Department of Pharmacology & Toxicology

2015 Annual Report
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Department of Pharmacology and Toxicology-2015
MISSION

The Department of Pharmacology and Toxicology is committed to academic excellence and to the attainment of regional, national, and international recognition for the quality of its educational, research, and service activities. Guided by the University of Louisville Strategic Plan (The 2020 Plan) to continue our path to national prominence, the mission of the Department of Pharmacology and Toxicology focuses on five broad objectives:

- Provide instruction in pharmacology and toxicology of the highest quality for the education and preparation of medical, dental, nursing, and other health care professional students. Emphasis is placed on the fundamental principles necessary for life-long learning and the essential knowledge required for rational, effective, and safe use of drug therapy.

- Advance biomedical knowledge through high quality research and other scholarly activities, particularly in pharmacology and toxicology and other areas of focus within the University of Louisville 2020 Plan.

- Provide high quality research and educational experiences in pharmacology and toxicology for the education and training of future biomedical scientists who will provide and advance biomedical education, research, and service.

- Provide instruction of the highest quality in pharmacology and toxicology that is appropriate for students at the undergraduate, graduate, and postgraduate levels.

- Provide high quality service to the School of Medicine, the Health Sciences Center, the University, the people of Louisville and the surrounding region, the Commonwealth of Kentucky, professional organizations, the nation, and the world.

OVERVIEW

2015 was a time of major changes in the Department of Pharmacology & Toxicology. Following numerous retirements over the past few years, the Department added seven new faculty with primary faculty appointments, five new faculty with secondary faculty appointments, and an adjunct appointment.

New PhD partnerships were approved with Jilin University and Cairo University. Program review of the Department of Pharmacology and Toxicology graduate programs were highly positive (with final approvals to occur in 2016).

The administrative offices and staff for the Department of Pharmacology and Toxicology transitioned from the 13th floor of the Research Tower to the 1st Floor of the Kosair Charities Clinical and Translational Research Building (KCCTRB). This change reflects the location of the great majority of Departmental faculty, staff, and students on all six floors of the KCCTRB.
Major increases in receipt of extramural grant support continued in FY2015, and the Department of Pharmacology and Toxicology was ranked 28th among all US medical schools in receipt of NIH funding.

![Graph showing Department Grant Awards ($ Millions) from FY2012 to FY2015](image)

**FACULTY CHANGES**

We mourn the loss of Professor Emeritus Len Waite who passed away April 16, 2015 after an extended illness. Dr. Waite provided exemplary leadership, teaching, and service to the Department of Pharmacology and Toxicology for 40 years from 1970 until his retirement from the faculty in 2011. During his tenure, he served as the Department Vice-Chair and Director of the graduate program. He mentored outstanding graduate students including our current Executive Vice President for Research and Innovation Bill Pierce, and served on the graduate committees of numerous other students. In addition to biomedical graduate students, Dr. Waite directed and largely taught many undergraduate, graduate, and professional courses and students in the Schools of Dentistry, Medicine, Nursing, and the College of Arts and Sciences. Dr. Waite was recognized for his excellence in teaching by the School of Dentistry and the President’s Award for Distinguished Service by the University. His service towards such a large and broad array of our educational programs at the University of Louisville exhibited his talent, work ethic and dedication to teaching. He was a dear friend and advisor to many of us and will be deeply missed.
NEW FACULTY APPOINTMENTS (Primary appointments)

Jonathan H. Freedman, PhD was appointed Professor (term) effective January 1, 2015. He was previously at the Integrated Toxicology Program, Duke University Medical Center in Durham, NC and Biomolecular Screening Branch, National Toxicology Program & Laboratory of Toxicology and Pharmacology, ETP, DIR at the National Institute of Environmental Health Sciences, NIH, Research Triangle Park, NC. His research program focuses on understanding the mechanisms by which transition metals affect the transcription of both specific genes and entire genomes through the activation of intracellular signal transduction pathways ultimately leading to adverse human health effects. A second research area is to develop in vivo toxicological assays using the nematode Caenorhabditis elegans and evaluate their utility as medium- and high-throughput screening tools. This research area is part of the international effort to reduce, refine or replace vertebrate animals in chemical testing.

Joshua L. Hood, MD, PhD was appointed Assistant Professor effective January 1, 2015. He served previously at the Consortium for Translational Research in Advanced Imaging and Nanomedicine (C-TRAIN), Department of Medicine, Washington University School of Medicine, St. Louis, MO. His research program focuses on translational design and implementation of biology inspired nanomedicine supported by biologic nanovesicle (exosome) investigations. Exosome function and nanocarrier properties in the context of tumor angiogenesis and pre-metastatic niche formation are explored with a specific focus on melanoma. Derivative projects include development of exosome based biomarkers for disease and nanomedicines to combat pathogenic exosomes and similarly structured viruses.
John Wise Sr., PhD was appointed Professor with tenure and an appointment as University Scholar effective May 1, 2015. Dr. Wise received his PhD in Pharmacology from George Washington University followed by postdoctoral studies at the National Cancer Institute. He served as Senior Toxicologist at an environmental and occupational medicine consulting firm prior to accepting a faculty appointment at Yale University School of Medicine. Most recently he was a Professor of Toxicology and Molecular Epidemiology and Director of the Maine Center for Toxicology and Environmental Health at the University of Southern Maine. His research program incorporates cellular and molecular mechanisms in cancer biology and deploys cell biology, molecular biology, toxicology, molecular epidemiology, and genomics to investigate the health impacts of environmental chemical exposures at the molecular, cellular, tissue, individual, community, and population levels. His internationally recognized research program is currently funded by NIEHS and has been funded by numerous federal agencies and private foundations, including NIH, US Army, NASA, and NOAA.

Joshua L. Fuqua, PhD was appointed as Instructor (term) effective June 1, 2015. Dr. Fuqua received his PhD in Anatomy and Neurobiology from the University of Kentucky. He completed postdoctoral work at Wake Forest University and the University of Louisville and was most recently a senior staff scientist in the Owensboro Cancer Research Program. His research program focuses on production and development of clinically relevant therapeutics for neurodegenerative diseases such as amyotrophic lateral sclerosis.
Sandra S. Wise, PhD  was appointed as Assistant Professor (term) effective June 1, 2015.  Dr. Wise received her PhD in Biochemistry and Molecular Biology from the University of Maine.  She most recently was Director of the Cytogenetics and Genomic Instability Program in the Wise Laboratory of Environmental and Genetic Toxicology at the University of Southern Maine and will continue to investigate mechanisms of heavy metal carcinogenesis in collaboration with John Wise Sr. at the University of Louisville.

Demetra Antimisiaris, PharmD  was appointed Associate Professor (term) effective July 1, 2015. She received her PharmD from the University of the Pacific in 1989 followed by a geriatrics residency at UCLA in collaboration with the University of Southern California. She has also served on the faculty at the University of Kentucky. She is director of the UofL polypharmacy initiative, dedicated to education, research and public awareness of polypharmacy. She serves on the Kentucky Institute on Aging, an advisory to the Secretary of the Cabinet for Health and Family Services on policy matters related to the development and delivery of services to the aged. Her research interests include clinician-patient decision making regarding medication use in geriatric and palliative care patients, as well as interdisciplinary perspectives on medication use in the elderly.
J. Calvin Kouokam, PhD was appointed Instructor (term) effective July 1, 2015. He received his doctorate in pharmacognosy and analytical photochemistry from the University of Saarland in 2002. He followed with postdoctoral work at the University of Louisville and is currently working with Drs. Ken Palmer and Nobi Matoba in the Brown Cancer Center/Owensboro Cancer Research Program to develop plant produced proteins for the treatment of human diseases. He is focusing on the safety, pharmacodynamics and pharmacokinetic evaluation of antiviral therapeutics and development of a plant produced cholera toxin B subunit, a component of an oral cholera vaccine, for mass vaccination during cholera outbreaks.

FACULTY EMERITUS APPOINTMENTS

Donald E. Nerland, PhD retired and was appointed Professor Emeritus effective January 1, 2015.
NEW FACULTY APPOINTMENTS (Secondary appointments)

Ayman El-Baz, PhD
   Associate Professor and Acting Chair of Bioengineering
   Ph.D., Electrical and Computer Engineering, University of Louisville (2006)

   **Research Interests:** Dr. El-Baz directs UofL’s BioImaging Laboratory. The primary focal point of the BioImaging Lab is to develop and implement innovative and ground-breaking techniques for use in image-guided surgeries, and the creation of non-invasive image-based diagnostic systems, which can help to revolutionize the early diagnosis of numerous diseases and brain disorders.

Kyung Hong, PhD
   Assistant Professor of Medicine
   Ph.D., Environmental Medicine/Toxicology, University of Rochester, School of Medicine and Dentistry (2003).

   **Research Interests:** Cell therapy for ischemic cardiomyopathy; cardiac regeneration/repair; cardiac stromal cell biology.
**Matthew A. Nystoriak, PhD**  
Assistant Professor of Medicine  
Ph.D., Pharmacology, University of Vermont, College of Medicine (2010)

**Research Interests:** Regulation of vascular calcium signaling and blood flow in diabetes.

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**Martin G. O’Toole, PhD**  
Assistant Professor of Bioengineering  
Ph.D., Chemistry, University of Louisville (2008)

Marcin Wysoczynski, PhD
Assistant Professor of Medicine
Ph.D., Pomeranian Medical University (2009)

Research Interests: Innate immunity in myocardial repair.

NEW FACULTY ADJUNCT APPOINTMENTS

Irina Tcherepanova, PhD: Adjunct Professor of Pharmacology and Toxicology, PhD, Molecular Pharmacology, Albert Einstein College of Medicine (1996).

FACULTY PROMOTIONS

Steven Myers, PhD was promoted to Professor of Pharmacology and Toxicology

Daniel Conklin, PhD was promoted to Professor of Medicine
Chi Li, PhD was promoted to Associate Professor of Medicine

Steven Jones, PhD was promoted to Professor of Medicine

Chendil Damodaran PhD, Associate Professor of Urology was awarded tenure

UNIVERSITY ADMINISTRATIVE CHANGES

David W. Hein, PhD was promoted to Vice Provost for Academic Strategy
DEPARTMENT ADMINISTRATIVE STAFF CHANGES

Blair Cade, M.A. was promoted to Department Manager and Executive Assistant to the Vice Provost.

Florence Su, M.M. was promoted to Program Coordinator, Senior

Hannah Bitter, B.S.Ed. was appointed Administrative Assistant (temporary; part-time).

Tracey Pender left the position of Program Coordinator, Sr. to take a position at Humana.
FACULTY WITH PRIMARY APPOINTMENTS

Demetra Antimisiaris, PharmD
Associate Professor
PharmD, University of the Pacific (1989)

**Research Interests:** Decision making regarding medication use: Prescribing, Monitoring, Patient Use (adherence, health and pharm literacy), and how Pharm-Tox awareness, education, and the healthcare systems (incentives for time and patient integration) impact medication use outcomes from the perspective of the providers, patients, and health care systems. FDA approved medication specifications vs. recommendations vs. real time use of medications and how this impacts treatment failure or success. (i.e. prevalence of missed monitoring parameters such as renal function with medications known to lead to renal accidents).

Gavin E. Arteel, PhD
Professor and Associate Chair for Research
Ph.D., Toxicology, University of North Carolina-Chapel Hill (1997)

**Research Interests:** Mechanisms of oxidative stress; mechanisms of alcohol-induced hepatitis, pancreatitis, and hepatocellular carcinoma.

Juliane I. Arteel, PhD (Juliane Beier in professional publications)
Assistant Professor
Ph.D., Biochemistry and Molecular Biology, Heinrich-Heine-Universität (2005)

**Research Interests:** Interactions of diet and environmental toxins in the production of non-alcoholic fatty liver disease.

Brian P. Ceresa, PhD
Associate Professor and Graduate Director: Recruitment and Admissions
PhD, Pharmacology, Vanderbilt University (1995)

**Research Interests:** Membrane trafficking and signaling of the epidermal growth factor receptor (EGFR); the EGFR is overexpressed and hyperactivated in many cancers; our goal is to better understand how signaling by this receptor is regulated with the goal of attenuating its signaling in cancer.

Shao-yu Chen, PhD
Professor
Ph.D., Biochemistry, Fujian Agriculture and Forestry University (1991)
**Research Interests:** Elucidation of cellular and molecular mechanisms of alcohol-induced birth defects utilizing a combination of experimental approaches including RNA interference, microRNA technology, and ultrasound-guided *in utero* microinjection in cellular, whole embryo and *in vivo* mouse models.

**Geoffrey J. Clark, PhD**
Associate Professor  
Ph.D., Molecular Oncology, University of Manchester (1989)

**Research Interests:** Role of RAS oncogenes and RASSF family of tumor suppressors in cancer etiology; development of oncogip model for human cancer; and the identification and development of novel small molecules for cancer therapy.

**Jonathan H. Freedman, PhD**
Professor  
Ph.D., Molecular Pharmacology, Albert Einstein College of Medicine (1986)

**Research Interests:** The research program in our group involves understanding regulatory processes controlling an organism's response to environmental stress. In particular, how organisms respond when they are exposed to toxic concentrations of transition metals and metalloids. By applying classic genetic and reverse-genetic approaches, molecular biology and transcriptomic techniques in an evolutionarily diverse group of animal species including the nematode *C. elegans* and mice, as well as mammalian cell culture, regulatory pathways that respond to metals are identified and characterized. Results from this research are used to help elucidate the fundamental mechanisms of transition metal induced disease: developmental abnormalities (*Autism Spectrum Disorders*), cancer and metabolic disorders, such as type 2 diabetes and obesity. In addition to our work with transition metals, we are interested in the development and application of high-throughput toxicity screening methods using alternative animal species (e.g., invertebrates and fish). This work is applicable to the Tox21 initiative and consistent with the 3R’s animal welfare paradigm.

**Joshua L. Fuqua, PhD**
Instructor  
Ph.D., University of Kentucky, Lexington, KY (2010)

**Research Interests:** Manufacture and development of clinically relevant proteins for the treatment and/or prevention of neurodegenerative and infectious diseases.

**Ramesh C. Gupta, PhD**
Professor and Agnes Brown Duggan Chair of Oncological Research  
Ph.D. Analytical/Physical Chemistry, University of Roorkee (1972)
Research Interests: Development and identification of intermediate biomarkers to investigate etiology and prevention of human cancers resulting from both environmental and endogenous exposures.

David W. Hein, PhD
Professor and Peter K. Knoefel Chair of Pharmacology and Toxicology
Ph.D., Pharmacology, University of Michigan (1982)

Research Interests: Molecular pharmacogenetics; molecular epidemiology; functional genomics; genetic predisposition to chemical carcinogenesis and drug toxicity; molecular genetics; and environmental toxicology.

Joshua L. Hood, MD, PhD
Assistant Professor
Ph.D., Microbiology, University of Kentucky (2004)
M.D., University of Kentucky (2006)

Research Interests: Translational design and implementation of biology inspired nanomedicine supported by biologic nanovesicle (exosome) investigations. Exosome function and nanocarrier properties in the context of tumor angiogenesis and pre-metastatic niche formation are explored with a specific focus on melanoma. Derivative projects include development of exosome based biomarkers for disease and nanomedicines to combat pathogenic exosomes and similarly structured viruses.

Y. James Kang, PhD
Professor
Ph.D., Cell Biology and Zoology, Iowa State University (1989)

Research Interests: Molecular and cardiac toxicology; transgenic and knock-out animal models to study oxidative injury and antioxidant systems in the heart; biological functions and toxicological significance of metallothionein and glutathione in vivo.

La Creis R. Kidd, PhD, MPH
Associate Professor and Our Highest Potential Endowed Chair in Cancer Research
Ph.D., Toxicology, Massachusetts Institute of Technology (1997)
**Research Interests:** Gene-gene and gene-environmental interactions; polymorphic xenobiotic metabolizing enzymes and prostate cancer susceptibility; and cancer health disparities.

