and working with homeless shelters. Vito is a newlywed and enjoys adventures with his wife. Vito plans to study emergency medicine in medical school.

Riddhi Machchhar, New Jersey, graduated from Univ. of Miami. She plans to study cardiology and emergency medicine. Riddhi enjoys music, reading, and exploring new places in her leisure time.

Justin McKone, Albany, CA, studied molecular toxicology at UC-Berkeley. During college, he was an EMT with Rock Medicine, a group providing medical care at concerts. Justin enjoys live music and running, and is interested clinical toxicology research and emergency medicine.

Ahsan Niazi, Houston, TX, UT-Austin. He enjoys reading and weight-

lifting. Throughout undergrad, Ahsan volunteered as an EMT. His research interests include stem-cell and gene therapy, and he plans to study neurology and tissue engineering in medical school.

Mimi Pham, Houston, TX, received a BS from Tulane. Mimi has volunteered at Children's Hospital and plans to study neuropharmacology. She takes delight in eating comfort foods in her spare time.

Taylor Smith, Rome, GA, graduated from the Univ. of Alabama. He has volunteered at several hospitals and at a Honduran community kitchen. He is interested in pathology and plays basketball and golf when he isn't studying.

Jessica Reed, Opelousas, LA, is an LSU alumna. Jessica has volunteered at several hospitals in Baton Rouge as well as Habitat for Humanity. She enjoys playing piano and exercising in her spare time.

Taylor Smith, Rome, GA, graduated from the Univ. of Alabama. He has volunteered at several hospitals and worked at a Honduran community kitchen. He is interested in pathology and plays basketball and golf when he isn't studying.

Bahia Wahba, New York, NY, graduated from Wellesley College. She volunteered for the Coalition for the Homeless in NY. Bahia enjoys reading, yoga, and city exploration. She is specifically interested in women's health, cancers, and infectious diseases.

Daniel Yoo, Metairie, LA, earned a BS in chemistry from Tulane Univ. Danny will study cardiology and surgery, and enjoys playing piano and weightlifting in his spare time.

Please contribute to [The Dr. Krishna C. Agrawal Education Fund](http://tulane.edu/som/departments/pharmacology/agrawalfund.cfm) to support our students.

This is an endowed pool of resources to support students in the Department of Pharmacology. To read the biography of Dr. Krishna please go to: <http://tulane.edu/som/departments/pharmacology/agrawalfund.cfm>

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, at 504-314-7380 or mmckeown@tulane.edu Tulane University, School of Medicine Office of Development #8745, 1430 Tulane Ave., NOLA 70112.

Graduate Spotlight: Dr. Michael Bogtach



My story is anything but traditional. I was born and raised in beautiful sunny Southern California, not knowing what a "crawfish" was or that a hurricane was a big storm located over water. I was the first person in the history of my family to graduate from college. However, I knew that I wasn't stopping at that, I wanted to be a doctor and for that I was up for whatever challenges or tribulations were ahead.

After college, I learned of the M.S. degree in Pharmacology at Tulane from a friend whose sister was an

alumni, and in an effort toward getting into medical school, I figured that it would be an excellent opportunity to submerge myself in a medical school setting. So to New Orleans I moved! I was in absolute culture shock after experiencing the French Quarter, seeing cockroaches that were the size of small rats, and weather that made me feel like I was in an oven, but I learned to love it!! Tulane's graduate program in Pharmacology was an unbelievable experience and I was so very fortunate to meet some of the people that would prove to be instrumental toward achieving my goals and accomplishments. I knew how priceless an opportunity it was to be part of the program and from day one, I dedicated myself to the fullest ... and this motivation is what I consider to be the cornerstone of my future success.

The graduate program in Pharmacology gave me the opportunity to obtain a first authorship publication and led to an appointment to the class of 2009 at Tulane School of Medicine. As a first year medical student, a "small storm" given the name Hurricane Katrina came through the city I was beginning to love which ended up putting my class on the map in terms of dealing with some of the most extraordinary circumstances and adversity ever seen by any class of medical students. Through this roller coaster of events, I learned the true meaning of the saying: "if it doesn't kill you, it makes you stronger!" We were able to come back to New Orleans my 2nd year and I continued in my medical studies, loving the experience and the energy of seeing a broken city rise back to its feet. In medical school, I decided that I wanted to pursue a career in the field of Orthopaedic Surgery. Through many interviews and soul searching, I decided to stay at Tulane for my Orthopaedic Surgery residency and was fortunate enough to be accepted to their great program.

I am now three months away from graduating from an incredible residency training and am about to move to San Francisco to do a private Sports Medicine Fellowship with S.O.A.R. (Sports Orthopaedic And Rehabilitation), where I will have the honor to be involved in caring for professional sports teams such as the San Francisco Giants. Although I'm excited to move on and see what my future has in store, I'm sad to see an era end of what New Orleans has given me, taught me, and most importantly, has contributed to the person I am today. I will forever love New Orleans.

Michael Bogtach, M.D., M.Sc.
PGY- 5

Publications

David W. Busija and **Prasad V. Katakam**. Mitochondrial Mechanisms in Cerebral Vascular Control: Shared Signaling Pathways with Preconditioning. *J. Vasc Res*, 2014, in press.

Carvalho C, Katz PS, Dutta S, **Katakam PV**, Moreira PI, **Busija DW**. Increased susceptibility to amyloid- β toxicity in rat brain microvascular endothelial cells under hyperglycemic conditions. *J Alzheimers Dis*. 2014;38(1):75-83.

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Publications are continued on the next page

Publications

Strong, A., Jiang, Q., Zhang, Q., Zheng, S., Boue, S., Elliott, S., Burow, M., **Bunnell, B.A.**, and Wang, G. (2014) Design, synthesis, and osteogenic activity of daidzein analogs on human mesenchymal stem cells. ACS Medicinal Chemistry Letters, in press.

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Parikh R, **Kadowitz PJ.** Angina pectoris: current therapy and future treatment options. Expert Rev Cardiovasc Ther. 2014 Jan 13.

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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.