

2010-2011
Summary of Scholarly Activities
Department of Biochemistry & Molecular Biology

I. PUBLISHED JOURNAL ARTICLES, BOOK CHAPTERS, AND PATENTS

Ata H, Rawat DK, Lincoln T, Gupte SA. Mechanism of glucose-6-phosphate dehydrogenase-mediated regulation of coronary artery contractility. *Am J Physiol Heart Circ Physiol*. 2011 Jun;300(6):H2054-63.

Bhardwaj A, Singh S, Srivastava SK, Honkanen RE, Reed E, Singh AP. Modulation of protein phosphatase 2A activity alters androgen-independent growth of prostate cancer cells: therapeutic implications. *Mol Cancer Ther*. 2011 May;10(5):720-31.

Cioffi DL. Redox regulation of endothelial canonical transient receptor potential channels. *Antioxid Redox Signal*. 2011 Sep 15;15(6):1567-82.

Cioffi DL, Hubler TR, Scammell JG. Organization and function of the FKBP52 and FKBP51 genes. *Curr Opin Pharmacol*. 2011 Aug;11(4):308-13.

Gupte RS, Ata H, Rawat D, Abe M, Taylor MS, Ochi R, Gupte SA. Glucose-6-phosphate dehydrogenase is a regulator of vascular smooth muscle contraction. *Antioxid Redox Signal*. 2011 Feb 15;14(4):543-58.

Jadhav R, Dodd T, Smith E, Bailey E, Delucia AL, Russell JC, Madison R, Potter B, Walsh K, Jo H, Rocic P. Angiotensin type I receptor blockade in conjunction with enhanced Akt activation restores coronary collateral growth in the metabolic syndrome. *Am J Physiol Heart Circ Physiol*. 2011 May;300(5):H1938-49.

Milton DL, Schneck AN, Ziech DA, Ba M, Facemyer KC, Halayko AJ, Baker JE, Gerthoffer WT, Cremo CR. Direct evidence for functional smooth muscle myosin II in the 10S self-inhibited monomeric conformation in airway smooth muscle cells. *Proc Natl Acad Sci U S A*. 2011 Jan 25;108(4):1421-6.

Pannell LK, Mott A, Rizk CB. Non-invasive diagnosis of endometriosis with proteomic technologies. In: Gardner D, Rizk B, Falcone T, editors. *Human assisted reproductive technology*. Cambridge: Cambridge University Press; 2011. Chapter 9, p. 88-100.

Perez J, Torres RA, Rocic P, Cismowski MJ, Weber DS, Darley-Usmar VM, Lucchesi PA. PYK2 signaling is required for PDGF-dependent vascular smooth muscle cell proliferation. *Am J Physiol Cell Physiol*. 2011 Jul;301(1):C242-51.

Singer CA, Lontay B, Unruh H, Halayko AJ, Gerthoffer WT. Src mediates cytokine-stimulated gene expression in airway myocytes through ERK MAPK. *Cell Commun Signal*. 2011 May 20;9(1):14.

Skarra DV, Goudreault M, Choi H, Mullin M, Nesvizhskii AI, Gingras AC, Honkanen RE. Label-free quantitative proteomics and SAINT analysis enable interactome mapping for the human Ser/Thr protein phosphatase 5. *Proteomics*. 2011 Apr;11(8):1508-16.

Tucker A, Driskell L, Pannell L, Wood D. Differential proteomic analysis of *Rickettsia prowazekii* propagated in diverse host backgrounds. *Appl Environ Microbiol*. 2011 Jul;77(14):4712-8.

Xia YC, Schuliga M, Shepherd M, Powell M, Harris T, Langenbach SY, Tan PS, Gerthoffer WT, Hogarth PM, Stewart AG, Mackay GA. Functional expression of IgG-Fc receptors in human airway smooth muscle cells. *Am J Respir Cell Mol Biol*. 2011 May;44(5):665-72.

Yang X, Liu Y, Yang XM, Hu F, Cui L, Swingle MR, Honkanen RE, Soltani P, Tissier R, Cohen MV, Downey JM. Cardioprotection by mild hypothermia during ischemia involves preservation of ERK activity. *Basic Res Cardiol*. 2011 May;106(3):421-30.

