

Molecular & Cellular Biology & Pathobiology Program
Donald R. Menick, Ph.D., Director
Annual Report 2014-2015
Division Directors

Dennis K. Watson, Ph.D.
Cancer Biology

Donald R. Menick, Ph.D.
Cardiovascular Biology

Steven A. Rosenzweig, Ph.D.
Cell Regulation

Andy Wessels, Ph.D.
Genetics and Development

Keith L. Kirkwood, DDS, Ph.D.
Caroline Westwater, Ph.D.
Oral Health Sciences

Louis Guillette, Jr., Ph.D.
Marine Biomedicine and
Environmental Science

Progress Committee

Dr. Craig Beeson
Dr. Edward L. Krug
Dr. Steven W. Kubalak
Dr. Donald R. Menick

Twelve (12) students graduated: May 15, 2015

Student's Name	Matriculation Date	Mentor	Degree Sought
Akter, Tanjina	2013	Dr. Galina Bogatkevich	Ph.D.
Akerman, Adam	2012	Dr. Jeffrey Jones	Ph.D.
Al Sarraf, Oday*	2010	Dr. Craig Crosson	Ph.D.
Alge, Joseph*	2010	Dr. John Arthur	M.D./Ph.D. Defended PhD12/2013
Aseem, Obaidullah*	2006	Dr. Scott Argraves	M.D./Ph.D.
Bangma, Jacqueline	2013	Dr. Louis Guillette, Jr.	Ph.D.
Briggs, Laura	2008	Dr. Andy Wessels	M.D./Ph.D. Defended PhD 2/2014
Cantu, Theresa	2011	Dr. Louis Guillette, Jr.	Ph.D.
Corum, Daniel *	2009	Dr. Robin Muise-Helmericks	Ph.D. Defended 6/2014
Dahrouj, Mohammad III*	2010	Dr. Craig Crosson	M.D./Ph.D. Defended PhD12/2013
Mohammed Dany	2013	Dr. Besim Ogretmen	M.D., Ph.D.

Desjardins, Danielle	2011	Dr. Craig Crosson Dr. Zsolt Ablonczy	M.D./Ph.D.
Doheny, Brenna	2010	Dr. Louis Guillette, Jr.	Ph.D.
Durham, Emily	2014	Dr. James	Ph.D.
e Silva (Trombetta), Jessica	2008	Dr. Amy Bradshaw	D.M.D./Ph.D Defended PhD 7/2013
Flanary, Jocelyn	2004	Dr. Paul Becker	Ph.D.
Galligan, Thomas	2013	Dr. Louis Guillette, Jr.	Ph.D.
Grayson, Robyn*	2010	Dr. John Baatz	Ph.D.
Hale, Matthew	2013	Dr. Louis Guillette, Jr.	Ph.D.
Herbert, Bethany	2010	Dr. Keith Kirkwood	D.M.D./Ph.D
Herr, Daniel	2011	Dr. Donald Menick	M.D./Ph.D.
Holmes, Casey*	2010	Dr. Steve Rosensweig	M.D./ Ph.D. Defended PhD 7/2014
Kemper, Jenny	2012	Dr. Gavin Naylor	Ph.D.
Kimbrough, Denise*	2009	Dr. Donald R. Menick	Ph.D. Defended 6/2014
Knackstedt, Rebecca*	2008	Dr. Michael Wargovich	M.D./ Ph.D. Defended PhD 5/2013
Lindner, Amanda*	2007	Dr. Muise-Helmericks	D.M.D./Ph.D Defended PhD 1/2015
Lockhart, Marie*	2007	Dr. Arno Wessels	Ph.D. Defended 6/2014
McCoy, Jessica	2010	Dr. Louis Guillette	Ph.D.
Nilsen, Frances	2013	Dr. Stephen Long	Ph.D.
Pleasant, Dorea	2010	Dr. Dhan Kuppuswamy	Ph.D.
Reese, Charles	2014	Dr. Stanley Hoffman Dr. Elena Tourkina	Ph.D.
Renaud, Ludivine	2010	Dr. Donald Menick	Ph.D.
Robichaux, Jacqulyne*	2010	Dr. Ann Ramsdell	Ph.D.
Rosset, Emilie	2012	Dr. Amy Bradshaw	D.M.D./Ph.D
Sauls, Kimberly	2011	Dr. Chip Norris Dr. Roger Markwald	Ph.D.
Smith, Joshua	2008	Dr. Rick Schnellmann	M.D., Ph.D. Defended PhD 6/2015
Melissa Sokolosky	2011	Dr. Louis Guillette, Jr.	Ph.D.
Strungs, Erik	2009	Dr. Robert Gourdie	M.D./Ph.D.

