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2015-2016 Department of Biomedical Sciences Scholarly Activity Report

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East Tennessee State University
Quillen College of Medicine

Summary of Scholarly Activities

Department of Biomedical Sciences
July 1, 2015 – June 30, 2016

I. PUBLICATIONS

Note: *graduate student; **undergraduate student; ***medical student

I-A. Journal Publications

Archer T, **Kostrzewa RM** (2015) Physical exercise alleviates health defects, symptoms and biomarkers in schizophrenia spectrum disorder. *Neurotox Res* Oct;28(3):268-280. PMID: 26174041.

Archer T, **Kostrzewa RM** (2016) Exercise and nutritional benefits in PD: Rodent models and clinical settings. *Curr Top Behav Neurosci*, 29:333-351. PMID: 26728168.

Archer T, **Kostrzewa RM** (2016) Neuroteratology and animal modeling of brain disorders. *Curr Top Behav Neurosci* 29:1-40. PMID: 26857462.

Beaumont E, Wright GL, Southerland EM, Li Y*, Chui RW, KenKnight BH, Armour JA, Ardell JL (2016) Vagus nerve stimulation mitigates intrinsic cardiac neuronal remodeling and cardiac hypertrophy induced by chronic pressure overload in guinea pig. *Am J Physiol Heart Circ Physiol* May15;310(10):H1349-59. PMID: 26993230.

Beaumont E, Southerland EM, Hardwick JC, **Wright GL**, Ryan S, Li Y*, KenKnight BH, Armour JA, Ardell JL (2015) Vagus nerve stimulation mitigates intrinsic cardiac neuronal and adverse myocyte remodeling postmyocardial infarction. *Am J Physiol Heart Circ Physiol* Oct;309(7): H1198-206. PMID: 26276818.

Bentley J, Snyder F, Brown SD, **Brown RW**, Pond BB (2015) Sex differences in the kinetic profiles of d- and l- methylphenidate in the brains of adult rats. *Eur Rev Med Pharmacol Sci* Jul;19(13):2514-9. PMID: 26214791.

Biswas S, Xin L, Panigrahi S, Zimman A, Wang H, **Yakubenko V**, Byzova TV, Salomon RG, Podrez EA (2016) Novel phosphatidylethanolamine derivatives accumulate in circulation in hyperlipidemic ApoE^{-/-} mice and activate platelets via TLR2. *Blood* May 26;127(21):2618-29. PMID:27015965.

Borel N, Leonard C, Slade J*, **Schoborg RV** (2016) Chlamydial antibiotic resistance and treatment failure in veterinary and human medicine. *Curr Clin Microbiol Rep* 3:10-18. PMID:27218014.

Brown RW, Peterson DJ* (2015) Applications of the neonatal quinpirole model to psychosis and convergence upon the dopamine D(2) receptor. *Curr Top Behav Neurosci* Oct 16;29:387-402. PMID: 26472551.

Cline-Parhamovich K, **Ferslew KE** (2016) The grape soda death: Acute fluid intoxication complicated by potential furosemide ingestion (part of K75 Postmortem Pediatric Forensic Toxicology). *Proceedings American Academy of Forensic Sciences*, 68th Annual Scientific Meeting 22:1015, Feb. 22-27 Las Vegas, NV.

Copes N*, Edwards C*, Saifee M**, Barjuca I**, Nelson D**, Parragio A**, **Bradshaw PC** (2015) Metabolome and proteome changes with aging in *Caenorhabditis elegans*. *Exp Gerontol* Dec;72:67-84. PMID:26390854.

Danysz W, Flik G, McCreary A, Tober C, Dimpfel W, Bizot JC, **Kostrzewa R, Brown RW, Jatzke CC, Greco S, Jenssen AK, Parsons CG** (2015) Effects of sarizotan in animal models of ADHD: Challenging pharmacokinetic-pharmacodynamic relationships. *J Neural Transm* (Vienna) Sep;122(9):1221-38. PMID: 25796190.

Delic V*, Brownlow M*, Joly-Amado A, Zivkovic S**, Noble K**, Phan T**, Ta Y**, Zhang Y**, Bell SD**, Kurien C**, Reynes C**, Morgan D, **Bradshaw PC** (2015) Calorie restriction does not restore brain mitochondrial function in P301L tau mice, but it does decrease mitochondrial F₀F₁-ATPase activity. *Mol Cell Neurosci* Jul;67:46-54. PMID:26048366.

Downs AM, Jalloh HB, Prater KJ, Fregoso SP, Bond CE, Hampton TG, **Hoover DB** (2016) Deletion of neurturin impairs development of cholinergic nerves and heart rate control in postnatal mouse hearts. *Physiol Rep* May;4(9). PMID:27162260.

Ewan EE, **Hagg T** (2016) Intrathecal acetyl-L-carnitine protects tissue and improves function after a mild contusive spinal cord injury in rats. *J Neurotrauma* Feb 1;33(3):269-77. PMID 26415041.

Garst C, Fulmer M*, **Brown S, Thewke D** (2016) Optimized extraction of 2-arachidonoyl glycerol and anandamide from aortic tissue and plasma for quantification by LC-MS/MS. *Eur J Lipid Sci Technol* May;118(5):814-820. PMID:27274705.

Habecker BA, Anderson ME, Birren SJ, Fukuda K, Herring N, **Hoover DB**, Kanazawa H, Paterson DJ, Ripplinger CM (2016) Molecular and cellular neurocardiology: Development, cellular and molecular adaptations to heart disease. *J Physiol* Apr 6 PMID: 27060296.

Hardwick JC, Ryan SE, Powers EN, **Southerland EM**, Ardell JL (2015) Angiotensin receptors alter myocardial infarction-induced remodeling of the guinea pig cardiac plexus. *Am J Physiol Regul Integr Comp Physiol* Jul 15;309(2):R179-88. PMID:25947168.

Harrison TA, He Z, Boggs K, Thuret G, Liu H-X, **Defoe DM** (2016) Corneal endothelial cells possess an elaborate multipolar shape to maximize the basolateral to apical membrane area. *Mol Vis* Jan 16;22:31-39. PMID:27081293.

He Y, Shi J, Yi W, Ren X, Gao X, Li J, Wu N, Weaver K, **Xie Q**, Khoo SK, Yang T, Huang X, Melcher K, Xu HE (2015) Discovery of a highly potent glucocorticoid for asthma treatment. *Cell Discov* Dec 2015;1.pii:15035. PMID: 27066265.

He Z, Forest F, Gain P, Rageade D, Bernard A, Acquart S, Peoc'h M, **Defoe DM**, Thuret G. (2016) 3D map of the human corneal endothelial cell. *Sci Rep* PMID: 27381832.