Yoo BK, Santhekadur PK, Gredler R, Chen D, Emdad L, Bhutia SK, Pannell L, Fisher PB, Sarkar D. Increased RNA-induced silencing complex (RISC) activity contributes to hepatocellular carcinoma. *Hepatology*. 2011 May;53(5):1538-48.

II. PUBLISHED ABSTRACTS

Ata H, Ochi R, Oka M, McMurtry I, Gebb S, Benjamin J, Gupte RS. Re-expression of DNA replication proteins in hypertrophic rat hearts. *Keystone Symposia*; 2011 Feb 21-27; Keystone, CO. Abstract no. A128.

Blandford J, Schambeau L, DiPoto C, Pannell LK. High level of iron adducts contribute to unassigned peaks in database searches. *The Proceedings of the American Society of Mass Spectrometry 59th Conference on Mass Spectrometry and Allied Topics*; 2011 Jun 5-9; Denver, CO. Abstract no. TP445.

Chettimada S, Gupte RS, Gupte SA. Role of glucose-6-phosphate dehydrogenase in pulmonary vascular remodeling. *FASEB J*. 2011;25:827.3.

Chettimada S, Kobelja R, Gupte RS, Gupte SA. Role of glucose-6-phosphate dehydrogenase in pulmonary artery smooth muscle cell proliferation and apoptosis. *Am J Respir Crit Care Med*. 2011 May 1;183:A3457. Available from: http://ajrccm.atsjournals.org/content/vol183/1_MeetingAbstracts/aindex.dtl

Cioffi EA, Alvarez DF, Pyakurel S, Cioffi D. Terminal alpha-2,3-linked sialic acids are a critical determinant of pulmonary endothelial barrier integrity. *Am J Respir Crit Care Med*. 2011 May 1;183:A4177. Available from: http://ajrccm.atsjournals.org/content/vol183/1_MeetingAbstracts/aindex.dtl

Comer BS, Kogut P, Camoretti-Mercado B, Solway J, Gerthoffer WT. Mirna expression in asthmatic airway smooth muscle airway smooth muscle cells. *Am J Respir Crit Care Med*. 2011 May 1;183:A3630. Available from: http://ajrccm.atsjournals.org/content/vol183/1_MeetingAbstracts/aindex.dtl

Dodd T, Jadhav R, Wiggins L, Smith E, Russell JC, Rocic P. p38 MAPK-dependent regulation of MMPs during coronary collateral growth. *FASEB J*. 2011;25:1031.9.

Dodd T, Wiggins L, Jadhav R, Smith E, Rocic P. MMP regulation during coronary collateral growth in the metabolic syndrome. *Keystone Symposia*; 2011 Jan 23-28; Keystone, CO. Abstract no. A324.

Gerthoffer WT, Murphy LT, Battles M, Charaff E, Malozzi C, Wenzel G, Massey CV. Dynamic changes in plasma HSP27 levels and phosphorylation in patients with cardiovascular disease. *FASEB J*. 2011;25:791.10.

Grankvist N, Amable L, Ortsater H, Sjöholm A, Honkanen RE. Genetic disruption of Ser/Thr protein phosphatase 5 in mice reveals insight into its role in UV light-induced signal transduction. *Europhosphatases 2011: Protein Phosphatase: From Molecular to Networks*; 2011 Jul 18-23; Baden, Austria. Abstract no. P29.

Hecker PA, Galvao TF, O'Shea KM, Brown BH, Henderson R, Riggle H, Gupte SA, Stanley WC. Metabolic and cardiac dysfunction are unaffected by high sugar intake in a hamster model of heart failure. *FASEB J*. 2011;25:825.11.

Hutcheson R, Musiyenko A, Smith E, Rocic P. MicroRNA regulation of vascular smooth muscle phenotype and coronary growth. *FASEB J*. 2011;1092.9.

