

MOLECULAR & CELLULAR BIOLOGY & PATHOBIOLOGY PROGRAM

Donald R. Menick, Ph.D., Director

Division Directors

Tien Hsu, Ph.D.
Genetics and Development

Steven A. Rosenzweig, Ph.D.
Cell Regulation

Eric R. Lacy, Ph.D.
Marine Biomedicine and
Environmental Science

Adam Smolka, Ph.D.
Structural Biology

Donald R. Menick, Ph.D.
Cardiovascular Biology

Dennis K. Watson, Ph.D.
Cancer Biology

Michael Rosol, Ph.D.
U. Joseph Schoepf, M.D.
Cardiovascular Imaging

Keith Kirkwood, DDS, Ph.D.
Caroline Westwater, Ph.D.
Craniofacial Biology

Progress Committee

Dr. Craig Beeson
Dr. Michael J. Kern
Dr. Ed Krug
Dr. Steven W. Kubalak
Dr. Donald R. Menick

STUDENTS

Student's Name	Matriculation Date	Mentor	Degree Sought
Obdaidullah Aseem	2006	Dr. Scott Argraves	Ph.D.
Vondina Brown	2007	Dr. Michael Wargovich	Ph.D.
Stephanie A. Brunelle	2005	Dr. Fran Van Dolah	Ph.D.
Colleen E. Bryan	2005	Dr. Steven Christopher	Ph.D.
Amanda Hailey Buff	2007	n/a	DMD
Jonathan T. Butler	2003	Dr. Naren Banik	MD/Ph.D. Defended: June 12, 2009
Jason Guichard	2000	Dr. Craig Beeson	MD/Ph.D. Defended: May 2, 2008
Blake C. Ellis	2004	Dr. Mark Kindy	Ph.D.
Jocelyn R. Flanary	2004	Dr. Paul Becker	Ph.D.

Christopher Gault	2003	Dr. Lina Obeid	MD/Ph.D.
Carmen Gentile	2008	n/a	
Angela Edwards-Ghatnekar	2003	Dr. Maria Trojanowska	Ph.D. Defended: April 24, 2009
Elizabeth Grant-Burton	2004	Dr. Steven Kubalak	Ph.D.
George Daniel Grass	2008	Dr. Bryan Toole	MD/Ph.D.
Christina Grek	2003	Dr. John Baatz	Ph.D. Defended: April 24, 2009
Alfred C. Griffin, III	2008	Dr. Sakamuri Reddy	DMD
Harikishnan Keerthi	2008	n/a	
Loretta L. Hoover	2003	Dr. Steve Kubalak	MD/Ph.D Defended: June 5, 2009
Linda A. Heffernan	2004	Dr. Lina Obeid	MD/Ph.D.
Rebecca K. Johnston	2004	Dr. Dhan Kuppuswamy	MD/Ph.D. Defended: February 13, 2009
Nikole E. Kimes	2006	Dr. Pamela Morris	Ph.D.
Hannah Lane	2007	Dr. Michael Wargovich	Ph.D.
Tod A. Leighfield	2005	Dr. John Ramsdell	Ph.D.
Marie M. Lockhart	2007	Dr. Kyu-Ho Lee	Ph.D.
Jillian G. Lynch	2007	Dr. Frances Van Dolah	Ph.D.
Barbara Lyon	2005	Dr. Giacomo Ditullio	Ph.D.
Erin E. Morris	2004	Dr. Maria Trojanowska	Ph.D.
Philip C. Moschella	2002	Dr. Dhan Kuppuswamy	MD/Ph.D.
Thomas D. Mullen	2003	Dr. Lina Obeid	Ph.D.
Jennifer K. Mulligan	2004	Dr. Rita Young	Ph.D. Defended: March 5, 2009
Benjamin Neely	2004	Dr. Pam Morris & Dr. Paul Bertsch	Ph.D.
Michael P. O'Quinn	2001	Dr. Robert Gourdie	MD/Ph.D.
Kathryn Alexa Orr	2006	Dr. Lina Obeid	Ph.D.
Joseph Palatinus	2005	Dr. Robert Gourdie	MD/Ph.D.
Christopher Potter	2003	Dr. Alexander Awgulewitsch	Ph.D.
Nathaniel Pruett	2004	Dr. Alexander Awgulewitsch	Ph.D.
Joshua Matthew Rhett	2004	Dr. Robert Gourdie	Ph.D.
Jessica S. Ross	2006	Dr. Ashley Cowart	Ph.D.
Arindam Saha	2004	Dr. Adam Smolka	Ph.D. Defended: March 11, 2009