Hilton BA*, Li Z, **Musich PR**, Wang H*, Cartwright BM*, Serrano M, Zhou XZ, Lu KP, **Zou Y**

(2015) ATR Plays a direct antiapoptotic role at mitochondria which is regulated by prolyl isomerase Pin1. *Mol Cell* Oct 1;60(1):35-46. PMID: 26387736

(Highlighted by editors of Nature Reviews Molecular Cell Biology: Minton, K. (2015) Research Highlight: DNA damage response - ATR prevents premature apoptosis, *Nat Rev Mol Cell Biol* 16, 640-641. Recommended by Dr. Siegfried Hekimi, et al to Faculty1000 Prime: Hekimi, S., and Yee, C. F1000 Prime, 27 October, 2015).

Huang J, Tufan T, Deng M, **Wright G**, **Zhu MY** (2015) Corticotropin releasing factor up-regulates the expression and function of norepinephrine transporter in SK-N-BE (2) M17 cells. *J Neurochem* Oct; 135:38-49. PMID: 26212818.

Johnson J, Ascierio ML, Mittal S, Newsome D, Kang L, Briggs M, Tanner K, Marincola FM, Berens ME, Vande Woude GF, **Xie Q** (2015) Genomic profiling of a hepatocyte growth factor-dependent signature for MET-targeted therapy in glioblastoma. *J Transl Med* Sep 17;13:306. PMID: 26381735.

Keasey MP, Lemos RR, **Hagg T**, Oliveira JR (2016) Vitamin-D receptor agonist calcitriol reduces calcification in vitro through selective upregulation of SLC20A2 but not SLC20A1 or XPR1. *Sci Rep* May17;6-25802. PMID:27184385.

Kim YW, **Yakubenko VP**, West XZ, Gugiu GB, Renganathan K, Biswas S, Gao D, Crabb JW, Salomon RG, Podrez EA, Byzova TV (2015) Receptor-mediated mechanism controlling tissue levels of bioactive lipid oxidation products. *Circ Res*. Jul 31;117(4):321-32. PMID: 25966710.

Kostrzewa RM, Kostrzewa RA, Kostrzewa JP (2015) Botulinum neurotoxin: Progress in negating its neurotoxicity; and in extending its therapeutic utility via molecular engineering. MiniReview. *Peptides* Oct; 72:80-87. PMID: 26192475.

Kostrzewa RM, Nowak P, Brus R, **Brown RW** (2016) Perinatal treatments with the dopamine D₂-receptor agonist quinpirole produces permanent D₂-receptor supersensitization: A model of schizophrenia. *Neurochem Res*;41(1-2):183-192. PMID: 26547196.

Kostrzewa RM (2015) Perinatal lesioning and life-long effects of the noradrenergic neurotoxin 6-hydroxydopa. *Curr Top Behav Neurosci* 29:43-50. PMID: 26660536.

Kostrzewa JP, Kostrzewa RA, **Kostrzewa RM**, Brus R, Nowak P (2016) Perinatal 6-hydroxydopamine modeling of ADHD. *Curr Top Behav Neurosci* 29:279-294. PMID: 26475157.

Kostrzewa JP, Kostrzewa RA, **Kostrzewa RM**, Brus R, Nowak P (2016) Perinatal 6-hydroxydopamine to produce a life-long model of severe Parkinson's disease. *Curr Top Behav Neurosci* 29:313-332. PMID: 26475156.

Kostrzewa RM, Brus R (2016) Life-long rodent model of tardive dyskinesia – persistence after antipsychotic drug withdrawal. *Curr Top Behav Neurosci* 29:353-362. PMID 26472552.

Lacy RT, **Brown RW**, Morgan AJ, Mactutus CF, Harrod SB (2016) Intravenous prenatal nicotine exposure alters meth-induced hyperactivity, conditioned hyperactivity, and BDNF in adult rat offspring. *Dev Neurosci*; June 11; Vol. 38, No. 3. PMID: 27287203.

Leonard C, **Schoborg RV**, Borel N (2015) Damage/danger associated molecular patterns (DAMPs) inhibit chlamydia pecorum and C. trachomatis serovar E inclusion development in

vitro. *PLoS One*, Aug 6;10(8):e0134943. PMID: 26248286.

Li X, Zhao H, Tan X, **Kostrzewa RM**, Du G, Chen Y, Zhu J, Miao Z, Yu H, Kong J, Xu X (2015) Inhibition of connexin43 improves functional recovery after ischemic brain injury in neonatal rats. *Glia* Sep;63(9):1553-1567. PMID: 25988944.

Liu J, Das M, Yang J, Ithychanda SS, **Yakubenko VP**, Plow EF, Qin J (2015) Structural mechanism of integrin inactivation by filamin. *Nat Struct Mol Biol* May;22(5):383-9. PMID: 25849143.

Maple AM, Smith KJ, Perna MK, **Brown RW** (2015) Neonatal quinpirole treatment produces prepulse inhibition deficits in adult male and female rats. *Pharmacol Biochem Behav* Oct;137:93-100. PMID: 26296939.

Netherland-Van Dyke C, Rodgers W, Fulmer M*, Lahr Z, **Thewke D** (2015) Cannabinoid receptor Type 2 (CB2) dependent and independent effects of WIN55,212-2 on atherosclerosis in Ldlr-null Mice. *J Cardiol Ther* Jul;3(2):53-63. PMID: 26413498.

Noss I, Ozment TR, Graves BM, **Kruppa MD**, Rice PJ, Williams DL (2015) Cellular and molecular mechanisms of fungal β -(1,6)-glucan in macrophages. *Innate Immun* Oct;21(7) 759-769. PMID: 26209532.

O'Neal-Moffitt G*, Delic V*, **Bradshaw PC**, Olcese J (2015) Prophylactic melatonin significantly reduces Alzheimer's neuropathology and associated cognitive deficits independent of antioxidant pathways in A β PP^(swe)/PS1 mice. *Mol Neurodegener* Jul 11:10:27. PMID:26159703.

Olive KE, **Kwasigroch TE**, Wooten DJ, Lybrand C, Peeples CR (2016). A career exploration program: An effective alternative to the traditional use of faculty advisors. *Acad Med* May 3. PMID 27144992.

Raza MU, Tufan T, Wang Y, Hill C, **Zhu MY** (2016) DNA damage in major psychiatric diseases. *Neurotox Res* Apr; 28:1-17. PMID: 27126805.

Schambra UB, Goldsmith J, Nunley K, Liu Y, Harirforoosh S, Schambra HM (2015) Low and moderate prenatal ethanol exposures of mice during gastrulation or neurulation delays neurobehavioral development. *Neurotoxicol Teratol*, PMID: 26171567.

