2009-2010
Summary of Scholarly Activities
Department of Physiology

I. PUBLISHED JOURNAL ARTICLES, BOOK CHAPTERS, AND PATENTS

Cohen MV, Yang X, Downey JM. A_{2b} adenosine receptors can change their spots. Br J Pharmacol 2010 Apr;159(8):1595-7.

Downey J, Cohen M. Endogenous mechanisms of cardioprotection. In: Hausenloy DJ, Yellon DM, editors. Cardioprotection. Oxford, England: Oxford University Press; 2009. Chapter 8. p. 79-87.

Hamanaka K, Jian MY, Townsley MI, King JA, Liedtke W, Weber DS, Eyal FG, Clapp MM, Parker JC. TRPV4 channels augment macrophage activation and ventilator-induced lung injury. Am J Physiol Lung Cell Mol Physiol 2010 Sep;299(3):L353-62.

He L, Hou X, Kanel G, Zeng N, Galicia V, Wang Y, Yang J, Wu H, Birnbaum MJ, Stiles BL. The critical role of AKT2 in hepatic steatosis induced by PTEN loss. Am J Pathol 2010 May;176(5):2302-8.

Iliodromitis EK, Downey JM, Heusch G. Kremastinos DT. What is the optimal postconditioning algorithm? J Cardiovasc Pharmacol Ther 2009 Dec;14(4):269-73.

Liu Y, Yang X, Yang XM, Walker S, Förster K, Cohen MV, Krieg T, Downey JM. AMP579 is revealed to be a potent A_{2b}-adenosine receptor agonist in human 293 cells and rabbit hearts. Basic Res Cardiol 2010 Jan;105(1):129-37.

Martens CJ, Ballard ST. Effects of secretogogues on net and unidirectional liquid fluxes across porcine bronchial airways. Am J Physiol Lung Cell Mol Physiol 2010 Feb;298(2):L270-6.

Nelson M, Ledoux J, Taylor M, Bonev A, Hannah R, Solodushko V, Shui B, Tallini Y, Kotlikoff MI. Spinning disk confocal microscopy of calcium signalling in blood vessel walls. Microscopy and Analysis 2010 Mar;24(2):5-8.

Rocic B, Bajuk NB, Rocic P, Weber DS, Boras J, Lovrencic MV. Comparison of antihyperglycemic effects of creatine and metformin in type II diabetic patients. Clin Invest Med 2009 Dec 1;32(6):E322.

Spadafora D, Hawkins EC, Murphy KE, Clark LA, Ballard ST. Naturally occurring mutations in the canine CFTR gene. Physiol Genomics 2010 Aug;42(3):480-5.

Townsley MI, Morisseau C, Hammock B, King JA. Impact of epoxyeicosatrienoic acids in lung ischemia-reperfusion injury. Microcirculation 2010 Feb;17(2):137-46.

Wang S, Lincoln TM, Murphy-Ullrich JE. Glucose downregulation of PKG-I protein mediates increased thrombospondin1-dependent TGF-β activity in vascular smooth muscle cells. Am J Physiol Cell Physiol 2010 May;298(5):C1188-97.

Wu S, Jian MY, Xu YC, Zhou C, Al-Mehdi AB, Liedtke W, Shin HS, Townsley MI. Ca^{2+} entry via α_{1G} and TRPV4 channels differentially regulates surface expression of P-selectin and barrier integrity in pulmonary capillary endothelium. Am J Physiol Lung Cell Mol Physiol 2009 Oct;297(4):L650-7.

Yang X, Cohen MV, Downey JM. Mechanism of cardioprotection by early ischemic preconditioning. Cardiovasc Drugs Ther 2010 Jun;24(3):225-34.

Yang XM, Liu Y, Liu Y, Tandon N, Kambayashi J, Downey JM, Cohen MV. Attenuation of infarction in cynomolgus monkeys: preconditioning and postconditioning. Basic Res Cardiol 2010 Jan;105(1):119-28.

Zhou C, Chen H, King JA, Sellak H, Kuebler WM, Yin J, Townsley MI, Shin HS, Wu S. α_{1G} T-type calcium channel selectively regulates P-selectin suface expression in pulmonary capillary endothelium. Am J Physiol Lung Cell Mol Physiol 2010 Jul;299(1):L86-97.