Glady H. Samuel	2005	Dr. Maria Trojanowska	Ph.D.
Kelli Margot Sas	2003	Dr. John Baatz	Ph.D. Defended: April 21, 2009
Brian Snarr	2004	Dr. Andy Wessels	Ph.D. Defended: August 12, 2008
Tejas S. Tirodkar	2006	Dr. Christina Voelkel- Johnson	Ph.D.
Maria I. Vizcaino	2005	Dr. Pam Morris & Dr. Peter Moeller	Ph.D.
Ali Vural	2007	Dr. Steve Lanier	Ph.D.
Brent A. Wilkerson	2007	Dr. Kelley Argraves	Ph.D.
Parker Callaway Wilson	2005	Dr. Ayad Jaffa/Dr. Louis Luttrell	MD/Ph.D.
Elaine E. Wirrig	2003	Dr. Andy Wessels	Ph.D. Defended: April 23, 2009
Julie A. Woolworth	2004	Dr. Tien Hsu	Ph.D. Defended: March 13, 2009
Jennifer Yordy	2003	Dr. John Kucklick	Ph.D. Defended: April 14, 2009
Youssef Zeiden	2003	Dr. Yusuf Hannun	MD/Ph.D. Defended: May 24, 2007

Students' publications

Journals

Butler J.T., Samantaray S., Beeson C.C., Ray S.K., Banik N.L. 2009. Involvement of Calpain in the Process of Jurkat T cell Chemotaxis. *JNR* 89 (3) 626-635.

Samantaray, S., **Butler, J.T.**, Ray, S.K., Banik, N.L. 2008. Extranigral Neurodegeneration in Parkinson's Disease: A role for Calpain in Neurodegeneration. *Ann NY Acad Sci.* 1139, 331-336.

Janardhanan, R., **Butler, J.T.**, Banik N.L., Ray S.K. 2009. N-(4-hydroxyphenyl) retinamide induced astrocyte differentiation potentiates paclitaxel induced cell cycle arrest sensitizing glioblastoma cells to apoptosis. *Brain Research* 1268, 142-153.

Das A., Guyton M.K., **Butler J.T.**, Ray S.W., Banik N.L. 2008. Activation of Calpain and Caspase Pathways in Demyelination and Neurodegeneration in Animal Models of Multiple Sclerosis. *CNS & Neurological Disorders – Drug Targets.* 7, 313-320.

Samantaray S., Knaryan V.H., **Butler J.T.**, Swapan R.K., Banik N.L. 2008. Spinal cord degeneration in C57BL/6N mice following induction of experimental parkinsonism with MPTP. *J. Neurochem.* 104(5):1309-320.

Anelli Viviana, **Gault Christopher R.**, Cheng Amy B., Obeid Lina M.. Sphingosine kinase 1 is up-regulated during hypoxia in U87MG glioma cells. Role of hypoxia-inducible factors 1 and 2. *Journal of Biological Chemistry* 2008; 283 (6):3365-75.

Gentile C., Fleming P. A., Mironov V., Argraves K. M., Argraves W. S., Drake C. J.. VEGF-mediated Fusion in the generation of uniluminal vascular spheroids. *Developmental Dynamics* 2008; 237(10):2918-25.

Gentile C., Fleming P., Zhang J., Visconti R. P., Visconti C. J., Mironovi V.. Bioprinting of Blood Vessels: Vascular Tissue Spheroids as Building Blocks. *International Journal of Artificial Organs* 2008; 31 (7):583-583.

Angela Ghatnekar and Maria Trojanowska. GATA-6 is a novel transcriptional repressor of the human Tenascin-C gene expression in fibroblasts *Biochim Biophys Acta.* 2008 March; 1779(3):145–151. Published online 2007 December 14.

Ghatnekar G. S., O'Quinn M. P., Jourdan L. J., Gurjarpadhye A. A., Draughn R. L., Gourdie R. G.. Connexin43 carboxyl-terminal peptides reduce scar progenitor and promote regenerative healing following skin wounding. *Regenerative Medicine* 2009; 4 (2):205-23.

Rhett J. M., **Ghatnekar G. S.**, **Palatinus J. A.**, **O'Quinn M.**, Yost M. J., Gourdie R. G.. Novel therapies for scar reduction and regenerative healing of skin wounds. *Trends in Biotechnology* 2008;26 (4):173-180.

Loretta L. Hoover, **Elizabeth G. Burton**, Bonnie A. Brooks, and Steven W. Kubalak. The Expanding Role for Retinoid Signaling in Heart Development *Scientific World Journal.* 8: 194–211. Published online 2008 February 25.