Scofield SLC*, Amin P, **Singh M, Singh K** (2015) Extracellular ubiquitin:Role in myocyte apoptosis and myocardial remodeling. *Compr Physiol* Dec 15;6(1):527-60 (Invited Review). PMID:26756642.

She X, Calderone R, **Kruppa M**, Lowman D, Williams D, Zhang L, Gao Y, Khamooshi K, Liu W, Li D (2016) Cell wall N-linked mannoprotein biosynthesis requires Goa1p, a putative regulator of mitochondrial complex in *candida albicans*. *PLoS One* Jan 25;11(1). PMID:26809064.

Slade J*, **Hall JV**, Kintner J, **Schoborg RV** (2016) Chlamydial pre-infection protects from subsequent herpes simplex Virus-2 challenge in a murine vaginal super-infection model. *PLoS One* Jan 4;11(1):e0146186. PMID: 26726882.

Wang Y, Hilton BA*, Cui K, **Zhu MY** (2015) Effects of antidepressants on DSP4/CPT-Induced

DNA damage response in neuroblastoma SH-SY5Y Cells. *Neurotox Res* Aug;28(2):154-70. PMID: 26038195.

I-B. Books or Chapters:

Books:

Kostrzewa RM and T Archer (co-Editors) *Neurotoxin Modeling of Brain Disorders – Life-long Outcomes in Behavioral Teratology*, for *Current Topics in Behavioral Neuroscience* (CTBN) book series (Geyer M, C Marsden, B Ellenbroek, Editors) (Springer New York) (2016). Each chapter is peer-reviewed and is treated as an individual refereed contribution. Each chapter is listed in Medline and PubMed as an article in the journal section.

Book Chapters:

Hagg T (2016) Axonal regeneration in the sensory dorsal column pathway. In: *Neural Regeneration* (So KF, Xu XM, Eds.), Science Press Beijing, Ch. 18, pp. 273-287.

Archer T, Kostrzewa RM (2016) Neuroteratology and Animal Modeling of Brain Disorders, In *Neurotoxin Modeling of Brain Disorders – Life-long Outcomes in Behavioral Teratology* (Kostrzewa RM, Archer T, Eds.), Springer Intl Publ Switzerland. doi: 10.1007/7854_2015_434. *Curr Top Behav Neurosci*. 29: 1-40. PMID: 26857462.

Kostrzewa RM (2016) Perinatal Lesioning and Life-Long Effects of the Noradrenergic Neurotoxin 6-Hydroxydopa, In *Neurotoxin Modeling of Brain Disorders – Life-long Outcomes in Behavioral Teratology* (Kostrzewa RM and Archer T, Editors), Springer Intl Publ Switzerland. doi: 10.1007/7854_2015_414. *Curr Top Behav Neurosci*. 29: 43-50. PMID: 26660536.

Kostrzewa JP, Kostrzewa RA, Kostrzewa RM, Brus R, Nowak P (2016) Perinatal 6-Hydroxydopamine Modeling of ADHD, In *Neurotoxin Modeling of Brain Disorders – Life-long Outcomes in Behavioral Teratology* (Kostrzewa RM and Archer T, Editors), Springer Intl Publ Switzerland. doi: 10.1007/7854_2015_397. *Curr Top Behav Neurosci* 29: 279-294. PMID: 26475157.

Kostrzewa JP, Kostrzewa RA, Kostrzewa RM, Brus R, Nowak P (2016) Perinatal 6-Hydroxydopamine to Produce a Life-long Model of Severe Parkinson's Disease, In *Neurotoxin Modeling of Brain Disorders – Life-long Outcomes in Behavioral Teratology* (Kostrzewa RM and Archer T, Editors), Springer Intl Publ Switzerland. doi: 10.1007/7854_2015_396. *Curr Top Behav Neurosci* 29: 313-332. PMID: 26475156.

Archer T, Kostrzewa RM (2016) Exercise and Nutritional Benefits in PD: Rodent models and Clinical Settings, In *Neurotoxin Modeling of Brain Disorders – Life-long Outcomes in Behavioral Teratology* (Kostrzewa RM and Archer T, Editors), Springer Intl Publ Switzerland. doi: 10.1007/7854_2015_409. *Curr Top Behav Neurosci* 29: 333-351. PMID: 26728168.

Kostrzewa RM, Brus R (2016) Life-long Rodent Model of Tardive Dyskinesia – persistence after antipsychotic drug withdrawal, In *Neurotoxin Modeling of Brain Disorders – Life-long Outcomes in Behavioral Teratology* (Kostrzewa RM and Archer T, Editors), Springer Intl Publ Switzerland. doi: 10.1007/7854_2015_395. *Curr Top Behav Neurosci* 29: 353-362. PMID: 26472552.

II. PAPERS, ABSTRACTS, AND/OR PRESENTATIONS

II-A. Regional

Alkhateeb T*, Ozment, T, Youngberg G, Williams D, **Hoover DB**. Effects of sepsis on renal structure and sympathetic innervation in mice. ETSU Appalachian Student Research Forum, April 2016. **Tuga Alkhateeb won First Place: Master's Candidate/Biomedical & Health Sciences Division.**

Armstrong MG**, **Hoover D**. Effect of sterile peritonitis on the expression of substance P in primary sensory neurons and nerves. ETSU Boland Undergraduate Research Symposium, March 2016.

Butler M**, **Hall JV**. Influence of estrogen and progesterone on chlamydial infections. ETSU Boland Undergraduate Research Symposium, March 2016.

Cantrell N***, Campbell R-P, Scofield S*, **Singh K, Beaumont E**. Vagus nerve stimulation improves neuronal action potential synchrony with cardiac and respiratory cycle in heart failure animal model. ETSU Appalachian Student Research Forum, April 2016.

Denton A**, Kirby S*, Kaestner C**, Burgess K, **Brown R**. The effects of antipsychotic treatment upon nicotine associative reward in a neonatal quinpirole model of schizophrenia. ETSU Appalachian Student Research Forum, April 2016. **Adam Denton/Charlotte Kaestner won Second Place: Undergraduates/Society, Behavior, Learning, Humanities, and Engineering (Group A) category.**

Denton A**, **Brown RW**. The effects of antipsychotic treatment upon associative learning in a neonatal quinpirole model of schizophrenia. ETSU Boland Undergraduate Research Symposium, March 2016.

DePreter CC**, Kirby SL*, Beuttel LA, Palmatier MI, **Brown RW**. Adolescent methylphenidate exposure alters the behavioral response to nicotine and sensitizes accumbal BDNF. ETSU Appalachian Student Research Forum, April 2016.

DePreter CC**, **Brown RW**. Adolescent methylphenidate exposure alters the behavioral response to nicotine. ETSU Boland Undergraduate Research Symposium, March 2016.