**Joseph Calvin Kouokam, PhD**  
Instructor  
Ph.D. (Dr. rer. nat), University of Saarland, Saarbrucken, Germany (2002)

**Research Interests:**  
Efficacy and safety of plant produced lectins in the treatment of infectious diseases and cancer.

**Igor S. Lukashevich, MD, PhD, DSci**  
Professor  
M.D., Minsk Medical Institute, Belaris (1973)  
Ph.D., Institute of Virology, Academy of Medical Science, Moscow Russia (1976)  
D.Sc., Institute of Virology, Academy of Medical Science, Moscow Russia (1987)

**Research Interests:** Novel vaccine technologies (virus-like-particle vectors; reassortant vaccines, infectious DNA vaccination); molecular biology and pathogenesis of viral hemorrhagic fevers.

**Nobuyuki Matoba, PhD**  
Associate Professor  
Ph.D., Applied Life Sciences, Kyoto University, Japan (2001)

**Research Interests:** Development of vaccines and antivirals; mucosal immune response to foreign substances; and plant biotechnology for human health.

**Steven R. Myers, PhD**  
Professor and Associate Chair for Professional Education  
Ph.D., Pharmacology, University of Kentucky (1986).

**Research Interests:** Drug metabolism; metabolism of xenobiotics and chemical carcinogens; use of hemoglobin as biomarker in exposure to xenobiotics.

**Kenneth E. Palmer, PhD**  
Professor and Hemsley Chair in Plant-Based Pharmaceutical Research  
Ph.D., Microbiology, University of Cape Town (1997)
**Research Interests:** Development of vaccines and antiviral proteins to prevent and treat viral diseases that predispose people to development of cancer.

**William M. Pierce Jr, PhD**  
Professor and Executive Vice President for Research and Innovation  
Ph.D., Pharmacology and Toxicology, University of Louisville (1981).

**Research Interests:** Mechanisms of bone formation and resorption; design of novel drugs for management of osteoporosis; biomolecular mass spectrometry; proteomics in structural biology.

**Leah J. Siskind, PhD**  
Associate Professor  
Ph.D., Biology, University of Maryland (2003)

**Research Interests:** Role of sphingolipids in regulating cellular processes such as apoptosis, necrosis, proliferation, and inflammation in the context of disease states; Design of drugs to re-balance sphingolipid metabolism and improve disease outcomes.

**Zhao-Hui (Joe) Song, PhD**  
Professor  
Ph.D., Pharmacology, University of Minnesota (1992).

**Research Interests:** Molecular pharmacology; cloning and functional characterization of novel G protein-coupled receptors; molecular mechanisms of action and structure-function relationships of cannabinoid (marijuana) receptors.

**J. Christopher States, PhD**  
Professor and Vice Chair for Graduate Education  
Ph.D., Molecular Biology and Pathology, Albany Medical College/Union University (1980).

**Research Interests:** Molecular biology and molecular genetics of DNA damage and repair in humans; mechanisms of chemo-resistance; arsenic toxicity and cell cycle disruption.

**John P. Wise, Sr., PhD**  
Professor  

**Research Interests:** In my laboratory we seek to understand how environmental chemicals cause a normal cell to become a tumor cell. We study how these chemicals damage DNA and
impact the DNA damage response. We consider how chemical-induced autophagy inhibition, loss of DNA repair and interference with mitosis cause centrosome amplification and chromosome instability as key outcomes in the carcinogenic process. We focus on humans, but we also work across wildlife species (e.g. whales, sea turtles, and alligators) considering toxicology in a “One” environmental health perspective. We also work on how cells respond differently in space. Students in my lab have both a laboratory component and a field research component to their projects.

Sandra S. Wise, PhD  
Assistant Professor  
Ph.D., Molecular Biology and Biochemistry, University of Maine, Orono, Maine (2013)  

**Research Interests:** Metal toxicology and carcinogenesis; molecular mechanisms of chromosome instability, DNA repair mechanisms and cell death resistance.

**FACULTY WITH SECONDARY APPOINTMENTS**

**Shirish Barve, PhD**  
Professor of Medicine  
Ph.D., Molecular Pathogenesis, University of Kentucky (1990)  

**Research Interests:** Effects of alcohol on molecular mechanisms of cytokine action, gene expression and liver injury.

**Levi J. Beverly, PhD**  
Assistant Professor of Medicine  
Ph.D., Molecular Biology, Biochemistry, and Microbiology, University of Cincinnati (2007)  

**Research Interests:** Regulation of anti-apoptotic proteins in cancer progression and treatment.

**Aruni Bhatnagar, PhD**  
Professor of Medicine  
Ph.D., Chemistry, University of Kanpur (1985)  

**Research Interests:** Cardiovascular toxicology; oxidative mechanisms of cardiovascular disease; lipid peroxidation in atherosclerosis; gene expression; secondary complications of diabetes.

**Haribabu Bodduluri, PhD**  
Professor of Microbiology & Immunology
Ph.D., Biochemistry, Indian Institute of Science (1983)

**Research Interests:** Signal transduction and chemoreceptors; role of leukotriene receptors in inflammation and host response.

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**Michael E. Brier, PhD**
Professor of Medicine  
Ph.D., Industrial and Physical Pharmacy, Purdue University (1986)

**Research Interests:** Clinical pharmacokinetics/dynamics; Drug dosing in renal failure.

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**Jian Cai, PhD**
Assistant Professor of Medicine  
Ph.D., Pharmacology and Toxicology, University of Louisville (1999)

**Research Interests:** Application of mass spectrometry in biomedical research; Drug and metabolite identification and quantification; Protein identification and post-translational modification; Hemoglobin adducts as biomarkers of chemical exposure and pathogenesis.

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**Lu Cai, MD, PhD**
Professor of Pediatrics and Radiation Oncology  
M.D., Norman Bethune University of Medical Sciences (1983)  
Ph.D., Radiation Biology/Oncology, Norman Bethune University of Medical Sciences (1987)

**Research Interests:** Diabetic cardiomyopathy and nephropathy.

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**Matthew C. Cave, MD**
Associate Professor of Medicine  
M.D., University of Kentucky (2001)

**Research Interests:** Steatohepatitis and liver cancer related to environmental and occupational chemical exposures; Complementary and alternative medicine in liver disease; Alcoholic and nonalcoholic fatty liver disease; Treatment of Hepatitis C.

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**Jason A. Chesney, MD, PhD**
Professor of Medicine  
Ph.D., Biomedical Sciences/Immunology, University of Minnesota (1997)  
M.D., University of Minnesota (1998)
Research Interests: Novel regulators of cancer cell metabolism; identification of emerging viruses and the development of immune-based therapies against widely metastatic cancers.

Daniel J. Conklin, PhD
Professor of Medicine
Ph.D., University of Notre Dame (1995)

Research Interests: Environmental cardiology; cardiovascular toxicology.

Albert R. Cunningham, PhD
Associate Professor of Medicine
Ph.D., Environmental and Occupational Health, University of Pittsburgh (1998)

Research Interests: Structure-Activity Relationship Modeling: Carcinogens, Chemotherapeutics, and Molecular Targets.

Chendil Damodaran, PhD
Associate Professor of Urology
Ph.D., Environmental Toxicology (Cancer Biology), University of Madras (1984).

Research Interests: Identifying novel therapeutic compounds of natural origin that possess anti proliferative properties in prostate cancer cells, both androgen-dependent and – independent.

John W. Eaton, PhD
James Graham Brown Professor of Medicine
Ph.D., Biological Anthropology and Human Genetics, University of Michigan (1969)

Research Interests: Biological oxidation/reduction reactions with special emphasis on inflammatory diseases and neoplasia.

Ayman El-Baz, PhD
Associate Professor and Acting Chair of Bioengineering
Ph.D., Electrical and Computer Engineering, University of Louisville (2006)

Research Interests: Dr, El-Baz directs UofL’s BioImaging Laboratory. The primary focal point of the BioImaging Lab is to develop and implement innovative and ground-breaking techniques for use in image-guided surgeries, and the creation of non-invasive image-based diagnostic systems, which can help to revolutionize the early diagnosis of numerous diseases and brain disorders.
Paul N. Epstein, PhD  
Professor of Pediatrics  
Carol B. McFerran Chair in Pediatric Diabetes Research  
Ph.D., Pharmacology, Baylor College of Medicine (1981)

**Research Interests:** Molecular mechanisms of diabetogenesis. The use of transgenic animals to study genetics and molecular mechanisms in vivo.

Wenke Feng, PhD  
Associate Professor of Medicine  
Ph.D, Biochem/Biotech, University for Bodenkultur (1998)

**Research Interests:** Mechanisms of alcoholic liver disease; Mechanisms of nonalcoholic steatohepatitis; Tissue hypoxia and diabetic complications.

Hermann B. Frieboes, PhD  
Assistant Professor of Bioengineering  
Ph.D., Biomedical Engineering, University of California, Irvine (2006)

**Research Interests:** 1) Develop and apply realistic, predictive biocomputational models integrated with clinical and laboratory data to study cancer growth and treatment; 2) Design of patient-specific therapies; and 3) Design of multiscale biocomputational models to describe the complex interaction between cancer treatment and the immune system.

Leila Gobejishvili, PhD  
Assistant Professor of Medicine  

**Research Interests:** Alcohol induced changes in innate immunity; alcohol mediated epigenetic changes of pro-inflammatory cytokines; role of phosphodiesterases in priming of monocytes and development of liver injury/fibrosis.

Evelyne Gozal, PhD  
Associate Professor of Pediatrics  
Ph.D., Toxicology, University of Southern California (1997)

**Research Interests:** Signal transduction pathways involved in neuronal cell survival and neuronal cell death during hypoxia; cellular mechanisms underlying brain adaptation to chronic and intermittent hypoxia; identification of the kinases and transcription factors activated by hypoxia, leading to gene induction and to adaptation to oxygen deprivation.
**Yiru Guo, MD**  
Professor of Medicine  
M.D., Xinjiang Medical University (1982)

**Research Interests:** Cardio-thoracic and vascular surgery, physiology, and pharmacology. Research focuses on: (i) elucidating the mechanisms of ischemic- pharmacologic- and exercise-induced preconditioning by using the ischemia/reperfusion model in genetically engineered animals, (ii) studying protection of ischemic myocardium by using gene and/or cell therapy, and (iii) elucidating adaptations to ischemia/reperfusion injury in the aging heart.

**Michal Hetman, MD, PhD**  
Professor of Neurological Surgery  
Endowed Professor of Molecular Signaling  
M.D., Warsaw Medical School (1994)  
Ph.D., Experimental and Clinical Medicine, Polish Academy of Sciences (1997)

**Research Interests:** Role of signaling kinases in neuronal repair and demise.

**Kyung Hong, PhD**  
Assistant Professor of Medicine  
Ph.D., Environmental Medicine/Toxicology, University of Rochester, School of Medicine and Dentistry (2003).

**Research Interests:** Cell therapy for ischemic cardiomyopathy; cardiac regeneration/repair; cardiac stromal cell biology.

**Ben Jenson, MD**  
Professor and Senior Scientist, James Graham Brown Cancer Center  
M.D., Baylor College of Medicine (1966)

**Research Interests:** Translational immunology: humoral responses to prevent infection by papillomavirus.

**Steven P. Jones, PhD**  
Professor of Medicine  
Ph.D., Physiology, Louisiana State University Health Sciences Center, Shreveport (2002)

**Research Interests:** Metabolic signaling in the cardiovascular system.
**Swati Joshi-Barve, PhD**  
Assistant Professor of Medicine  
Ph.D., Biochemistry, University of Kentucky (1992)

**Research Interests:** Mechanisms of Steatohepatitis (nonalcoholic and alcoholic fatty liver disease); Mechanisms of Alcohol-induced Immune Dysfunction; Mechanisms of Hepatocellular Carcinoma.

**Brad B. Keller, MD**  
Professor of Pediatrics and Bioengineering  
Kosair Charities Chair and Chief, Division of Pediatric Heart Research  
M.D., Pennsylvania State University (1985)

**Research Interests:** Cardiovascular bioengineering: Development of 3D tissues for heart repair and regeneration.

**Irina Kirpich, PhD, MPH**  
Assistant Professor of Medicine  
Ph.D., Biology and Physiology, Pomor State University (1997)  
MPH, University of Louisville (2014)

**Research Interests:** Gut-liver interactions in alcoholic and non-alcoholic liver disease; alcohol and dietary fat mediated intestinal and liver injury; gut barrier, microbiome, probiotics; epigenetics and hepatic steatosis; Oxidized Metabolites of Linoleic Acid (OXLAMs).

**Chi Li, PhD**  
Associate Professor of Medicine  
Ph.D, Molecular Biology, Columbia University (1998)

**Research Interests:** Mechanisms of apoptotic pathways initiated from different intracellular organelles. Molecular and cellular mechanisms that affect inflammation and immunity.

**Robert C. G. Martin, MD, PhD**  
Professor and Sam and Lolita Weakley Endowed Chair in Surgical Oncology  
M.D., University of Louisville (1995)  
Ph.D., Pharmacology & Toxicology, University of Louisville (2008)

**Research Interests:** Genetic predisposition to cancer.
Craig J. McClain, MD  
Professor of Medicine  
M.D., University of Tennessee-Memphis (1972)  

**Research Interests:** Role of cytokines in liver injury and other forms of hepatotoxicity, interactions with nutrition and toxicology.

Kelly M. McMasters, MD, PhD  
Endowed Professor and Chair of Surgical Oncology  
Ph.D., Cell and Developmental Biology, Rutgers University (1988)  
M.D., University of Medicine and Dentistry of New Jersey (1989)  

**Research Interests:** Adenoviral vector cancer gene therapy; Development of vectors that selectively replicate in cancer cells; Mechanisms of E2F-1-induced apoptosis.

Lacey R. McNally, PhD  
Assistant Professor of Medicine  
PhD, Veterinary Medical Science, Louisiana State University (2004)  

**Research Interests:** Metastasis suppressors, such as KISS1, as a method for preventing and treating metastatic pancreatic and ovarian cancers; Mechanisms of chemotherapy resistance and alternative treatment for macro-metastasis and recurrence in ovarian and prostate cancers; Mechanisms involved in organ specific metastasis of pancreatic, prostate, and breast cancers.

Michael L. Merchant, PhD  
Associate Professor of Medicine  
PhD, Chemistry, University of Arkansas (1994)  

**Research Interests:** Translational research - the discovery and understanding of biomarkers of renal disease; Basic Research - Mechanisms of renal function decline and fibrosis; Basic Research - Mechanisms for the transition from acute to chronic disease

Chin K. Ng, PhD  
Associate Professor of Radiology  
Ph.D., Medical Physics, University of Wisconsin (1989)  

**Research Interests:** Development, evaluation, and kinetic studies of radiopharmaceuticals; the use of molecular imaging for biomedical research.
Matthew A. Nystoriak, PhD
Assistant Professor of Medicine
Ph.D., Pharmacology, University of Vermont, College of Medicine (2010)

Research Interests: Regulation of vascular calcium signaling and blood flow in diabetes.

Martin G. O’Toole, PhD
Assistant Professor of Bioengineering
Ph.D., Chemistry, University of Louisville (2008)


Timothy E. O’Toole, PhD
Assistant Professor of Medicine
Ph.D., Biological Chemistry, University of Michigan (1987)

Research Interests: Function and regulation of the endothelium in various disease states; Role of miRNA in endothelial regulation towards understanding how diabetic conditions and pollutant exposure affects endothelial miRNA content and the consequent changes in protein expression levels and cellular function.

Donald M. Miller, MD, PhD
James Graham Brown Professor of Medicine
M.D., Duke University (1973); Ph.D., Biochemistry, Duke University (1973)

Research Interests: Molecular and clinical oncology; modulation of oncogene expression; triplex DNA based gene therapy; treatment of melanoma.