Temkin, Alexis	2012	Dr. Demetri Spyropoulos	Ph.D.
Toomer, Katelynn	2013	Dr. Roger Markwald Dr. Chip Norris.	Ph.D.
Wenzel(Goodson), Abby	2011	Dr. Louis Guillette, Jr.	Ph.D.
Wheeler, Jason	2009	Dr. Jeffrey Jones	Ph.D.
Zhang, Xiaoyi	2008	Dr. Keith Kirkwood	M.D./Ph.D. Defended PhD 12/2014

*Graduated in May 2015

STUDENTS' PUBLICATIONS

Journals

Coaxum SD, Blanton MG, Joyner A, **Akter T**, Bell PD, Luttrell LM, Raymond JR Sr, Lee MH, Blichmann PA, Garnovskaya MN, Saigusa T. Epidermal growth factor-induced proliferation of collecting duct cells from Oak Ridge polycystic kidney mice involves activation of Na⁺/H⁺ exchanger. *Am J Physiol Cell Physiol*. Sept 2014; 307(6):C554-60. doi: 10.1152/ajpcell.00188.2014. PMID: 25055824

Alge JL, Arthur JM. Biomarkers of AKI: a review of mechanistic relevance and potential therapeutic implications. *Clin J Am Soc Nephrol*. 2015 Jan 7, 10 (1): 147-55.

Alsarraf O, Fan J, **Dahrouj M**, Chou CJ, Menick DR, Crosson CE. Acetylation: a lysine modification with neuroprotective effects in ischemic retinal degeneration. *Exp Eye Res*. 2014 Oct;127:124-31. doi: 10.1016/j.exer.2014.07.012.

Alsarraf O, Fan J, **Dahrouj M**, Chou CJ, Yates PW, Crosson CE. Acetylation preserves retinal ganglion cell structure and function in a chronic model of ocular hypertension. *Invest Ophthalmol Vis Sci*. Oct 30;55(11):7486-93. doi: 10.1167/iovs.14-14792.

Bowden JA*, **Cantu TM***, Sommerville S, Guillette M, Botha H, Guillette L. Plasma-based biomarkers for pansteatitis in Mozambique Tilapia from Loskop dam, South Africa. (In review at PLoS ONE). *Co-First Author

Dahrouj M, **Desjardins DM**, Liu Y, Crosson CE, Ablonczy Z. Receptor mediated disruption of retinal pigment epithelium function in acute glycated-albumin exposure. *Exp Eye Res*. 2015 June 10. pii: S0014-4835(15)00191-8. doi: 10.1016/j.exer.2015.06.004.

Dany M, Ogretmen B. Ceramide induced mitophagy and tumor suppression. *Biochim Biophys Acta*. 2015 Jan 26. Review. PubMed PMID: 25634657 PMC25634657

Dany M*, Chidiac A, Nassar AH. Human papillomavirus vaccination: assessing knowledge, attitudes, and intentions of college female students in Lebanon, a developing country. *Vaccine*. 2015 Feb 18; 33(8):1001-7. PubMed PMID: 25597945 PMC25597945.*

Nunes-Alves C, Booty M, Carpenter S, Rothchild A, Martin C, **Desjardins D**, Steblenko K, Kløverpris H, Madansein R, Ramsuran D, Leslie A, Correia-Neves M, Behar S & Lewinsohn D (2015) Human and Murine Clonal CD8+ T Cell Expansions Arise during Tuberculosis Because of TCR Selection. *PLOS Pathogens* 11:e1004849.

Doheny, B.M., S. Kohno, L.J. Guillette, Jr. Activation of Estrogen Receptor 1 (ESR1; ERalpha), induces hypertrophy and precocious development in the embryonic American alligator female reproductive tract. In press.

Miyagawa, S., R. Yatsu, S. Kohno, **B.M. Doheny**, Y. Ogino, H. Ishibashi, Y. Katsu, Y. Ohta, L.J. Guillette, Jr., T. Iguchi. 2015. Identification and characterization of the androgen receptor from the American alligator, *Alligator mississippiensis*. *Endocrinology*, e-published May 2015 ahead of print.

Kohno, S., M.C. Bernhard, Y. Katsu, J. Zhu, T.A. Bryan, **B.M. Doheny**, T. Iguchi, L.J. Guillette, Jr. 2015. Estrogen receptor 1 (ESR1; ERalpha), not ESR2 (ERbeta), modulates estrogen-induced sex reversal in the American alligator, a species with temperature-dependent sex determination. *Endocrinology*, 156(5): p. 1887-99.

Smith TD, Muchlinski MN, Bhatnagar KP, **Durham EL**, Bonar CJ, Burrows AM. The vomeronasal organ of Lemur catta. *Am J Primatol*. 2015 Feb;77(2):229-38. doi: 10.1002/ajp.22326. Epub 2014 Sep 12. PubMed PMID: 25220179.

Burrows AM, **Durham EL**, Matthews LC, Smith TD, Parr LA. Of mice, monkeys, and men: physiological and morphological evidence for evolutionary divergence of function in mimetic musculature. *Anat Rec (Hoboken)*. 2014 Jul;297(7):1250-61. doi: 10.1002/ar.22913. Epub 2014 Apr 7. PubMed PMID: 24706483; PubMed Central PMCID: PMC4051843.

Herbert BA, Valerio MS, Gaestel M, Kirkwood KL. Sexual Dimorphism in MAPK-Activated Protein Kinase-s (MK2) Regulation of RANKL-Induced Osteoclastogenesis in Osteoclast Progenitor Subpopulations. *PLoS One*. 2015 May 6;10(5):e0125387. doi: 10.1371/journal.pone.0125387. eCollection 2015.