Bledsoe G., Shen B., Yao Y. Y., Hagiwara M., Mizell B., Teuton M., **Grass D.**, Chao L., Chao J.. Role of tissue kallikrein in prevention and recovery of gentamicin-induced renal injury. *Toxicological Sciences.* 2008; 102 (2):433-443.

Pettigrew L. C., Kindy M. S., Scheff S., Springer J. E., Kryscio R. J., Li Y., **Grass D. S.** Focal cerebral ischemia in the TNFalpha-transgenic rat. *Journal of Neuroinflammation* 2008; 5

Mark G. Slomiany, **G. Daniel Grass**, Angela D. Robertson, Xiao Y. Yang, Bernard L. Maria, Craig Beeson, and Bryan P. Toole. Hyaluronan, CD44, and Emmprin Regulate Lactate Efflux and Membrane Localization of Monocarboxylate Transporters in Human Breast Carcinoma Cells. *Cancer Research*. 69:1293-1301, 2009.

Grek C. L., Newton D. A., Qiu Y. Z., Wen X. J., Spyropoulos D. D., Baatz J. E.. Characterization of Alveolar Epithelial Cells Cultured in Semipermeable hollow fibers exp. *Lung Res* 2009; 34:155-74.

Sridharan V., **Guichard J.**, Li C. Y., Muise-Helmericks R., Beeson C. C., Wright G. L.. O-2-sensing signal cascade: clamping of O-2 respiration, reduced ATP utilization, and inducible fumarate respiration. *American Journal of Physiology-Cell Physiology* 2008; 295 (1):C29-C37.

Keller J. M., Swarthout R. F., Carlson B. K. R., **Yordy J.**, **Guichard A.**, Schantz M. M., Kucklick J. R. Comparison of five extraction methods for measuring PCBs, PBDEs, organochlorine pesticides, and lipid content in serum. *Analytical and Bioanalytical Chemistry* 2009; 393 (2):747-760.

Hoover L. L., Burton E. G., O'Neill M. L., Brooks B. A., Sreedharan S., Dawson N. A., Kubalak S.W.. Retinoids regulate TGF beta signaling at the level of Smad2 phosphorylation and nuclear accumulation. *Biochimica Et Biophysica Acta-Molecular Cell Research* 2008; 1783 (12):2279-2286.

Hoover L. L., Kubalak S. W.. Holding their own: The Noncanonical roles of smad proteins. *Science Signaling* 2008; 1 (46):pe48.

Christopher D. Willey, Arun P. Palanisamy, **Rebecca K. Johnston**, Santhosh K. Mani, Hirokazu Shiraishi, William J. Tuxworth, Michael R. Zile, Sundaravadeivel Balasubramanian, Dhandapani Kuppuswamy. STAT3 Activation in Pressure-Overloaded Feline Myocardium: Role for Integrins and the Tyrosine Kinase BMX *Int J Biol Sci*. 2008; 4(3): 184–199.

Johnston RK, Balasubramanian S, Kasiganesan H, Baicu C, Zile M, Kuppuswamy D. Beta3 integrin-mediated ubiquitination activates survival signaling in myocardial hypertrophy. *FASEB J*. In press.

Balasubramanian S, **Johnston RK**, **Moschella PC**, Mani S, Tuxworth W, Kuppuswamy D. mTOR in growth and protection of hypertrophying myocardium. Review. *Cardiovascular and Hematological Agents in Medicinal Chemistry*. *Cardiovasc Hematol Agents Med Chem*. 2009 Jan;7(1):52-63.

T Leighfield, P.A Conrad, J Barakos, D.C Williams, S Dennison, M Haulena, and F.M.D Gulland. Novel symptomatology and changing epidemiology of domoic acid toxicosis in California sea lions (*Zalophus californianus*): an increasing risk to marine mammal health. *Proc Biol Sci*. 2008 February 7; 275(1632): 267–276.

Tuxworth W. J., Shiraishi H., **Moschella P. C.**, Yamane K., McDermott P. J., Kuppuswamy D. Translational activation of 5'-TOP mRNA in pressure overload myocardium. *Basic Research in Cardiology* 2008; 103 (1):41-53.

Mulligan J. K., Lathers D. M., Young M. R.. Tumors skew endothelial cells to disrupt NK cell, T-cell and macrophage functions. *Cancer Immunology, Immunotherapy* 2008; 57 (7):951-61.