M. Michele Pisano, PhD
Professor of Molecular, Cellular and Craniofacial Biology
Ph.D., Anatomy, Thomas Jefferson University (1985)

Research Interests: Molecular developmental toxicology; gene-environment interactions in normal and abnormal embryonic development; growth factor directed cellular signal transduction in embryonic cell growth and differentiation.
Shesh N. Rai, PhD
Professor of Bioinformatics and Biostatistics; Wendell Cherry Chair in Clinical Trial Research
Ph.D., Statistics, University of Waterloo (1993)

Research Interests: Clinical Trials, Survival Analysis, Bioinformatics, Mixed Effects Model, Sample Survey, Quantitative Risk Assessment

George C. Rodgers, MD, PhD
Professor of Pediatrics; Humana Chair of International Pediatrics
Ph.D., Organic Chemistry, Yale University (1964)
M.D., State University of New York (1975).

Research Interests: Toxicokinetics in drug overdoses and pharmacokinetics in pediatric disease states.

Jesse Roman, MD
Professor and Chair of Medicine
M.D., University of Puerto Rico School of Medicine (1983)

Research Interests: Extracellular matrices and integrin receptors in lung development, injury, and repair; Role of nicotinic acetylcholine receptors and control of matrix expression in lung; Lung tissue remodeling in tobacco- and ethanol-related lung disorders; Control of lung carcinoma growth by extracellular matrices.

David A. Scott, PhD
Professor of Oral Immunology & Infectious Diseases
Ph.D., Microbiology and Immunology, McGill University (1997)

Research Interests: Tobacco-induced alterations to microbial-associated molecular patterns of Porphyromonas gingivalis; Tobacco-induced alterations to innate-pathogen interactions; Tobacco alkaloid amplification of endogenous anti-inflammatory pathways; Identification of gingivitis- and periodontitis-specific infrared molecular signatures.

Sanjay Srivastava, PhD
Professor of Medicine
Ph.D., Chemistry, University of Lucknow (1993)

Research Interests: Delineating the mechanisms by which environmental pollutants cause endothelial activation, vascular inflammation, insulin resistance and atherosclerosis.
**Jill M. Steinbach-Rankins, PhD**  
Assistant Professor of Bioengineering  
Ph.D., Biomedical Engineering, Arizona State University (2009)  

**Research Interests:** Design and development of drug and gene delivery vehicles for physiologically difficult-to-deliver-to microenvironments.

---

**Yi Tan, PhD**  
Assistant Professor of Pediatrics  
Ph.D., Biomedical Engineering, Chongqing University (2004)  

**Research Interests:** Signaling pathways and therapeutic strategies in diabetic complications including cardiomyopathy, cardiac insulin resistance, stem cell mobilization and ischemic angiogenesis.

---

**David J. Tollerud, MD**  
Professor and Chair of Environmental and Occupational Health Sciences  
M.D., Mayo Medical School (1978)  
M.P.H., Harvard Medical School (1990)  

**Research Interests:** Occupational and environmental health; Occupational toxicology; molecular epidemiology.

---

**Janice E. Sullivan, MD**  
Professor of Pediatrics  
M.D., University of Minnesota (1988)  

**Research Interests:** Clinical pharmacology with a focus on developmental pharmacokinetics and pharmacodynamics.

---

**Brian (Binks) W. Wattenberg, PhD**  
Associate Professor of Medicine  
Ph.D., Biological Chemistry, Washington University (1981)  

**Research Interests:** Sphingosine-kinase and lipid signaling. Trafficking of tail-anchored proteins.

---

**Marcin Wysoczynski, PhD**  
Assistant Professor of Medicine  
Ph.D., Pomeranian Medical University (2009)
**Research Interests:** Innate immunity in myocardial repair.

**Jun Yan, MD, PhD**  
Professor of Medicine and Endowed Chair in Translational Research  
M.D., Jiangsu University School of Medicine (1985)  
Ph.D., Immunology, Shanghai Jiaotong University School of Medicine (1997)  

**Research Interests:** Immunotherapy and vaccines for treatment of cancer and infectious diseases.

**Hong Ye, PhD**  
Associate Professor of Medicine  
Ph.D., Biophysics, Keele University (1998)  

**Research Interests:** Research to understand the structure and mechanism of tumorigenesis, with focus on Notch signaling pathway and chromosome DNA damage; X-ray crystallography, in combination with other biochemical and biophysics methods to understand the function of various molecular complexes.

**Walter H. Watson, PhD**  
Assistant Professor of Medicine  
Ph.D., Toxicology, University of Kentucky (1999)  

**Research Interests:** Oxidative stress and redox signaling; Mechanistic toxicology; Alcoholic and nonalcoholic fatty liver disease.

**Wolfgang Zacharias, PhD**  
Professor of Medicine  
Ph.D., Biochemistry, Philipps-University, Marburg, Germany (1980)  

**Research Interests:** Ribozymes for gene therapy in rheumatoid arthritis; involvement and roles of cathepsins in oral cancers; gene expression profiling with DNA microarray chip technology.

**Xiang Zhang, PhD**  
Professor of Chemistry  
Ph.D., Bioanalytical Chemistry, Purdue University (2001)  

**Research Interests:** Molecular systems biology, by exploiting practical and efficient high-throughput technologies for analyses of complex mixtures to facilitate the development of preventive, predictive and personalized medicine for the promotion of health and wellness.
FACULTY WITH EMERITUS APPOINTMENTS

Benz, Frederick W., Professor Emeritus, Ph.D., Pharmacology, University of Iowa (1970).

Carr, Laurence A., Professor Emeritus; Ph.D., Michigan State University (1969).

Chen, Theresa, Professor Emerita; Ph.D., University of Louisville (1971).

Dagirmanjian, Rose, Professor Emerita; Ph.D., University of Rochester (1960).

Darby, Thomas D., Professor Emeritus; Ph.D., Medical College of South Carolina (1957).

Hurst, Harrell E., Professor Emeritus, Ph.D., Toxicology, University of Kentucky (1978).

Jarboe, Charles H., Professor Emeritus; Ph.D., University of Louisville (1956).

Rowell, Peter P., Professor Emeritus, Ph.D., Pharmacology and Therapeutics, University of Florida (1975).

Williams, W. Michael, Professor Emeritus, Ph.D., University of Louisville (1970); M.D., University of Louisville (1974).

FACULTY WITH ADJUNCT APPOINTMENTS

- **James A. Blank**, Adjunct Associate Professor of Pharmacology and Toxicology; PhD, Pharmacology and Toxicology, University of Louisville School of Medicine (1985).

- **Osama El-Tawil**, Adjunct Professor of Pharmacology and Toxicology, PhD, Toxicology, University of Medicine and Dentistry of New Jersey/Cairo University (1997)

- **Adrian J. Fretland**, Adjunct Assistant Professor of Pharmacology and Toxicology; PhD, Pharmacology and Toxicology, University of Louisville School of Medicine (2000).

- **John C. Lipscomb**, Adjunct Associate Professor of Pharmacology and Toxicology; PhD, Pharmacology and Toxicology, University of Arkansas for Medical Sciences (1991).

- **Kevyn E. Merten**, Adjunct Assistant Professor of Pharmacology and Toxicology, PhD, Pharmacology and Toxicology, University of Louisville School of Medicine (2007)

- **Kristin J. Metry-Baldauf**, Adjunct Assistant Professor of Pharmacology and Toxicology; PhD, Pharmacology and Toxicology, University of Louisville School of Medicine (2007).
• **Arnold J. Schecter**, Adjunct Professor of Pharmacology and Toxicology, MD, Howard University Medical School (1962); MPH, Columbia University (1975)

• **Jesse D. Sutton**, Assistant Clinical Professor of Pharmacology and Toxicology, PharmD, University of Montana (2012)

• **Irina Tcherepanova**, Adjunct Professor of Pharmacology and Toxicology, PhD, Molecular Pharmacology, Albert Einstein College of Medicine (1996).

• **Joshua M. Thornburg**, Adjunct Assistant Professor of Pharmacology and Toxicology, PhD, Pharmacology and Toxicology, University of Louisville School of Medicine (2007)

• **Eric M. Vela**, Adjunct Assistant Professor of Pharmacology and Toxicology; PhD, Virology and Gene Therapy, University of Texas Health Sciences Center at Houston (2005).

• **Chad Wilkerson**, Adjunct Assistant Professor of Pharmacology and Toxicology, PhD, Biochemistry & Molecular Biology, Louisiana State University Health Sciences Center (2002).

**OFFICE STAFF**

**Blair Cade**  
Department Manager & Exec. Asst. to Vice Provost

**Tracey Pender**  
Program Coordinator, Sr.

**Florence Su**  
Program Coordinator, Sr.

**Hannah Bitter**  
Administrative Assistant (temporary part-time)

**Marion McClain**  
Research Facilitator (Primary appointment in Department of Medicine; Part time in Department of Pharmacology and Toxicology)

**Shiloh Tatum**  
Unit Business Manager, Intermediate (Primary appointment in Department of Medicine; Part time in Pharmacology and Toxicology)

**2015 NEW GRADUATE STUDENT CLASS**

**Adrienne Bushau**  
B.S., Chemistry, University of Louisville
Christine Dolin
B.S., Chemistry, University of Louisville

Nagawa El-Baz
B.Sc., Pharmaceutical Sciences, Mansoura University

Elizabeth Hollis
B.A., Chemistry, Hanover College

Divya Karukonda
Bachelor of Pharmacy, Rajiv Gandhi University of Health Sciences
Masters in Pharmaceutical Sciences, Jawaharlal Nehru Technological University
Alyssa Laun
B.S., Biology & Psychology, University of Louisville

Qian Lin
B.S., Pharmacy, Wenzhou Medical University

Jamie Rush
B.S., Microbiology, University of Oklahoma

Doug Saforo
B.A., Biology, University of Louisville
Rachel Speer  
B.S., Molecular Bioscience and Biotechnology, Rochester Institute of Technology

Sanet Steyn  
B.S., Biology & Chemistry, Emory University  
M.S., Biology, Emory University

Jamie Young  
B.S., Biology, University of Maine

GRADUATE STUDENTS

Adcock, Scott  
Al-Maqtari, Tareq  
Avila, Diana  
Baldauf, Keegan  
Barve, Aditya S.  
Bushau, Adrienne  
Carlisle, Samantha  
Chen, Wei Yang (Jeremy)  
Dolin, Christine  
Dupre, Tess  
Donde, Hridgandh
### 2015 GRADUATES

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Advisor Name</th>
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<tr>
<td>Hridgandh Donde</td>
<td>Ph.D.</td>
<td>Shirish Barve, Ph.D.</td>
<td></td>
<td>Mechanisms and intervention strategies for alcohol and HIV-antiretroviral therapy-induced liver injury</td>
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<td>Keegan J. Baldauf</td>
<td>Ph.D.</td>
<td>Nobuyuki Matoba, Ph.D.</td>
<td></td>
<td>Studies on the impacts of a plant-made recombinant cholera toxin B subunit on the gastrointestinal tract</td>
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<td>Pritesh P. Kumar</td>
<td>Ph.D.</td>
<td>Zhao-Hui (Joe) Song, Ph.D.</td>
<td></td>
<td>Searching for novel ligands for the cannabinoid and related receptors</td>
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<td>Zimple D. Kurlawala</td>
<td>M.S.</td>
<td>Levi J. Beverly, Ph.D.</td>
<td></td>
<td>Regulation of receptor tyrosine kinases by UBQLN1</td>
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<td>Stephen L. Wechman</td>
<td>M.S.</td>
<td>Kelly M. McMasters, M.D., Ph.D.</td>
<td></td>
<td>Improved oncolytic virotherapy by increasing virus spread within tumors</td>
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<td>Lauren G. Poole</td>
<td>M.S.</td>
<td>Gavin E. Arteel, Ph.D.</td>
<td></td>
<td>Alcohol-enhanced acute lung injury: Role of plasminogen activator inhibitor-1 and the transitional extracellular matrix</td>
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<td>Harshulkumar M. Pandit</td>
<td>M.S.</td>
<td>Robert C.G. Martin, II, M.D., Ph.D.</td>
<td></td>
<td>Identifying hepatocellular carcinoma (HCC) cells with cancer stem cell-like properties</td>
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<tr>
<td>Nicole M. Jackson</td>
<td>M.S.</td>
<td>Brian P. Ceresa, Ph.D.</td>
<td></td>
<td>The regulation and mechanisms of EGFR-mediated apoptosis in MDA-MB-468 cells</td>
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<td>Tess V. Dupre</td>
<td>M.S.</td>
<td>Leah J. Siskind, Ph.D.</td>
<td></td>
<td>Identifying novel renoprotective strategies for cisplatin-induced AKI</td>
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<td>Samantha M. Carlisle</td>
<td>M.S.</td>
<td>David W. Hein, Ph.D.</td>
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<td>Investigating pathway changes associated with varying levels of human arylamine N-acetyltransferase 1 (NAT1) activity</td>
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<td>Tareq Al-Maqtari</td>
<td>Ph.D.</td>
<td>Aruni Bhatnagar, Ph.D. &amp; Kyung Hong, Ph.D.</td>
<td></td>
<td>Promoting differentiation and survival of human c-kit+ cardiac progenitor cells ex vivo</td>
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<td>J. Caleb Greenwell</td>
<td>M.S.</td>
<td>Jesse Roman, M.D.</td>
<td></td>
<td>Role of nicotinic acetylcholine receptors in lung cancer</td>
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</table>

### FACULTY HONORS

**Antimisiaris:**
- ASCP leadership honor at annual meeting.

**Arteel:**
- Coauthor on abstract (Anders et al; see section 1E) selected for an oral presentation at Digestive Disease Week annual meeting.
Trainee (Poole) received a travel award from the Alcohol and Immunology Research Interest Group (AIRIG), to attend the annual Society for Leukocyte Biology meeting.
Trainee (Poole) received Doctoral Basic Science Graduate Student Award at Research!Louisville annual meeting.
Appointed Fellow of the American Association for the Study of Liver Diseases (FAASLD).
Coauthor on abstract (Anders et al) selected for the Resident Research Award at the AASLD annual meeting.

Beier:
- Abstract selected for oral presentation, Digestive Disease Week 2015, Washington, DC
- Resident Research Award (for Anders LC’s abstract), AASLD 66th annual meeting, San Francisco, CA

Chen:
- Honored at University of Louisville 14th Annual Celebration of Faculty Excellence, September, 2015
- Senior author on a poster awarded a junior investigator award from the Research Society on Alcoholism, RSA annual meeting, San Antonio, Texas.

Hood:
- NCI Cancer Education Program, Norbert J. Burzynski Award, 2nd place, Professional Student Category, “Development of Immunomodulatory Exosomal Nanocarriers to Treat Melanoma,” Thomas Noel, MS (1st year medical student, mentor Joshua L. Hood), Research!Louisville, October 27-30, 2015, Louisville, KY
- Selected through an internal competition to represent the University of Louisville School of Medicine’s Beckman Young Investigator Grant application.
- Selected through an internal competition to represent the University of Louisville School of Medicine’s Searle Scholars Program Grant application.
- Selected through an internal competition to represent the University of Louisville School of Medicine’s PEW Scholars Program in the Biomedical Sciences application.