Valerio MS, **Herbert BA**, Basilakos DS, Browne C, Yu H, Kirkwood KL. Critical role of MKP-1 in lipopolysaccharide-induced osteoclast formation through CXCL1 and CXCL2. *Cytokine*. 2015 Jan;71(1):71-80. doi: 10.1016/j.cyto.2014.08.007. Epub 2014 Sep 27.

Herr DJ, Aune SE, Menick DR. Induction and Assessment of Ischemia-Reperfusion Injury in Langendorff-Perfused Rat Hearts. *The Journal of Visualized Experiments*. 2015 [In Press]

Aune SE, **Herr DJ**, Kutz CJ, Menick DR. Histone deacetylases exert class specific roles in conditioning the brain and heart against acute ischemic injury. *Frontiers in Neurology*. 2015. doi: 10.3389/fneur.2015.00145 [In Press]

Kemper, J.M., Ebert, D.A., Naylor, G.J.P. and Didier, D.A. 2015. *Chimaera carophila* (Chondrichthyes: Chimaeriformes: Chimaeridae), a new species of chimaera from New Zealand. *Bulletin of Marine Science* 91(1): 63-81.

Mani SK, Kern CB, **Kimbrough D**, Addy B, Kasiganesan H, Rivers WT, Patel RK, Chou JC, Spinale FG, Mukherjee R, Menick DR. Inhibition of class I histone deacetylase activity represses matrix metalloproteinase-2 and -9 expression and preserves LV function postmyocardial infarction. *Am J Physiol Heart Circ Physiol*. 2015 Jun 1;308(11):H1391-401. doi: 10.1152/ajpheart.00390.2014. Epub 2015 Mar 20.

Brown J, Lydecker JA, Turner T, **Knackstedt RW**, O'Neil PM. A novel approach to training students in delivering evidence-based obesity treatment. *Fam Med*. 2015 May;47(5):378-82.

Lockhart MM, Boukens BJ, Phelps AL, Brown CL, **Toomer KA**, Burns TA, Mukherjee RD, Norris, Trusk TC, van den Hoff MJ, Wessels A. Alk3 mediated Bmp signaling controls the contribution of epicardially derived cells to the tissues of the atrioventricular junction. *Dev Biol*. 2014 Dec 1;396(1):8-18. doi: 10.1016/j.ydbio.2014.09.031. Epub 2014 Oct 6.

McCoy, J.A.*, Parrott, B.B.*, Rainwater, T.R., Wilkinson, P.W., Guillette Jr, L.G. 2015. Incubation Prior to the Canonical Thermosensitive Period Determines Sex in the American Alligator Reproduction. *In review*.

Kendall, R. T., Lee, Mi-Hye, **Pleasant, D.L.**, Kuppuswamy, D., McDermott, P.J., and Luttrell, L.M. Arrestin-dependent angiotensin AT1 receptor signaling regulates Akt and mTOR-mediated protein synthesis. *J Biol Chem.*, 2014. 289(38): 26155-66

Durst R*, **Sauls K***, Peal D, deVlaming A, **Toomer K**, Leyne M, Salani M, Talkowski M, Brand H, Perrocheau M, Simpson C. et al. (2015). Mutations in the DCHS1 gene cause mitral valve prolapse. *Nature*. April 2015. *Co-first authors.

Smith JA, Stallons LJ, Schnellmann RG. Renal cortical hexokinase and pentose phosphate pathway activation through the EGFR/Akt signaling pathway in endotoxin-induced acute kidney injury. *Am J Physiol Renal Physiol*. 2014; 307(4):F435-44. PMID: PMC4137133.

Smith JA, Stallons LJ, Collier JB, Chavin KD, Schnellmann RG. Suppression of mitochondrial biogenesis through toll-like receptor 4-dependent mitogen-activated protein kinase/extracellular signal-regulated kinase signaling in endotoxin-

induced acute kidney injury. *J Pharmacol Exp Ther.* 2015; 352(2):346-57. PMID: PMC4293437.

Davis N, **Sokolosky M**, et al. Deregulation of the EGFR/PI3K/PTEN/Akt/mTORC1 pathway in breast cancer: possibilities for therapeutic intervention. *Oncotarget* [Online], 5.13 (0): 4603-4650. Web. 11 Jun. 2015

Temkin AM¹, Bowers R¹, Magaletta M, Holshouser S, Maggi A, Ciana P, Guillette L, Bowden J, Kucklick J, Baatz J, Spyropoulos D. Dioctyl Sodium Sulfosuccinate (DOSS; CAS #577-11-7) a Major Dispersant Component is a Putative Obesogen. *Environmental Health Perspectives.* 2015. In Press. ¹The first two authors made equal contributions to this work.

Trombetta-esilva J, Rosset EA, Hepfer RG, et al. Decreased Mechanical Strength and Collagen Content in SPARC-null Periodontal Ligament is Reversed by Inhibition of Transglutaminase Activity. *J Bone Miner Res.* 2015.

Dina C, Bouatia-Naji N, Tucker N, Delling F, **Toomer K**, et al. A genome-wide association study of mitral valve prolapse and functional studies of risk loci provide insight into underlying biological mechanism. In revision at Nature Genetics. March 2015.