Fleenor JW***, King KA, **Harrison TA, Defoe DM**. Development of multipolar cell shape in mouse corneal endothelium. ETSU Appalachian Student Research Forum, April 2016.

Fulmer M*, Englehaupt E, Garst C, **Brown S, Thewke D**. Systemic type-2 cannabinoid receptor deletion alters atherosclerotic lesion calcification in Ldlr-null Mice. ETSU Appalachian Student Research Forum, April 2016.

Gill WD*, Wherry JD, **Brown RW**. Behavioral epigenetic evidence of increases in dopamine D2 receptor sensitivity after neonatal quinpirole treatment in rats. ETSU Appalachian Student Research Forum, April 2016.

Gilmer D**, **Cuihong J.** Focal adhesion kinase inhibition promotes adult olfactory stem cell proliferation via ciliary neurotrophic factor. ETSU Boland Undergraduate Research Symposium, March 2016.

Gilmer D**, **Cuihong J.** Focal adhesion kinase inhibition promotes adult olfactory stem cell proliferation via ciliary neurotrophic factor. Undergraduate Research Symposium at University of Tennessee, Knoxville TN.

Hernandez LJ**, Burgess KC, Wherry J, **Szebeni A, Ordway G, Brown RW.** A double hit stress rodent model of major depressive disorder. ETSU Appalachian Student Research Forum, April 2016.

Hinkle M**, **Beaumont E.** Sympathetic overdrive observed in heart failure. ETSU Boland Undergraduate Research Symposium, March 2016.

Ingram V**, **Ordway G.** 3D printed food and dysphagia: Food of the future has a purpose. ETSU Boland Undergraduate Research Symposium, March 2016.

Jones R**, **Zou Y.** Pin1 in the DNA damage response in relation to RPA modification. ETSU Appalachian Student Research Forum, April 2016.

Jones R**, **Zou Y.** Pin1 interaction in the hyperphosphorylation of RPA. ETSU Boland Undergraduate Research Symposium, March 2016.

Kirby J***, **Kruppa M.** Polymicrobial interactions: Rediscovery and characterization of an inhibitor of neisseria gonorrhoeae. ETSU Appalachian Student Research Forum ETSU, April 2016. **John Kirby won First Place: Medical Residents category.**

Kirby SL*, Burgess KC, Beuttel LA, Dean S, Bradley CA, Palmatier, MI, **Zhu MY, Brown RW.** Nucleus accumbens bdnf overexpression alters the behavioral response to nicotine. ETSU Appalachian Student Research Forum ETSU, April 2016.

Li Y*, **Wright G,** Peterson J. Hepatic cell metabolism regulation by C1q tumor necrosis factor-related protein-3. ETSU Appalachian Student Research Forum, April 2016.

Lim KA**, **Singh K.** Role of exogenous ubiquitin (Ex-Ub) in myocardial ischemia/reperfusion injury (IRI). ETSU Boland Undergraduate Research Symposium March 2016.

Mahmodian M**, Kwenda E**, DiPeri T, **Szebeni A, Szebeni K** Ardell JL, **Ordway GA.** Effects of spinal cord stimulation on heart failure induced hippocampal damage. ETSU Appalachian Student Research Forum, April 2016.

Mathis K**, Pyles, R, Stewart J, **Ecay T.** Impact of reduced calcium during development in snakes. ETSU Appalachian Student Research Forum, April 2016.

Mathis K**, Pyles, R, Stewart J, **Ecay T.** Impact of reduced calcium during development in snakes. ETSU Boland Undergraduate Research Symposium, March 2016.

Mattie S**, Brooks A, Becker R, Abercrombie C, **Kwasigroch T.** Modernizing educational resources for an advanced anatomy lab experience. Appalachian Student Research Forum, April 2016.

Monroe LL^{***}, Armstrong MG^{*}, Williams DL, **Hoover DB**. Zymosan-induced SIRS results in severe hypothermia and mild depression of cardiac dromotropic function in mice. ETSU Appalachian Student Research Forum, April 2016. **Lizzie Monroe won First Place, Group B: Medical Student category.**

Mussard C^{**}, **Thewke D**. In Vitro Investigation of the effects of exogenous ubiquitin on processes associated with atherosclerosis. ETSU Boland Undergraduate Research Symposium, March 2016.

Ngwa DN^{*}, Gang TB, Singh SK, **Agrawal A**. Engineered C-reactive protein with improved protective action against pneumococcal infection. ETSU Appalachian Student Research Forum, April 2016.

Pathak A^{*}, Singh SK, Thirumalai A, Armstrong PB, **Agrawal A**. Evolution of a host-defense function of C-reactive protein from horseshoe crab to humans. ETSU Appalachian Student Research Forum, April 2016.

Pendola EM^{**}, Sciara AN^{*}, Crawford JD^{*}, **Ordway GA, Chandley MJ**. Pro-inflammatory microglia pathology in the anterior cingulate cortex in ASD. ETSU Appalachian Student Research Forum, April 2016. **Emma Pendola won First Place: Undergraduates Biomedical and Health Sciences category.**

Rabulinski D^{**}, **Thewke D**. Modulation of osteogenic gene expression in cultured murine vascular smooth muscle cells by the cannabinoid receptor type 2. Boland Undergraduate Research Symposium, March 2016.

Sciara AN^{*}, Pendola EE^{**}, Crawford JD^{*}, **Chandley MJ, Ordway GA**. Characterization of anti-inflammatory microglia in anterior cingulate cortex white matter in autism spectrum disorder. ETSU Appalachian Student Research Forum, April 2016. **Audrey Sciara won First Place, Group B: Master's Candidate/Natural Sciences category.**

Scofield LCS^{*}, Lim KA^{**}, Daniels CR^{*}, Dalal S, Singh M, **Singh K**. Extracellular ubiquitin decreases adverse effects of myocardial ischemia/reperfusion injury in mice. ETSU Appalachian Student Research Forum, April 2016. **Stephanie Scofield won First Place, Group B: Doctoral Candidate/Biomedical, Health & Natural Sciences category.**

Sheth P^{***}, Campbell R, **Brown S, Duffourc M, Schoborg RV, Beaumont E**. The effects of vagal nerve stimulation on trimethylamine-n-oxide levels in a rat heart failure model. ETSU Appalachian Student Research Forum, April 2016.

Thrasher PR^{*}, Scofield LCS^{*}, Dalal S, **Singh M, Singh K**. Ataxia Telangiectasia mutated kinase induces autophagy in mice following myocardial infarction. ETSU Appalachian Student Research Forum, April 2016.