Kidd:
- American Society for Pharmacology and Experimental Therapeutics (ASPET) Underrepresented Graduate Student Travel Award Travel
- American Society for Pharmacology and Experimental Therapeutics (ASPET), 1st Place Delores C. Shockley Best Abstract Award

Lukashevich:
- Distinguished University Scholar

Palmer:
- Recognition of Endowed Chair appointment at the annual faculty celebration of excellence. (Appointed to an endowed chair in the School of Medicine as the Helmsley
Siskind:
- Nominee for the American Society of Cell Biology, Early Career Award
- Co-Chair, South Eastern Regional Lipid Conference, Nov. 10-13th 2015, Cashiers, NC

States:
- **Laila Al-Eryani**: First place graduate student poster presentation, Dermatology Specialty Section, Society of Toxicology
- **Laila Al-Eryani**: Second Place graduate student poster presentation, Metals Specialty Section, Society of Toxicology
- **Laila Al-Eryani**: First Place PhD student poster presentation, Ohio Valley Regional Chapter, Society of Toxicology
- **J. Mason Hoffman**: First Place, Masters Student poster presentation, Ohio Valley Regional Chapter, Society of Toxicology

Wise, J.:
- Education Award, Society of Toxicology
- University Scholar, University of Louisville
- Selected to appear in "Who's who in biomedical research".
- Coauthor on student posters selected for awards

**STUDENT HONORS**

**Dr. Pritesh Kumar** was honored with the 2014 KC Huang Outstanding Graduate Student Award at the Department of Pharmacology and Toxicology welcome picnic held August 14, 2015. The award is named in honor of Professor KC Huang who served as a distinguished department faculty member from 1953 to 1998. Dr. Kumar received his PhD in pharmacology and toxicology in 2015. His faculty mentor Zhao-Hui (Joe) Song included in Dr. Kumar's nomination that he had published 7 scientific papers during his dissertation studies, four as first author. He presented his research at many national and international scientific meetings, including selections for oral presentation and receipt of a best graduate student presentation award. Dr. Kumar was very active in a number of activities at UofL, including the LCME accreditation process, and service as a SIGS ambassador, and on the Graduate Student Council. Dr. Kumar is CEO of PhytoSciences Inc., a company developing advanced medicinal cannabis-based therapeutics. Dr. Kumar joins a distinguished group of **KC Huang Outstanding Graduate Student Awards**.

**Shanice V. Hudson** received an NIH-funded diversity supplement to support her PhD training. Her dissertation project is funded by an NIH R01 parent grant to Professor Gavin
Alyssa Laun, a participant in the National Cancer Institute-funded Cancer Education Program at the University of Louisville, received a travel award from the International Cannabinoid Research Society to present her research at their 25th annual symposium held July 2015 in Wolfville, Nova Scotia Canada. Alyssa was the youngest attendee selected to give an oral presentation of her research entitled "Cannabigerol modulates the efficacy of amandamide on the CB2 cannabinoid receptor". Alyssa is pursuing her research under the direction of Professor Zhao-hui (Joe) Song in the Department of Pharmacology & Toxicology and was accepted into the PhD program in Pharmacology and Toxicology.

Laila El-Aryani (mentor Dr. Chris States) received the Sinclair Student Award from the Dermal Toxicology Specialty Section and the second place graduate student award in the Metals Toxicology Specialty Section at the March 2015 national meeting of the Society of Toxicology held in San Diego, California.

Dominique Jones (mentor Dr. La Creis Kidd) received a national travel award and the first place Delores C. Shockley Best Abstract Award at the April 2015 national meeting of the American Society for Pharmacology and Experimental Therapeutics held in Boston, Massachusetts.

Samantha Carlisle (mentor Dr. David Hein) received a national travel award to attend the June 2015 annual NIGMS-sponsored workshop on metabolomics in Birmingham, Alabama.

Gretchen Holz (mentor Dr. Igor Lukashevich) received an international travel award to present her abstract at the July 2015 annual meetings of the American Society for Virology in London, Ontario, Canada.

Nicole Jackson, former University of Louisville Cancer Education Program participant and current Department of Pharmacology & Toxicology PhD candidate received a $1200 travel award from the American Society of Cell Biology to present her research entitled Cyclic GMP Dependent Protein Kinase (PKG) as a Mediator of EGFR-Induced Apoptosis in Breast Cancer at their annual meetings December 12-16 in San Diego, CA. Nicole is carrying out her dissertation research in the laboratory of Dr. Brian Ceresa.

Pharmacology and Toxicology graduate students were honored at the annual meetings of the Ohio Valley Society of Toxicology held in Highland Heights, Kentucky in November. Laila Al-eryani (mentor Dr. Chris States) received the first place award for her research poster in the PhD graduate student category. J. Mason Hoffman (mentor Dr. Chris States) received the first place award for his research poster in the MS graduate student category. Marcus W. Stepp (mentor Dr. David Hein) was selected for oral presentation of his research in the PhD graduate student category. His mentor is Professor David Hein.

Diana Avila (mentors Dr. Shirish Barve and Laila Gobejishvili); Wei-yang Chen (mentors Drs. Swati Joshi-Barve & Craig McClain); Tuo Shao (mentor Dr. Wenke Feng) received prestigious Presidential Poster of Distinction Awards at the annual meetings of the American Association for Study of Liver Diseases in San Francisco, November 2015.
Department of Pharmacology and Toxicology students & faculty receive awards at 2015 Research!Louisville

- **Cierra Sharp**: First place Masters Basic Science Graduate Student Award (mentors Leah Siskind and Levi Beverly)
- **Rachel Speer**: Second place Masters Basic Science Graduate Student Award (mentor John Wise Sr.)
- **Lauren Poole**: First place Doctoral Basic Science Graduate Student Award (mentor Gavin Arteel)
- **Harshul Pandit**: Second place Doctoral Basic Science Graduate Student Award (mentor Robert Martin)
- **Ashley Mudd**: First place Louisville Chapter-Women in Medicine and Science Award (mentor Ramesh Gupta)
- **Nicole Jackson**: Third place Louisville Chapter-Women in Medicine and Science Award (mentor Brian Ceresa)
- **Desmond Stewart**: First place NCI Cancer Education Program Norbert J. Burzynski Award Professional Student Category (mentor Geoffrey Clark)
- **Thomas Noel**: Second place NCI Cancer Education Program Norbert J. Burzynski Award Professional Student Category (mentor Joshua Hood)
- **Hailey Griffey**: First place NCI Cancer Education Program Norbert J. Burzynski Award Undergraduate Student Category (mentor Brian Ceresa)
- **Alexander Sobolev**: Third place NCI Cancer Education Program Norbert J. Burzynski Award Undergraduate Student Category (mentor Lacey McNally)

**Jamie Young**, a Department of Pharmacology and Toxicology graduate student in the laboratory of Dr. John Wise Sr. received a prestigious travel award to present her research at the Environmental Mutagenesis and Genomics meeting scheduled for September 2015 in New Orleans.

**Tess Dupre**, a Department of Pharmacology and Toxicology graduate student in the laboratory of Dr. Leah Siskind has received a prestigious STARS travel award to present her research at the American Society of Nephrology scheduled for November 2015 in San Diego.

**PHARMACOLOGY & TOXICOLOGY PUBLICATIONS**

**Faculty with Primary Appointments and Students/Post-Doctoral Fellows**


2. Antimisiaris D. ADAPT: 100 CEU Training for Certification in Patient Care Skills (Canadian CPhA): Lead content consultant and author for United States version with APhA. Patient Care vignette development and portrayal. 7 online modules, each lasting 2-4 weeks. 2015


14. Beier JI, Jokinen JD, Holz GE, Whang PS, Martin AM, Warner NL, Arteel GE, Lukashevich IS. Novel Mechanism of Arenavirus-Induced Liver Pathology, PLOS One, 10:e0122839. 2015. PMID: 25822203; PMCID: PMC4378851


http://www.tandfonline.com/action/doSearch?quickLinkJournal=&journalText=&AllField=Donninger&publication=47078613


61. Sharma RJ, Gupta RC, Bansal AK, Singh IP. Metabolite fingerprinting of Eugenia jambolina fruit pulp extracts using NMR, HPLC-PDA-MS, MALDI-TOF-MS and ESI-MS/MS spectrometry. Natural Products Communications, 10, 1-8, 2015


**PHARMACOLOGY & TOXICOLOGY ABSTRACTS**

**Faculty with Primary Appointments and Students**

**Antimisiaris:**
1. 2015-University of Louisville Geriatric Outpatient Clinic and Family Medicine Clinic: Survey of Beta Blocker Use in the Elderly. (Poster Presentation at ASHP Mid-Year Meeting, Dec 2015, New Orleans, LA)

**Arteel:**

National/International:
3. Watson WH, Burke TJ, Massey VL, Arteel GE, Merchant ML (2015) Activity of the zinc finger transcription factor NHF-4α is inhibited by arsenic in the livers of mice with diet-induced nonalcoholic fatty liver disease. The Toxicologist 144:422

Local/Regional:


Beier-Arteel:

National/International:

1. Bushau AM, Anders LC, Douglas AN, Lang AL, Joshi-Barve S, Poole LG, Massey VM, Falkner KC,
7. Lang AL, Kaelin BR, Yeo H, Hudson SV, McKenzie CM, Sharp CN, Poole LG, Arteel GE, and Beier JI (2016) Critical Role of Mammalian Target of Rapamycin (mTor) in Liver Damage Caused by VC Metabolites in Mice. The Toxicologist. Supplement to Toxicological Sciences (in press).

Local/Regional:

8. Lang AL, Kaelin BR, Yeo H, Hudson SV, McKenzie CM, Sharp CN, Poole LG, Arteel GE, and Beier JI (2015) Inhibiting mammalian target of rapamycin (mTOR) via rapamycin blunts liver damage caused by VC metabolites in mice. Research! Louisville annual meeting, Louisville, KY.
10. Yeo H, Anders LC, Bushau AM, Kaelin BR, Arteel GE, Cave MC, McClain MJ and Beier JI (2015) Exploring Energy Metabolism Changes In Vinyl Chloride Induced Non-
Alcoholic Fatty Liver Disease (NAFLD). Research! Louisville annual meeting, Louisville, KY.


Ceresa:
National/International:
1. Jun 2015: 7th International Conference on cGMP, Trier, Germany, Jackson, N. and Ceresa, B. Cyclic GMP Dependent Protein Kinase (PKG) as a mediator of EGFR-Induced Apoptosis in Breast Cancer.

Chen:

Freedman:


**Gupta:**


**Hein:**


Hood:

Kidd:

National/International:

Local/Regional:
3. Packer, T., Jones D.Z., Kidd L.R. Impact of Quercetin on miR-21, Cell Proliferation and Migration of Metastatic and Non-Metastatic Prostate Cancer Cell lines. Research
Louisville!, Louisville, Kentucky, October, 2015.

Lukashevich:

Matoba:
multiple HPV types” Plant-Based Vaccines, Antibodies & Biologics. June 8 – 10, 2015, Lausanne, Switzerland.


Siskind:
National/International:


**Local/Regional:**


**Song:**


2. Laun AS and Song ZH. Cannabigerol Modulates the Efficacy of Anandamide on the CB2 Cannabinoid Receptor. Research Louisville!, Louisville, KY, October 2015.

States:
Published abstracts:


Local/Regional meetings:


Wise, J.: National/International:

Comparison of the Cytotoxic and Genotoxic Effects of Hexavalent Chromium in Human, Aquatic Reptile and Aquatic Mammal Skin Cells. Environmental and Molecular Mutagenesis 56(S1): P71.


Local/Regional:


Wise, S.:


ACTIVE GRANTS/CONTRACTS
Faculty with Primary Appointments

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<tr>
<th>Agency/Number</th>
<th>Title</th>
<th>Role</th>
<th>PI</th>
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<td>NIH RO1</td>
<td>Asthma in Older Adults: Identifying Phenotypes and Factors</td>
<td>Co-I</td>
<td></td>
<td>2/1/2015-1/31/2020</td>
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<td>HRSA (GWEP- Geri workforce education program)</td>
<td>Ky Rural Underserved Geriatric Interprofessional program (KRUGIEP)</td>
<td>Key</td>
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<td>July 2015, 2016, 2017</td>
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<td>Coulter Translational Partnership Subgrant Award</td>
<td>Virtual Manager to Assist Caregivers of Patients with Dementia</td>
<td>Co-I</td>
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<td>May 2014-August 2015</td>
<td>$105,000</td>
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<td><strong>Arteel, Gavin</strong></td>
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<td>T32 ES011564</td>
<td>UofL Environmental Health Sciences Training Program</td>
<td>Mentor</td>
<td>Hein</td>
<td>$1,918,730</td>
<td>$119,015</td>
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<td>U01 AA021901</td>
<td>Novel therapies in alcoholic hepatitis</td>
<td>Co-I</td>
<td>McClain</td>
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<th>Project ID</th>
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<th>PI/Co-I</th>
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<th>Description</th>
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<td>R01 AA021978</td>
<td>Role of ECM and inflammatory remodeling in alcohol-induced liver and lung damage</td>
<td>Arteel</td>
<td>Julian Arpeel</td>
<td>University of Louisville</td>
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<td>$1,125,000</td>
<td>$562,500</td>
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<td>R01 AA021978S1</td>
<td>Role of ECM and inflammatory remodeling in alcohol-induced liver and lung damage</td>
<td>Hudson</td>
<td>Julian Arpeel</td>
<td>University of Louisville</td>
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<td>$83,418</td>
<td>$39,871</td>
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<td>R01 DK100414</td>
<td>Therapeutics development for hepatic fibrosis</td>
<td>Maitra</td>
<td>Rakesh Maitra</td>
<td>University of Louisville</td>
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<td>$94,767</td>
<td>$47,383</td>
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<tr>
<td>MFE-135424 (CIHR postdoctoral fellowship)</td>
<td>Role of extracellular matrix and inflammatory remodeling in alcohol liver and lung damage</td>
<td>Mohamed</td>
<td>Abdul Mohamed</td>
<td>University of Louisville</td>
<td></td>
<td>$88,000</td>
<td>n/a</td>
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<td>1K01DK09 6042-01</td>
<td>Enhancement of NAFLD risk by vinyl chloride: interaction of gut-liver-adipose axis</td>
<td>Beier</td>
<td>Julian Beier</td>
<td>University of Louisville</td>
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<td>7R01AI09 3450-02</td>
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<td>1R03DK1079 12</td>
<td>Vinyl chloride-NAFLD interaction</td>
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<td>Ceresa, Brian</td>
<td>Ubiquilin1 regulates EMT and metastasis of human lung adenocarcinoma</td>
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<td>Beverly Ceresa</td>
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<td>NIH/NIGMS R01GM09287 4</td>
<td>Endocytic Regulation of EGFR Signaling</td>
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<td>NIH/NEI R01EY02149 7</td>
<td>Modulation of EGFR Signaling to Promote Corneal Wound Healing</td>
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<td>PanOptica, LLC</td>
<td>The Effect of PAN-90806 on EGFR-mediated Corneal Epithelial Homeostasis</td>
<td>Ceresa</td>
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**Chen, Shao-yu**
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<td>R01 AA021434</td>
<td>Role of microRNA in ethanol-induced apoptosis and teratogenesis</td>
<td>Chen</td>
<td>07/2013 – 06/2018</td>
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<td>R01AA020265</td>
<td>Role of Siah1 in ethanol-induced apoptosis and teratogenesis</td>
<td>Chen</td>
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<td>R01AR063630</td>
<td>Coordinated cytoskeletal dynamics in skin somatic stem cells</td>
<td>Wu</td>
<td>09/2013 – 08/2018</td>
<td>$1,125,000 ($125,000 for subcontract)</td>
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**Clark, Geoffrey**

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<td>R01 CA133171-01A2</td>
<td>The Role of the Ras effector Nore1a in tumor suppression</td>
<td>Clark</td>
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<td>NIH Eureka Award/1R01CA153132-01</td>
<td>Oncopigs as a better model for human cancer</td>
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<td>NIH Excite Award</td>
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<td>Jewish Hosp Fund for Excellence</td>
<td>The development of a novel small molecule inhibitor of lung cancer</td>
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<td>2015-2017</td>
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**Gupta, Ramesh**