Wheeler JB, Ikonomidis JS, Jones JA. Connective tissue disorders and cardiovascular complications: the indomitable role of transforming growth factor-beta signaling. *Adv Exp Med Biol.* 2014;802:107-27. doi: 10.1007/978-94-007-7893-1_8. Review. PMID:24443024

Wheeler JB, Mukherjee R, Stroud RE, Jones JA, Ikonomidis JS. Relation of murine thoracic aortic structural and cellular changes with aging to passive and active mechanical properties. *J Am Heart Assoc.* 2015 Feb 25;4(3):e001744. doi: 10.1161/JAHA.114.001744. PMID:25716945

Zhang X, Hyer JM, Yu H, D'Silva NJ, Kirkwood KL. DUSP1 phosphatase regulates the proinflammatory milieu in head and neck squamous cell carcinoma. *Cancer Res.* 2014 Dec 15;74(24):7191-7. doi: 10.1158/0008-5472.CAN-14-1379. Epub 2014 Oct 13.

Abstracts

Bangma J, Catron B, Bryan C, Long S, Lowers R, Guillette M, Cantu T, Pienaar D, Botha H, Guillette L. Heavy metal analysis of Nile Crocodile blood in Kruger National Park, South Africa. Poster presentation. Perry V. Halushka Student Research Day, MUSC, November 2014.

Cantu T, John Bowden, Jacob Scott, Louis Guillette, Jr. Eicosanoid measurement in extraembryonic membranes through Liquid Chromatography/Tandem Mass

Spectrometry. Poster presentation. MUSC Marine Biomedicine and Environmental Health Open House. Hollings Marine lab, July 18th, 2014.

Dany M, Ogretmen B. Inhibition of FLT3 in Acute Myeloid Leukemia induces lethal autophagy after activating Ceramide Synthase 1 expression. Southeastern Medical Scientist Symposium. Poster presentation. Emory School of Medicine, Atlanta, GA, August 23, 2014.

Dany M, Ogretmen B. Inhibition of FLT3 in Acute Myeloid Leukemia reactivates Ceramide Synthase 1 expression resulting in C₁₈-ceramide mediated mitophagy. Poster presentation. Hollings Cancer Center Research Symposium, Charleston, SC, November 7, 2014.

Dany M, Ogretmen B. Inhibition of FLT3 in Acute Myeloid Leukemia reactivates Ceramide Synthase 1 expression resulting in C₁₈-ceramide mediated mitophagy. Poster presentation. Research Symposium-MUSC College of Medicine, Charleston, SC, February 20, 2015.

Dany M, Ogretmen B. Ceramide mediated lethal mitophagy: a novel cell death mechanism in FLT3 targeted therapy for Acute Myeloid Leukemia. Poster presentation. CSCTR Annual Meeting, Chicago, IL, April 22, 2015.

Dany M, Ogretmen B. Ceramide mediated lethal mitophagy: a novel cell death mechanism in FLT3 targeted therapy for Acute Myeloid Leukemia. Poster presentation. ASCI/AAP/APSA Annual Meeting, Chicago, IL, April 24, 2015.

Desjardins, D, Lin Y, Yates P, Crosson C, Ablonczy Z. Trichostatin: A rescues RPE function in diabetic rats. Poster Presentation. AOPT Meeting, Charleston, SC, February 2015.

Desjardins, D, Lin Y, Yates P, Crosson C, Ablonczy Z. Trichostatin: A rescues RPE function in diabetic rats. Poster Presentation. ASCI/APA/APSA Joint Annual Meeting, Chicago, IL, April 2015.

Desjardins, D, Lin Y, Yates P, Crosson C, Ablonczy Z. Trichostatin: A rescues RPE function in diabetic rats. Poster Presentation. ARVO 2014 Annual Meeting, Moderator, Denver, CO, May 2015.

Durham EL. Effects of Citalopram Exposure on Calvarial Cell Hyperplasia. Poster presentation. Perry V. Halushka MUSC Student Research Day, November 14, 2014.

Galligan, T.M., A.S.P. Boggs, L.J. Guillette Jr. Characterizing the Patterns of Thyroid Function and Regulation in the Embryonic American Alligator (*Alligator mississippiensis*). Poster presentation. Society for Developmental Biology Southeastern Regional Meeting 2015. Clemson, SC. May 2015.

Herbert BA, Valerio M, Kirkwood KL. MK2 signaling is essential for *Aggregatibacter Actinomycetemcomitans* inflammatory-induced bone loss. Poster Presentation. Life Sciences Baltics MAP Kinases Conference, Vilnius, Lithuania, September 10-12, 2014.

Herbert BA, Valerio M, Kirkwood KL. MK2 signaling is essential for *Aggregatibacter Actinomycetemcomitans* inflammatory-induced bone loss. Poster Presentation. Perry V. Halushka MUSC Student Research Day, November 14, 2014.

Herbert BA, Valerio M, Kirkwood KL. MK2 signaling is essential for *Aggregatibacter Actinomycetemcomitans* inflammatory-induced bone loss. Poster Presentation. James B. Edwards College of Dental Medicine Scholars Day, Charleston, SC, February 19, 2015.

