

**2011-2012**  
**Summary of Scholarly Activities**  
**Department of Cell Biology and Neuroscience**

**I. PUBLISHED JOURNAL ARTICLES, BOOK CHAPTERS, AND PATENTS**

Ata H, Shrestha D, Oka M, Ochi R, Jong CJ, Gebb S, Benjamin J, Schaffer S, Hobart HH, Downey J, McMurtry I, Gupte R. Down-regulation of replication factor C-40 (RFC40) causes chromosomal missegregation in neonatal and hypertrophic adult rat cardiac myocytes. *PLoS One*. 2012;7(6):e39009. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3375256/pdf/pone.0039009.pdf>

Cioffi DL, Wu S, Chen H, Alexeyev M, St Croix CM, Pitt BR, Uhlig S, Stevens T. Orail determines calcium selectivity of an endogenous TRPC heterotetramer channel. *Circ Res*. 2012 May 25;110(11):1435-44.

Creighton J, Jian M, Sayner S, Alexeyev M, Insel PA. Adenosine monophosphate-activated kinase  $\alpha 1$  promotes endothelial barrier repair. *FASEB J*. 2011 Oct;25(10):3356-65.

Feinstein WP, Zhu B, Leavesley SJ, Sayner SL, Rich TC. Assessment of cellular mechanisms contributing to cAMP compartmentalization in pulmonary microvascular endothelial cells. *Am J Physiol Cell Physiol*. 2012 Mar;302(6):C839-52.

Gairhe S, Bauer NN, Gebb SA, McMurtry IF. Myoendothelial gap junctional signaling induces differentiation of pulmonary arterial smooth muscle cells. *Am J Physiol Lung Cell Mol Physiol*. 2011 Oct;301(4):L527-35.

Jing L, Chu XP, Jiang YQ, Collier DM, Wang B, Jiang Q, Snyder PM, Zha XM. *N*-Glycosylation of acid-sensing ion channel 1a regulates its trafficking and acidosis-induced spine remodeling. *J Neurosci*. 2012 Mar 21;32(12):4080-91.

Jing L, Jiang YQ, Jiang Q, Wang B, Chu XP, Zha XM. The interaction between the first transmembrane domain and the thumb of ASIC1a is critical for its *N*-glycosylation and trafficking. *PLoS One*. 2011;6(10):e26909. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3203923/pdf/pone.0026909.pdf>

Lin W, Lin Y, Li J, Harding HP, Ron D, Jamison S. A deregulated integrated stress response promotes interferon- $\gamma$ -induced medulloblastoma. *J Neurosci Res*. 2011 Oct;89(10):1586-95.

Lin Y, Jamison S, Lin W. Interferon- $\gamma$  activates nuclear factor- $\kappa$  B in oligodendrocytes through a process mediated by the unfolded protein response. *PLoS One*. 2012;7(5):e36408. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3344863/pdf/pone.0036408.pdf>

Ochoa CD, Alexeyev M, Pastukh V, Balczon R, Stevens T. *Pseudomonas aeruginosa* exotoxin Y is a promiscuous cyclase that increases endothelial Tau phosphorylation and permeability. J Biol Chem. 2012 Jul 20;287(30):25407-18.

Yuzefovych LV, Solodushko VA, Wilson GL, Rachek LI. Protection from palmitate-induced mitochondrial DNA damage prevents from mitochondrial oxidative stress, mitochondrial dysfunction, apoptosis and impaired insulin signaling in rat L6 skeletal muscle cells. Endocrinology. 2012 Jan;153(1):92-100.

Zeng H, Pappas C, Belser JA, Houser KV, Zhong W, Wadford DA, Stevens T, Balczon R, Katz JM, Tumpey TM. Human pulmonary microvascular endothelial cells support productive replication of highly pathogenic avian influenza viruses: possible involvement in the pathogenesis of human H5N1 virus infection. J Virol. 2012 Jan;86(2):667-78.

## II. PUBLISHED ABSTRACTS

Hargett LA, Brown L, Sayner S, Bauer N. Microparticles from pulmonary microvascular endothelial cells contain cyclic AMP. Am J Respir Crit Care Med. 2012 May 1;185:A4819. Available from: [http://ajrccm.atsjournals.org/cgi/reprint/185/1\\_MeetingAbstracts/A4819](http://ajrccm.atsjournals.org/cgi/reprint/185/1_MeetingAbstracts/A4819)

Sayner SL, Kundstadt, R, Nix, J. Pulmonary endothelial barrier disruption via bicarbonate stimulation of endogenous soluble adenylyl cyclase, AC10. FASEB J. 2012;26:1130.3.

## III. PUBLISHED BOOKS

Fields PA. The "how to" dissector for human anatomy for physician assistants. 9th ed. Mobile, AL: USA Publications Department; 2012, 75 p.

## IV. INVITED PRESENTATIONS

LeDoux SP. Invited speaker. Mitochondrial DNA repair in the central nervous system. Department of Toxicology, University of Kentucky; 2012 Jan 23; Lexington, KY.

Lin W. Invited speaker. The unfolded protein response in immune-mediated demyelinating diseases. Neuroscience Institute, Morehouse School of Medicine; 2012 Feb 24; Atlanta, GA.

Lin W. Invited speaker. The unfolded protein response in immune-mediated demyelinating diseases. Stark Neurosciences Research Institute, Indiana University School of Medicine; 2012 Mar 13; Indianapolis, IN.

Lin W. Invited speaker. The unfolded protein response in immune-mediated demyelinating diseases. Center for Neurodegenerative Diseases, University of Minnesota; 2012 Mar 28; Twin Cities, MN.