Joshi SR, Abe K, Oka M, McMurtry IF, Gerthoffer WT. Mir-145 in vascular smooth muscle phenotype in pulmonary arterial hypertension. *Am J Respir Crit Care Med*. 2011 May 1;183:A3448. Available from: http://ajrccm.atsjournals.org/content/vol183/1_MeetingAbstracts/aindex.dtl

Kadeba K, Chen H, Wu S, Scammell JG, Cioffi DL. Regulation of pulmonary endothelial store-operated calcium entry by FK506-binding immunophilins. *Am J Respir Crit Care Med*. 2011 May 1;183:A1946. Available from: http://ajrccm.atsjournals.org/content/vol183/1_MeetingAbstracts/aindex.dtl

McLendon JM, Joshi SR, Abe K, Oka M, McMurtry IF, Gerthoffer WT. Role of MicroRNA-204 in arterial smooth muscle phenotype in pulmonary hypertension. *Am J Respir Crit Care Med*. 2011 May 1;183:A4947. Available from: http://ajrccm.atsjournals.org/content/vol183/1_MeetingAbstracts/aindex.dtl

Morrow R, Richards W, Alvarez DF, Cioffi DL. Anti-endothelial cell antibodies bind to pulmonary endothelium in type II diabetes. *Am J Respir Crit Care Med*. 2011 May 1;183:A1964. Available from: http://ajrccm.atsjournals.org/content/vol183/1_MeetingAbstracts/aindex.dtl

Murphy F, Finan M, Rocconi R, Pannell L. Characterization of the N-linked glycome from ascites as an early indicator for ovarian cancer. 59th American Society for Mass Spectrometry Annual Meeting; 2011 Jun 5-9; Denver, CO. Abstract no. MP15-289.

Murphy F, Finan M, Rocconi R, Pannell L. Characterization of the N-linked glycome of ovarian cancer ascites. University of South Alabama 18th Annual Research Forum; 2011 Mar 31; Mobile, AL. Abstract no. 67.

Ochi R, Gupte RS, Ata H, Gupte SA. Apocynin exerts rapid inhibition and slow stimulation of I_{Ca,L} associated with changes of reactive oxygen species in vascular smooth muscle cells. *FASEB J*. 2011;25:821.20.

Ochi R, Gupte SA. Apocynin induces rapid inhibition and slow facilitation of I_{Ca,L} and decrease and increase of reactive oxygen species in rat ventricular myocytes. *Biophys J*. 2011 Feb 2;100(3 Suppl 1):197a.

III. PUBLISHED BOOKS

IV. INVITED PRESENTATIONS

Cioffi DL. Invited speaker. Glycomorphology of the pulmonary vasculature: Endothelial cell glycocalyx and endothelial barrier function. Biomedical Sciences Society-Allied Health, University of South Alabama; 2010 Nov 3; Mobile, AL.

Cioffi DL. Invited speaker. A role for immunophilins in regulation of store-operated calcium entry. Mitchell Cancer Institute; 2011 Jun 21; Mobile, AL.

Gerthoffer WT. Invited speaker. Novel RNAi therapy of pulmonary hypertension. EGEN Corporation; 2011 Mar 4; Huntsville, AL.

Gerthoffer WT. Invited speaker. MicroRNAs and pulmonary hypertension. Bloomberg School of Public Health, Johns Hopkins University; 2011 Mar 10; Baltimore, MD.

Gerthoffer WT. Invited speaker. Post-transcriptional gene silencing in airway and vascular remodeling. Young Investigators Meeting, University of Manitoba; 2011 May 9; Winnipeg, CA.

Gerthoffer WT. Invited speaker. HSP20 as a novel endogenous bronchodilator. Grant Review Symposium – a multi-scale modeling approach to airway hyperresponsiveness; from molecule to organ. American Thoracic Society Meeting; 2011 May 14; Denver, CO.

Rocic P. Invited speaker. Beneficial effects of physiological Ang II and ROS levels in coronary collateral formation. Experimental Biology; 2011 Apr 10; Washington, DC.

V. NATIONAL PROFESSIONAL RECOGNITION

Cioffi DL, Reviewer, *Journal of Cellular Biochemistry, Antioxidants & Redox Signaling, American Journal of Physiology-Lung Cellular & Molecular Physiology, Therapeutic Advances in Respiratory Disease*.