Herbert BA, Valerio M, Kirkwood KL. MK2 signaling is essential for *Aggregatibacter Actinomycetemcomitans* inflammatory-induced bone loss. Poster Presentation. American Association for Dental Research Annual Meeting, Boston, MA, March 11-14, 2015.

Herr DJ, Aune SE, Menick DR. Inhibition of class I histone deacetylases at reperfusion attenuates ischemia-reperfusion injury and modifies mitochondrial acetylation. Poster Presentation at the 11th Annual American Physician Scientists Association Meeting, Chicago IL, April 25th, 2015.

Herr DJ, Aune SE, Menick DR. Inhibition of class I histone deacetylases at reperfusion attenuates ischemia-reperfusion injury and modifies mitochondrial acetylation. Poster Presentation at the MUSC Department of Medicine Research Symposium, Charleston SC, February 18th 2015.

Herr DJ, Aune SE, Menick DR. Inhibition of class I histone deacetylases at reperfusion attenuates cardiac ischemia-reperfusion injury. Poster presentation at the MUSC Perry V. Halushka Student Research Day, Charleston SC, November 14th, 2014.

Herr DJ, Aune SE, Menick DR. Inhibition of class I histone deacetylases at reperfusion attenuates ischemia-reperfusion injury. Poster presentation at the National M.D./Ph.D. Student Conference, Keystone, CO, July 18th, 2014.

McCoy, J.A., Parrott, B.B., Guillette Jr, L.G. Do warmer eggs yield hyper-masculinized hatchlings? Poster Presentation. MUSC Marine Biomedicine and Environmental Sciences Student Research Open House. Charleston, SC. July 2014.

McCoy, J.A., Parrott, B.B., Guillette Jr, L.G. The influence of incubation temperature on intra-sexual characteristics. Poster Presentation. Perry V. Halushka Student Research Day. Charleston, SC. November 2014.

Pleasant D, Sundararaj K, Kasiganesan H, Panneerselvem K, Balasubramanian S, Jones J, & Kuppaswamy D. Fibrosis is promoted by Beta3 Integrin in the pressure

overloaded Heart. Poster presentation. Medical University of South Carolina, Perry V. Halushka Student Research Day, November 2014.

Pleasant D, Sundararaj K, Kasiganesan H, Panneerselvem K, Balasubramanian S, Jones J, & Kuppuswamy D. Fibrosis is promoted by Beta3 Integrin in the pressure overloaded Heart. Poster presentation. Medical University of South Carolina, Department of Medicine Research Symposium, February 20, 2015.

Renaud, L. Acetylation and methylation regulates miRNAs expression during hypertrophic cardiac remodeling. Poster Presentation. MUSC Department of Medicine Research Day, January 2015.

Smith JA, Stallons LJ, Collier JB, Schnellmann RG. TLR4-Dependent MEK/ERK Activation Suppresses Mitochondrial Biogenesis (MB) in a Mouse Model of Sepsis-Induced Acute Kidney Injury (AKI). American Society of Nephrology Kidney Week, Philadelphia, PA, November 2014.

Collier JB, **Smith JA**, Whitaker RM, Schnellmann RG. ERK1/2 Suppresses PGC-1 α and Mitochondrial Biogenesis in Endotoxin and I/R-Induced AKI. Society of Toxicology Annual Meeting, San Diego, CA, March 2015.

Sokolosky M. Translating Environmental Science for Consumer Benefit: Breast Cancer Prevention-based Outreach via the Healthy-Living Pocket Guide. Poster presentation. NCI-NIEHS Breast Cancer and Environment Research Program (BCERP) Annual Meeting, San Francisco, CA, November 20, 2014.

Strungs E. Beta-arrestin2 Intramolecular BRET Conformational Biosensors Correlate with GPCR-arrestin Complex Avidity. Poster Presentation. MUSC Department of Medicine Research Day, January 2015.

Temkin A et al. Predicting long term impacts of oil/dispersant exposures on human health and other higher trophic organisms: obesogenicity. Poster Presentation. Oil Spill and Ecosystem Science Conference. Houston, TX. February 2015

Wenzel, A., Cruze L., Brock J., Unal R., Somerville S., Newman R., Kucklick J., and Guillette L. Assessing the prevalence of phthalate metabolites in a population of pregnant women. Poster presentation. Medical University of South Carolina Student Research Day. Charleston, South Carolina. November 14, 2014.

Wenzel, A., Cruze L., Brock J., Unal R., Somerville S., Newman R., Kucklick J., and Guillette L. Assessing the prevalence of phthalate metabolites in a population of pregnant women. Poster presentation. PPTOXIV: Environmental Stressors in Disease and Implications for Human Health. Boston, Massachusetts. October 27, 2014.

Wenzel, A., Brock J., Cruze L., Somerville S., Kucklick J., and Guillette L. Assessing the prevalence of phthalate metabolites in a population of pregnant women. Poster

presentation. Medical University of South Carolina, Student Research Open House. Charleston, South Carolina. July 18, 2014.

Wheeler J., Mukherjee R., Stroud R., Ikonomidis J., Jones J. Thoracic Aortic Smooth Muscle Cell Phenotype and Contractility is Altered with Aging. MUSC Surgical Research Day, September 2014.