Michael P O'Quinn; Brett S Harris; Kenneth W Hewett; Robert G Gourdie. Action Potential Propagation and Arrhythmias Abstract 3866: A Peptide Containing the Carboxy-Terminal Domain of Connexin43 Reduces Arrhythmias and Improves Cardiac Function after Myocardial Injury. *Circulation*. 2008;118:S_495.

Ghatnekar G. S., **O'Quinn M. P.**, Jourdan L. J., Gurjarpadhye A. A., Draughn R. L., Gourdie R. G.. Connexin43 carboxyl-terminal peptides reduce scar progenitor and promote regenerative healing following skin wounding. *Regenerative Medicine* 2009; 4 (2):205-23.

Snider A. J., Kawamori T., Bradshaw S. G., **Orr K. A.**, Gilkeson G. S., Hannun Y. A., Obeid L. M.. A role for sphingosine kinase 1 in dextran sulfate sodium-induced colitis. *FASEB Journal* 2009; 23(1):143-152.

Rhett J. M., Ghatnekar G. S., **Palatinus J. A.**, **O'Quinn M.**, Yost M. J., Gourdie R. G.. Novel therapies for scar reduction and regenerative healing of skin wounds. *Trends in Biotechnology* 2008; 26 (4):173-180.

Gieh K, **Potter CS**, Wu B, Silva K, Rowe L, Awgulewitsch A, Sundberg J. Hair interior defect (hid) in AKR/J mice on Chromosome. *Clinical and Experimental Dermatology*. Accepted for publication, 2008

Wu B., Silva K., Perell L., Rowe L. B., Seymour R. E., **Potter C.**, Roopenian D. C., Awgulewitsch A., Sandberg J. P.. Mutation in sterol O-acyltransferase 1 (Soat1) results in hair medulla defects in (AKR/J) mice. *Journal of Investigative Dermatology*. 2008; 128 S117-S117.

Nathanael D Pruett, Richard P Visconti, Donna F Jacobs, Dimitri Scholz, Tim McQuinn, John P Sundberg, and Alexander Awgulewitsch. Evidence for *Hox*-specified positional identities in adult vasculature. *BMC Dev Biol*. 2008; 8:93

Saha A., Hammond C. E., Goos M., Smolka A. J.. The role of Sp1 in IL-1 beta and H. pylori-mediated regulation of H,K-ATPase gene transcription. *American Journal of Physiology-Gastrointestinal and Liver Physiology* 2008; 295 (5):G977-G986.

Saha A., Hammond C. E., Trojanowska M., Smolka A. J.. *Helicobacter pylori*-induced H, K-ATPase alpha-subunit gene repression is mediated by NF-kappa B p50 homodimer promoter binding. *American Journal of Physiology-Gastrointestinal and Liver Physiology* 2008; 294 (3):G795-G807.

Snarr B. S., Kern C. B., Wessels A.. Origin and Fate of Cardiac Mesenchyme. *Developmental Dynamics* 2008; 237 (10):2804-2819.

Argraves K. M., Gazzolo P. J., Groh E. M., **Wilkerson B. A.**, Matsuura B. S., Twal W. O., Hammad S. M., Argraves W. S.. High density lipoprotein-associated sphingosine 1-phosphate promotes endothelial barrier function. *Journal of Biological Chemistry* 2008; 283 (36):25074-25081.

Gouthami Nallamothu, **Julie A. Woolworth**, Vincent Dammai, and Tien Hsu *awd*, the Homolog of Metastasis Suppressor Gene *Nm23*, Regulates *Drosophila* Epithelial Cell Invasion. *Mol Cell Biol.* 2008 March; 28(6): 1964–1973.

Keller J. M., Swarthout R. F., Carlson B. K., **Yordy J.**, **Guichard A.**, Schantz M. M., Kucklick J. R.. Comparison of five extraction methods for measuring PCBs, PBDEs, organochlorine pesticides, and Lipid content in serum. *Analytical and Bioanalytical Chemistry* 2009; 393 (2):747-60.

Zeidan Youssef H., Wu Bill X., Jenkins Russell W., Obeid Lina M., Hannun Yusuf A.. A novel role for protein kinase C-delta-mediated phosphorylation of acid sphingomyelinase in UV light-induced mitochondrial injury. *FASEB Journal* 2008; 22 (1):183-93.

Chudakova D. A., **Zeidan Y. H.**, Wheeler B. W., Yu J., Novgorodov S. A., Kindy M. S., Hannun Y. A., Gudz T. I. Integrin-associated Lyn Kinase Promotes Cell Survival by Suppressing Acid Sphingomyelinase Activity. *Journal of Biological Chemistry* 2008; 283 (43):28806-28816.