Wang H^{*}, Hilton BA^{*}, **Musich P, Zou Y**. The novel role of ATR in suppressing the ionomycin-induced necrotic cell death response. ETSU Appalachian Student Research Forum, April 2016. **Hui Wang won First place, Group B: Doctoral Candidate Biomedical & Health Sciences category.**

Whitted C^{*}, Cartwright M^{*}, Walls S, **Zou Y**, Torrenegra R, Palau V. Two isomeric flavonoids have a synergistic effect in colon cancer when used in combination with 5-fluorouracil cells due to increased DNA damage. ETSU Appalachian Student Research Forum, April 2016.

II-B. National

Brown RW, Beuttel LA, Odineal EM, Cummins ED, Kassem G, Bradley CA, Palmatier MI. Neonatal quinpirole treatment enhances nicotine self-administration in adult rats. Society for Neuroscience, October, 2015. Chicago, IL.

Campbell RP, **Duffourc M**, **Schoborg RV**, **Beaumont E**. Vagal nerve stimulation mitigates aberrant gut flora observed in guinea pigs with pressure overload. American Heart Association Scientific Sessions, November 2015, Orlando, FL.

Cline-Parhamovich K, **Ferslew KE**. The grape soda death: Acute fluid intoxication complicated by potential furosemide ingestion (part of Pediatric Postmortem Toxicology). Presented at the 68th Annual Meeting of the American Academy of Forensic Sciences, Feb 26, 2016, Las Vegas, NV.

Cummins ED, Leedy KK, Peterson DJ*, Kirby SK*, Hernandez LJ**, **Brown RW**. An analysis of the interaction of methylphenidate and nicotine in adolescent rats: Effects on BDNF. Society for Neuroscience, October 2015, Chicago, IL.

Defoe DM, Fleenor J***, King K, Marshall B, **Harrison T**, Liu H-X. Development of multipolar cell shape in mouse corneal endothelium. IOVS 2016;57:ARVO E-Abstract 5295, May 1-5, 2016, Seattle, WA.

Downs AM, Ozment TR, Bond CE, Elgazzar M, Williams DL, **Hoover DB**. Leukocytes may alter their mode of acetylcholine release during sepsis. Poster presentation at the 38th Annual Conference on Shock, Shock 43 (Suppl. 1):56, June 6-9, 2015, Denver, CO.

Fulmer M*, Englehaupt E, Garst C, **Brown S**, **Thewke D**. Type-2 cannabinoid receptor deficiency is associated with atherosclerotic lesion calcification in Ldlr-null Mice. (Oral presentation - M. Fulmer received a travel award from AHA-ATVB to present the abstract) Arteriosclerosis, Thrombosis and Vascular Biology / Peripheral Vascular Disease Scientific Sessions, Omni Hotel, May 5-7, 2016, Nashville, TN.

Graus MS, Young JM, Pappas HC, **Kruppa M**, Williams D, Lidke KA, Neumann AK (2016) Concealing carbohydrates: *Candida sp.* secret to masking β -glucan. 13th ASM conference on *Candida* and candidiasis. April 2016, Seattle, WA.

Hernandez LJ**, Burgess KC, Wherry J, Szebeni A, **Ordway GA**, **Brown RW** (2016) A double hit stress rodent model of major depressive disorder. Society for Neuroscience Annual Meeting, Oct. 2015, Chicago, IL.

Hilton B*, Gopal S, Xu L, Mazumder S, **Musich PR**, Cho BP, **Zou Y**. ATR plays a direct antiapoptotic role at mitochondria which is regulated by prolyl isomerase Pin1. Cell Symposia on Multifaceted Mitochondria, July 19-21, 2015, Chicago, IL.

Hilton B*, Liu Y, Liu J, Jones R, Tang H, Mehraban N, Johnson M, Wang Y, Breitman M, **Rusinol A**, **Musich P**, **Zou Y**. Progerin sequesters PCNA resulting in replication fork collapse in hutchinson-gilford progeria. The 18th Annual Midwest DNA Repair Symposium, Ohio State

University, May 28-29, 2016, Columbus, OH.

Joplin KH, **Duffourc M**. Initial analysis of the transcriptome of pupal diapause in the flesh fly (*Sarcophaga crassipalpis*) Entomological Society of America Annual Meeting, November 15-18, 2015, Minneapolis, MN.

Kirby SL*, Cummins ED, Peterson DJ*, Denton AR, Dose JM, **Brown RW**. A test of the aversive versus the rewarding effects of nicotine in rats neonatally treated with quinpirole. Society for Neuroscience, October 2015, Chicago, IL.

Kirby SL*, Cummins ED, Peterson DJ*, Denton AR, Dose JM, **Brown RW**. The associative effects of nicotine in a neonatal quinpirole model of schizophrenia: Neurobiological mechanisms and sex differences. College of Problems in Drug Dependence, June 2016, Palm Springs, CA.

Kruppa M, Kwofie F*, Lowman D, Rosler B, Graves B, Rice PJ, Greene R, van de Veerdonk F, Netea MG, Williams D. Albicans yeast and hyphal mannans: High affinity interactions with human Dectin-2 and induction of Th17-cytokines (IL-17, IL-22) in human PBMCs. 13th ASM Conference on *Candida* and Candidiasis Session Talk, Apr 13-17 2016, Seattle, WA.

Levine E, **Defoe DM**, Vazquez-Chona F. Tumor suppressor p27KIP1 modulates cell-cycle entry and limited neurogenic potential in radial Müller glia. IOVS 2016;57:ARVO E-Abstract 4186, ARVO Annual Meeting, May 1-5, 2016, Seattle, WA.

Li D, Williams D, Lowman D, **Kruppa M**, Calderone R. Cell wall synthesis, mitochondrial complex 1 subunits and signal transduction. 13th ASM conference on *Candida* and candidiasis. Apr 2016, Seattle, WA.

Monroe LL***, Armstrong MG, Zhang X, **Hall JV**, Ozment TR, Li C, Williams DL, **Hoover DB**. Zymosan-induced peritonitis results in hypothermia, impaired cardiac function and bacterial translocation. Poster presentation at the 39th Annual Conference on Shock, June 11-14, 2016, Austin, TX.

Monroe LL***, Armstrong MG*, Williams DL, **Hoover DB**. Zymosan-induced SIRS results in severe hypothermia and mild depression of cardiac dromotropic function in mice. Lizzie Monroe presented poster at the 2016 Meeting of the American Medical Student Association, Washington, DC.

Ngwa DN*, Gang TB, Singh SK, **Agrawal A**. Engineered C-reactive protein with improved protective action against pneumococcal infection. Immunology 2016 Meeting, . *J. Immunol.* 196: 63.4 (Selected for Oral Presentation and Travel Award), Seattle, WA.