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<td>R43-CA-162417</td>
<td>Sustained, Target Delivery for Treatment of Cervical Pathologies</td>
<td>Gupta Spencer</td>
<td>07/12-12/15</td>
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<td>U.S. Highbush Blueberry Council</td>
<td>Therapeutic Activity of Blueberry Against Lung Cancer</td>
<td>Gupta</td>
<td>08/13-07/15</td>
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<td>KY Matching</td>
<td>This grant is a supplement to the SBIR Phase I grant listed above</td>
<td>Gupta</td>
<td>01/13-12/15</td>
<td>$150,000 (Directs)</td>
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<td>Coulter Foundation</td>
<td>Treatment of Cervical Pathologies by Curcumin Delivered Locally by a Polymeric Device - Phase I</td>
<td>Gupta Parker O’Toole</td>
<td>07/14-02/16</td>
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<td>Dept of Defense</td>
<td>Prevention &amp; Treatment of Breast Cancer by Blueberry</td>
<td>Gupta</td>
<td>09/14-08/17</td>
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<td>STTR Phase I</td>
<td>Exosomal Drug Formulation</td>
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<td>Plant-based cancer therapeutics</td>
<td>Gupta</td>
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**Hein, David W.**
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<td>Cempra Pharmaceuticals, Inc.</td>
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<td>Elsa U. Pardee Foundation</td>
<td>Magnetic Resonance Imaging and Tracking of Melanoma Exosomes</td>
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<td>Hood</td>
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<td>NIH NIGMS R21 GM107894-03</td>
<td>Continuous Separation of Melanoma Exosomes using Field-Flow Fractionation</td>
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<td>Gale/Hood</td>
<td>1/1/15-7/31/16</td>
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<td>Melittin Modified Exosome Immunotherapy for Melanoma</td>
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<td>NIH NCI R21 CA198249-01</td>
<td>A Novel Vaccination Stratagem for Lung Cancer</td>
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<td><strong>Lukashevich, Igor S</strong></td>
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<td>Pushko</td>
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<td>NIH Microbicide Innov</td>
<td>Plant-produced Actinohivin as a Candidate HIV Microbicide</td>
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<td>Plant-Based Expression Systems for New Vaccines and Therapeutics</td>
<td>Sub-Proj PI</td>
<td>Wilkerson</td>
<td>9/30/11-10/29/16</td>
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<td>Brown Ca Ctr Helmsley Charitable Trust Prog</td>
<td>Immunotherapeutic potential of plant-made CTB against colitis and colon cancer</td>
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<td>Plant-made N-mannosylated cholera toxin B subunit as a novel vaccine scaffold</td>
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<td>Griffithsin-based Rectal Microbicides for PREvention of Viral ENtry (PREVENT)</td>
<td>Core C PI</td>
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<td>Plant-made lectibody targeting tumor-associated high-mannose-glycan antigens as a novel cancer immune-therapeutic/diagnostic agent</td>
<td>CoBRE Pilot PI</td>
<td>Miller</td>
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<td><strong>Palmer, Kenneth</strong></td>
<td><strong>NIH/NIHLB 1U10HL1275 18-01</strong></td>
<td>The EXCITE Program: Expediting Commercialization, Innovation, Translation and Entrepreneurship</td>
<td>Leaders hip team</td>
<td>Bates, Miller, Krentzel</td>
<td>04/01/2015 – 03/21/2018</td>
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<td><strong>NIH/NIAID U19 AI 113182-01</strong></td>
<td>Griffithsin-based rectal microbicides for prevention of viral entry (PREVENT)</td>
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<td>07/01/2014 – 06/30/2019</td>
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<td>PREVENT Program Administrative Core</td>
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<td>07/01/2014 – 06/30/2019</td>
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<td>Project 2: PREVENT program preclinical studies</td>
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<td>07/01/2014 – 06/30/2019</td>
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<td><strong>Leona M and Harry B Helmsley Charitable Trust 2014-PG-MED001</strong></td>
<td>Advancing the discovery and development of plant-made pharmaceuticals</td>
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<td><strong>NIH/NIAID R33 A1088585</strong></td>
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<td>Wilkerson, Palmer</td>
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<td>Wilkerson, Palmer</td>
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<td>Targeting Ceramide-Induced Kidney Cell Apoptosis and Necrosis for the Treatment of Acute Kidney Injury</td>
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<td>Molecular Determinants of Cannabinoid Activity</td>
<td>P Reggio</td>
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<td>Prince William Sound Regional Citizens’ Adv Council/955-12-02</td>
<td>Toxicology of Chemical Dispersants in Alaskan Whales</td>
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<td>Toxicity of Gold Nanoparticles in Human Lung Cells</td>
<td>PI</td>
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<td>Particulate Cr(VI) Toxicology in Human Lung Epithelial Cells and Fibroblasts</td>
<td>PI</td>
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<td>07/01/08 - 12/31/18</td>
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**RESEARCH GRANTS SUBMITTED**

Faculty with Primary Appointments

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<th>Role</th>
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<th>Project Period (requested)</th>
<th>Budget Request</th>
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<tr>
<td>Antimisiaris</td>
<td>Process Based Medication Management Education for Three Categories of Stake Holders</td>
<td>Investigator</td>
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<td></td>
<td>University of Louisville Alcohol Research Center</td>
<td>Pilot Core Director, Proj. Co-I; Education Co-director</td>
<td>McClain</td>
<td>12/01/15-11/30/20</td>
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<td>Hepatobiology and Toxicology COBRE</td>
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<td>Contribution of environmental toxicants in the development of metabolic disease</td>
<td>Co-I</td>
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<td>04/01/16-03/31/21</td>
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<td>Start Date</td>
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<td>Chlorinated solvent-induced NASH/TASH interaction: insight into mechanisms and potential risk</td>
<td>PI</td>
<td>Beier</td>
<td>12/15/20</td>
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<td>VA</td>
<td>Military Chemical Exposures and Liver Disease in Veterans</td>
<td>Co-I</td>
<td>Cave</td>
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<td>Gilead Sci</td>
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<td>Research Scholars Program in Liver Disease</td>
<td>chloride on mitochondrial function in NAFLD: potential mechanism of nutrient:toxicant interaction</td>
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<td>NIEHS/1R01ES027039-01</td>
<td>Chlorinated solvent-induced NASH/TASH interaction: insight into mechanisms and potential risk</td>
<td>PI   Beier</td>
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<td>T32 ES011564 (A1)</td>
<td>UofL Environmental Health Sciences Training Program</td>
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<td>R25CA134283</td>
<td>University of Louisville Cancer Education Program</td>
<td>Mentor Hein and Kidd</td>
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**Ceresa**

<p>| NIH/NEI T35EY026509                          | Summer Vision Sciences Training Program | Co-PI Ceresa/Kaplan | 4/1/16-3/31/21 | $40,066 |
| NIH/NIGMS R01GM118681                        | ErbB3 as a Regulator of EGFR signaling | PI Ceresa | 4/1/16-3/31/21 | $1,250,000 |
| NIH/NEI R21EY027032                         | Identifying novel c-Cbl antagonists to promote corneal epithelial regeneration | PI Ceresa | 7/1/16-6/30/18 | $275,000 |
| Molecular Targets CoBRE Pilot Project Program | ErbB3 Regulation of EGFR signaling | PI Ceresa | 7/1/15-6/30/17 | $150,000 |
| KY Lung Cancer Research Program              | ErbB3 as a Regulator of EGFR Signaling in Lung Cancer | PI Ceresa | 6/1/16-05/31/18 | $150,000 |
| ADA                                         | Enhancement of corneal wound healing via c-Cbl antagonists. | Mentor Neves | 4/1/16-3/31/19 | $177,468 |
| UofL ExCITE Product Development Grant       | Novel compound designed to enhance corneal wound healing | Mentor Neves | 9/1/15-8/30/17 | $150,000 |
| NIH/NIGMS                                  | Endocytic regulation of EGFR:effector communication by tyrosine phosphorylation | Mentor Bankston | 4/1/15-3/31/18 | $239,859 |
| ACS                                         | Endocytic regulation of EGFR phosphorylation and downstream signaling | Mentor Bankston | 7/1/15-6/30/18 | $163,500 |
| OCAST | Role of MMP-2 in corneal epithelial barrier function in homeostatic cell turnover and disease | Co-I | Wiechmann | 7/1/15-6/30/18 | $135,000 |
| NIH/NCI | UofL Cancer Education Program | Mentor | Hein | 4/1/16-3/31/21 | $1.62M |
| <strong>Chen</strong> | | | | | |
| NIAAA/P50 Alcohol Center grant | The role of nutrition in the development/progression of alcohol-induced organ injury. Project 3 PI | McClain | 5/1/16-4/30/21 | $9,000,000 (total budget) $1,207,000 Project 3 total budget |
| NIH P20 | North Carolina Central University-JGBCC Cancer Health Disparity Partnership Faculty Mentor | Kidd | 10/15-9/19 | $798,636 |
| NIH S10 | Shared Instrument grant Participant | Bickford | | |
| NIH NCI R25 | Cancer Education Mentor | Hein | | |
| NIH NIEHS T35 | Summer Training Program in Environmental Health Mentor | Prough | | |
| NIH NIEHS T32 | UofL Training Program in Environmental Health Mentor | Hein/Arteel | | |
| <strong>Clark</strong> | | | | | |
| Avon Foundation | A Novel Inhibitor of RalGDS to Inhibit Breast Cancer Metastasis PI | Clark | 2015-2017 | $200,000 |
| St. Baldrick Foundation | Novel inhibitors of RalGDS for Medulloblastoma PI | Clark | 2015-2016 | $100,000 |
| CDMRP Breast cancer research | A RalGDS Inhibitor to Suppress Breast Tumor Growth and Metastasis PI | Clark | 2015-2018 | $394,000 |
| National Pancreas Association | Novels RalGDS inhibitors to antagonize pancreatic cancer PI | Clark | 2015-2016 | $50,000 |
| CDMRP ovarian Cancer | A RalGEF inhibitor as a novel therapeutic approach to ovarian cancer PI | Clark | 2016-2018 | $250,000 |
| CDMRP Pancreatic cancer | Novel RalGEF inhibitors to antagonize pancreatic cancer PI | Clark | 2016-2018 | $400,000 |
| Kentucky Lung Ca Res Prog | Novel small molecule inhibitors of the Ras PI | Clark | 2016-2018 | $150,000 |</p>
<table>
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<tr>
<th>Funders</th>
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<th>PI/co-PI (Co-PIs)</th>
<th>Start-End Period</th>
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<tr>
<td>NIH R21</td>
<td>Novel RaGDS Inhibitors to Block Pancreatic Cancer</td>
<td>Clark</td>
<td>2016-2018</td>
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<td>NIH Transformative R01</td>
<td>Turning Hyde Into Jekyll: Re-Routing Oncogenic Signaling to Induce Cancer Cell Death</td>
<td>Bates</td>
<td>2016-2021</td>
<td>$1,000,000</td>
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<td>NIH U01</td>
<td>Physiologically relevant K-Ras synthetic lethals</td>
<td>Clark (Co-PIs Siskind and Beverley)</td>
<td>2016-2020</td>
<td>$2,500,000</td>
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<td>Freedman</td>
<td>NIEHS/R01 ES026628-01</td>
<td>Contribution of environmental toxicants in the development of metabolic disease</td>
<td>Freedman</td>
<td>10/16-09/21</td>
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<td>Freedman</td>
<td>NIEHS/R01 ES027039-01</td>
<td>Chlorinated solvent-induced NASH/TASH interaction: insight into mechanisms and potential risk</td>
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<td>07/16-06/21</td>
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<td>DoD/PR151975 - GRANT11959061</td>
<td>A phylogenomic approach for the identification and development of biomarkers of transition metal toxicity in humans</td>
<td>Freedman</td>
<td>10/2016-09/2017</td>
<td>$304,421 ($200,000 direct)</td>
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<td>European Commission Horizon 2020</td>
<td>Phylogenomic Toxicology: a statistically robust framework for predictive human safety testing</td>
<td>Co-Project PI Colbourne</td>
<td>09/2015-08-2020</td>
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<td>NCI/R25 CA134283</td>
<td>University of Louisville Cancer Education Program</td>
<td>Member Hein</td>
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<td>UoFL Environmental Health Sciences Training Program</td>
<td>Member Arteel</td>
<td>06/2016-05/2021</td>
<td>$2,211,776 ($2,183,597 direct)</td>
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<td>NIEHS/T35 ES014559</td>
<td>Summer Environmental Health</td>
<td>Member Prough</td>
<td>04/2016-03/2021</td>
<td>$190,000 ($175,000 direct)</td>
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<td>Sciences Training Program</td>
<td>Fuqua</td>
<td>Economic Analysis and Development of Broad-spectrum Antiviral Griffithsin</td>
<td>PI Fuqua</td>
<td>11/15-10/17</td>
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<td>UofL Excite RFA #1</td>
<td>UofL Excite RFA #2</td>
<td>Cost-Guided Process Design and Optimization in the Production of the Broad-Spectrum Antiviral Griffithsin</td>
<td>PI Fuqua</td>
<td>2/16-1/18</td>
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<tr>
<th>Gupta</th>
<th>NCI SBIR Phase I</th>
<th>New Technology for Isolation of Anthocyanidins and Efficacy against Human Cancers</th>
<th>PI Gupta Spencer</th>
<th>4/15-3/16</th>
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<td>NCI SBIR Phase II</td>
<td>Exosomal Drug Delivery</td>
<td>PI Gupta Spencer</td>
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<td>NCI R01</td>
<td>Novel Adjuvant Therapy for Lung Cancer</td>
<td>PI Gupta</td>
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<td>NCI R01</td>
<td>Strategies for Effective Treatment of Breast Cancer</td>
<td>PI Gupta</td>
<td>7/16-6/21</td>
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<th>University of Louisville Cancer Education Program</th>
<th>PI Hein</th>
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<td>NIH R15-HD087911</td>
<td>The interaction between NAT2 acetylator status and exposure to tobacco smoke on ovarian reserve and in vitro fertilization outcomes</td>
<td>Co-I Taylor</td>
<td>04/01/16 - 03/31/19</td>
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<td>NIEHS T35 ES014559</td>
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<td>Prough</td>
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<td>NIH R25 GM119953</td>
<td>Building a Bridge to Biomedical Research Careers (BBBRC)</td>
<td>Kakar &amp; Joshua</td>
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<td>NIH P20 CA203535</td>
<td>2/2 NCCU/JBCC Cancer Health Disparity Partnership</td>
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<td>Stem cells in regenerative medicine and tumorigenesis</td>
<td>Ratajczak &amp; Kakar</td>
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<td>NIH T32</td>
<td>Stem cells in physiology and pathophysiology</td>
<td>Ratajczak &amp; Kakar</td>
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<td>$1,905,380</td>
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<td>Cempra Pharmaceuticals, Inc.</td>
<td>Investigation into the N-acetylation of solithromycin</td>
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<td>NIH NCI R21 CA196672-01</td>
<td>Tracking Melanoma Exosomes in vivo</td>
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<td>JGBCC Molecular Targets CoBRE Phase III Pilot OGMB130096</td>
<td>Antagonizing the Pre-Metastatic Niche with Melittin Modified Melanoma Exosomes</td>
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<td>7/1/15 – 6/30/17</td>
<td>$150,000(Direct)</td>
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<td>DOD Peer reviewed cancer research program, idea award with special focus W81XWH-15-PRCRP-IA</td>
<td>Targeting phenotype switching via tumor-derived exosomes to inhibit melanoma progression</td>
<td>McMasters (JGBCC collaborator)</td>
<td>(Nanomedicine expert required)</td>
<td>5/1/16 – 4/30/18</td>
<td>4% effort</td>
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<td>Beckman Young Investigators Program</td>
<td>Tuning exosomes to modulate macrophage inflammation: A therapeutic strategy for melanoma</td>
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<td>Exosome Immunotherapy for Melanoma</td>
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<td>7/1/16 – 6/30/19</td>
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<td>Pew Biomedical Scholars Program</td>
<td>Exosomal Adjuvant Nanocarriers to Treat Melanoma</td>
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<td>8/1/16 – 7/31/20</td>
<td>$240,000</td>
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<td>SBIR Contract Solicitation PHS 2016-1 NIH/NCI 344</td>
<td>Continuous exosome and oncosome separations using a modified SPLITT system</td>
<td>Co-PI (Research component, application scientist)</td>
<td>Petersen/Gale/Sant (Univ. of Utah Espira Inc.) and Hood (U of L)</td>
<td>7/1/16 – 3/31/17 (9 months)</td>
<td>$32,467 (Phase I, Direct)</td>
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<td>NIH Director’s New Innovator Award Program (DP2), RFA-RM-13-007</td>
<td>Pioneering Immunotherapeutic Exosomal Nanocarriers to Treat Melanoma</td>
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<td>9/30/16 – 6/30/21</td>
<td>$1,500,000 (Direct)</td>
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<td>Kidd</td>
<td>NCCU-JGBCC Cancer Health Disparity Partnership</td>
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<td>Kidd/Kimbro</td>
<td>10/1/15-9/30/19</td>
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<td>NCI, NIH P20</td>
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<td>9/1/16-8/31/20</td>
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<td>Kouokam</td>
<td>Recombinant Reassortant Vaccine Platform to Control Lassa Fever</td>
<td>PI</td>
<td>MPI</td>
<td>07/1/16-6/30/11</td>
<td>$1,283,330</td>
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<td>NIAID</td>
<td>A versatile, diamond-based approach to transdermal drug delivery</td>
<td>Co-PI</td>
<td>Paxton</td>
<td>2016-2017</td>
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<td>Lukashevich</td>
<td>Subproject: Plant-made lectibody targeting tumor-associated high-mannose-glycan antigens as a novel cancer immuno-therapeutic/diagnostic agent</td>
<td>PI</td>
<td>Matoba</td>
<td>7/1/15-6/30/16</td>
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<td>Design and Development of a Virus Trap and Safety Net Approach for STI Prevention</td>
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<td>Steinbach</td>
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<td>UofL ExCITE NIH U01 HL127518</td>
<td>Oral Solid Dosage Formulation of Cholera Toxin B Subunit</td>
<td>Co-PI</td>
<td>Hamorsky/ Matoba</td>
<td>10/1/15</td>
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<td>UofL ExCITE NIH U01 HL127518</td>
<td>Oral Solid Dosage Formulation of Cholera Toxin B Subunit</td>
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<td>1R21CA205542-01</td>
<td>Plant-made lectibody for cancer immunoPET and radioimmunotherapy</td>
<td>Co-PI</td>
<td>Guo/ Matoba</td>
<td>4/1/16</td>
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<td>1R21CA208865-01</td>
<td>Investigation of a lectibody targeting tumor-associated oligomannose glycans</td>
<td>PI</td>
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<td>Palmer</td>
<td>Economic Analysis and Development of Broad-spectrum Antiviral Griffithsin</td>
<td>Co-PI</td>
<td>Fuqua/Palmier</td>
<td>11/1/15</td>
<td>10/31/17</td>
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<td>Palmer</td>
<td>Cost-Guided Process Design and Optimization in the Production of the Broad-Spectrum Antiviral Griffithsin</td>
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<td>Fuqua/Palmier</td>
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<td>R01 AI125113-01</td>
<td>Design and development of a virus trap and safety net approach for STI prevention</td>
<td>Co-I</td>
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<td>3/31/21</td>
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<td>Siskind</td>
<td>Identifying physiologically relevant RAS synthetic lethal components</td>
<td>M-PI</td>
<td>Siskind, Clark, Beverly</td>
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<td>1R01CA205601-01</td>
<td>(PQ9) Cisplatin induces accelerated renal aging and chronic kidney disease</td>
<td>M-PI</td>
<td>Siskind, Beverly</td>
<td>3/1/16</td>
<td>2/28/21</td>
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<td>1R01DK110348-01</td>
<td>Mechanisms of Renal Dysfunction Following Repeated Low Dose Cisplatin</td>
<td>M-PI</td>
<td>Siskind, Beverly</td>
<td>7/1/16</td>
<td>6/30/21</td>
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<td>Kentucky Lung Ca Res Prog</td>
<td>Identification of Physiologically Relevant K-Ras Synthetic Lethal Components</td>
<td>PI</td>
<td>Siskind</td>
<td>1/16-12/17</td>
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<td>1R01HL133798-01</td>
<td>Age-dependent matrisome changes predispose to injury-</td>
<td>M-PI</td>
<td>Roman</td>
<td>7/1/16</td>
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<td>NIH/NIDDK (F31)</td>
<td>The role of glycol-sphingolipids in cisplatin-induced mitochondrial dysfunction during acute kidney injury</td>
<td>Siskind, Clark, Beverly,</td>
<td>Mentor/Dupre</td>
<td>9/1/16-8/31/21</td>
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<td>Song R25CA134283-06</td>
<td>UofL Cancer Education Program</td>
<td>Faculty Mentor</td>
<td>Hein/Kidd</td>
<td>9/1/16-8/31/21</td>
<td>$1,620,000</td>
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<td>Wise, J</td>
<td>Mechanisms of Particulate Hexavalent Chromium-Induced Centrosome Abnormalities in Human Lung Cells</td>
<td>Wise</td>
<td></td>
<td>4/01/16-3/31/21</td>
<td>$1,811,096</td>
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<tr>
<td>Department of Defense/CDMRP</td>
<td>Identifying and Ameliorating the Genotoxic and Carcinogenic Interactions of Depleted Uranium, Cobalt, Nickel and Tungsten</td>
<td>Wise</td>
<td></td>
<td>7/1/2016-6/30/19</td>
<td>$1,809,768</td>
</tr>
<tr>
<td>Wise, J</td>
<td>Maternal Heavy Metal Exposure, Fetal Development and Birth Size</td>
<td>Zheng</td>
<td></td>
<td>4/1/16-3/31/20</td>
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<td>Hein and Kidd</td>
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<td>Wise, S</td>
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**DOD/CDMRP**
Identifying and Ameliorating the Genotoxic and Carcinogenic Interactions of Depleted Uranium, Cobalt, Nickel and Tungsten