Presentations

Tanjina Akter, Iliia Atanelishvili, Yuichiro Shirai, Sybil L. Prince Nelson, Alvaro Garcia-Martos*, Thomas A. Morinelli, Richard M. Silver, Galina S. Bogatkevich. IQGAP1 Enhances Contractility of Scleroderma Lung Fibroblasts and Promotes Bleomycin-induced Pulmonary Fibrosis. Presented at 2014 ACR/ARHP Annual Meeting in Boston, MA, November 2014.

Jacqueline Bangma, Thomas Rainwater, Lori Cruze, Phillip Wilkinson, John Bowden, Matthew Guillette, and Louis Guillette. Population wide assessment of organic contaminants in *Alligator mississippiensis* plasma at Tom Yawkey Wildlife Center Heritage Preserve. South Carolina Annual Alligator Workshop, March 19, 2015.

Theresa Cantu, John Bowden, Alexis Temkin, Demetri Spryopolos, Louis Guillette, Jr. Eicosanoid Signals of Stress, inflammation and Obesity: the Gateway to Major health concerns. GoMRI Site Visit, Gulf Oil Spill, Hollings Marine Lab, Charleston, SC June 5th, 2015. Oral Presentation, contributed.

Theresa Cantu, Jacob Scott, John Bowden, Louis Guillette, Jr. South Carolina Eicosanoid signaling in the Chorioallantoic membrane of American Alligators. GATOR Workshop, Hollings Marine Lab, Charleston, SC, March 19th, 2015. Oral Presentation, contributed.

Theresa Cantu, John Bowden, Matthew Guillette, Hannes A. Botha, Louis Guillette, Jr. Pansteatitis and eicosanoid signals of inflammation and stress, Loskop Dam, South Africa. MUSC Global Health Trainee Travel Grant Presentation, MUSC Charleston, SC, January 22nd, 2015. Oral Presentation, invited.

Theresa Cantu, John Bowden, Matthew Guillette, Hannes A. Botha, Louis Guillette, Jr. Pilot Project: Pansteatitis in Mozambique Tilapia from Loskop Dam, South Africa. MUSC Student Research Day 2014, MUSC, Charleston, SC, November 14, 2014. Oral Presentation, contributed.

Theresa Cantu, John Bowden, Jacob Scott, Louis Guillette, Jr. Eicosanoid signaling in the developing CAM of the American Alligator. Society for Advancement of Chicanos and Native Americans (SACNAS), Los Angeles, California, October 6-10, 2014. Oral Presentation, contributed.

Theresa Cantu, John Bowden, Jacob Scott, Louis Guillette, Jr. The development of a method to measure pro and anti-inflammatory eicosanoids in both clinical and environmental samples. NIST interlab meeting, Hollings Marine Lab, Charleston, SC February 6, 2014. Oral Presentation, contributed.

Mohammed Dany. Inhibition of FLT3 in Acute Myeloid Leukemia reactivates Ceramide Synthase 1 expression resulting in C₁₈-ceramide mediated mitophagy. MUSC Student Research Day, Charleston, SC, November 14, 2014.

Mohammed Dany. Regulation of ceramide metabolism by FLT3 signaling in Acute Myeloid Leukemia: defining novel mechanisms of cell death and drug resistance. Lipid Signaling in Cancer/COBRE Seminar, Charleston, SC, December 16, 2014.

Mohammed Dany. Ceramide mediated lethal mitophagy in FLT3 targeted therapy for acute myeloid leukemia. Department of Biochemistry-Research and Methods Seminar. MUSC, Charleston, SC, January 13, 2015.

Mohammed Dany. Lipid signaling in AML therapy and drug resistance. Grand rounds presentation - Division of Hematology/Oncology. MUSC, Charleston, SC, January 16, 2015.

Mohammed Dany. Ceramide mediated lethal mitophagy: a novel cell death mechanism in FLT3 targeted therapy for Acute Myeloid Leukemia. Experimental Biology 2015- ASIP- Boston MA, March 30, 2015.

Mohammed Dany. Ceramide mediated lethal mitophagy: a novel cell death mechanism in FLT3 targeted therapy for Acute Myeloid Leukemia. International Ceramide Conference- Izmir, Turkey, May 8, 2015.

Brenna Deheny, S. Miyagawa, S. Kohno, L.J. Guillette, Jr., T. Iguchi. Investigating the regional differentiation of the female reproductive tract of the American alligator (*Alligator mississippiensis*). Japan Society for the Promotion of Science Summer Fellowship Program. Soken-dai University, Hayama, Japan. June 13, 2014.

Jessica McCoy, Parrott BB, Guillette LG. The developmental timing of sex determination in the American alligator. South Carolina Alligator Workshop. Charleston, SC. March 2015.

Jessica McCoy, Parrott BB, Guillette LG. Exposures to differing thermal dynamics during alligator embryonic development generates intra- and inter-sexual variation in gonadal gene expression. Society for the Study of Reproduction Annual Meeting. San Juan, Puerto Rico. June 2015.

Jessica McCoy. MUSC Summer Undergraduate Program (guest lecture), MUSC, Neuroendocrine Targets of EDCs. July 2014.

Jessica McCoy. Bench to Bedside Program (guest lecture), Winthrop University, Endocrine Disruption and the developing ovarian follicle. November 2014.