Ordway GA, **Szebeni K**, DiPeri TP, Johnson LA, Stockmeier CA, Crawford JD*, Chandley MJ, **Szebeni A**. Elevated DNA oxidation and DNA repair enzyme gene expression in brain white matter in major depressive disorder. *Biological Psychiatry* 79(9S): 233S, May 11-14, Atlanta, GA.

Pathak A*, Singh SK, Thirumalai A, Armstrong PB, **Agrawal A**. Evolution of a host-defense function of C-reactive protein from horseshoe crab to humans. Immunology 2016 Meeting, *J. Immunol* 96: 132.5 (Poster Presentation), April 13-17, 2016, Seattle, WA.

Peterson DJ*, Bardo CM, Cummins ED, **Brown RW**. The role of the $\alpha 7$ and $\alpha 4\beta 2$ nicotinic

receptors in nicotine sensitization and neural plasticity of adolescent rats neonatally treated with quinpirole. Society for Neuroscience, Chicago, IL (October, 2015).

Phillips Campbell R, **Duffourc M, Schoborg RV, Beaumont E**. Vagal nerve stimulation mitigates aberrant gut flora observed in guinea pigs with pressure overload. American Heart Association Scientific Sessions, Poster presentation. *Note: only 2700/8000 (34%) of submitted abstracts were accepted. Nov. 7-11, 2015, Orlando, FL.

Wang H*, Hilton BA*, Cartwright BM*, Gong H*, **Musich PR, Zou Y**. Role of ATR in Non-DNA damage stress responses (NDDR): A novel function in suppressing Ca²⁺ overload-induced PARP1-mediated necrosis. The 18th Annual Midwest DNA Repair Symposium, Ohio State University, May 28-29, 2016, Columbus, OH.

II-C. International

Acosta L, **Rodriguez-Gil DJ**, Rela L, Greer CA. Olfactory pathway plasticity, early response of the olfactory ensheathing cells and microglial cells to a massive damage of the olfactory epithelium, 23rd Meeting of the French glial cell club, June 1st - 3rd, 2016, Carry-le-Rouet, France.

Busch FA, **Agrawal A**, Wysocki V. Native mass spectrometry as a structural biology tool. (Poster presentation) Mosbacher Kolloquium: Protein structure, from first principles to biomedical applications, March 31-April 2, 2016, Mosbach, Germany.

Fulmer M*, Englehaupt E, Garst C, **Brown S, Thewke D**. Modulation of late stage atherosclerosis by the Type-2 cannabinoid receptor. Cannabinoid Research and IACM 8th Meeting of Cannabinoids in Medicine, Sept. 12, 2015, Sestri Levante, Italy.

Leonard CA, **Schoborg RV**, Borel N. Damage/danger associated molecular patterns (DAMPs) inhibit chlamydia pecorum and C. trachomatis serovar E inclusion development in vitro. 3rd European Meeting on Animal Chlamydioses and Zoonotic Implications (EMAC-3), Sept.14-25, 2015, Maisons-Alfort, France.

III. INVITED PRESENTATIONS

III-A Regional

Dr. Patrick Bradshaw. Title: "Natural therapies for improving mitochondrial function in neurodegenerative diseases." ETSU Department of Biomedical Sciences Seminar Series, January 15, 2016.

Dr. Michelle Duffourc. Title: "Introduction to RNA-seq;Key considerations for project design." ETSU Department of Biomedical Sciences Seminar Series, December 11, 2015.

Dr. Regina Phillips Campbell. Title: "Effect of vagal nerve stimulation on gut flora in guinea pigs with heart failure." ETSU Department of Biomedical Sciences Seminar Series, October 23, 2015.

Dr. Theo Hagg. Title: "Microvascular damage regulates outcomes after nervous system injury." ETSU Department of Biomedical Sciences Seminar Series, September 4, 2015.

Dr. Jennifer Hall. Title: “Hormones and *chlamydia trachomatis*: friend or foe?” ETSU Department of Biological Sciences Seminar Series, March 2016.

Dr. Jennifer Hall. Title: Presented a talk to high school students interested in careers in the fields of science and medicine and about college programs necessary to achieve their goals, Grundy High School (Grundy, VA) Career Chat Presenter.

Dr. Cuihong Jia. Title: “Integrin signaling regulates CNTF, LIF and neurogenesis *in vivo*.” TSU Department of Biomedical Sciences Seminar Series, December 4, 2015.

Dr. Diego Rodriguez-Gil. Title: “A cilia-associated protein alters axon extension in Meckel Gruber Syndrome.” ETSU Department of Biomedical Sciences Seminar Series, April 8, 2016.

Dr. Antonio Rusinol. Title: “Prelamin A in cell cycle control.” ETSU Department of Biomedical Sciences Seminar Series, September 25, 2015.

Dr. Rob Schoborg. Title: “Ascertaining the role of acetylcholine producing cells in chlamydial genital tract infection.” ETSU Department of Biomedical Sciences Seminar Series, September 11, 2015.

Dr. Valentin Yakubenko. Title: “New potential mechanism for neutrophil-mediated macrophage recruitment during inflammation.” ETSU Department of Biomedical Sciences Seminar Series, November 13, 2015.

III-B. National

Dr. Russ Brown. Title: “Neonatal quinpirole enhances nicotine self-administration and motivation to consume nicotine in adult rats.” Brown RW, Beuttel LA, Odineal EM, Cummins ED, Kassem G, Bradley CA, Palmatier MI. Invited talk at the College of Problems in Drug Dependence, Palm Springs, CA, June, 2016.

Dr. Eric Beaumont. Title: “Effect of Neuromodulation on visceral processing.” Guest speaker, Neuromodulation Meeting. San Francisco, CA, May 25-29, 2016.

Dr. Diego Rodriguez-Gil. Title: “Axon guidance in the olfactory system.” Seminar speaker, Southern Connecticut State University, New Haven, CT, February 29, 2016.

Dr. Don Hoover. Title: “Exploration of cholinergic mechanisms: From brain to heart to spleen.” Robert E. Stitzel Lecture, Department of Physiology and Pharmacology, West Virginia University School of Medicine, Morgantown, WV, October 14, 2015.

Dr. Don Hoover. Title: “Exploration of cholinergic mechanisms: From brain to heart to spleen.” University of New England, Department of Pharmaceutical Sciences, College of Pharmacy, November 9, 2015.

Dr. Gregory Ordway. Title: “White matter oligodendrocyte pathology in depression and suicide.” Mini-Symposium Speaker, Suicide Research Summit, IASR/AFSP, NYC, October 11, 2015.

Dr. Gregory Ordway. Title: "Suicide, Depression, and Brain Biology." Guest presentation, Virginia Polytechnic Institute Out of Darkness Event, sponsored by the American Foundation for Suicide Prevention, March 17, 2016.