II. PUBLISHED ABSTRACTS

Ballard ST, Martens CJ. Measurements of unidirectional liquid secretion and absorption across porcine bronchial epithelium. Ped Pulmonol 2009 Oct;44(Suppl 32):244-5. Abstract no. 97.

Ballard ST, Martens CJ. How bronchial airways secrete thick mucus. Am J Respir Crit Care Med 2010 May;181:A6260. Available from: http://ajrccm.atsjournals.org/cgi/reprint/181/1_MeetingAbstracts/A6260

Francis M, Solodushko V, Taylor MS. Mathematical modeling of calcium signaling in porcine coronary arteries. FASEB J 2010;24:1065.13.

Jian MY, Thorneloe K, Townsley MI. Effect of GSK1016790A, a potent TRPV4 agonist, on lung endothelial permeability. FASEB J 2010;24:797.5.

Krieg T, Förster K, Xu Z, Rüdebusch J, Cuello F, Cohen MV, Downey JM. Cardioprotective A_{2b} adenosine receptors are localized to mitochondria rather than the sarcolemma. J Mol Cell Cardiol 2010 Mar;48(Suppl 1):S118. Abstract no. P-2-36-5.

Mayer A, Mouner M, Boothe P, Hashizume M, Parker JC. Modulation of TRPV4 Ca^{2+} entry by cytoskeletal tension. Proceedings of the 87th Annual Meeting of Alabama Academy of Science 2010 Mar 30-Apr 1; Normal, AL. Abstract no. 67.

Methner C, Cohen MV, Downey JM, Krieg T. Both A_{2a} and A_{2b} adenosine receptors are necessary to reduce infarct size at reperfusion in mouse hearts. J Mol Cell Cardiol 2010 Mar;48(Suppl 1):S159-60. Abstract no. P-3-25-5.

Parker JC, Hashizume M, Mayer A, Mouner M. TRPV4 channel activation modulates barrier properties in cultured lung epithelial and macrophage cell lines. Am J Respir Crit Care Med 2010 May;181:A3020. Available from: http://ajrccm.atsjournals.org/cgi/reprint/181/1_MeetingAbstracts/A3020

Spadafora D, Hawkins EC, Ballard ST. Progress in the search for CF-causing CFTR mutations in dogs. Ped Pulmonol 2009 Oct;44(Suppl 32):279. Abstract no. 179.

Torres RA, Drake DA, Solodushko V, Jadhav R, Smith ES, Rocic P, Weber DS. Slingshot-isoform specific regulation of cofilin activation during VSMC migration and neointima formation following vascular injury. FASEB J 2010;24:790.7.

Villalta PC, Rocic P, Townsley MI. Impact of cyclic strain on integrin expression in rat pulmonary microvascular endothelial cells, FASEB J. 2010;24:797.1.

Williams JM, Stockman SL, Lincoln TM, Pearce WJ. Postnatal maturation and hypoxic acclimatization modulate PKG-mediated activation of BK channels in ovine cereral arteries. FASEB J 2010;24:979.2.

Yang J, Eliasson B, Smith U, Cushman SW, Sherman A. Inverse correlation of adipose cell size with insulin sensitivity in lean, healthy individuals. Proceedings of American Diabetes Association 70th Scientific Sessions; 2010 Jun 25-29; Orlando, FL; p. LB23. Abstract no. 82-LB.

Yang X, Xin W, Cohen MV, Rich T, Downey JM. Suppressed radical production by intracellular A2b adenosine receptors in rabbit cardiomyocytes. J Mol Cell Cardiol 2010 Mar;48(Suppl 1):S34. Abstract no. P-1-22-4.

III. PUBLISHED BOOKS

IV. INVITED PRESENTATIONS

Ballard ST. Invited speaker. How airways secrete thick mucus. Children's Hospital of Philadelphia; 2010 Apr 20; Philadelphia, PA.

Ballard ST. Invited speaker. CFTR mutations in dogs. University of Pennsylvania; 2010 Apr 21; Philadelphia, PA.

Cohen MV. Invited speaker. The biology and mechanisms of ischemic preconditioning. Unofficial satellite symposium of 2009 American Heart Association Scientific Sessions; 2009 Nov 15; Orlando, FL.