Liu X., Elojeimy S., Turner L. S., Mahdy A. E. M., **Zeidan Y. H.**, Bielawska A., Bielawski J., Dong J.Y., El-Zawahry A. M., Guo G. W., Hannun Y. A., Holman D. H., Rubinchik S., Szulc Z., Keane T. E., Tavassoli M., Norris J. S.. Acid ceramidase inhibition: a novel target for cancer therapy. *Frontiers in Bioscience.* 2008;13 ():2293-2298.

Jin J., Hou Q., Mullen T. D., **Zeidan Y. H.**, Bielawski J., Kravaka J. M., Bielawska A., Obeid L. M., Hannun Y. A., Hsu Y. T.. Ceramide generated by sphingomyelin hydrolysis and the salvage pathway is involved in hypoxia/reoxygenation-induced Bax redistribution to mitochondria in NT-2 cells. *The Journal of Biological Chemistry* 2008; 283 (39):26509-17.

Holman D. H., Turner L. S., El-Zawahry A., Elojeimy S., Liu X., Bielawski J., Szulc Z. M., Norris K., **Zeidan Y. H.**, Hannun Y. A., Bielawska A., Norris J. S.. Lysosomotropic acid ceramidase inhibitor Induces apoptosis in prostate cancer cells. *Cancer Chemotherapy and Pharmacology* 2008; 61(2):231-242.

Zeidan Y. H., Jenkins R. W., Hannun Y. A.. Remodeling of cellular cytoskeleton by the acid sphingomyelinase/ceramide pathway. *Journal of Cell Biology* 2008; 181 (2):335-50.

Zeidan Y. H., Jenkins R. W., Korman J. B., Liu X., Obeid L. M., Norris J. S., Hannun Y. A. Molecular targeting of acid ceramidase: Implications to cancer therapy. *Current Drug Targets* 2008; 9 (8):653-661.

Abstracts

Butler J.T., Beeson C.C., Banik N.L. The involvement of calpain in CD4⁺ T helper cell bias. American Society for Neurochemistry. Charleston, SC. *J. Neurochem.* **108 (Suppl. 1)**, 131. March 2009

Janardhanan R., **Butler J.T.**, Banik N.L., Ray S.K. N-(4-Hydroxyphenyl) retinamide induced Differentiation with down regulation of telomerase and potentiated paclitaxel actions for cell cycle arrest and apoptosis in rat glioblastoma C6 and RG2 cells. Society for Neuroscience Annual Meeting, Washington D.C. October 2008

Ghatnekar A, Trojanowska M. The role of GATA-6 during Pulmonary Arterial Hypertension. Keystone Angiogenesis Conference (2008) Vancouver, Canada

Ghatnekar A, Trojanowska M. The role of GATA-6 during Pulmonary Arterial Hypertension in Scleroderma. ASCB Conference (2008) San Francisco, CA

G. Daniel Grass, Mark G. Slomiany, Bryan P. Toole. Hyaluronan-CD44 Interactions Aid in Stabilization of Pro-Tumorigenic Signaling Complexes and Transporters in the Plasma Membrane. MUSC Perry V. Halushka Student Research Day, 2008.

Johnston RK, Van Laer AO, Baicu CF, Zile MR, Kuppuswamy D. Rapamycin Augments Akt Activation in *In Vitro* and *In Vivo* Models of Cardiac Hypertrophy. Abstract. *Journal of Cardiac Failure*. 2008 Aug;14(6):S44.

Kimes NE, Van Nostrand JD, Weil E, Zhou J and Morris PJ. The microbial functional structure associated with healthy and yellow band-infected *Montastrea faveolata*, a Caribbean reef-building coral abstract 09-GM-A-2432-ASM]. American Society for Microbiology 109th General Meeting. Philadelphia, PA, 2009

Kimes NE, Johnson WR, Kilpatrick L, Hasan NA, Grim CJ, Colwell RR and Morris PJ. The temperature-dependent coral pathogen *Vibrio coralliilyticus*: using the genome and proteome to identify potential virulence factors [abstract 09-GM-A-2432-ASM]. American Society for Microbiology 109th General Meeting. Philadelphia, PA, 2009

Johnson WR, **Kimes NE**, Smith GW, Nelson KE, Weil E and Morris PJ. Zooxanthellar and Bacterial communities associated with healthy and diseased colonies of the Caribbean coral *Montastrea faveolata* [abstract 09-GM-A-2432-ASM]. American Society for Microbiology 109th General Meeting. Philadelphia, PA, 2009

Snider, A.J., Kawamori, T., Bradshaw S.G., **Orr, K.A.**, Gilkeson, G.S., Hannun, Y.A. and Obeid, L.M. (2009) A Role for Sphingosine Kinase 1 in Dextran Sulfate Sodium-Induced Colitis. *FASEB J.* 23(1): 143-52.