Dr. Rob Schoborg. Title: "Using co-infections to explore the biology of sexually transmitted pathogens." Guest speaker, Department of Biomedical Sciences, University of South Alabama, Mobile, AL, December 7, 2015.

Dr. Krishna Singh. Title: "Molecular Signals Involved in Myocyte Apoptosis and Myocardial Remodeling." Department of Physiology and Biophysics, University of Louisville, KY, December 8, 2015.

III-C. International

Dr. Patrick Bradshaw. Title: "Aging-induced metabolomics and proteomic changes in *C. elegans*." Copes N*, Edwards-Canfield C*, Chaput D*, Stevens Jr, SM, Bradshaw PC. Keystone Symposium Entitled Epigenetic and Metabolic Regulation of Aging and Aging-Related Diseases. Santa Fe, NM, May 2016.

Dr. Richard Kostrzew. Title: "Neurotoxicity and neuroprotection." Invited Lecture, XIX Congress of the Polish Pharmacological Society. Invited Lecture on *Monoaminergic System Interactions in Neurotoxicity*, in the session "Neurotoxicity and Neuroprotection," Swinoujscie, Poland, September 2015.

Dr. Richard Kostrzewa. Title: "L-DOPA effects on striatal microdialysate levels of hydroxyl radical in parkinsonian rats." Invited oral presentation, 2nd Central European Biomedical Congress (CEBC). Chairman, symposium on Processes and Mechanisms Associated with Parkinson's Disease, Krakow, Poland, 15-18 June 2016.

Dr. Ming-Yang Zhu. Title: "Effects of chronic social defeat and glucocorticoids on norepinephrine transporter expression and underlying molecular mechanisms Invited Seminar Speaker, Guangji Mental Hospital, Soochow University, May 11, 2016.

Dr. Yue Zou. Title: "A novel role of ataxia telangiectasia RAD3-related (ATR) in cell death". Invited Seminar Speaker, "Department of Biochemistry and Molecular Biology, Sichuan University, Chengdu, China. July 16-17, 2015.

V. VISITING PROFESSORS:

Name: John C. Quindry, Ph.D., FACSM
Title: Associate Professor, School of Kinesiology
Institution: Auburn University, Auburn AL
Date: September 14, 2015
Event: External Seminar Series
Topic: "Exercise and cardioprotection against ischemia/reperfusion injury"

Name: Bruce D. Carter, Ph.D.
Title: Professor, Department of Biochemistry
Associate Director, Vanderbilt Brain Institute
Director of Graduate Studies for Neuroscience
Institution: Vanderbilt University School of Medicine, Nashville, TN
Date: October 12, 2015
Event: External Seminar Series
Topic: "Killing and eating neurons: Mechanisms of retrograde apoptotic signaling and phagocytic clearance of the cell corpses"

Name: Arturo, Casadevall, M.D., Ph.D.
Title: Chair, W. Harry Feinstone Department of Molecular Microbiology & Immunology
Institution: John Hopkins Bloomberg School of Public Health, Baltimore MD
Date: April 18, 2016
Event: External Seminar Series
Topic: "Thoughts on the origin of microbial virulence"

Name: Peisong Ma, Ph.D.
Title: Research Assistant Professor, Department of Medicine and Pharmacology
Institution: University of Pennsylvania, Philadelphia, PA
Date: April 25, 2016
Event: External Seminar Series
Topic: "Fine tuning the hemostatic response through regulated control of G Protein signaling in platelets"

Name: Lance A. Johnson, Ph.D.
Title: Postdoctoral Fellow, Department of Behavioral Neuroscience
Institution: Oregon Health & Science University, Portland, OR
Date: May 5, 2016
Event: External Seminar Series
Topic: "Cognitive impairment, diabetes and apoe: Mechanisms of cerebrovascular dysfunction and recovery"

Name: Aaron Polichnowski, Ph.D.
Title: Research Scientist
Institution: Edward Hines, Jr., VA Hospital, Hines IL
Date: May 13, 2026
Event: External Seminar Series
Topic: "The acute kidney injury-chronic kidney disease nexus"

Name: Wei Qiu, Ph.D.
Title: Assistant Professor, Department of Surgery/Oncology Institute
Institution: Loyola University Chicago, Maywood, IL
Date: May 16, 2016
Event: External Seminar Series
Topic: "The role of FAK in hepatocarcinogenesis"

Name: Carlos Bolanos-Guzman, Ph.D.
Title: Professor, Department of Psychology
Institution: Florida State University, Tallahassee, FL

Date: June 1, 2016
Event: External Seminar Series
Topic: "Neurobiological sequelae of witnessing stressful events early in life"

Name: Zhiqiang Qin, M.D., Ph.D.
Title: Assistant Professor, LSU Health Science Center-New Orleans
Institution: Stanley S. Scott Cancer Center, New Orleans, LA
Date: June 6, 2016
Event: External Seminar Series
Topic: "Role of glycoprotein emmprin (CD147) in virus-associated malignancies"

VI. EXTRAMURAL FUNDING

GRANT FUNDING

Extramural Funding Awards:

Total New Extramural Funding Awarded to Biomedical Sciences PI: \$4,998,079

Total Amount of New Funding FY2016 Distribution: \$1,423,514

"C-reactive protein in rheumatoid arthritis" NIH; Alok Agrawal, PI; project funding period 7/13/15 to 5/31/20;

Total Direct: \$1,970,855; Total Indirect: \$710,631; **Total Award \$2,681,486**

Year Direct: \$425,323; Year Indirect: \$152,703; **Year Total \$578,026**

"Complement-mediated anti-pneumococcal functions of C-reactive protein" NIH; Alok Agrawal, PI; project funding period 9/1/15 to 8/31/16;

Total Direct: \$250,000; Total Indirect: \$120,000; **Total Award \$370,000**

Year Direct: \$83,108; Year Indirect: \$39,892; **Year Total \$123,000**

"Metabolic mechanisms of amino acid-mediated lifespan extension in c. elegans" NIH; Patrick Bradshaw, PI; project funding period 9/15/15 to 4/30/16;

Total Direct: \$49,022; Total Indirect: \$22,550; **Total Award \$71,572**

Year Direct: \$20,797; Year Indirect: \$8,991; **Year Total \$29,788**

"Nicotine and the roles of nicotine receptors in rodent model of schizophrenia" NIH; Russell Brown, PI; project funding period 7/1/13 to 6/30/16 (transfer from ETSU Psychology);

Total Direct: \$300,000; Total Indirect: \$108,221; **Total Award \$408,221**

Year Direct: \$100,000; Year Indirect: \$35,114; **Year Total \$135,114**

"Effect of compound A on recovery from cerebral ischemia" Neurodetection Int'l Inc., Russell Brown, PI; project funding period 5/1/13 to 4/30/18 (transfer from ETSU Psychology);