Lin W. Invited speaker. The unfolded protein response in immune-mediated demyelinating diseases. Center for Molecular Medicine and Genetics, Wayne State University; 2012 Apr 24; Detroit, MI.

Lin W. Invited speaker. The unfolded protein response in immune-mediated demyelinating diseases. Hunter James Kelly Research Institute, University of Buffalo; 2012 May 10; Buffalo, NY.

Rachek LI. Invited speaker. Mitochondrial DNA damage and insulin resistance. Mitchell Cancer Institute Research Seminar; 2011 Nov 22; Mobile, AL.

## V. NATIONAL PROFESSIONAL RECOGNITION

Mikhail Alexeyev: Grant Reviewer, Italian Ministry of Health; Reviewer, NIH Study Section ZES1 LWJ-J (MI); Editorial Board, *World Journal of Experimental Medicine*; Associate Editor, *International Journal of Cell Biology*, *International Journal of Molecular Biology*; Reviewer, *Aging Cell*, *Mitochondrion*, *Biology of the Cell*, *The International Journal of Biochemistry & Cell Biology*, *Human Molecular Genetics*, *Journal of Scientific Research*; *Journal of Zhejiang University*.

Ronald Balczon: Ad Hoc Reviewer, The Lytmos Group LLC.

Phillip Fields: Member, Society for the Study of Reproduction Awards Committee.

Anthony Gard: Ad Hoc Reviewer, *Journal of Neuroscience*.

Steve Kayes: Member, American Society of Parasitologists; Member of the Board, Alabama Department of Rehabilitation Services.

Susan LeDoux: Member, NIH Cancer Etiology Study Section; Member, Editorial Board *DNA Repair*; Journal Peer Reviewer, *DNA Repair*, *Science*, *Brain Research*, *Aging and Development*, *J Neuroscience*, *Carcinogenesis*, *Nucleic Acids Research*; President, Mitochondrial Research Society; Member, Physiology and Cell Biology Item Writing Committee of NBME.

Wensheng Lin: Ad Hoc Reviewer, *Acta Neuropathologica*, *Journal of Cellular Biochemistry*.

Lyudmila Rachek: Reviewer, *Journal of Cellular Physiology*, *PLoS One*, *Pharmacological Research*.

Sarah Sayner: Grant Reviewer, American Heart Association; Ad Hoc Reviewer, *AJP Lung*, *PLoS One*; Reviewer, meeting abstracts, Pulmonary Circulation Assembly, American Thoracic Society Conference; Chair, mini-symposium, American Thoracic Society Conference.

Glenn Wilson: Member, Editorial Board, *Molecular Development and Aging*; Reviewer, NIEHS Study Section; Chair, NIEHS ViCTER Study Section.

## **VI. BRIEF SUMMARY OF ACTIVITIES AND PROGRESS**

The Department places strong emphasis on both teaching and research. To enhance its research efforts, the Department sponsored visits from five distinguished scientists to meet with members in the Department and to present seminars on their research. Dr. Nicolas Musi from University of Texas HSC presented a seminar titled "Metabolic endotoxemia and insulin resistance" on October 6, 2011. Dr. Zhigang Xiong from Morehouse School of Medicine presented a seminar titled "ASICs as novel target for neurological disorder" on January 19, 2012. Dr. John McLaughlin from Ohio State University COM presented a seminar titled "Transplant models of patient-specific gamete-derived pluripotent stem cells" on February 23, 2012. Dr. Steven Green from University of Iowa presented a seminar titled "A culture of noise: An in vitro approach to the study of acoustic trauma" on April 26, 2012. Dr. Yidong Bai from University of Texas HSC presented a seminar titled "The role of mitochondrial respiratory complex I in tumorigenesis" on May 3, 2012.

In the area of education, the Department continued to provide over 30% of the instruction given to medical students in the first two years. The mean scores of our first year medical students on the mini board in both Gross and Developmental Anatomy and Cell Biology and Histology were over the 70<sup>th</sup> percentile. For second year medical students, the Department continued to play a leading role in the presentation of the Neuroscience course. The class average on the Neuroscience mini board was over the 90<sup>th</sup> percentile for the fourth straight year. These high miniboard scores clearly demonstrate that the quality of instruction provided by this Department is among the best in the country. In addition, faculty members from this Department taught Parasitology in the Medical Microbiology course and participated in the teaching of IDL I and IDL II, the Methods course and the Seminar course for first year graduate students. Moreover, they taught in IDL 630 and 631 for more advanced graduate students. In the area of resident training, a course on Pelvic Anatomy was provided for Residents in the Department of Obstetrics and Gynecology. Additionally, Allied Health courses were presented on Gross Anatomy for both Physician's Assistant students and Physical Therapy students, Neuroanatomy for Physical Therapy Students, Histology and Cell Biology for Biomedical Sciences students, and Anatomy and Physiology for Biomedical Science students. In addition, an Anatomy Laboratory was presented for Nursing Students. Finally, the Department presented two courses in the DREAM Program. In total, the Departmental faculty performed over 1360 hours of teaching. In the new curriculum, the Departmental faculty members continue to play key roles. Four faculty members serve as module directors and almost all of the faculty have important assignments within the modules.

In the area of community service, the Department expanded its efforts and provided health related education to over 750 high school and middle school students. Additionally, we played an integral part in the SCRUBS Program to attract students into the Health Professions.

Due to budgetary constraints, the Department was unable to recruit any new faculty over the past year. However, it is still a goal to increase the Neuroscience focus when it is possible to identify new faculty in the future. Over the past year, we lost two faculty members. Dr. Valentina Grishko died following a courageous bout with colon cancer. She was an outstanding scientist, and she will be greatly missed. Dr. Wensheng Lin left to take a faculty position at the University of Minnesota.