Gerthoffer WT, Editorial Board Member, *American Journal of Physiology, Cell Physiology*; Editorial Board Member, *American Journal of Physiology, Lung Cell and Molecular*; Editorial Board Member, *Cell Health and Cytoskeleton*; Associate Editor, *Comprehensive Physiology, Respiratory Physiology*; Chairman, American Thoracic Society, Planning Committee of the RSF Assembly; Reviewer NIH, VCMB study section (ad hoc); Member Conflict: Asthma, Immunology; Chair, Lung Host Defense.

Gupte SA, Editorial Board Member, *American Journal of Physiology, Heart and Circulatory*; Guest Editor, *Antioxidant & Redox Signaling*; Study Section, Italian Health Ministry, Government of Italy; Swiss Science Foundation and Government of Switzerland.

Honkanen RE, Editorial Board Member, *The Open Enzyme Inhibition Journal*; NIH ZRG1 BST-J51 Review Group Panel Member, NIH Roadmap Initiative (Assay Development for High Throughput Molecular Screening).

Rocic P, Editorial Board Member, *American Journal of Physiology, Heart and Circulatory Physiology Microcirculation*; Peer Review Committee Member-American Heart Association and Vascular Wall Biology.

VI. BRIEF SUMMARY OF ACTIVITIES AND PROGRESS

The department continues to undergo significant changes in personnel. Retirement of senior personnel has been balanced by successful searches to fill vacant faculty positions with the most recent recruit, Dr. Lawrence LeClaire, joining the faculty in January 2011. Dr. LeClaire trained in the Department of Cell and Tissue Biology, University of California, San Francisco. His expertise in protein biochemistry of the actin cytoskeleton complements existing research on actin binding proteins in the department and in the College of Medicine. Two new postdoctoral fellows joined the department to work with Dr. Donna Cioffi. Dr. Xiogan Wang (Chinese Academy of Medical Sciences) and Dr. Audrey Vasauskas (University of South Alabama) add to an active group of trainees in the department.

Education activities in the department have focused on three major activities: updating the medical biochemistry course, expanding the contributions of department faculty to graduate education, and revision of the undergraduate medical curriculum. Medical Biochemistry was transformed to a format more consistent with current integrative approaches in medical education. The faculty continued to add case-based lectures and self-directed modules. All department teaching faculty adopted the student-response system for in-class assessments. The senior faculty all contributed to multiple IDL and departmental graduate courses. Five third year graduate students and two second year students are training with department faculty members (Gerthoffer, S. Gupte, Rocic, Cioffi).

Teaching faculty also contributed to a summer biochemistry course in phase II of the DREAM program which was directed by Dr. Sachin Gupte. The program targets disadvantaged undergraduate students interested in a medical career. Drs. Cioffi, Gerthoffer, Gupte, Honkanen, and Rocic contributed lectures. Several postdoctoral fellows (Drs. Joshi, Wang and Vasauskas) also presented lectures as part of the mentoring process for academic career development. The department also contributed to biomedical science education by hosting four sophomore medical students and a USA undergraduate in the College of Medicine and UCUR summer research programs.

The level of research activity and research funding remains strong. Three of the four junior faculty members direct active labs funded by NIH grants. The senior faculty R. Honkanen (Protein phosphatase-5) and W. Gerthoffer (small heat shock proteins) continue to be supported by NIH grants. Two fellowships from the American Heart Association were awarded to department trainees. Dr. A. Vasauskas working with Dr. D. Cioffi will be supported by a postdoctoral fellowship. Rebecca Hutcheson (GSII) training with Dr. Rocic will be awarded a predoctoral fellowship. In addition, new grant applications from every faculty member have either been submitted, or are in development. The faculty publication rate and impact continues to improve. The impact of research in the department is demonstrated by publication of multiple invited reviews and chapters and by invitations to speak at symposia at national meetings (Gupte, Gerthoffer, Rocic) and at other universities. A publication from Dr. Honkanen's lab was highlighted on the cover page of the Journal of Organic Chemistry. A high level of scholarly activity is also evidenced by participation on national and regional peer review committees and memberships on journal editorial boards. With continued expansion and development of recently hired faculty members the department anticipates positive changes in the medical and graduate curriculum to continue as well as continued growth in the scope and impact of scholarly activity.