Total Direct: \$11,644; Total Indirect: \$5,356; **Total Award \$17,000**

Year Direct: \$1,474; Year Indirect: \$678; **Year Total \$2,152**

"Role of ATM in myocardial remodeling following myocardial infarction" NIH; Krishna Singh, PI; project funding period 8/1/15 to 7/31/18;

Total Direct: \$300,000; Total Indirect: \$123,485; **Total Award \$423,485**

Year Direct: \$100,000; Year Indirect: \$41,162; **Year Total \$141,162**

“Role of B2 integrins in macrophage retention and egress during inflammation” NIH; **Valentin Yakubenko, PI**; project funding period 1/15/16 to 4/30/18 (transfer from Cleveland Clinic);

Total Direct: \$585,000; Total Indirect: \$237,943; **Total Award \$822,943**
Year Direct: \$150,000; Year Indirect: \$72,000; **Year Total \$222,000**

“The contribution of integrin alphaDbeta2 to the macrophage migration and lipid deposition during atherogenesis” AHA; **Valentin Yakubenko, PI**; project funding period 9/1/15 to 6/30/16 (transfer from Cleveland Clinic);

Total Direct: \$63,110; Total Indirect: \$6,311; **Total Award \$69,421**
Year Direct: \$63,110; Year Indirect: \$6,311; **Year Total \$69,421**

“Identifying molecular determinants and biomarkers for MET targeted therapy in glioblastoma” Stephen M. Coffman Foundation; **Qian Xie, PI**; project funding period 2/1/16 to 1/31/17 (transfer from Van Andel Research Institute);

Total Direct: \$100,000; Total Indirect: \$0; **Total Award \$100,000**
Year Direct: \$100,000; Year Indirect: \$0; **Year Total \$100,000**

“Unrestricted funds transfer for research” Van Andel Research Institute; **Qian Xie, PI**; project funding period 2/1/16 to 6/30/18 (transfer from Van Andel Research Institute);

Total Direct: \$10,539; Total Indirect: \$0; **Total Award \$10,539**
Year Direct: \$10,539; Year Indirect: \$0; **Year Total \$10,539**

“AARN 2016 Travel Award” American Brain Tumor Association; **Qian Xie, PI**; project funding period 3/1/16 to 6/30/16;

Total Direct: \$1,212; Total Indirect: \$0; **Total Award \$1,212**
Year Direct: \$1,212; Year Indirect: \$0; **Year Total \$1,212**

“Alector LLC Sponsored Research Agreement” Alector LLC; **Theo Hagg, PI**; project funding period 11/1/15 to 10/31/16;

Total Direct: \$15,000; Total Indirect: \$7,200; **Total Award \$22,200**
Year Direct: \$7,500; Total Indirect: \$3,600; **Total Award \$11,100**

Continued Extramural Funded Grant Awards:

Total Amount of Continued Funding FY2016 Distribution: \$1,192,791

“Anti-apoptotic Role of Ataxia Telangiectasia and Rad3-Related” NIH; **Yue Zou, PI**; project funding period 9/1/14 to 8/31/17;

Year Direct: \$108,024; Year Indirect: \$49,138; **Year Total \$157,162**

“Cholinergic anti-inflammatory mechanisms in sepsis and septic shock” NIH; **Donald Hoover, PI**; project funding period 9/1/14 to 8/31/17;

Year Direct: \$59,474; Year Indirect: \$31,712; **Year Total \$91,186**

“Targeting CNTF to increase adult forebrain neurogenesis.” NIH R01; **Theo Hagg, PI**; project funding period 04-15-2014 to 03-31-2019;

Year Direct: \$198,850; Year Indirect: \$91,471; **Year Total: \$290,321.**

“Oxidative DNA damage in brainstem oligodendrocytes in depressed suicide victims.” American Federation for Suicide Prevention; **Gregory Ordway, PI**; project funding period 06-30-2014 to 07-01-2016;
Year Direct: \$44,988; Year Indirect: \$0; **Year Total: \$44,988.**

“Genetics of trans-kingdom interactions between candida and bacteria.” NIH R15; **Mike Kruppa, PI**; project funding period 06-14-2014 to 05-31-2017;
Year Direct: \$78,056; Year Indirect: \$35,906; **Year Total: \$113,962.**

“Osteopontin: role in myocyte apoptosis and myocardial function” Dept. of Veterans Affairs; **Krishna Singh, Ph.D., PI**; project funding period 07-01-14 to 6-30-2018;
Year Direct: \$241,364; Year Indirect: \$0; **Year Total: \$241,364.**

“Vascular responses as therapeutic targets after SCI.” NIH (University of Louisville Sub-award); **Theo Hagg, PI**; project funding period 01-01-2014 to 07-31-2016; Year Direct: \$171,492; Year Indirect: \$82,316; **Year Total: \$253,808.**

Continued Extramural Funded Grant Extensions:

“Characterization of a novel host pathway that regulates chlamydial development.” NIH-National Institute of Allergy and Infectious Disease; R01 AI095637-01; **Robert V. Schoborg, PI, Michelle M. Duffourc, Consultant; Jennifer Hall, Co-I**; project funding period 07-01-2011 to 07-31-2016.

“Health Sciences Fellowship in Neurocardiology.” American Heart Association. Jeffrey L. Ardell, PI; **Don Hoover, Co-I**; project funding period 01-01-2009 to 01-31-2017.

“Modulation of atherosclerosis by type 2 cannabinoid receptor.” NIH 1R15HL113878-01A1. **Douglas P Thewke, PI; Antonio Rusinol, Co-I**; project funding period 01-10-2013 to 12-31-2016.

Continued Extramural Funding for Grants Awarded to non-DBMS PI:

None

Intramural Grant Awards:

Total Internal Grants Awarded to Biomedical Sciences PI: \$40,000

“Molecular analysis of nutrient transport pathways in amniote embryos” ETSU RDC **Thomas Ecay, PI**, project funding period 7/1/15 to 6/30/16; Total Award \$10,000

“Does estrogen and/or progesterone alter chlamydia trachomatis development through the Wnt/B-catenin signaling pathway” ETSU RDC **Jennifer Hall, PI**, project funding period 7/1/15 to 6/30/16; Total Award \$10,000

“The induction of integrin signaling by microsporidia adherence to host cells” ETSU RDC **Russell Hayman, PI**, project funding period 7/1/15 to 6/30/16; Total Award \$10,000

“How does chlamydia genital tract infection protect from subsequent herpes virus challenge?” ETSU RDC **Robert Schoborg, PI**, project funding period 7/1/15 to 6/30/16; Total Award \$10,000