Dorea Pleasant. To Connect or Not Connect: Understanding the Multifaceted Role of Beta3 Integrin in the Heart. Ernest E. Just Symposium, Charleston, SC February 2015.

Ludivine Renaud. HDAC2 Regulates miR-133a Expression in Left Ventricular Pressure Overload Hypertrophy, Perry V. Halushka Student Research Day, Charleston, SC, November 14, 2014.

Kimberly Sauls, Katelynn Toomer, Johnson A, Williams K, Norris RA. Hematopoietic Derived Cells Contribute to Disease in the Filamin-A Model of Myxomatous Valvular Dystrophy. Presented at Weinstein Cardiovascular Conference, Boston, MA.

Joshua Smith, Stallons LJ, Collier JB, Schnellmann RG. Suppression Of Mitochondrial Biogenesis (MB) Through TLR4/MEK/ERK Signaling in a Mouse Model of Sepsis-induced Acute Kidney Injury. Drug Discovery and Biomedical Sciences Annual Graduate Student Retreat, Columbia, SC, October 2014.

Melissa Sokolosky. Why Environment Matters: Pollutants to Sentinel Species to Human Health. MUSC Office of Sustainability's monthly meeting, June 19, 2014.

Melissa Sokolosky. Mechanisms of Endocrine-active Compounds in Breast Cancer Cells: Environmental Influences on Growth, Signaling and Epigenetic Pathways, and Drug Response. MUSC REACH Scientific Research Day, April 10, 2015.

Melissa Sokolosky. Caring About Personal Care: Why Ingredients Matter. Ashley Hall School Assembly, April 10, 2015.

Erik Strungs. Beta-arrestin2 Intramolecular BRET Conformational Biosensors Correlate with GPCR-arrestin Complex Avidity. Perry V. Halushka Student Research Day, November 14, 2014.

Abby Wenzel, Cruze L., Brock J., Unal R., Somerville S., Newman R., Kucklick J., and Guillette L. Assessing the prevalence of phthalate metabolites in a population of pregnant women. Science Seminar at Columbia College. Columbia, South Carolina. February 9, 2015.

Jason Wheeler MD; Rupak Mukherjee, PhD; Robert E. Stroud, MS; Jeffrey A. Jones, PhD; and John S. Ikonomidis, MD/PhD. Age-related Changes in the Structure and Composition of the Thoracic Aorta. MUSC Department of Surgery Smithy Lecture, 2014.

Jason Wheeler, MD; Rupak Mukherjee, PhD; Robert E. Stroud, MS; Jeffrey A. Jones, PhD; and John S. Ikonomidis, MD/PhD. Age-related Changes in the Structure and

Composition of the Thoracic Aorta. Perry V. Halushka Student Research Day, Charleston, SC, November 14, 2014.

STUDENTS' HONORS AND AWARDS

Jacqueline Bangma

Center for Global Health Trainee Travel Grant Award, MUSC Center for Global Health, 2015.

Theresa Cantu

SACNAS Travel Scholarship, 2014

Sigma Xi Best Oral Presentation, Perry V. Halushka Student Research Day, 2014.

Grant Submission: MUSC Center for Global Health, Faculty Pilot Project "Pansteatitis in Loskop Dam: Implications for human health". PI: Dr. Louis Guillette, Jr. Co-PI: Dr. John Bowden and Theresa Cantu. 2015.

Mohammed Dany

Southeastern Medical Scientist Symposium SEMSS Best Poster Presentation Award, August 23, 2014

American Society for Investigative Pathology (ASIP) award for outstanding research in experimental pathology, Experimental Biology 2015 meeting-Boston, MA, March 28-31, 2015

Ray Greenberg Presidential Scholar Award, Medical University of South Carolina, April 14, 2015

Student Leadership Society Honor Award, Medical University of South Carolina, April 15, 2015

Central Society for Clinical and Translational Research Trainee Travel Award, CSCTR 2015 Annual Meeting- Chicago, IL, April 23, 2015

American Physician Scientist Association Trainee Travel Award, ASCI/AAP/APSA Annual meeting 2015- Chicago, IL, April 25, 2015

ASCI/APSA Best Presentation Award, ASCI/AAP/APSA Annual meeting 2015- Chicago, IL, April 26, 2015

Danielle Desjardins

MUSC Ray Greenberg Presidential Scholar
Ruth L. Kirschstein NRSA F30 Fellowship Awardee

Brenna Doheny

National Science Foundation. East Asia and Pacific Summer Institutes. Brenna Doheny, P.I. Funded.

Marine Biomedicine and Environmental Sciences Student Association. Presentation at Charleston Country Earth Day Celebration, 4/18/15. Funded by a grant from SC SeaGrant Consortium Researcher-Educator Exchange Forum.