Co-I J Wise
7/1/16-6/30/19 $1,809,768

**NIH/NIEHS ES025306**
Mechanisms of Particulate Hexavalent Chromium-Induced Centrosome Abnormalities in Human Lung Cells

Collaborator J Wise
4/1/16 - 3/31/21 $1,811,096

**INVITED SCIENTIFIC PRESENTATIONS**
Faculty with Primary Appointments

**Antimisiaris:**
2. AMDA (Am. Medical Directors Association, 2015 annual conference): Dementia, Dysphagia and Avoiding Disaster: Considerations of Altered Medication Administration. March 2015

**Arteel:**
1. Research seminar, 02/15 “Transitional ECM remodeling in hepatic (dys) function.” GI/Liver research group and the Department of Pharmacology and Toxicology, University of Louisville, Louisville, KY.
2. Research seminar, 02/15 “Transitional ECM remodeling in hepatic (dys)function.” Undergraduate Biology Honors program, University of Louisville, Louisville, KY.
3. Research seminar, 03/15 “Transitional ECM remodeling in hepatic (dys)function.” Cardiovascular Innovation Institute, University of Louisville, Louisville, KY.
4. Seminar, 06/15, “How to write a discussion.” NIH R25 Research Program, University of Louisville, Louisville, KY.
5. Research seminar, 05/15 “Transitional ECM remodeling in alcohol-induced organ (dys)function” National Institute on Alcoholism and Alcohol Abuse, Washington DC.
6. Symposium, 05/15, “Writing abstracts well” Digestive Disease Week annual meeting, Washington, DC.
7. Webinar, 12/15, “Transitional ECM changes in hepatic disease beyond collagen and before fibrosis” Steatosis AOP Task Group meeting, USEPA.
8. Organizer, 1/15, research seminar by Anwar Anwar Mohamed, PhD, CIHR and AIHS
Post-doctoral Fellow, Li Ka Shing Applied Virology Institute, University of Alberta, Edmonton AB. Dept of Pharmacology and Toxicology, Louisville, KY.

9. Moderator, 05/15, “Clinical and Experimental Advances in Alcoholic Liver Disease,” Digestive Disease Week annual meeting, Washington, DC.


Beier-Arteel:
1. Research symposium, 10/28/15. Vinyl Chloride Induced Liver Injury. Research!Louisville, Louisville, KY.
2. Poster, 03/23/15. Exposure to Vinyl Chloride Metabolites Exacerbates Liver Injury Caused by High Fat Diet in Mice. Society Of Toxicology Annual Meeting, Phoenix, AZ.
3. Research symposium, 05/17/15. "Mechanistic Insight Into Vinyl Chloride Metabolite-Induced Liver Injury Caused by High Fat Diet in Mice." Digestive Disease Week Annual Meeting, Washington, DC.

Chen:
2. Epigenetic mechanisms underlying ethanol-induced apoptosis and birth defects. Hainan University, HaiKou, Hainan, China, September 22, 2015
8. Epigenetic mechanisms underlying ethanol-induced apoptosis and birth defects. Hainan University, HaiKou, Hainan, China, September 22, 2019
9. NIH, Center for Scientific Review. The Neurotoxicology and Alcohol (NAL) study section. Ad Hoc Member. 2015
10. Grant Review panel, Italian Ministry of Health, Italy, 2015
11. Grant Review panel, Beijing Natural Science Foundation, China, 2015

Clark:
1. “Ras oncogenes and RASSF tumor suppressors”, Dept. Pharmacology University of Louisville.
2. “Striking at the heart of cancer”, Cancer Colloquia, Brown Cancer Center.

Fuqua:

Hein:
2. PhD in Pharmacology & Toxicology Partnership between University of Louisville and Wenzhou Medical University. Second Affiliated Hospital of Wenzhou Medical University, Wenzhou, China, June 2015.

Hood:

Kang:
2. Oct 12, 2015, Plenary Lecture, “3D Printing in Translational Medicine” at the 3rd International Experimental Biology and Medicine Conference, Chengdu, China

Lukashevich:
1. American Society for Microbiology, Biodefense and Emerging Diseases Research Meeting, February 9-11, 2015, Washington, DC
2. 7th Annual NBL-RBL Networking Meeting, UTMB, Galveston, TX, April 12-14, 2015
3. 9th Vaccine & ISV Congress, Seoul, South Korea, 18-20 October, 2015

Matoba:
1. “Therapeutic effects of a cholera toxin vaccine antigen produced in Nicotiana benthamiana plants” Graduate School of Agricultural and Life Sciences, University of Tokyo, Tokyo, Japan, July 6, 2015.
3. “Molecular Farming of Protein Pharmaceuticals” Kanazawa University Medical School, Kanazawa, Japan, July 15, 2015.
4. “Engineering of a lectibody targeting viral- and tumor-associated high-mannose glycans” Department of Chemical Engineering and Materials Science, University of California Davis, November 12, 2015.
5. “Development of Protein Pharmaceuticals Made in Plants” Center for Predictive Medicine, University of Louisville, November 19, 2015.

Myers:
1. Methods of Analysis in HPLC Chromatography, Faculty of Agriculture, Faculty of Medicine, Cairo University, Cairo, Egypt, April, 2015
2. Methods of Analysis in Gas Chromatography and Mass Spectrometry, Faculty of Agriculture, Faculty of Medicine, Cairo University, Cairo, Egypt, April, 2015
3. Analysis of PAH and Aflatoxins by HPLC and GC/MS, Faculty of Agriculture, Faculty of Medicine, Cairo University, Cairo, Egypt, April, 2015
4. Analysis of Pesticides by HPLC and GC/MS, Faculty of Agriculture, Faculty of Medicine, Cairo University, Cairo, Egypt, April, 2015
5. Biomarkers of Environmental Chemicals, Faculty of Agriculture, Faculty of Medicine, Cairo University, Cairo, Egypt, April, 2015
6. Molecular Markers in Toxicology and Epidemiology: Development, Validation and Application of Biomarkers, Faculty of Agriculture, Faculty of Medicine, Cairo University, Cairo, Egypt, May, 2015
7. Molecular Markers in Toxicology and Epidemiology: Development, Validation and Application of Biomarkers, Faculty of Medicine, Cairo University, Cairo, Egypt, May, 2015
8. The University of Louisville, Faculty of Medicine, Cairo University, Cairo, Egypt, May, 2015
9. Molecular Biomarkers in Toxicology, University of Copenhagen, Faculty of Environmental Sciences, Copenhagen, Denmark, November, 2015
10. Analytical Tools for Assessing PAH Exposures, University of Copenhagen, Faculty of Environmental Sciences, Copenhagen, Denmark, November, 2015
11. HPLC Method Development for Assessing Exposures to Polycyclic Aromatic Hydrocarbons, Faculty of Environmental Sciences, Copenhagen, Denmark, November, 2015
12. Keynote Address: Biomarkers in Environmental Toxicology, 2nd International Conference on Toxicology and Environmental Health, Cairo University, Cairo, Egypt, November, 2015
13. Polycyclic Aromatic Hydrocarbons: Analytical Assessments, 2nd International Conference on Toxicology and Environmental Health, Cairo University, Hurghada, Egypt, November, 2015
14. HPLC Methodologies in Detection of Environmental Contaminants, 2nd International Conference on Toxicology and Environmental Health, Cairo University, Hurghada, Egypt, November, 2015
15. Effective Techniques in Manuscript Writing, 2nd International Conference on Toxicology and Environmental Health, Cairo University, Hurghada, Egypt, November, 2015
16. Molecular Markers in Toxicology and Environmental Health, 2nd International Conference on Toxicology and Environmental Health, Cairo University, Hurghada, Egypt, November, 2015
17. Opportunities for Graduate Education at the University of Louisville, 2nd International Conference on Toxicology and Environmental Health, Cairo University, Hurghada, Egypt, November, 2015
18. Introduction to Neuropharmacology, Faculty of Medicine, AinShams University, Cairo, Egypt, November, 2015
19. Adrenergic Agonists and Antagonists, Faculty of Medicine, AinShams University, Cairo, Egypt, November, 2015
20. Gastrointestinal Pharmacology, Faculty of Medicine, AinShams University, Cairo, Egypt, November, 2015
21. HPLC Methodologies in Detection of Environmental Contaminants, Faculty of Medicine, AinShams University, Cairo, Egypt, November, 2015
22. Molecular Markers in Toxicology and Environmental Health, Faculty of Medicine, AinShams University, Cairo, Egypt, November, 2015
23. The University of Louisville, Faculty of Medicine, AinShams University, Cairo, Egypt, November, 2015
24. The Changing Face of Medical Education, Faculty of Medicine, AinShams University, Cairo, Egypt, November, 2015
25. Opportunities for Graduate Education at the University of Louisville, Faculty of Medicine, 6th of October University, 6th of October, Egypt, November, 2015
26. Introduction to Neuropharmacology, Faculty of Medicine, 6th of October University, 6th of October, Egypt, November, 2015
27. Adrenergic Agonists and Antagonists, Faculty of Medicine, 6th of October University, 6th of October, Egypt, November, 2015
28. Gastrointestinal Pharmacology, Faculty of Medicine, 6th of October University, 6th of October, Egypt, November, 2015
29. Molecular Markers in Toxicology and Environmental Health, Faculty of Medicine, 6th of October University, 6th of October, Egypt, November, 2015
30. Problem Based Learning in Medical Education, Faculty of Medicine, 6th of October University, 6th of October, Egypt, November, 2015
31. Medical Education in the 21st Century, Faculty of Medicine, 6th of October University, 6th of October, Egypt, November, 2015

Palmer:
1. Invited Seminar in the Center for Predictive Medicine, University of Louisville.
**Targeting the Glycan Shield: A Broad-Spectrum Antiviral Strategy.** December 15th, 2015


5. Invited participation in the Microbicide Trial Networks Mucosal Assays meeting and forum discussions. August 2015.

6. Invited by the international rectal microbicides advocacy group to present a webinar on updates in the microbicide product pipeline. April 2015.

**Siskind:**

1. Invited Speaker, 2016 Gordon Research Conference on Glycolipid & Sphingolipid Biology, 03/06/2016 - 03/11/2016, Renaissance Tuscany Il Ciocco Resort, Lucca (Barga), Italy.


3. Department of Pharmacology and Toxicology, University of Louisville, Seminar Series, Title: Mechanisms of kidney injury by cisplatin. October 8, 2015, 12 pm.