Orr, K.A., Gault, C.R., Luttrell, L.M and Obeid, L.M. (2008) Involvement of the Sphingosine Kinase 1/Sphingosine 1-Phosphate Pathway in TNF- α -mediated Inflammation.

CS Potter, N. D. Pruett, M. J. Kern, A. R. Godwin, J. P. Sundberg, A. Awgulewitsch Foxn1 is a regulatory target of Hoxc13 in ectodermal development and dysplasia. International Investigative Dermatology Annual Meeting 2008, Kyoto, Japan

Nathanael Pruett. Evidence for Hox-specified Positional Identities in Adult Vasculature. Society for Developmental Biology 67th Annual National Meeting, 2008, Philadelphia, PA.

Nathanael Pruett. Functional Relevance of Hox-specified Positional Identities in Adult Vasculature. Society for Developmental Biology 68th Annual National Meeting, 2009, San Francisco, CA

Tirodkar, Tejas S; Kasman, Laura; Voelkel-Johnson, Christina. Ratios of C16ceramide and C16dihydroceramide rather than C16ceramide alone appear to dictate apoptotic outcome following TRAIL stimulation.

Presentations

Ghatnekar A & Trojanowska M. GATA-6 is a novel transcriptional repressor of the human Tenascin-C gene expression in fibroblasts. *BBA* 1779 (3): 145-51 MAR 2008

Linda A. Heffernan

Title: A proposed role for sphingosine kinase 1 in the p53 pathway

Poster presentation: International p53 Conference in Shanghai, China, October 2008-Graduate Student Association Travel Award

Poster presentation: MUSC Department of Medicine Research Day, December 2008

Oral presentation: Hollings Cancer Center Retreat, December 2008

-1st place, Edith Peng Excellence in Research Award

Poster presentation: Charleston Ceramide Conference, March 2009

-Student Travel Award

Rebecca Johnston

Beta3 integrin-mediated ubiquitination controls survival signaling for compensatory hypertrophic growth. Dissertation defense. February 2009.

Beta3 integrin-mediated ubiquitination for NF κ B transcription is necessary to maintain compensated hypertrophic growth. Committee report. October 2008.

Li et al. "c-kit Is Required for Cardiomyocyte Terminal Differentiation". *Circulation Research*. 2008;102:677-685. Cardiovascular Journal Club presentation. May 2008.

Selective ubiquitin-mediated degradation promotes survival in cardiomyocytes. Committee report. March 2008.

Johnston RK , Van Laer AO, Baicu CF, Zile MR, Kuppuswamy D. Rapamycin Augments Akt Activation in *In Vitro* and *In Vivo* Models of Cardiac Hypertrophy. Heart Failure Society Meeting. September 2008. Toronto, Canada.

Johnston RK , Balasubramanian S, Baicu CF, Zile MR, Kuppuswamy D. Beta3 integrin-mediated ubiquitination for NFkB transcription is necessary to maintain compensated hypertrophic growth. NIH Student Research Festival. September 2008. Bethesda, Maryland.

Johnston RK, Balasubramanian S, Kuppuswamy D. Integrin activation causes increased ubiquitin-mediated signaling for NFkB activation in adult cardiomyocytes. Poster. FASEB Summer Conference: Ubiquitin and Cellular Regulation. June 2008. Saxtons River, Vermont.

Michael O'Quinn

American Heart Association, Scientific Sessions 2008 (presentation)

Perry V. Halushka, Student Research Day 2008 (presentation)

MSTP Research Day 2008 (presentation)

Kathryn Alexa Orr

Poster Presentation, 5th International Charleston Ceramide Conference
March 2009, Charleston, SC

Rhett, J.M., Jourdan, J., **O'Quinn, M.P.**, and R.G. Gourdie. Inhibition of Cx43/ZO-1 Interaction Improves Gap Junction Intercellular Communication and Reduces Connexon Activity. Experimental Biology 2009. New Orleans, LA.