Cohen MV. Invited speaker. Cardioprotective A_{2b} adenosine receptors are localized to mitochondria rather than the sarcolemma. XXth World Congress International Society for Heart Research; 2010 May 14; Kyoto, Japan.

Cohen MV. Invited speaker. Both A_{2a} and A_{2b} adenosine receptors are necessary to reduce infarct size at reperfusion in mouse hearts. XXth World Congress International Society for Heart Research; 2010 May 16; Kyoto, Japan.

Cohen MV. Invited speaker. Suppressed radical production by intracellular A2b adenosine receptors in rabbit cardiomyocytes. XXth World Congress International Society for Heart Research; 2010 May 13; Kyoto, Japan.

Downey JM. Invited speaker. Ischemic preconditioning and its elusive mechanism: protecting the ischemic heart. University College; 2009 Dec 1; London, England.

Downey JM. Invited speaker. A2b receptors in cardioprotection. Adenosine A_{2b} workshop; 2009 Dec 5; Padova, Italy.

Downey JM. Invited speaker. Can preconditioning be put to good use? Jos Spaan Retirement Symposium on Cardioprotection; 2010 Feb 19; Amsterdam, The Netherlands.

Downey JM. Invited speaker. Ischemic preconditioning, the key to protecting the heart. Anesthesia Grand Rounds. University of Rochester; 2010 Apr 8; Rochester, NY.

Downey JM. Invited speaker. Redox signaling in cardioprotection. XXth World Congress International Society for Heart Research; 2010 May 14; Kyoto, Japan.

Downey JM. Invited speaker. Protecting the ischemic heart. Peter Harris Distinguished Scientist Award. XXth World Congress International Society for Heart Research; 2010 May 14; Kyoto, Japan.

Downey JM. Invited speaker. Clinical cardioprotection: optimizing its translation. The Hatter Cardiovascular Institute Workshop 2010 Aug 17; Republic of Mauritius.

Lincoln TM. Invited speaker. Cyclic AMP dependent protein kinase and expression of smooth muscle specific genes. Experimental Biology 2010; 2010 Apr 27; San Diego, CA.

VI. BRIEF SUMMARY OF ACTIVITIES AND PROGRESS

The Department of Physiology maintained excellent overall extramural funding for the 2009-2010 year. Drs. David Weber and Stephen Ballard were recipients of grants from NIH and the Cystic Fibrosis Foundation, respectively. Drs. Michael Cohen, James Downey, and Mary Townsley received awards provided by pharmaceutical companies. In total, the Department of Physiology has over $2.5 million in extramurally funded awards over the past year.

Faculty in the Department of Physiology maintained high visibility in local, national, and international scientific communities. Several faculty members (Drs. Ballard, Downey, Lincoln, Taylor, Townsley, and Yang) presented external seminars and invited symposium talks at scientific meetings. Dr. Mary Townsley continues to chair the American Heart Association United Peer Review Steering Committee. Drs. Cohen, Downey, Lincoln, and Townsley all serve on the Editorial Boards of several scientific journals. Dr. Mark Taylor was named Director of the College of Medicine Imaging Core Facility. Dr. Townsley serves as Chair for the LCME Task Force, charged with a college-wide self-study of educational and academic programs.

Graduate student training activity continues this year with four Basic Medical Sciences (BMS) graduate students training in the Department of Physiology (Kiana Bradley, Michael Francis, Rebecca Torres, and Patricia Villalta). Departmental faculty sponsored Summer Medical Student Research students funded by the American Heart Association.

Teaching activities continue in the Department of Physiology. Dr. Townsley continued her role as course director for "Statistics and Experimental Design in Biomedical Research" and "Effective Scientific Writing." Dr. Lincoln continued as course director for Medical Physiology and Graduate Physiology Special Topics. Dr. Weber assumed the role of Director of the Vascular Biology Graduate Program, a focus area for Basic Medical Sciences. Physiology faculty continue to be actively involved in the Fundamentals of Basic Medical Sciences course offered in the first year. Dr. Mary Townsley continues to serve as the Principal Investigator on the NIH-funded Institutional Training Grant in Lung Biology.