4. Invited Lecture at the Molecular Endocrine Grand Rounds, University of Louisville Department of Medicine, Division of Endocrinology, Metabolism and Diabetes. Title: The role of bioactive lipids in type II diabetic nephropathy. April 22nd 2015, 4pm.

5. Invited Lecture at the University of Louisville Geriatric Fellowship Didactic Conference. Title: Role of bioactive lipids in renal aging. April 21st 2015, 1pm.


7. Invited Speaker, 2016 Gordon Research Conference on Glycolipid & Sphingolipid Biology, 03/06/2016 - 03/11/2016, Renaissance Tuscany Il Ciocco Resort, Lucca (Barga), Italy.

8. Department of Pharmacology and Toxicology, University of Louisville, Seminar Series, Title: Mechanisms of kidney injury by cisplatin. October 8, 2015, 12 pm.


10. Invited Lecture at the Molecular Endocrine Grand Rounds, University of Louisville Department of Medicine, Division of Endocrinology, Metabolism and Diabetes. Title: The role of bioactive lipids in type II diabetic nephropathy. April 22nd 2015, 4pm.

11. Invited Lecture at the University of Louisville Geriatric Fellowship Didactic Conference. Title: Role of bioactive lipids in renal aging. April 21st 2015, 1pm.

Wise, J.:

INVENTIONS, DISCLOSURES, LICENSE/OPTION AGREEMENTS, PATENT AWARDS, AND BUSINESS STARTUPS
Faculty with Primary Appointments

Antimisiaris:
- Provisional Patent Pending: Virtual Dementia Manager Feb 2015 (OTT RDF on file 2014) no start up. Licensing agreement pending with OTT- contact: Matthew Hawthorne.

Clark:
- A United States provisional patent application, ser. no. 62/196,336, entitled, “Ras Inhibitors, RALGDS Inhibitors, Related Compositions, and Their Uses to Treat Disease,” has been filed.

Fuqua:
- Oxidation Resistant Variants of the HIV Microbicide, Griffithsin – ULRF 15042 – Provisional Filed February 2015 (Prior to Faculty Position)
- Library of Griffithsin Research Tools – Provisional Filed October 2015

Gupta:
- University of Louisville Research Foundation filed the following patent applications to protect the valuable technology described in ULRF Research Disclosure, titled “Milk Derived Microvesicle Compositions and Related Methods”: Provisional filed Feb 2013; PCT filed Feb 2014; U.S. patent filed August 2015. Inventors – R.C. Gupta, R. Munagala, F. Aqil and J. Jeyabalan.

Hood:
- Invention disclosure: U of L Office of Technology Transfer Invention: “Exosome based Immunotherapy for Melanoma” Inventor(s): Joshua L. Hood
Lukashevich

Matoba:
- Research Disclosure: #16014: Avaren-Fc lectibody for broad spectrum cancer immunotherapy and diagnosis

Palmer:

Siskind:

DEPARTMENTAL COURSES
- Medical Pharmacology instruction to second year medical students. Dr. Steve Myers served as departmental liaison.
- Pharmacology and Dental Therapeutics course to dental students. Dr. David Hein served as course director.
- Pharmacology course to second year students in the Dental Hygiene Program. Dr. Steve Myers served as course director.
- Basic Pharmacology course for undergraduate students. Dr. Steven Myers served as course director.
- The Department team taught several courses for graduate students. The individual courses and course directors included:

  PHTX 660 – Principles of Drug and Chemical Action (Dr. Ceresa)
STANDING COMMITTEES

**Graduate Student Affairs and Curriculum Committee**

Dr. Chris States (Chair)
Dr. Brian Ceresa (ex officio)
Dr. Gavin Arteel (2015)
Dr. Leah Siskind (2016)
Dr. Geoff Clark (2017)
Student rep: Marcus Stepp
Student rep: Samantha Carlisle

**Graduate Student Admissions and Recruitment Committee**

Dr. Brian Ceresa (Chair)
Dr. Chris States (ex officio)
Dr. Ramesh Gupta (2015)
Dr. Steve Myers (2016)
Dr. Shao-yu Chen (2017)

**SIBUP/Grievance Committee**

Nobuyuki Matoba (Chair)
Dr. Joe Song (2015)
Dr. Michael Merchant (2016)
Dr. Ramesh Gupta (2017)

**Teaching Evaluation Committee**

Dr. Steve Myers (Chair)
Dr. Juliane Arteel (2015)
Dr. Gavin Arteel (2016)
Dr. Joshua Hood (2017)

Seminar Committee

Dr. Geoff Clark (Chair)
Dr. Gavin Arteel (2015)
Dr. Levi Beverly (2016)
Dr. Igor Lukashevich (2017)

Events Committee

Dr. La Creis Kidd (Chair)
Hannah Bitter
Blair Cade
Florence Su
Dr. Juliane Arteel (2015)
Dr. Swati Joshi-Barve (2016)
Student rep: Marcus Stepp

Wenzhou Medical University and Jilin University Task Force

Dr. David W. Hein (Chair)
Dr. Lu Cai
Dr. Wenke Feng
Dr. James Kang
Dr. Joe Song
Dr. Yi Tan

DEPARTMENTAL EVENTS

- New Faculty Welcome Reception was held February 12 in the Knoefel Conference Room
- New faculty and student welcome picnic was held August 14 at Captain’s Quarters
- Thanksgiving potluck celebration was held November 20 in the CTR
- Department holiday party was held December 12 at Garden Court, Presbyterian Seminary
2015 UNIVERSITY OF LOUISVILLE CANCER EDUCATION PROGRAM CLASS

Marisa Bohn  
University of Cincinnati undergraduate  
Faculty Mentor: Levi Beverly, PhD  
Research Project: Optimizing IHC for cisplatin treated tissue

Logan Bond  
Auburn University graduate  
Faculty Mentor: Robert C.G. Martin, MD, PhD  
Research Project: Intra-operative navigation of a three-dimensional needle localization system for precision of irreversible electroporation needles in locally advanced pancreatic cancer

Andrew Bratton  
University of Louisville undergraduate  
Faculty Mentor: Jason Chesney, MD, PhD  
Research Project: Small molecule inhibition of choline kinase-α decreases proliferation of non-small cell lung cancer
Phillip Burkhardt
Clemson University undergraduate
Faculty Mentor: John Eaton, PhD
Research Project: Radioprotective effects of ferritin

Aneesha Carter
University of Louisville undergraduate
Faculty Mentor: Jesse Roman, MD
Research Project: The interplay between aging and lung inflammation / Remodeling in lung cancer progression

Maggie Chang
University of Louisville undergraduate
Faculty Mentor: David Hein, PhD
Research Project: Effect of arylamine N-acetyltransferase 1 knockout by CRISPR/Cas 9 on doubling time in MDA-MB-231, MCF-7, & ZR-75-1 breast cancer cell line
**Jenna Chong**  
Cornell University undergraduate  
Faculty Mentor: Sham Kakar, PhD  
Research Project: Withaferin A in combination with cisplatin suppresses mucin family proteins in epithelial ovarian cancer cells

**Sarah Duff**  
University of Louisville medical student  
Faculty Mentor: Brian Clem, PhD  
Research Project: Novel PSAT1 small molecule inhibitors decrease breast cancer cell proliferation and synergize with anti-estrogen therapies in endocrine resistant cells

**Rakesh Gadde**  
University of Louisville dental student  
Faculty Mentor: Richard Lamont, PhD  
Research Project: Porphyromonas gingivalis induction of EMT transcriptional factors in gingival epithelial cells
Thomas Gordon III  
University of Louisville undergraduate  
Faculty Mentor: David Samuelson, PhD  
Research Project: A CRISPR/Cas9 system to edit rat Mcs1b candidate causal variants

Hailey Griffey  
University of Louisville undergraduate  
Faculty Mentor: Brian Ceresa, PhD  
Research Project: The effects of ligand treatment on the dimerization of EGFR-GFP and ErbB3-dsRED in Chinese hamster ovary cells

Justin Heidel  
University of Louisville undergraduate  
Faculty Mentor: Jill Steinbach, PhD  
Research Project: Design and synthesis of polymer blend electrospun fibers for sustained release of siRNA to the female reproductive tract
Erica Holland
University of Louisville undergraduate
Faculty Mentor: Rebecca Redman, MD
Research Project: Perceived survivorship needs in patients with human papillomavirus (HPV)-positive and (HPV)-negative head and neck cancer

Brenna Kaelin
University of Louisville undergraduate
Faculty Mentor: Juliane Beier-Arteel, PhD
Research Project: Mechanistic insight into vinyl chloride-induced liver injury: Role of dietary fatty acids

Nicholas Kemper
University of Louisville undergraduate
Faculty Mentor: Kelly McMasters, MD, PhD
Research Project: I3C decreases cyclin E expression and represses cancer cell growth
Alexandra Kiefer  
University of Louisville medical student  
Faculty Mentor: Leah Siskind, PhD  
Research Project: Role of sphingosine kinase 1 and 2 in MYC-induced leukemogenesis

Alyssa Laun  
University of Louisville graduate  
Faculty Mentor: Joe Song, PhD  
Research Project: Cannabigerol modulates the efficacy of anandamide on the CB2 cannabinoid receptor

Christina Leonhardt-Albert  
University of Louisville graduate  
Faculty Mentor: Sandra Sephton, PhD  
Research Project: Circadian rhythms and diurnal profiles of salivary alpha amylase in women with breast cancer
Maya McFrazier  
University of Louisville undergraduate  
Faculty Mentor: David Scott, PhD  
Research Project: Nucleoside diphosphate kinase-dependent suppression of apoptosis in esophageal cancer cells by the oral pathogen Porphyromonas gingivalis

Matthew Neal  
University of Louisville medical student  
Faculty Mentor: Lacey McNally, PhD  
Research Project: Small dual surfactant mesoporous silica nanoparticles demonstrate acidic pH specificity

Bailey Nelson  
University of Louisville medical student  
Faculty Mentor: Susan Galandiak, MD  
Research Project: Genetic polymorphisms in 5-FU related enzymes predict complete pathologic response in rectal cancer
**Thomas Noel**
University of Louisville medical student
Faculty Mentor: Joshua Hood, MD, PhD
Research Project: Development of immunomodulatory exosomal nanocarriers to treat melanoma

**Rachel O'Connor**
University of Louisville undergraduate
Faculty Mentor: Robert C.G. Martin, MD, PhD
Research Project: A multi-organ study using microwave ablation: Comparison of Solero system to the Sulis VpMTA and the NeuWave Certus 140 system

**Chukwuka Okafor**
University of Louisville dental student
Faculty Mentor: Doug Darling, PhD
Research Project: Regulation of oncogenic ZEB1 gene expression by cigarette smoke components
Abbigail Pace
Western Kentucky University undergraduate
Faculty Mentor: Liz Cash, PhD
Research Project: Distress, anxiety, depressive symptoms and malnutrition biomarkers on head and neck cancer progression and overall survival

Thomas Packer, Jr.
University of Louisville undergraduate
Faculty Mentor: LaCreis Kidd, PhD
Research Project: Impact of quercetin on miR-21, cell proliferation and migration of metastatic and non-metastatic prostate cancer cell lines

Rigoberto Perez-Hernandez
Cornell University undergraduate
Faculty Mentor: Jorge Gomez-Gutierrez, PhD
Research Project: Temozolomide enhances breast cancer virotherapy regardless of estrogen receptor status
Henry Roberts
University of Louisville medical student
Faculty Mentor: Susan Galandiak, MD
Research Project: Can cancer cell lines clarify molecular mechanisms of hereditary non-polyposis colorectal cancer?

Cody Sheffield
Western Kentucky University graduate
Faculty Mentor: Levi Beverly, PhD
Research Project: Determining whether SUMO interacts with ubiquilin

John Simmons
University of Louisville undergraduate
Faculty Mentor: Richard C.G. Martin, MD, PhD
Research Project: Wide versus narrow margins after partial hepatectomy for hepatocellular carcinoma
Lee Sims
University of Louisville undergraduate
Faculty Mentor: Jill Steinbach, PhD
Research Project: Effect of hybrid surface-modified nanoparticles on knockdown of HPV 18 E6 in vitro

Alexander Sobolev
Washington University undergraduate
Faculty Mentor: Lacey McNally, PhD
Research Project: pH specific dual targeting of colloidal mesoporous silica nanoparticles for pancreatic adenocarcinomas

Vanessa States
University of Louisville medical student
Faculty Mentor: Susan Galandiak, MD
Research Project: Development of a plasma miRNA panel in detecting response to treatment of colorectal adenoma & colorectal cancer
**Desmond Stewart**  
University of Louisville medical student  
Faculty Mentor: Geoff Clark, PhD  
Research Project: The role of DAB2IP in RASSF-mediated tumor suppression

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**Nichole Stivers**  
University of Louisville medical student  
Faculty Mentor: Chi Li, PhD  
Research Project: Paraoxonase-2 mediates a homoserine lactone-induced apoptosis in breast cancer cells

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**Karen Udoh**  
University of Louisville undergraduate  
Faculty Mentor: J. Christopher States, PhD  
Research Project: Inhibiting the anaphase-promoting complex/cyclosome: An innovative approach for cancer chemotherapy
Jingjing Xiao
Yale University undergraduate
Faculty Mentor: Kelly McMasters, MD, PhD
Research Project: Targeting ATP-binding cassette transporter (ABCB5) in BRAF inhibitor resistant melanoma

Heegook Yeo
University of Louisville undergraduate
Faculty Mentor: Juliane Beier-Arteel, PhD
Research Project: Exploring energy metabolism changes in vinyl chloride induced non-alcoholic fatty liver disease (NAFLD)
PhD Partnership Signing Ceremony with Cairo University
May 5, 2015
PhD Partnership Signing Ceremony with Jilin University
June 2, 2015
Memorandum of Understanding  
In Research, Education and  
Training Programs  
Between the University of Louisville Department of Pharmacology and Toxicology (USA) and  
Cairo University, Egypt

The Department of Pharmacology and Toxicology of the University of Louisville and Cairo University Faculty of Veterinary Medicine and Faculty of Medicine intend to enhance relations between the two universities by developing an academic and cultural exchange in teaching, research and other activities. This agreement describes a MS and PhD partnership in which students can either enter and complete an MS program at Cairo University and then transfer to the University of Louisville to complete the requirements for the PhD in pharmacology and toxicology or apply directly to the MS program in Louisville. The program will be administered and coordinated by Dr. Osama El-Tawil (Cairo University) and Dr. Steven Myers (University of Louisville).

ARTICLE I

Students from Cairo University applying directly into the MS program at the University of Louisville will be required to successfully complete all requirements for the MS degree, including coursework as applicable at the University of Louisville for the MS degree. Courses taken at Cairo University will be evaluated on a case-by-case basis with each student for substitution or waiving of those required courses necessary in obtaining a MS degree at the University of Louisville. Initial evaluations will be conducted by the program coordinators and their recommendations forwarded to the graduate education committee at the University of Louisville for final decision.

ARTICLE II

Students from Cairo University applying to the PhD program at the University of Louisville will be required to have an existing MS degree from the Cairo University or the University of Louisville. Upon completion of the MS in pharmacology, toxicology or forensic medicine to be awarded at Cairo University, top students will be recommended to apply for transfer to the PhD program in pharmacology and toxicology at the University of Louisville. These students will be reviewed for eligibility and acceptance into the graduate program in Pharmacology and Toxicology at the University of Louisville by the graduate education committee and by the program coordinators. Upon transfer to the University of Louisville these students will be required to complete presentation/communication courses as well as the remaining required coursework for the PhD in pharmacology and toxicology. These students also will be required to pass applicable qualifying exams, including preparation, presentation, submission, and defense of their PhD dissertation proposal. Upon successful defense of their PhD proposal, the students will engage in research towards the preparation, presentation, and defense of their PhD dissertation. Following successful completion of all required courses at the University of Louisville and successful defense of their PhD dissertation, the student will be awarded the PhD in Pharmacology and Toxicology from the University of Louisville.
ARTICLE III

The projected number of students successfully entering the program at the University of Louisville will depend upon the quality of the students interested and the capacity of University of Louisville faculty members to incorporate these students into their laboratory research programs.