Rhett, J.M., **O'Quinn, M.P.**, Jourdan, J., and R.G. Gourdie. Inhibition of Cx43/ZO-1 Interaction Improves Gap Junction Intercellular Communication, Reduces Connexon Activity, Inhibits Cardiac Dilation and Reduces Arrhythmias after Myocardial Injury. Keystone Symposia – Cardiac Disease: Development, Regeneration, and Repair. Asheville, NC. 2009

Rhett, J.M., Jourdan, J., **O'Quinn, M.P.**, and R.G. Gourdie. Inhibition of Cx43/ZO-1 Interaction Improves Gap Junction Intercellular Communication and Reduces Connexon Hemichannel Activity. Medical University of South Carolina Student Research Day. Charleston, SC. 2008

Tejas Tirodkar. Poster Presentation, 5th international Charleston Ceramide Conference (March '09): awarded the Best Poster in the Graduate Student Category.

Vizcaino, M.I., P.D.R. Moeller, and P.J. Morris. Determining the antimicrobial activity of Bacteria associated with a Caribbean coral. In Vitro Biology Meeting, June 6-10, 2009, Charleston, South Carolina (Oral Presentation)

Vizcaino, M.I., K. Williams, P.D.R. Moeller, and P.J. Morris. Characterization of marine antimicrobial compounds from a *Pseudovibrio* sp. associated with the surface mucopolysaccharide layer of a Caribbean coral. American Society for Microbiology 109th General Meeting, May 17-21. 2009, Philadelphia, Pennsylvania (Oral and Poster Presentation).

Boroujerdi, A.F.B., A. Meyers, T. Schock, M. **Vizcaino, P.J.** Morris, and D.W. Bearden. NMR-based microbial metabolomics and the temperature-dependent coral pathogen *Vibrio coralliilyticus*. Society of Environmental Toxicology and Chemistry 29th Annual Meeting, November 16-20, 2008. Tampa, Florida (Poster Presentation)

Vizcaino, M.I., G.S. Matthews, N.E. Kimes, K. Williams, P.D.R. Moeller, and P.J. Morris. Anti-microbial and antibiotic resistance of *Vibrio coralliilyticus* phylotypes. 11th International Coral Reef Symposium, July 7- 11, 2008. Ft. Lauderdale, Florida (Poster Presentation)

Students' honors and awards

Jonathan T. Butler

Predocutorial Fellowship Training in Environmental Stress Signaling (T32-012878) June 2006 – June 2008

Angela Edwards-Ghatnekar

Young Investigator Travel Award International Scleroderma Meeting Boston 2006

NIH Predocutorial Fellowship in Cardiovascular Science: Training to Improve Cardiovascular Therapies

Alfred Charles Griffin, III

MUSC's Clarion Interprofessional Group Competition

Perry V. Halushka Student Research Day – 1st Place

Presidential Scholar

Linda A. Heffernan

Grants: Renewal of Environmental Stress Signaling Training Grant support

August 2009-Present NIH Predocutorial Fellowship in Cardiovascular Science: Training to Improve Cardiovascular Therapies

March 2009 Student Travel Award 5th International Charleston Ceramide Conference Charleston, SC

Loretta Hoover

National Research Service Award Recipient

Rebecca Johnston

American Heart Association Predocutorial Fellowship, 0615468U (2006-2008)

National Institute of Heart, Lung and Blood Training Grant "Training to Improve Cardiovascular Therapies" NIH T32HL07260 (awarded twice: 2007-2008, 2008-2009)

Graduate Student Association Travel Scholarship, 1 of 2 awarded (2008)

Perry H. Halushka Student Research Day, 1st Place Poster (2008)

Maria Lockhart

NIH Predocutorial Fellowship in Cardiovascular Science: Training to Improve Cardiovascular Therapies

Jennifer Mulligan

7th Annual Head and Neck Cancer Research Workshop, First Place Presenter
MUSC Student Research Day – 2nd Place Presenter

Michael O'Quinn

Basic Cardiovascular Sciences Abstract Travel Grant, American Heart Association
Heart Rhythm Society – moderated poster, Keystone Symposia Scholarship, 2008-2009
NIH T32 Training Grant: Training to Improve Cardiovascular Therapies, 2008
Willard and Betty Peterson Award for 1st place at The Perry V. Halushka Student Research Day 2008
Basic Cardiovascular Sciences Abstract Travel Grant, American Heart Association

Kathryn Alexa Orr

NIH Predoctoral Fellowship in Cardiovascular Science: Training to Improve Cardiovascular Therapies

Joseph Palatinus

Ruth L. Kirschstein National Research Service Award from the National Heart Lung and Blood Institute

Christopher Potter

2008 Albert M. Kligman Travel Fellowship, to attend *International Investigative Dermatology Annual Meeting* 2008, Kyoto, Japan
2008 1st Place Poster Award for the Perry V. Halushka MUSC Student Research Day