Emily Durham

2015 SMART Award eBioscience, Characterization of murine cranial suture cells.

Thomas Galligan

NSF Graduate Research Fellowship Program 2015 Honorable Mention

Bethany Herbert

Ruth L. Kirschstein NRSA F30 Fellowship Awardee, Sept., 2014

1st place, poster presentation, Life Sciences Baltics MAP Kinases Conference, 2014

1st place Kinard-Gadsden Award, PhD III poster presentation, Perry V. Halushka MUSC Student Research Day, 2014

Daniel Herr

Ralph H. Johnson Student Research Honorable Mention Certificate-Perry V Halushka Student Research Day

AAAS/*Science* Program for Excellence in Science, 2014-2015

SCTR NIH/NCATS Pre-doctoral Fellowship Training Grant TL1 TR 000061 2014-2015

T32 Cardiovascular Training Grant Pre-doctoral Fellowship, 8/1/2015-7/31/2016.

Jessica McCoy

Eric R. Lacy Poster Presentation Award, July 2014

Slocum Lunz Foundation Award, April 2015

Sigma Xi Membership, April 2015

Grant Submission: McCoy, J.A., Guillette Jr, L.J. 2015. Investigating the impact of modern climate change on the sex specific gene expression in the American alligator. Slocum Lunz Foundation. Funded.

Dorea Pleasant

Medical University of South Carolina Student Leadership Society, 2014-2015.

Medical University of South Carolina Provost Scholarship, 2014-2015.

United Negro College Fund (UNCF)/Merck Graduate Dissertation Fellowship, 2015-2016.

Ludivine Renaud

2014 Ralph H. Johnson VAMC Student Research Award, 1st Place Winner, Oral Presentation.

Emilie Rosset

AADR Student Research Fellowship 2015 Recipient

Perry V. Halushka MUSC Student Research Day 2014, 1st Place Winner, PhD I Poster Presentation

Ralph H. Johnson VAMC Student Research Honorable Mention, PhD I Poster Presentation, 2014

Alexis Temkin

TA for Molecular Biology (BIO312) at College of Charleston Fall 2015

Grant Submission: EPA Science to Achieve Results (STAR) Fellowships for Graduate Environmental Study, Evaluating Dioctyl Sodium Sulfosuccinate (DOSS) as an Obesogen, 05/26/2015

Katelynn Toomer

T32 Cardiovascular Training Grant Pre-doctoral Fellowship, 8/1/2015-7/31/2016.

Abby Wenzel

MUSC Student Research Day, Sigma Xi 1st place poster award. November 14, 2014.

MUSC Student Research Day, Health Disparities 2nd place poster award. November 14, 2014.

Department/Program Accomplishments for 2014-2015

This has been another exceptional year for the students in the MCBP Program. This year, our students published 34 manuscripts, many in high-impact journals, including *Nature*, *Journal of American Heart Association*, *Cancer Research*, and *The Journal of Biological Chemistry*. In addition to the manuscripts, our students presented 63 abstracts/presentations at local, national, and international meetings. Our students' work has been honored with an impressive number of highly competitive local, national, and international local awards and fellowships. Both Bethany Herbert and Danielle Desjardins received Ruth L. Kirschstein NRSA F30 Fellowships. Dorea Pleasant received a UNCF/Merck Graduate Dissertation Fellowship. Emilie Rosset received a

AADR Student Research Fellowship. Jessica McCoy was awarded a Slocum Lunz Foundation Award. Daniel Herr received a SCTR NIH/NCATS Pre-doctoral Fellowship. Five of our students, Dylan Richards, Tucker Williamson, Abby Washispack, Daniel Herr, and Katelynn Toomer received NIH T-32 Training Fellowships, "NIH Training to Improve Cardiovascular Therapies". Our students do very well each year at the MUSC Perry V. Halushka Student Research Day. Theresa Cantu received the Sigma Xi Best Oral Presentation, Bethany Herbert was awarded the 1st place Kinard Gadsden Award, Daniel Herr received Ralph H. Johnson Student Research Honorable Mention, Jessica McCoy received the Eric R. Lacy Poster Presentation Award, Ludivine Renaud was a Ralph H. Johnson VAMC Student Research 1st place winner for an oral presentation, Emilie Rosset was awarded 1st place in PhD I Poster Presentation and Ralph H. Johnson VAMC Student Research Honorable Mention, Abby Wenzel received the Sigma Xi Best Poster Presentation Award and Health Disparities 2nd place poster award. Our students receive recognition at national meetings as well, with Theresa Cantu receiving a SACNAS Travel scholarship, Mohammed Dany was awarded the Southeastern Medical Scientist Symposium Best Poster Presentation award, the ASIP award for outstanding research in experimental pathology 2015, and American Physician Scientist Association Trainee travel award, Bethany Herbert-1st place poster presentation at the Life Sciences Baltics MAP Kinases Conference, and Jacqueline Bangma-Center for Global Health Trainee Travel Grant award. Theresa Cantu, Jessica McCoy, Alexis Temkin have all submitted small grants for their work, and Emily Durham was awarded a 2015 SMART award eBioscience. Lastly, 12 of our students graduated from MUSC on May 15, 2015. Six received PhD degrees, 1 received a DMD/PhD dual degree, and 5 received a MD/PhD dual degree. These graduates are moving on to postdoctoral trainees positions and internships in some of the best laboratories and institutes in the country. One of our graduates, Jacquelyne Robichaux, was recognized as one of the 2015 Distinguished Graduates. All the students in the MCBP program have done well and we are very proud of their accomplishments.

Department/Program Goals for 2015-2016

The MCBP Graduate Program provides 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 Program 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. 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.