ARTICLE IV

Requirements for transfer of students from Cairo University into the PhD program in Pharmacology and Toxicology at the University of Louisville include:

1. Letter of application from the student acknowledging that the student is responsible for all required tuition and fees including health insurance to be paid to the University of Louisville.
2. Students from Cairo University will have the opportunity to apply for Scholarships/Fellowships from University of Louisville or other sources (private/governmental) to assist in their educational expenses.
3. Top students from Cairo University in either MS or PhD programs gaining acceptance into the program will be eligible for full tuition waiver for all academic fees and tuition, and health insurance encountered in their program of study. Top students from Cairo University entering the program will be assessed for this eligibility by Dr. Osama El-Tawil (Cairo University) and Dr. Steven Myers (University of Louisville) and their recommendations as program coordinators will be forwarded to the Departmental Graduate Admissions committee.
4. For entering into the MS or PhD program at the University of Louisville students must provide an official transcript detailing with coursework and grades completed at Cairo University.
5. For entering into the PhD program at the University of Louisville students must provide an Electronic copy of MS thesis awarded at Cairo University.
6. A minimum of two recommendation letters that include assessment of applicant’s competency in written and spoken English as well as student’s research skills and applicability for the MS or PhD program. GRE and TOEFL scores are encouraged but can be waived based on interviews with program coordinators or graduate admissions committee.
7. Students will be subject to compliance with entry and visa requirements of Egypt and the United States with assistance provided by the International Center at the University of Louisville.

ARTICLE V

The present Memorandum of Understanding shall be effective for a period of five years from the date it is signed by both parties. It may be renewed unless written notice is given one year before the termination by one of the two parties.
Courses taken at Cairo University in pharmacology, toxicology or forensic medicine can substitute for courses at the University of Louisville, in either the MS or PhD programs. Evaluation of these courses will be conducted on a case-by-case basis by the program coordinators (Dr. Osama El-Tawil (Cairo University) and Dr. Steven Myers (University of Louisville)) as well as the graduate admissions committee at the University of Louisville. Students transferring into the PhD program in pharmacology and toxicology at the University of Louisville will be expected to have completed the following course work at the Cairo University. Credit hours of each specific course are dependent on the student’s major at Cairo University.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit Hours</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General toxicology</td>
<td>3</td>
<td>Drugs used for treatment of genital diseases and Introduction, Dose-response relationship, Factors affecting toxic action, Absorption, distribution, excretion, Metabolism, Bioactivation, Mechanistic toxicology, Diagnosis of poisoning, Treatment of poisoning, Antidotes</td>
</tr>
<tr>
<td>Environmental Toxicology</td>
<td>3</td>
<td>Routes and kinetics of pollutant uptake, Factors affecting pollutant toxicity, Toxic action of air pollutants, Toxic action of water and soil pollutants, Metals and other inorganic chemicals. Organic pollutants (I), pesticides, Organic pollutants (II), hydrocarbons, Nitrate + non-protein nitrogen, Radioactive pollution</td>
</tr>
<tr>
<td>Clinical or applied Toxicology</td>
<td>3</td>
<td>Diagnosis and treatment of poisoning, corrosives, organic acids, Metals (1), Metals (2), Poisonous plants, Animal poisons, Pesticides, hydrocarbons, Nitrate + non-protein nitrogen</td>
</tr>
<tr>
<td>Pharmacology I</td>
<td>3</td>
<td>Recent concepts in Pharmacology, Drugs acting on the different body systems; their actions, mechanisms of actions, side effects, therapeutic uses, and drug interactions</td>
</tr>
<tr>
<td>Pharmacology II</td>
<td>3</td>
<td>Studying the antimicrobial drugs, the drugs used for combating internal and external parasites, antiseptics and disinfectants, antifungal drugs, antiviral drugs, growth promoters, drug residues in food of animal origins</td>
</tr>
<tr>
<td>Physiology</td>
<td>3</td>
<td>Students will explore in details the function of the nervous the endocrine, the reproductive and the digestive system as well their integration to achieve homeostasis. Students will integrate physiological data and mechanisms with the ongoing basic sciences of anatomy, histology and biochemistry and their clinical applications and follow the rapidly changing and details about Molecular physiology and genetics.</td>
</tr>
<tr>
<td>Biochemistry I</td>
<td>3</td>
<td>Students will explore in details the function of the nervous the endocrine, the reproductive and the digestive system as well their integration to achieve homeostasis. Students will integrate physiological data and mechanisms with the ongoing basic sciences of anatomy, histology and biochemistry and their clinical applications and follow the rapidly changing and details about Molecular physiology and genetics. The course also, covers the metabolism of minerals, nucleic acid, porphyrin as well as water and fat soluble vitamins</td>
</tr>
<tr>
<td>Course</td>
<td>Credit</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------------</td>
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</tr>
<tr>
<td>Biochemistry II</td>
<td>3</td>
<td>The course deals with the study of Biological oxidation that includes the bioenergetics, electron transport chain and oxidative phosphorylation and reactive oxygen species. Carbohydrate chemistry and metabolism that include the oxidation of glucose under aerobic (Krebs cycle) and anaerobic condition (glycolysis), glycogen synthesis and conversion of dietary carbohydrates into important metabolic intermediates in the body. Study of Hormones, which include the mechanism of hormone action, hormones chemistry, metabolic and biologic effects of different classes such as peptide hormones (pituitary and pancreatic hormones), steroidal hormones, and hormones derived from tyrosine amino acid. Integration of metabolism is also studied.</td>
</tr>
<tr>
<td>Cellular/Molecular Biology</td>
<td>3</td>
<td>The course deals with various metabolic disorders such as those concerning carbohydrate metabolism, lipid and lipoproteins as well as protein metabolism. It also includes a satisfactory understanding about clinical enzymology demonstrating enzyme markers of various diseases. In addition, it involves a full explanation about liver and renal functions and tests evaluating such functions. Mineral metabolism and endocrine system disorders are also covered during the course. Regulation of gene expression, recombinant DNA technology along with a comprehensive classification of tumor markers and their clinical uses are included.</td>
</tr>
<tr>
<td>Statistics</td>
<td>3</td>
<td>Students will learn the basics of statistical analysis of data, including t-test, ANOVA, chi-square, probability, power analysis, sample size, variance, populations</td>
</tr>
<tr>
<td>Skills and Ethics of Scientific Research</td>
<td>3</td>
<td>Searching and selection of the points of interest, scientific design of the research experiments, treating experimental animals, How to use library and web net for searching for information, different search engines-evaluation of the published materials – bases for good scientific writing-methods of Data Views – scientific publications- Methods of scientific citation.</td>
</tr>
</tbody>
</table>

Students at Cairo University will take courses in order to fulfill requirements for the Masters degree in either Pharmacology or Toxicology. These courses will consist of core content courses that will prepare selected students for eligibility to transfer to the University of Louisville Department of Pharmacology and Toxicology for completion of their studies for the PhD. Core content courses for the Masters degree awarded at Cairo University will consist of courses specific in the following areas of study. Detailed information regarding these courses as well as credit hours and course descriptions are provided.

Curricular requirements to be taken at the University of Louisville for students transferring to the PhD program in pharmacology and toxicology are shown below (steps 1-4 should be completed in the first year of residency).
1. Communication in English (3 credits)
2. Scientific Writing (2 credits)
3. Research Ethics (1 credit)
4. Seminar (1 credit)
5. Defense of dissertation proposal (Final Qualifying Exam)
6. Presentation and Defense of PhD dissertation
7. Award of the PhD in pharmacology and toxicology from the University of Louisville
ARTICLE VII

All instruction and coursework, presentations, examinations and defenses are in English. Curricular requirements at the University of Louisville may be revised as program quality and effectiveness is assessed through faculty teaching and course evaluations, and through the program review process required of all graduate programs at the University of Louisville. Member(s) of the University of Louisville or Cairo University faculty may travel to the partner university to meet with students, faculty, and administrators to discuss curriculum, course quality, students and logistical issues. Payment for faculty time and effort and for research expenses are the responsibility of the University of Louisville upon admission to the MS or PhD program.

ARTICLE VIII

Students transferring from Cairo University will have access to the full complement of services available to students enrolled at the University of Louisville, including health, sports and recreation, the arts, advising, entertainment, and housing. The International Center at the University of Louisville provides comprehensive information and serves all international students at the University of Louisville, including those transferring from Cairo University.

ARTICLE IX

Originals of this Memorandum of Understanding will be prepared in both the Arabic and English languages, and both versions shall be signed by both parties, with each institution to retain an original agreement in Arabic and in English. Notwithstanding the foregoing, both parties agree the English language version of the Memorandum of Understanding is the definitive statement of the agreement between the parties, and is therefore the official version of the Memorandum of Understanding to resolve any issues of interpretation that may arise during the term of the agreement.

Approved by unanimous vote of the Department of Pharmacology and Toxicology faculty, February 12, 2015
Implemented effective with official signing ceremony held at Cairo University, May 5, 2015
Signatures for Cairo University

Gamal Eldin Esmat, Ph.D.
Vice President for Graduate Studies and Research
Cairo University
Professor of Tropical Medicine and Hepatology,
Cairo University.
Director of the Viral Hepatitis Treatment Centers,
Ministry of Health, Egypt

Osama S. El-Tawil, Ph.D.
Professor and Chair
Department of Toxicology and Forensic Medicine
Faculty of Veterinary Medicine
Cairo University
Program coordinator

Prof Dr. Gaber Nassar
Cairo University President
Signatures for University of Louisville

Steven R. Myers, Ph.D.
Associate Professor
Associate Chair for Professional Education
Program coordinator
Department of Pharmacology and Toxicology

Date:

David W. Hein, Ph.D.
Professor and Chair
Department of Pharmacology and Toxicology
Associate University Provost for Strategic Planning

Date:

Beth A. Boehm
Vice Provost for Graduate Affairs
Dean, School of Interdisciplinary and Graduate Studies

Date: 3/10/15

Mordean Taylor-Archer
Vice Provost for Diversity and International Affairs

Date: March 10, 2015
AGREEMENT FOR PhD PARTNERSHIP IN PHARMACOLOGY AND TOXICOLOGY
JILIN UNIVERSITY AND UNIVERSITY OF LOUISVILLE

The Department of Pharmacology and Toxicology of the University of Louisville and the Norman Bethune Health Science Center of Jilin University intend to enhance relations between the two universities by developing an academic and cultural exchange in teaching, research and other activities. This agreement describes a PhD partnership in which students enter an MS program at Jilin University and then transfer to the University of Louisville to complete the requirements for the PhD in pharmacology and toxicology.

Students initially will be admitted into the existing MS program in Medical Science at Jilin University. Their course of study at Jilin University includes coursework that will substitute for required coursework for the PhD in pharmacology and toxicology at the University of Louisville. Top students will be recommended for transfer to the PhD program in pharmacology and toxicology at the University of Louisville. Upon transfer to the University of Louisville these students will be required to complete presentation/communication courses as well as the remaining required coursework for the PhD in pharmacology and toxicology. The students also will be required to pass applicable qualifying exams, including preparation, presentation and defense of their PhD dissertation proposal. Upon successful defense of their PhD proposal, the students will engage in research towards the preparation, presentation, and defense of their PhD dissertation. Following successful completion of all required courses at the University of Louisville and successful defense of their PhD dissertation, the student will be awarded the PhD in pharmacology and toxicology from the University of Louisville.

The projected number of students will depend upon the quality of the students and the capacity of University of Louisville faculty members to incorporate these students into their laboratory research programs.

Requirements for transfer of students from Jilin University into the PhD program in pharmacology and toxicology at the University of Louisville include:
1. Submission of a complete application to the University of Louisville for admittance into the PhD program in pharmacology and toxicology, including complete transcript, GRE and TOEFL scores, and recommendation letters that include assessment of applicant's competency in written and spoken English.
2. Signed letter of application from the student to the Department of Pharmacology and Toxicology at the University of Louisville describing research experience, career ambitions, and full documentation of financial resources available to the student.
3. Signed letter submitted by the student to the Department of Pharmacology and Toxicology acknowledging student responsibility to pay for all required tuition and fees including health insurance to the University of Louisville.
4. Transfer of students will be subject to compliance with entry and visa requirements of China, the United States, Jilin University and the University of Louisville.
5. Interview with member(s) of the University of Louisville faculty.

Courses completed at Jilin University will substitute for courses at the University of Louisville. The curricular requirements to be completed at Jilin University that substitute for the specific courses at the University of Louisville are listed below with additional details on course objectives and faculty teaching these courses is provided as an attachment.

1. Pharmacology (Basic Pharmacology, 120 class h with 6 credits; Clinical Pharmacology, 40 class h with 2 credits; Pharmacokinetic, 40 class h with 2 credits; Pharmacy Experimental Technology, 40 class h 2 credits) total 240 h with 12 credits
2. Cell Biology (40 class h with 2 credits)
3. Physiology (80 class h with 4 credits)
4. Biochemistry (60 class h with 3 credits)
5. Medical Statistics (60 class h with 3 credits)
6. Medical English (60 class h + 20 h Oral English seminar attendance & Presentation with 4 credits)
7. Medical Research Methods (30 class h with 1.5 credit)
8. Medical Molecular Biology (40 class h with 2 credits)

Curricular requirements to be taken at the University of Louisville for students transferring to the PhD program in pharmacology and toxicology are shown below:

Fall Semester of first year
1. Communication in English (3 credits)
2. Scientific Writing (2 credits)
3. Seminar (1 credit)
4. Defense of dissertation proposal (Final Qualifying Exam)

**Spring Semester of first year**

1. Research Ethics (1 credit)
2. Registration for PhD candidacy (2 credits)

**Subsequent requirement**

1. Registration for PhD candidacy (2 credits) every semester
2. Successful Presentation and Defense of PhD dissertation for award of the PhD in pharmacology and toxicology from the University of Louisville

All instruction and coursework, presentations, examinations and defenses are in English. Curricular requirements at the University of Louisville may be revised as program quality and effectiveness is assessed through faculty teaching and course evaluations, and through the program review process required of all graduate programs at the University of Louisville.

All tuition and fee costs for the PhD program at the University of Louisville, including participation in the health insurance program, is to be paid by the student.

Payment for faculty time and effort and for research expenses are the responsibility of the host university (Jilin University during the MS program and the University of Louisville upon transfer to the PhD program). No additional support to the student or waiver of required tuition and fees will be provided by the University of Louisville.

Students transferring from Jilin University will have access to the full complement of services available to students enrolled at the University of Louisville, including health, sports and recreation, the arts, advising, entertainment, and housing. The International Center at the University of Louisville provides comprehensive information and serves all international students at the University of Louisville, including those transferring from Jilin University.

This agreement shall be effective upon approval by both universities and shall remain in effect indefinitely subject to the right of either institution to withdraw from the agreement by giving no less than one (1) year written notice to the other institution. Any termination shall not affect the obligations already in progress prior to termination.

Any changes or additions to this agreement shall be agreed to in writing by both universities.
Signatures for the University of Louisville:

[Signature]

David W. Hein,
Chair, Department of Pharmacology and Toxicology
Associate University Provost for Strategic Planning

[Signature]

Beth A. Boehm,
Vice Provost for Graduate Affairs
Dean, School of Interdisciplinary and Graduate Studies

[Signature]

Mordean Taylor- Archer,
Vice Provost for Diversity and International Affairs

Date: June 3, 2015
Date: December 16, 2014
Date: December 16, 2014

Signatures for Jilin University:

[Signature]

Professor Gang Chen
Vice President for Graduate and Undergraduate Education
and International Relations

[Signature]

Professor Fan Li
Vice President of Jilin University
Chancellor of Norman Bethune Health Science Center

Date: 2015-6-2
Date: 2015-6-2