Joshua M. Rhett

Fellowship from the South Carolina Space Grant Consortium
Years Membership in AAAS (association that sponsors Science magazine)
Spring 2008 Recipient of South Carolina Space Grant Consortium Fellowship
Spring 2009 Recipient of South Carolina Space Grant Consortium Fellowship

Maria Vizcaino

First Place Ph.D. Award Winner MUSC Department of Medicine Research Day Poster Presentation - 2008
2009 American Society for Microbiology Invited Speaker for the Student Oral Session at the 109th General Meeting
2009 American Society for Microbiology Corporate Activities Program Student Travel Grant for the 109th General Meeting
2008 2nd Place PhD II Poster Award for the Perry V. Halushka MUSC Student Research Day

Brent Wilkerson

NIH Predoctoral Fellowship in Cardiovascular Science: Training to Improve Cardiovascular Therapies

Arindam Saha

Finalist: Distinguished Graduate Student Award

Elaine Wirrig

Finalist: Distinguished Graduate Student Award

Youssef Zeidan

Gold Humanism Honor Society Award

Distinguished Graduate of the Year

Department/Program Accomplishments for 2008-2009

This has been another outstanding year for the students in the MCBP Program. This year our students published 50 manuscripts, many in high impact journals including Nature, Journal of Biological Chemistry, Journal of Cell Biology, FASEB Journal, Developmental Dynamics, and Molecular and Cellular Biology. In addition to the manuscripts, our students have presented numerous abstracts at national and international meetings. Our students' work has been honored with an impressive number of highly competitive international, national and local awards and fellowships. These awards include Maria Vizcaino and Jennifer Mulligan who received second place and Michael O'Quinn and Alfred Griffin who received first place awards for this year's Perry V Halushka Student Research Day. Six of our students, Rebecca Johnston, Maria Lockhart, Michael O'Quinn, Angela Edwards Ghatnekar, Linda Heffernan and Brent Wilkerson received NIH Training Fellowships. Joseph Palatinus was awarded an individual Ruth L. Kirschstein National Research Fellowship and Nikole Kimes, received an individual NSF graduate fellowship. The Distinguished Graduate Student Award this year went to MCBP student, Youssef Zeidan. Elaine Wirrig and Arindam Saha were honored as Distinguished Graduate Student Award Finalists. This means that Dr. Zeidan will be returning to campus this August to deliver the Elizabeth Chesterman Memorial Lecture to the incoming graduate students. This is the sixth year in a row in which one of our MCBP graduates has received this high honor. Several of our students received travel awards to national and international meetings as well as honors received for presentations given at those meetings. Last, but in no way least, three of our students graduated receiving their M.S., twelve graduated receiving their Ph.D., and two graduated receiving their M.D./Ph.D. These graduates are moving on to postdoctoral training positions and internships in some of the best laboratories and institutions in the country. All of the students in the MCBP have done well and we are very proud of their accomplishments.

Department/Program Goals for 2009-2010

The MCBP Program is a cooperative effort by research faculty from all of the basic science departments as well as many of the clinical departments. It brings together approximately 120 faculty members and 51 graduate students including the 2009 graduates with research interests in different areas of the biomedical sciences. This year we added two new divisions, **Craniofacial Biology**, which is co-directed by Drs. Keith Kirkwood and Caroline Westwater and **Cardiovascular Imaging**, co-directed by Drs. Michael Rosol and Joseph Schoepf. These two new areas of research and training greatly expand the number of faculty in the program and allow us to offer more variety in our courses and journal clubs. The interdisciplinary flavor extends to our seminar program. This provides for a rich and diverse training environment for students allowing for multi-disciplinary projects that can easily span the traditional areas of

molecular biology, cell biology, pharmacology and physiology. One of the greatest challenges we continue to have in this time of increased difficulty in getting and maintaining extramural support for our research efforts is preventing the erosion of the quality of teaching and academic excellence. We are undergoing a concerted effort to maintain and even increase the number of advanced courses that are being offered to our students. Our commitment is to making the MCBP the best possible training environment for our students. To this end our goals for the next year are to ensure that the many MCBP advanced graduate courses including new courses are offered on a regular basis. This year the MCBP progress committee is also reexamining the MCBP written Qualifying Exam to insure that it serves to prepare our students to succeed and compete for the best post-doctoral fellowships and academic positions. We will work to insure that the journal clubs which have been established in many of the divisions are continued and new journal clubs established in those that do not have them, be more informative to students inquiring about the program as well as our own students who are currently in the program, and to re-double our efforts to giving our students the best training and preparation possible for a fulfilling career in biomedical research.